Exploring the benefits and challenges of embedded innovation:

Multiple cases from Jordanian mobile telecoms

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List of Abbreviations

Abbreviation	Explanation
CEO	Chief Executive Officer
CI	Closed innovation
CSR	Corporate Social Responsibility
DSL	Digital subscriber line
DOI	Diffusion of innovation
EIS	Embedded innovation systems
FTA	Free Trade Agreements
FLI	Firm level innovation
IC	Intellectual capital
ICT	Information Communication Technology
II	Inclusive innovation
IS	Innovation system
KAAYIA	King Abdullah II fund for development
LTE	Long-Term Evolution
MENA	Middle Eastern and North African
MFS	Mobile financial services
MNOs	Mobile Network Operators
MOICT	The ministry of information and communication technology
O	Orange mobile telecom
OI	Open Innovation
QRCE	Queen Rania Centre for Entrepreneurship
R&D	Research & Development
TRC	Telecommunications Regulatory Committee
TRC	The telecommunication regulatory commission.
U	Umniah mobile telecom
Z	Zain mobile telecom
ZINC	Zain Innovation Campus

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Abstract

This research offers a framework of embedded innovation systems (EIS) that helps understand the mechanisms, drivers, and challenges that encounter multinational mobile telecoms while developing and deploying their services based on this system. Using a case evidence, a purposive sample of Innovation, Marketing, Finance, and Operation executives has been selected. Based on evidence from the three multinational telecoms in Jordan, a case study with multiple units of analysis is presented. Focus groups is the second source of data collection to understand the discourse between the telecoms' customers and the operators on how service innovation is designed and implemented.

The embedded Innovation literature pointed out key models of innovation systems such as Open, Inclusive, Quadrable Helix, Organisational Ambidexterity, and Regional Innovation Support. A proposed conceptual model has been mixed with the firm-level innovation to grasp the advantages of all these models and draw a systemic view of embedded innovation system at the firm-level. Normative Theories of Innovation and the Theory of Innovation Diffusion have been also considered in the proposed model to advance it to a theoretical framework.

Using thematic analysis, three categories of findings have been interpreted and classified. The first, conveys the mechanisms of embedded innovation systems. This theme refers to innovation support system, production environment, R&D infrastructure and policies, and internal factors. The second theme conveys the drivers for Jordanian telecoms to develop EIS, including diversified markets (e.g. fintech industry) for a higher level of competitive advantage, simulating intellectual capital, and creating social innovation initiatives. The third theme conveys the challenges of developing EIS, including lack of customer's trust, managing innovation change, and lack of customer co-creation policy.

The present study offers a contribution to knowledge by theorizing EIS as a systemic firm-level innovation that Simanis & Hart (2008) claimed missing. It also offers an advancement for the regional innovation firm-level innovation developed by Hassink (2001) where telecoms service innovation is the context not a standard line of production. The theory building process followed in this study uncovered new relationships between the intellectual capital, and innovation change management. It also emphasised on the role of customer trust during the design, implementation, and deployment of EIS. At the practical level, this study offers a systemic guide for telecoms professionals to understand the key success factors of EIS systems and know how to face the obstacles they encounter when involving the wider stakeholders of the Jordanian telecoms in this system.

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Chapter 1: Research Introduction

1.1. Jordan Telecom Sector

In response to the substantial transformations occurring at the global stage, Jordanian telecom organisations are facing various challenges. Today, the competition has outdated the traditional ways in which mobile services were designed and developed. The success of modern telecom enterprises is dependent on their ability to develop innovative business strategies that are effectively aligned with the overall corporate strategy (Zabadi, 2016; Nabot., Omar & Almousa, 2021). However, capturing value from mobile data services has proven difficult. One key indicator is that revenues generated from services other than voice telephony and SMS are below expectations (Sutherland, 2016; Loudon 2016), even though the number of mobile users worldwide is continuously increasing (Statista, 2021).

This research addresses the drivers, diffusion processes and challenges of embedded innovation in Jordanian telecommunication market. The telecommunication industry is constantly changing and growing in line with the customers' demands and needs. Given the significantly differentiated capabilities and competencies amongst telecommunication firms as an expected contribution, the findings of this study will enhance our knowledge of the innovation diffusion and embedded innovation in a chosen research context.

1.2. Research Problem

Amid enormous intellectual and administrative momentum, rapid technological advancement, globalisation and increased environmental turbulence have brought major transformations in the business world (Souza & El Ghazouani, 2016; Mehrotra & Menon 2021). Today, organisations are induced to continually assess the competitive environment and adopt a proactive approach in translating the random data coming from such environment into meaningful insights (Nayar, 2015; Chorna, Smolnyakova, Volosov, & Lazarieva, 2020). The business intelligence can be achieved by making the optimal use of knowledge acquired from various sources. Ironically, Jordanian business do not realize that sustainable entrepreneurship cannot be achieved without embedding innovation in the business strategy, especially in a highly turbulent environment (Muita, 2013; Adıgüzel, & Sönmez Çakır, 2020).

In developing markets like Jordan, such advanced concepts are regarded as virgin research areas. In the western world, these notions have received considerable importance, which is evidence that the world has moved from era of information technology to era of intelligence. The Jordanian Telecoms must integrate and embed innovation into their structure to enhance their competitive positioning and ensure survival in the long-run (Schlick, 2016; Ranjan & Foropon, 2021). Due to the importance of the Jordanian telecom sector, its closer association with the regional and national economy, its rapid development during the last few years, intense market competition and saturation, the key market players must recognise the significance of (EI) for successful accomplishment of organisational goals at national and international stage (Dishman & Calof, 2008; Gottfried, Hartmann & Yates, 2021).

Nevertheless, it is also important to consider that various organisations attempting to integrate the innovation to achieve sustainable competitive advantage get disappointed when they cannot realise the tangible results. Management should understand that (IS) is abstract by

nature and often produce intangible results that cannot be evaluated and measured by traditional ways (Calof & Wright, 2008; Cavallo, Sanasi, Ghezzi, & Rangone, 2020). Resultantly, senior management demonstrates an unwillingness to invest in (EI) until a tangible improvement in the form of enhanced financial indicators is visible. Researchers are required to identify the challenges and perceptions of senior management towards (EI) with an aim to offer meaningful and convincing recommendations in favour of embedded innovation (Yassine, 2014).

In the context of Jordan, the telecom sector is already facing intense competition and the market has attained its saturation stage. Academic sources have reported that in the Jordanian telecom industry, charges and costs are eating the profits due to market saturation and the continuous influx of new entrants. The market is currently having an extremely high penetration rate of 155 percent (Research & Market, Dec 2020). According to the ranking given by an Arab advisory group, such market is the second highest competitive market in the Middle East region, next to the Saudi Arabian market. (Oxford Business Group, 2020) has reported that the Jordanian telecom sector is facing intense pressure due to various state levies imposed recently.

The telecom report published by Orange, Umniah and Zain Jordan as cited in shows that their combined revenue has decreased sharply by 9 percent after the recent increase in tax (Orange & Umniah & Zain 2021 reports). Orange, Umniah and Zain are the Jordanian telecom organisations, and currently the key player of this industry. They proposed that the impact on profits is more severe, resulting in a decline by 30 to 40 percent. The tax on mobile devices has increased from 8 percent to 16 percent, whereas levy on mobile subscriptions has increased from 12 percent to 24 percent (Orange & Umniah & Zain 2021 reports). Academic sources have further revealed that government is ready to issue a fourth telecommunication license for

a new key telecom player in the Jordanian market (Global news wire, 2020). Recently, the Jordanian government launched a tender that facilitates the entrance of new market player and paved the way for 5G services. Orange, Zain and Umniah telecom skipped the tender and contended that entry of a new market player will have a substantial negative influence on their earnings as well as on the whole telecom market.

The entrance of new players can result in a fierce price war (Jordan's ICT industry, 2020). However, supporters of new entrant contend that it will result in enhanced telecom services and additional government revenue. Moreover, it will induce the current telecom organisations to adopt innovative techniques and offer a high value telecom service (Alrawabdeh, 2014; Yaseen, Dingley & Adams, 2015; Khwaldeh, Alkhawaldeh, Masa'deh, AlHadid, & Alrowwad, 2020). Currently, the market is saturated and mature; still, the data usage is low.

> *"The future is clear to everybody. People and businesses are connecting wirelessly, so we should facilitate this as much as possible."* – (Mohammad Al Taani, CEO and chairman TRC). (Jordan's ICT industry, 2014).

Despite an escalating increase in the telecom users in Jordan there has been a drop in the total revenue derived from the industry. Given the huge investments that telecommunication industries have put in to launch data services, minimal use by users is a critical problem since this lengthens the payback period of the telecoms company investment (Telecom paper, 2021). Moreover, due to rapid changes in the Telecommunication industry, increasing competition and increasing acceptance of digital communication and services, Jordanian telecom organisations need to constantly improve their products, processes, and services to achieve a competitive advantage, remain relevant and maximise their profits (Jayawardhana & Weerawardena, 2014; Fahim, & Baharun, 2017; van der Westhuyzen, 2018) Numerous studies have shown the importance of gathering knowledge from multiple sources

to improve organisational performance and enhance innovation (Sankowska, 2013; Tubigi and Alshawi, 2015; Areed, Salloum, & Shaalan, 2021). In Jordan, the main market competitors are Zain, Umniah, and Orange that is hosted by Zain and focuses solely on Jordanian's residing in Jordan. All these providers have already launched 3G networks which enable them to provide users with an even wider variety of services due to Internet accessibility. However, sources report that Jordanian telecom organisations are facing intense competition due to market saturation.

To succeed in this highly competitive environment, these organisations are required to embed innovation into their organisational structure (Zaske, 2014; Obeidat, Al-dalahmeh, & Masa'deh, 2015; Ayoub, Abdallah & Suifan, 2017; Migdadi, Zaid, Yousif, Almestarihi & Al-Hyari, 2017; Qandah, Suifan, & Obeidat, 2020) . Hence, the study will be executed to highlight the challenges being faced by Jordanian telecom organisations and assess their perceptions towards embedded innovation for the accomplishment of business objectives in a highly saturated market.

The research problem of this study is also based on the knowledge gaps which are directed towards the fact that there are less theories which are related to the embedded innovation. However, this lack of theorisation has motivated the researcher to carry out the research in this field. Since the previous research does not take into consideration the trends and challenges of the telecommunication sector of Jordan, therefore, this research will fill the gap by contributing significantly to this research and positing a new dimension within the context of embedded innovation.

As far as the corporate scenario is concerned, the telecommunication companies at Jordan lacks at strategising innovative measures in their product and services which eventually results in the dissatisfaction level of the customers. The continuous innovation in the product and services offered to the customers can influence the satisfaction level, however, it is necessary to consider the trends which are the part of telecommunication industry globally. This will help the companies to address their issues of lacking innovation and receive greater attention of the customers. A detailed audit of all research gaps is presented at the end of the literature review chapter.

1.3. Research Aim & Objective

This research aims to highlight the challenges being faced by Jordanian telecom organisations and assess their perceptions towards embedded innovation for the accomplishment of business objectives in a highly saturated market. In doing so the researcher will explore the mechanism and processes to build a system for embedded innovation. The researcher will explore the challenges, benefits, and processes of embedded innovation in Jordanian multinational telecommunication organisations. The accomplishment of this research aim would require a thorough understanding of firm-level learning, mechanisms of embeddedness and the boundaries of (IS) in multinational telecoms that operate in developing countries.

Following research, objectives have been formulated to accomplish the aim of the underlying research study.

1) To explore the concept on systems of innovation at the firm level and innovation in a multinational context

2) To critically evaluate the theories of (IS), in the Jordanian telecommunication industry.

3) To examine the trends, drivers, and challenges of embedded innovation within the case of telecommunication sector Jordan

4) To propose a theoretical framework that helps in successful implementation for Embedded Innovation Systems (EIS).

1.4. Research Questions

This research will be executed to answer the following research question:

Main RQ: How to conceptualise and understand the embedded innovation systems in the telecommunication services in Jordan?

This broad research question has been divided into sub-research questions to facilitate the analysis process:

Sub-Q1: How do telecom professionals perceive the Embedded Innovation Systems from a firm-level perspective in Jordan?

Sub-Q2: What are the key elements of Firm-Level Embedded Innovation Systems in Jordanian Telecoms?

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Sub-Q3: What are the key drivers and challenges that encounters the implementation of Embedded Innovation Systems in Jordanian Telecoms?

1.5.   Background to the study

In a contemporary, technologically advanced era, information and communication technologies (ICT) play a prime role in corporations' quest for innovation. However, the environmental complexities and increased competition in the corporate world have made the sole reliance of organisations on ICT services and systems inadequate. Today, organisations must adopt holistic views for attaining sustainable competitive edge based on innovation (Gressgard et al., 2014; Nasifoglu Elidemir, Ozturen, & Bayighomog, 2020). Tools, processes and people are responsible for fostering innovation within the organisation as well as capitalising its benefits. Researchers contend that successful integration and capitalisation of innovation relies on the functionality of these three elements. Hence, ICTs should be integrated and aligned with the adaptation of organisational structure and process for effective innovation process (Hafkesbrink & Schroll, 2011; Costa, & Matias, 2020; Zincir, 2020).

Successful innovation requires an intricate alignment of both capital and human resources along with efficient distribution and diffusion of knowledge to certify the successful adoption and commercialisation of innovation (Nesheim & Gressgård, 2014; Gallego-bono & Chaves-avila, 2020). This feature of complexity has triggered an intense argument between proponents of a protective innovation strategy who advocate the protection of the organisation's innovation process to avoid the imitation of firm's competitive advantage, and

supporters of collaborative innovation approach, founded on effective knowledge disbursement and capitalising organisation's network (Adner, 2006; Hieu, 2021).

Firm's resource-based view contends that organisations can attain sustainable competitive advantage by possessing non-substitutable, inimitable, rare and valuable resources. In this case, the innovation-based success relies on the organisation's ability to convert these resources into core competencies and strategic capabilities. A technologically innovative organisation can gain competitive advantage through the effective exploitation of its core competencies and valuable resources. In such case, an isolating mechanism is required to maintain the competitive edge, which includes information asymmetry.

This means that the organisation has an exclusive access to a transaction as compared to its competitors (Hafkesbrink & Schroll, 2011). However, the current perspective suggests that sustainable competitive advantage could be derived by integrating the innovation into business processes rather than relying on resource-based perspective (Li, Huang & Tsai, 2009). Hence, this study aims to highlight the challenges faced by Jordanian telecom organisations and assess their perceptions towards embedded innovation for the accomplishment of business objectives in a highly saturated market. In doing so, the research will explore the mechanism and processes of building a system for embedded innovation.

Within a resource-based perspective, knowledge is considered extremely important to preserve the competitive advantage (Lin & Wu, 2014). Whereas recent researchers contend that the resource-based theory has lost its relevance with contemporary era to a great extent. Today, we live in an era where digitalisation of information has made it almost impossible for organisations to attain and sustain a technology based competitive advantage in the long run.

Previously, the knowledge was regarded as a resource, (as suggested by the firm's resource-based perspective) but today, the knowledge is regarded as a process initiated by collaborating with the stakeholders and results in the fulfilment of their implied needs (Jarmai, K., & Vogel-Pöschl, H. (2020).

Recent theories emphasize the knowledge sharing and collaborative innovation. The theorists contend that it is not possible to develop the innovation in a vacuum (Adner, 2006). They further argue that technological innovation requires a complicated structure of supportive technologies and services that an organisation cannot handle without collaborating with other parties. The debate does not only entail a vibrant research topic in academia, but, contemporary organisations pursuing innovation are also showing extreme concern, as their survival in a highly turbulent environment has become challenging than ever before. These organisations struggle to choose between the collaborative innovation strategies or resource-based strategy. In the latter case, they can probably miss out the advantages of supportive knowledge and collaboration with customers, suppliers and competitors (Lin & Wu, 2014).

> *"Competition is essential to the innovation process and to capitalist economic development more generally. But so is cooperation. The challenge to policy analysts and to managers is to find the right balance of competition and cooperation, and the appropriate institutional structures within which competition and cooperation ought to take place."* (Teece, 1990, p. 1).

The current scholarly debate in innovation studies revolves around the transformation from a resource-based, linear innovation model to an open, systematic and user-centric innovation model. There are two types of processes to develop innovation systems (IS). They could be through competitiveness or through cooperation, and both would be considered leaner. However, the current innovation debate emphasises that this linear model will not lead to

successful innovation. The other structure is non-leaner innovation model, which is open and systematically considers stakeholders such as including suppliers, users, government, supply chain partners and broader society. Researchers are interested in exploring how knowledge creation develops under unique and new innovation paradigm (Carayannis, Barth & Campbell, 2012). For instance, the quadruple helix innovation model proposes that knowledge creation and utilisation occur in non-linear and highly interactive modes, in different multifactor innovation networks, and involves collaboration with all stakeholders including suppliers, users, government, supply chain partners and broader society. The issue is how contemporary organisations can select between completely linear and utterly non-linear innovation models (Dubina, Carayannis & Campbell, 2012). Contending on the same note, a previous researcher has made the following comment:

The above comment suggests that while functioning in a hypercompetitive market, the firms cannot ensure sustainability until they adopt a collaborative approach with all stakeholders. Such collaboration depends on the innovative communication style and results into strengthened competitive positioning at marketplace. "Competitive pressure" is one of the biggest challenges of contemporary organisations that can be addressed by ensuring effective collaboration with primary stakeholder- as suggested by embedded innovation (Boyer, 2003).

Invariably, the term "embeddedness" has been introduced to address the current innovation challenges being faced by contemporary organisations. This introduction has marked the increasing challenge of substantial integration of firms into surrounding community to ensure that their exploitable knowledge has been well absorbed organic (Hafkesbrink and Evers, 2010). Granovetter (1985) has already marked the organisations' social embeddedness approach and researcher has supported the argument in the context of contemporary economic

sociology. The shift from innovation 1.0 (closed innovation) to innovation 3.0 (embedded innovation) needs to be realised by proactive organisations if they are seeking a long-term survival in such a turbulent scenario. This shift has transformed various traditional management practices by opening various formal and informal communication channels to foster the knowledge flow.

The previous innovation models were closed in a way that they allowed a one-way flow of innovative ideas, hindering the management's ability to maximise the business potential. Later, the open innovation models were introduced that to a great extent, they resolved the issues associated with previous innovation models. However, the open innovation models also have their own limitations. These include increased reliance on the external knowledge sources and expensive collaboration with the external stakeholders. To overcome these weaknesses, the latest innovation model, "innovation 3.0" has surpassed the closed innovation (also called "Innovation 1.0") and open innovation (also called "Innovation 2.0").

The innovation 3.0 has theoretically embraced the ambidextrous structural capabilities of using institutional arrangements for the accomplishment of the embedding process (O'Reilly and Tushman, 2008). These institutional arrangements can be explicit (in the form of formal contracts with other parties), implicit (such as cultivation of a trust culture), exploitative or explorative, mechanic or organic (Hafkesbrink and Evers, 2010), depending on the relationship characteristics, the phase, and the nature of overall innovation process.

Embedded innovation offers a more inclusive approach to service innovation where multinational telecoms can engage end-users in the experimentation and design of their services. Simon & Hart (2009) defines embedded innovation as the process of creating long-

term, sustainable sources of growth and re-embed consumers, potential customers, and producers to generate an infinite number of new services, products, markets and business enterprises in the current economy. Noordhoff et al (2011) defines embedded innovation as the interaction between the supplier and the customers' innovative knowledge to influence innovation, as well as to what degree they benefit from customer relationships. Van der Meer & van Zwieten (2010) define innovation as the total set of activities that lead to the introduction of something new that gives the company defendable competitive advantage. Hassink (2001) defined embeddedness as the firm's interactive learning from other institutions in the direct environment (rivals, suppliers, and regulators) to a high level of inclusiveness. Schumpeter (1950) points out that innovation not only affects current profits and output of the firms but also makes fundamental changes in the organisations, lives, and people.

The integration of innovation 3.0 or embedded innovation has become crucial for modern business enterprises. The businesses operating in a highly competitive industry need to innovate continuously to strengthen their competitive position in the market and increase the survival chances in a highly competitive scenario (Hafkesbrink & Schroll, 2011). Embedded Innovation (EI) is considered a sustainable approach for enhancing service innovation in multinational information and communication technology providers. Telecom sector is one of the advanced ICT providers facing tight competition in a highly saturated local and global market. However, telecom organisations can mitigate the competitive pressure through effective integration of embedded innovation based on external knowledge acquired from the product users and combining knowledge of market needs and technological solution principles (Hafkesbrink & Evers, 2010).

After describing the background to the study, the next section provides a brief overview of the Jordan Telecom Sector before stating the research problem. The next section clarifies how these issues shape the (IS) in the Jordanian telecoms.

1.6. Research Approach

Research is a systematic way of gathering and analysing information, which is targeted at developing or contributing to generalizable knowledge. It is a process through which a particular subject can be studied elaborately for better understanding in order to make future predictions. However, the research approach for this study will adopt theoritical assumption upon which this research is concentrated and the implication of this for the method adopted to acquire and examine research data.

The approaches that form the philosophical basis of research include qualitative and quantitative approaches. The quantitative is also called positivist approach while qualitative is a post-positivist approach. However, a clear divergency exists between the two approaches. Positivism deals with a clear quantitative approach to investigating phenomena and does not offer a required instrument for measuring human behaviours sufficiently. On the other hand, qualitative approach seeks to explore phenomena and its instruments use more flexible style in eliciting and categorizing responses to questions. It also adopts semi-structured methods such as indebt interviews, focus groups and participant observation. It involves analysing and interpreting texts and interviews in order to discover meaningful patterns descriptive of a particular phenomenon (Auerbach & Silverstein, 2003).

Qualitative research analysis appears to be the suitable method for this research. This method could be used to gather in-depth data by discovering the meaning of the business problem and reconstructing the stories of participants on a conceptual level (Guba & Lincoln, 1994). The qualitative method is appropriate for this research because it will be able to interpret the nature of the context by answering the problem being explored (Yates and Leggett, 2016). This approach has several obvious strengths, *firstly*, because it examines issues in detail. Researchers conducting interviews are also not restricted. They have the advantage of asking any question in real time. As the research takes a new direction, the research framework can be revised to match existing new information. In order words, participant's response affects how and which questions the researcher asks next. In addition, the data collections and research questions are adjusted according to the knowledge obtained. Moreover, data from qualitative research has been found to be more compelling and powerful as opposed to quantitative data, which dwells more on numbers.

Qualitative research also has its limitations. The quality of the research depends entirely on the researcher. Cases exist where the researcher's personal ideologies and perspectives affect the quality of the discourse. Their presence in data gathering may also influence the subjects' responses. Qualitative data is often voluminous thus, it takes the time to analyse and interpret it. However, the quantitative method is not the chosen method for the study because quantitative methods are used to correlate data between variables (Horsewood, 2011). For the purpose of this study, the quantitative method is not appropriate because researchers use a quantitative method to test hypotheses (Palinkas et al., 2015). Additionally, the mixed method also is not an ideal approach for this study. Mixed method approach enables researchers to juxtapose qualitative and quantitative techniques to explore the research question (Hay, 2016).

The current research has chosen the qualitative research approach and the research paradigm that complements the qualitative study nature is interpretivism. To examine the extent to which embedded innovation can improve the telecommunication services in Jordan market; the research will collect the qualitative insights from telecom organisations and the clients using the telecommunication services. Moreover, the researcher will also adopt multiple case-study approaches to conducting an organisation specific in-depth investigation of three telecom organisations selected for the research. An effective comparison and contrast of these organisations will determine their levels of adoption on embedded innovation and how this has influenced their service innovation. Semi-structured interviewing approach will be used to collect the data and rationale for choosing semi-structured approach is that it allows the researcher to use the probing technique while maintaining an overall structure. Interview will be conducted with senior management of each selected organisation. For this purpose, researcher plans to interview the branch manager, chief operating officer and chief strategy and business development. The researcher has selected the purposive sampling technique to draw the required number of respondents. The thematic analysis will be conducted to analyse the qualitative insights.

1.7. Research Justification & Rationale

1.7.1. Embeddedness in Innovation Systems

Like other communication industries at the global stage, Jordanian telecommunication organisations also seek modernisation, development and innovation that can elevate organisations' position to the level of excellence and leadership. (Bose, 2008). The

organisations are being induced to adopt a proactive approach towards innovation due to various influential factors present in surrounding environment. However, achievement of leadership and excellence wouldn't be possible until organisations are highly effective, efficient, responsible and honest in fulfilling the corporate mission, accomplishing their strategic objectives, maximising the operational efficiency and integrating the innovation in core business activities (Zabadi, 2016). Additionally, the organisations are required to introduce different mechanisms for dissemination, expropriation and utilisation of information to assure the sustainability within this highly competitive and turbulent environment (Jayawardhana & Weerawardena, 2014).

In the next few subsections, the research presents the research rationale *in relation to theory*, *the embedded innovation discipline*, as well as *the under-covered context of the Jordanian telecommunication*. The researcher tends to discuss the limitations of the current innovation models, thereby highlighting the need to adopt the concept of embedded innovation to assist the organisations operating in highly competitive markets. Through the findings of this research, suggestions would emerge for the organizations to make a shift from a dis-embedded approach to innovation embeddedness.

Definition of Terms

Before turning to the discussion of the concept of Embedded Innovation, it is necessary first to define the terms, which will be used throughout this work and in relation to the purpose of this study. The most important of these terms are innovation, embedded innovation and dis-embedded innovation.

Innovation- The term innovation involves the application of imagination, information and initiative for deriving great values from the resources which mainly includes different ideas that are then converted into the useful products (Jacobsson & Bergek, 2011).

Embedded Innovation- The embedded innovation is explained as the paradigm which takes the approach towards how a company develops at creating sustainability. Moreover, the new concept is focused on integrating the company within the community perspective (Abu, 2014).

Dis-embedded Innovation- The dis-embedded innovation is associated with handling of environmental complexities, the contemporary organisations are required to embed the innovation into different business processes to exploit the existing business opportunities Finegan, 2000).

A shift from dis-embeddedness to the embeddedness

To handle the environmental complexities, the contemporary organisations are required to embed the innovation into different business processes to capitalise the existing business opportunities (Simanis and Hart, 2008). Successful application of advanced management techniques can assist the organisations in achieving their corporate and business objectives, and embedded innovation are the basic characteristics of an effective management systems (Bose, 2008). Embedded innovation is comparatively new terms that have recently emerged in the innovation and management literature. In the contemporary era, organisations' ability to survive and maintain high standards of competitiveness is grounded on its ability to gather, spread and utilise meaningful insights to develop its innovative capabilities (Jayawardhana & Weerawardena, 2014).

Stating differently, the contemporary era suggests embedding the innovation into business processes and adopt an opportunity creation ideology instead of opportunity identification (Simanis and Hart, 2008). However, the review of innovation literature provides an inadequate evidence to support the application of embedded innovation in organisational settings due to the newness of the concept. It has caused the modern organisations to integrate tested innovation strategies for dealing with the prevailing environmental complexities (Lawson-Lartego & Mathiassen, 2016). In this regard, the theories of open and inclusive innovation have been increasingly used to deal with the complex business challenges (Heeks, Foster & Nugroho, 2014). Today, the proactive management seeks to integrate the open innovation model, which allows the purposive inflow and outflow of knowledge for accelerating the internal innovation and expanding the markets for external innovation use (Ryzhkova & Bengtsson, 2013). Based on this model, the firms operating in highly competitive industries seek to generate the ideas from inside as well as the outside of the focal firm. The ideas collected from external and internal sources are combined into systems and architectures. This theory suggests the management to actively seek geniuses inside and outside the firm to provide the fuel for the business model (Patra and Krishna, 2015).

Furthermore, it is also important to note that enterprises integrating the open innovation model still face challenges in developing an efficient business model that can sustain in a highly complex market for long. Although, various telecom organisations have integrated the open innovation model, still the model is unable to resolve the core issues at hand. For instance, recently, the Orange (Jordanian telecom network operator) shared how the management is developing the innovative solutions by engaging with innovative eco-system. However, the Jordanian telecom sector is still facing several challenges that seek immediate consideration

(Zabadi, 2016). The recent reports suggest that Jordanian telecom sector lacks the innovation, which can affect their survival in a highly competitive global telecom market. The analysis further suggests that Jordanian telecom sector lags the required innovation pace and despite its efforts to foster the innovation, the environmental complexities lessen the positive impact of innovation initiatives taken by organisations (Zabadi, 2016; Al-Zoubi, 2013).

This analysis suggests a review of the current innovation practices of the Jordanian telecom organisations and analyse if the increasing environmental complexity requires an innovation model beyond the open innovation. For this purpose, this research tends to explore the current organisational practices to foster the innovation. The research will also assess different innovation models and emerging innovation concepts to explore the innovation system practices of Jordanian telecommunication organisations.

As discussed earlier, the open innovation model is the latest development in the innovation literature. The model is tested in different settings to become a theory, but the review of innovation literature has highlighted various limitations of the open innovation model, which suggests a need to develop a new innovation-model that can cater the complex business needs in a highly turbulent scenario (Chesbrough, 2017). At organisational level, the integration of open innovation model causes the organisations to bear high process coordination and implementation costs. It is also reported that open innovation results into more errors in the routine work. The integration of open innovation model also results into heavy reliance on the external knowledge that results into a loss of knowledge control (Lazzarotti and Manzini, 2009). Grimaldi, Cricelli, Rogo & Iannarelli (2012) contend that open innovation results into loss of strategic power, creativity and flexibility. The intellectual property spill over also causes significant challenges.

The review of recent innovation literature suggests that innovation researchers have started recognising the need to introduce a new model. Recently, the innovation researchers have introduced non-traditional innovation models that still require further testing in different contexts. These proposed concepts require further construction and testing in different settings to transform into a complete model. For example, to overcome the challenges associated with open innovation, the researchers have proposed the concept of open-inclusive innovation. The open-inclusive innovation helps the management to understand the relationship dynamics between intellectual, ethical, social and natural capital within the institutional context of innovation (Gupta et al., 2016). Another emerging concept is the embedded innovation that is based on the innovation from inside out. The embedded innovation is built over the open innovation and open-inclusive innovation concepts (Poirier, Staub-French & Forgues, 2015). The concept has grabbed the attention of various researchers as it adopts holistic view and proposes to embed the innovation in every business process for maximising the potential. However, this concept requires further modification and testing to transform into a verified theory (Gupta et al., 2016).

The underlying research will apply the concept of embedded innovation besides deriving the theoretical support from open innovation and open -inclusive innovation. The rationale for choosing the embedded innovation is that ineffectiveness of dis-embedded innovation framework has become visible with time. In continuous efforts to serve the geographically dispersed mass markets and meet corporate growth objectives, the organisations' innovation strategies historically reflect the dis-embedded, production-driven quality (Simanis and Hart, 2008).

The dis-embedded innovation notion suggests the firms to view the communities as target markets and ecological system as natural resources providing the essential raw-material. Despite the tremendous advancements in the innovation theories, almost all models are based on the concept of dis-embeddedness (Milstein, London & Hart, 2007) (See Figure 1.1 below).

Figure 1.1. Structural Innovation Paradigm
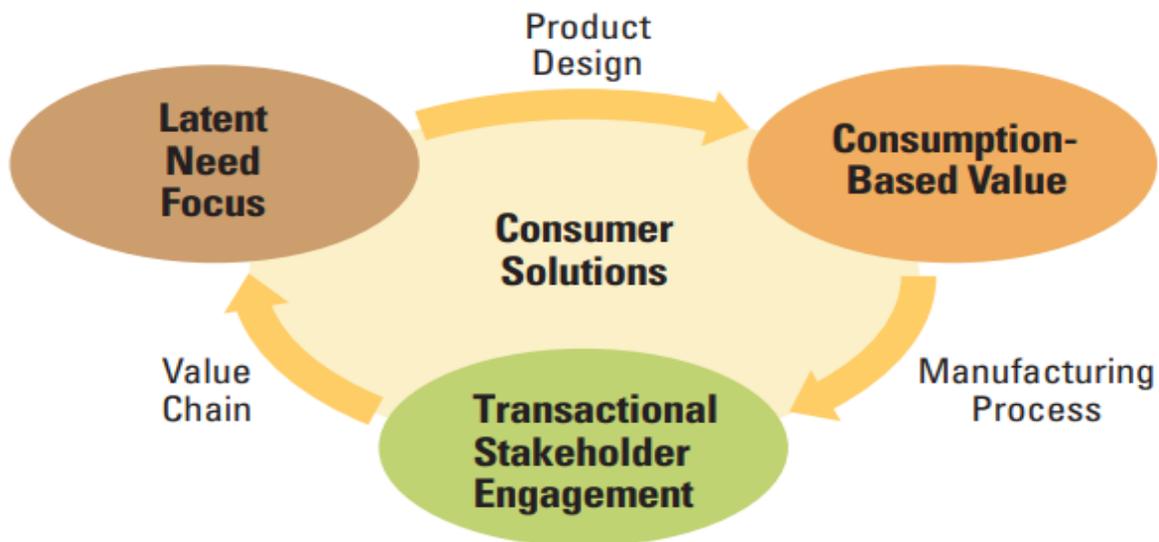
Source: (Simanis and Hart, 2008, p. 5).

The dis-embedded innovation provides limited insights to integrate the innovative practices and maximise the business potential. For example, Groves (2015) argued that this approach is only valid when there are clearly set industry benchmarks to evaluate the offered products/services. The dis-embedded model is built over the wrong assumption about the customers' needs. This model suggests that dis-embedded innovation practices can reinforce the customers' needs by searching out the data from field visits and confirming the pre-determined needs and viable business opportunities (Milstein, London & Hart, 2007).

Usually, the data collection processes are ineffective, violating the base of pyramid that suggests thinking beyond the market research phase (Simanis and Hart, 2008). The current open and inclusive innovation models though integrate the concept of inclusiveness, still the dis-embedded ideology persists to some extent that leads towards the formulation of sub-optimal business models. This would consequently weaken the competitive positioning at marketplace. In most of the organisations, the lack of shared commitment and trust hinders the knowledge inflow and outflow (Dahlander & Gann, 2010).

The emerging embedded innovation concept urges to reverse the business practice and management thinking, which typify the traditional dis-embedded innovation strategies. For instance, in B2C, the embedded innovation proposes to view the C as community instead of customer. When viewed as a community, the locally rooted relationship forms the primary value source instead of products or services (Milstein, London & Hart, 2007). Hence, if Jordanian telecom organisations adopt the embedded innovation practices, it will lead them to engage with the rich as well as poor communities in a spirit of mutual sharing and joint learning, which entails face-to-face, sustained interaction. Moreover, the firms will co-evolve the value by collaborating with the community.

Embedded innovation model creatively marries the abilities of both partners, that is, firm and the community. There are three essential attributes of embedded innovation. They include long-term partnership orientation to all stakeholders, community centred value propositions and creation-based opportunity approach (Boyer, 2003). It has been that one of the major reasons behind the lack of innovation in Jordanian telecom industry is the limited growth opportunities available in the market (Zabadi, 2016).

The embedded innovation will guide the enterprises to create the opportunities by collaborating with the community instead of searching them in the highly competitive market. Here is the pictorial presentation of embedded innovation model:

Figure 1.2: Embedded Innovation
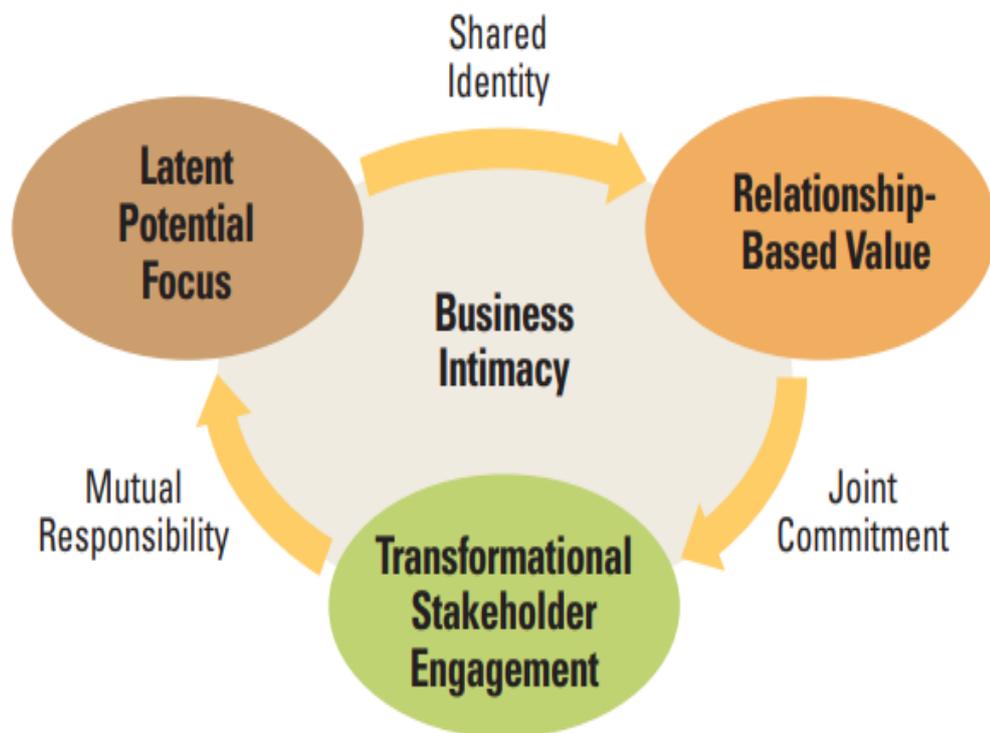
Source: (Simanis and Hart, 2008, p. 12).

From the foregoing, this research will derive the theoretical support from open innovation theory and open inclusive innovation model and will attempt to explore how Jordanian telecom organisations can embed the innovation by collaborating with the stakeholders. The researcher will also analyse the challenges faced during embedding innovation and how the structural resistance could be minimised to enhance the performance.

1.8. Research Contribution

1.8.1. Theoretical Contribution

As explained in Chapter 1 & 7, the key theoretical contribution is theorizing the process of (EIS) by mixing the theory of Firm-Level Innovation by Hassink (2001) and the Agile/Embedded Innovation Paradigm by Simens & Hart (2008).

Figure 1.3: theory building process
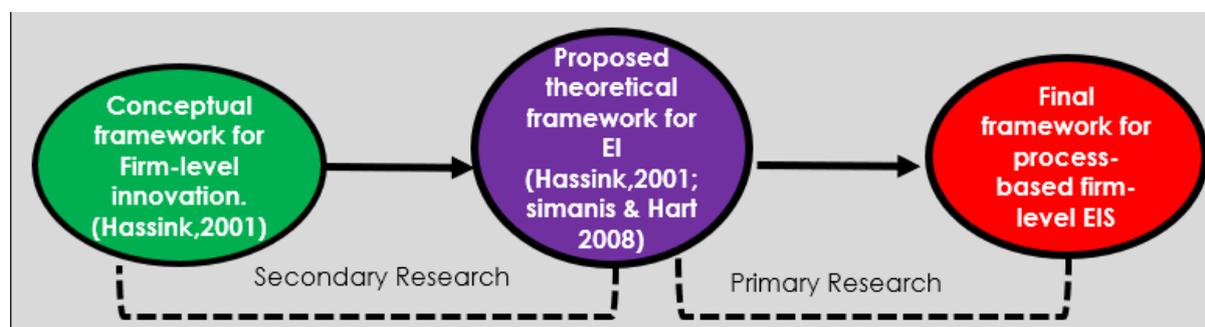
Previous discourses on innovation have not actually focused on exploring the dimensions of embedded innovation. The significance of this empirical evidence on (EI) lies on its commitment to go beyond the single issue of open innovation to fuller concerns of its conceptualisation and theorisation.

The emerging concept of (EI) fills this gap and meets the complex needs of turbulent environment; however, the innovation researchers have under-explored this concept despite its

huge potential to address the contemporary business issues related to innovation. This concept requires rigorous exploration by the researchers to transform into a new theory in the innovation literature. This study will fill the literature gap and will be a milestone in setting the basis for the new innovation paradigm, i-e innovation 3.0- (EI). The information obtained from this current study may also aid production managers who lack information on new strategies.

Based on the review of the top cited models of (IS), including open innovation, inclusive innovation, quadrable helix, organisational ambidexterity, and the regional innovation support system. The key merits of each model have been identified the possibility of each one towards being a lens for agile/EIS is identified (See *Table 2.2*). The regional innovation support system the best fit as a conceptual lens due to its ability to achieve "Transformational Stakeholders Engagement", "Focuses on customer's Needs", "Relationship-Based Value Creation", "Business Intimacy in the Business Environment". The end of *Section 2.6* and *Figure 3.1* provide *Framework 1*, which is called a conceptual framework for (EIS).

However, the researcher dedicated **Chapter 3**, to explore the top cited theories of (IS) to enhance the conceptual framework and turn it into a *proposed theoretical framework* (Van De Ven, 2007). *Framework 2* offers a firm-level embedded innovation system as a iterative process. This framework found the best fit to offer a theorization of the firm perspective of how several stakeholders get engaged/embedded in the service innovation process. *Framework 2* was the base for the data collection and the deductive coding for the interviews and focus groups transcript.

The data collection out of semi-structured interviews and focus groups were the third stage in the theory building process. Starting from the archival analysis, the researcher managed to frame the research background and the key characteristics on telecoms innovation in Jordan. The case selection and justification of this selection was a key activity in the third stage.

The fourth stage of theory development was the inductive (tree and advanced) coding of the interviews and focus groups transcripts. **Framework 3** (See Figure 6.3) represents the final theoretical framework for process-based firm-level (EIS). The researcher found new factors that shapes the implementation of firm-level embedded innovation system. Factors such as bridging ties and CSR was quite evident during COVID19 crises. The Jordanian Telecoms played a critical role in tracking the first wave of the pandemic and transforming the start-ups with advanced technologies.

The discussion of the key drivers of (EIS) revealed important factors such as "*intellectual capital of innovation knowledge*". As shown in **Figure 6.3**, intellectual capital increases based on the four elements of the (EIS). Because intellectual capital includes human capital, structural capital, and relational capital, it could arise from several sets of the four elements of firm-level (EIS).

Framework 3 clearly defined the drawbacks of disembedded innovative systems. Based on the literature, this framework explains the shift from a disembedded to an embedded framework. It has been well defined in this study that an embedded innovation framework suits the Jordanian telecom sector best. The study has focused on the factors associated with the

proposed framework, which includes innovation support systems (technology transfer, chamber of commerce, start-up, since and technology parks), business environment and embedded innovation (Labor market, competitors, supplier, customers) as well as internal factors (innovation and core competency, skill and qualification, financial resources, strategy and attitude). The study has proposed that this framework should apply in Zain, Orange and Umniah for innovation purposes, and is supported with reference to the literature.

Whereas, after communicating with managers of the Jordanian telecom sector, the latter explained some issues that required this study to incorporate few more factors that are:

i) bringing in ties (this includes the role of strengthening relationships with each other,

ii) service cocreation (this includes the emergence of innovative ideas while operating cocreation of services with stakeholders),

iii) Public engagement (this includes engaging the public for innovation purposes,

iv) Social innovation (this includes the rule of social work, campus and services for innovation),

v) Management of inheritance (inheritance management is the systematic method of using the assets that have been carried down by the previous leaders, and using those assets in a manner that would benefit the organization),

vi) Financial services innovation (this includes the financial service innovation project that aims to promote financial services and products that not only construct new financial structures but also provide the customers with the financial interactions), and

vii) Corporate social responsibility (this includes corporate social responsibility aimed at the acts of the company that facilitate the society and the telecom organization). Moreover, the added factors are listed below for a clearer view

1.8.2. Practical Contribution

This study provides meaningful insights to the comprehension of the role of embedded innovation in enhancing service innovation in the telecom sector. The researcher offers new his insights by identifying different government (telecom policies and procedures, relevant regulations, tax rates, other incentives) and organisational aspects (including information technology, human capital, organisational structure, and organisational culture) that facilitate or hinder the integration of embedded innovation Jordanian telecom sector. The research will contribute to the existing body of knowledge by creating a linkage between embedded and service innovation based on empirical evidence. The research results will be highly meaningful for the management of selected telecom organisations for refining their innovation system practices by collaborating with the external environmental actors to gain meaningful insights. The strategic application of such market insights can transform it into business intelligence that defines, gathers, analyses and distributes the intelligence about competitors, customers and products/services. It can also be relevant in any other important environmental aspect with an aim to assist the management in their strategic decision-making process.

Moreover, findings will enhance the management's ability to exploit competitive positioning through embedded innovation. The researcher will fundamentally examine the challenges, benefits, processes and motives of telecommunication organisations for embedded innovation in the context of Jordan. In addition, it will determine the extent embedded innovation would improve the telecommunication services in the Jordan market. Overall, the

research will fulfil its main motives to understand the concept of embedded technology within the Jordanian telecommunication industry, expand the knowledge of embedded innovation and subsequently improve the telecommunication service in Jordan, and influence the policy makers and regulatory authorities in creating an innovation friendly environment in the telecommunication industry in Jordan.

Briefly summarising the research purpose and its theoretical and practical contribution, the underlying research will analyse the Jordanian telecom organisations' innovation practices to evaluate the fit between dis-embeddedness and embeddedness. The researcher will adopt a holistic approach and will collect data from three main entities, firm, community and government. "Firm" will include the Jordanian telecom management. The exploration of the managerial perceptions will suggest important insights to determine the extent to which firms' structure can embed the innovation, and what could be possible challenges.

The overview of prevailing legislations will also determine the intensity legislative pressure that could be faced while adopting the embedded innovation practices. Finally, the viewpoints of "community" will determine whether the customers, suppliers and other business partners are willing to collaborate with each other to produce the shared value and create opportunities in a highly competitive market. It is clear from the discussion that each empirical research dimension will make a significant contribution in achieving research objective that is, enhancing the performance of Jordanian telecom industry by embedding innovation. Findings will also be useful to refine the embedded innovation concept that is still emerging and requires rigorous testing before transforming into a tested and verified model. The results will help the researchers, analysts and policymakers to understand where the Jordanian telecom industry fits

on the embeddedness continuum. The purpose will be to locate the current positioning and develop strategies to shift towards embeddedness.

Dis-embeddedness

Embeddedness

Jordana Telecom Sector Current Positioning? and How to shift leftwards

1.8.3. Contribution of Objectives

The objectives which are proposed in the research will contribute significantly towards the existing research. Moreover, the first objective of the study is theoretical in nature which is focused towards exploring the concept of embedded innovation within the global context and understand its significance.

This objective will be achieved by referring to different theories and descriptions postulated by the authors previously for understanding the concept of embedded innovation. The second objective proposed will help in identifying the trends and challenges associated with the embedded innovation within the context of Jordanian Telecommunication Sector. In addition, the objective will help in proposing strategies for effective implementation of embedded innovation in the light of telecommunication sector of Jordan.

1.9. Scope of the study

Review of literature has revealed that Jordanian telecom sector has grabbed the attention of various researchers due to its rapid development during last few decades (e.g. Zabadi, 2016). Analysts are increasingly interested in exploring the factors promoting the rapid development of the industry. Hence, Jordan forms an ideal environment to carry out this research due to its rapidly growing telecommunication services in the Middle East.

The country has grown in the statute to be named the hub of telecommunication services within the region. Furthermore, due to competitive nature of the Jordan telecommunication market, the concept of innovation is very invaluable. The effective integration of innovation into organisational structure ensures the survival of firms in a highly competitive and turbulent scenario (Jordan, 2014).

Embedded innovation is a concept that not only assist the firms in building their brands but also benefits the customers in meeting their explicit and implicit needs. Embedded innovation in telecommunication services integrates both the organisation and the clients in attaining sustainability since it builds strong trusts and loyalty between both parties (Yassine, 2014).

The research focuses on exploring the challenges benefits, processes and motives entailed in the concept of embedded innovation involving the three key players in the Jordanian telecommunication market. The research will further limit its concentration to the extent, which

the embedded technology can improve telecommunication services within a rapidly developing

market, using Jordan Telecom as a case study.

Chapter 2: Literature Review

Introduction

The innovations systems have been frequently used as lends to demonstrate the differences in innovativeness between economies, industries, and firms at international, national, regional and local levels (Gupta, Gupta & Jain, 2016). The (IS) researchers argue that business enterprises heavily rely on the surrounding institutions for competitiveness and innovativeness.

In local and regional (IS), business enterprises systematically involve themselves in collaborative learning culture through an institutional milieu that is categorised by the embeddedness (Abu, 2014). Based on the governance infrastructure of these (IS), firms can develop a typology that comprises the grass-root system with the optimum level of local embeddedness, an integrated framework and a *dirigiste* system with the lowermost level of local embeddedness (Villarreal & Calvo, 2015).

Our review of literature highlights that much research has been done to explore the concept of embedded innovation, however, researchers have paid less attention to explore the mechanism/factors, drivers, and implementing the embedded innovation in general, and in telecommunication more specifically (Danish et al., 2016). The main reason for choosing the telecom sector to study embedded innovation is that the telecom sector has undergone major transformations due to changes in the macro-environment. The primary factors driving rapid innovation are; short service and product life cycles, advancing technology, fierce competition and changes in customer needs (Hajir et al., 2015). Hence, organisations are striving for uniqueness and originality they need to ensure their services and products are innovative so at to survive in the competitive environment. Modern telecom enterprises must engage all resources to foster the innovation and address the explicit and implicit customer needs (Danish et al., 2016). It requires an active interaction with the customers and other stakeholders. The

researcher intends to highlight the challenges being faced by Jordanian telecom organisations and assess their perceptions towards embedded innovation for the accomplishment of business objectives in a highly saturated market. Review of literature reveals that the previous researchers haven't explored the emerging concept of embedded innovation in the Jordanian telecom market. Recent reports on the Jordan's national innovation system also suggest that country is facing difficulties in embedding the innovation into its business environment.

The underlying study "*explores the perceptions of Jordanian telecom professionals about the emerging concept of embedded innovation, analyse the challenges and drivers behind embedding the innovation*", and ways through which telecom professionals can improve the stakeholders' embeddedness in the service innovation deployed in the Jordanian market. This chapter will critically analyse the existing innovation literature, past empirical studies and innovation theories to extract important insights, identify a theoretical framework and set a theoretical foundation for the underlying research.

Accordingly, this chapter includes three sections as follows:

First section introduces the key concepts of Innovation, the following section further describes and explains the various variables and terms in this study with reference to earlier scholars. This section contains an in-depth assessment of the concept of service innovation, its characteristics, innovation systems and the application of embedded innovativeness. The third section explores the common definitions of innovation systems, its elements and the impact of systems thinking on the service innovation.

The fourth section, explains the top cited models and scholarly schools of thoughts in the area of service innovation systems, including Inclusive Innovation, Open Innovation, hybrid model, Quadruple Helix, Organisational Ambidexterity, and regional innovation support. The advantages and disadvantages of each model is discussed, and a justification audit is provided to explain why each of them have been considers and why it has not been enough to guide the data collection and the rest of the study.

The fifth section elaborates the process of implementing of embedded innovation systems. In doing so, the research follows Simanis & Hart (2008 & 2011) embedded/agile innovation paradigm to compare between the abovementioned models of innovation systems.

2.1. What is Innovation?

"*Innovation is widely considered as the lifeblood of corporate survival and growth*". Zahra and Covin (1994, p. 183). The term innovation has been defined in the Oslo Manual (OECD, 2005) as

> *"... the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations."*

In other studies, innovation is defined as a process of enhancing business value and sustaining a competitive advantage (Hamel, 1998; Roberts 1998). Bessant et al (2005, p. 1366) extend this process towards renewing organisational processes and routines. "*Innovation*

represents the core renewal process in any organisation. Unless it changes what, it offers the world and the way in which it creates and delivers those offerings it risks its survival and growth prospects". Organisations have always looked for improved ways of business to keep themselves highly competitive and sustainable in the market. As a result, they continually create knowledge with a view to differentiating from and gain an advantage over their competitors which may be termed 'innovation'.

Innovation gives companies a competitive advantage by increasing and sustaining high performance and attracting new customers and retaining the existing ones (Cooper, 1998; Gopalakrishnan & Damanpour, 1997).

According to reports, successful companies produce 75% of their revenues from new products or services that did not exist five years ago (Smith, 2006). Innovation is the most fundamental activity for every company that aims for survival and long-term competitiveness (Hamel 1998, Roberts 1998). Schumpeter (1930) defines innovation as *"the introduction of new goods, new methods of production, the opening of new markets, the conquest of new sources of supply and new organizational structure of any industry"*. This definition addresses five aspects of innovation. These aspects include a) product (either new to consumers or with improved quality for those that were already available), b) process (methods of production either new to the world or new to the industry), c) new market, d) new sources of supply, and e) new forms of competition. This definition, although comprehensive, fails to address service as an aspect (Goffin and Mitchell 2010).

One of the reasons might be the economic situation of that period when more focus was on manufacturing. However, the telecommunication service sector started to emerge in the last 30 years and there has been a substantial shift from manufacturing to the service sector.

AH Van de ven et al. (1999, p. 13) in their definition of innovation addresses service and defines innovation as "the development and implementation of new ideas and knowledge into a socially and economically successful product, process or service innovation". Considering the importance of the telecommunication service sector in the current economy, this definition is more appropriate compared to the above-mentioned definitions and addresses the main aspects of innovation that are significant in firms' survival. Innovation is a process in which valuable ideas are transformed into new forms of benefit for the organization, customers, employees and stakeholders. In developing countries, innovation tends to happen "behind the technology frontier" which is transmitted from developed countries (Hobday, 2005).

Batiz-Lazo and Woldesenbet (2006) stated that ATMs (Automatic Teller Machines) were used in US and UK banks in the 1970s, while the majority of Jordanian banks started to use this technology in the last decade. Therefore, innovation is something new, but not always in absolute terms. It can be only defined in context with a clear insight of its inputs and outputs, which is explained further as the so called "Innovation Systems".

2.2. Service Innovation

Service innovation is the systematic emulsion of a number of novel elements that allow an organization to have organizational growth and sustainability (den Hertog, van der Aa, & de Jong, 2010). For an incentive to be called a service innovation there has to be either new products and services being provided by the company, or there has to be new methods of developing those products and services that are more effective than the ones in the past.

Providing a clearer definition of the service innovation, it is the process of renewal of any product and service (which has been previously offered) for the intent of accomplishing the organizational benefit who proposed the innovation. Furthermore, for a service to be labelled as innovation, there has to be commercialization because any service or product achieved after a successful innovation plan can be termed as invented unless it is offered as a commercial product which can give a financial benefit to the organization (Lusch & Nambisan, 2015).

Given the productive nature of service innovation, it could not be limited to only commercial organizations. The importance of this phenomenon is global and has to be initiated by not just manufacturing industries, but also mobile telecoms and public organizations for the benefit of the economy. It is because of the intellectual nature of the service innovation which gives it an edge over the competitive environment. Any organization, if successfully implements the service innovation plan can have a higher market ratio as compared to the book ratio due to higher intangible assets.

The concept of innovation is vastly practiced in manufacturing firms and mobile telecom firms but the core difference between the two is that unlike the former, the latter is

more focused on the management of the project without having to rely on research and development of the organization and the management (den Hertog et al., 2010). The mobile telecom focuses on customer interaction and how it can be used in service innovation for the benefit of embedded innovation.

Service innovation enables businesses to stay ahead of competitors and even more importantly exceed customers' expectations. Innovation is seen as the key to victory however, starting to implement service innovation can be quite tricky. Scholars and consultants will suggest to start it by engaging a bunch of people then setting a strategy finding insight, creating ideas, building prototype, executing ideas and reviewing results it doesn't need to be that complex, thinking small often works best especially for the first time innovation will be more successful with a smaller scope a shorter timeline a smaller budget and fewer people Singh, S., Akbani, I., & Dhir, S. (2020). Service innovation is about people, customer, partners and suppliers, the new services should be able to create value by satisfying end-users basic needs customers seek happiness and crave acceptance the objective of a new service may be just as simple as delighting customers. Service is purely transactional good service ideas are not likely to come from the same categories if an organisation follows what its competitors have done, the best it can achieve is to be as good as its competitors not to outperform them. Therefore ideas from other areas are a particularly good source of inspiration and good service ideas come to those who are in the habit of looking for them once firms start collecting ideas from outside you create an idea box and a flow of inspiration, this is so crucial because the more ideas to which you are exposed the more likely you are to come up with better ideas and services artists and innovators understand that nothing comes from nothing all creative work builds on what came before and nothing is original. Tajeddini, K., Martin, E., & Altinay, L. (2020).

In order to help companies develop new service innovations there is some kind of process to follow and also implement a structure. This process consists of two components the main one is that firms must understand customers and to understand how they want to use the service or product and the other part is building and orchestrating things. In more detailed description of the underlying process there will be more components and the first component is the focused component. This focuses on understanding where the service innovation should happen, it is about helping customers, financing, differentiation and experience, so firms have to decide where they want to focus their efforts first, secondly better understanding what they need to involve the customers in, and learn from customers when it comes to experience, when it comes to differentiation when it comes to financing when it comes to helping or when it comes to streamlining so the firms are learning from customers and once they've learned from customers they have to learn themselves, so then have to synthesise what they've learned, to experiment to realise what a service could be, and to decide if this is what they want, then review it from an organisational view, more importantly to orchestrate this change or this innovation in the organisation, therefore it's about strategy and whether the innovation really fit with the organisation strategy, ability to make these changes Hameed, Nisar, & Wu, (2021). In some cases culture is seen as an obstacle and organisation can't deliver Lam, Nguyen, Le & Tran (2021). Organisations usually depends on networks to help them deliver new services and once they've decided on all these aspects they proceeded to the testing the new service on your real customers to see if it will be a success and finally when they have completed all these steps they test, implement and standardise what they've developed however, another layer of complexity is that not all service innovations are created equally, some will be easier than others, some services based on fixing problems, others will be more about sharpening or are competitive abilities and the third one is more radical so each of these will require slightly different ways of acting Vendrell-Herrero, Bustinza, & Opazo-Basaez, (2021).

Due to the vast research on the service innovation, it can be observed that they do not focus as much on the service innovation from service provider's perspective. Therefore, that part of literature cannot be used for effected service innovation initiations and demands more research on service innovation has to take place in mobile telecoms.

2.2.1. The Characteristics of Service Innovation

Given the importance of service innovation within mobile telecoms who has so much role to play in the improvement of services, there is not enough research to define what exactly is its nature. Since services are not easily defined and their nature still something to be discovered it is unknown to the researchers as to which service can be deemed as innovation and whether renewed services can be called innovative at all (Lusch & Nambisan, 2015). Since it is necessary to understand the nature of service innovation before investing in it, it is for that reason that many researchers have adopted multidimensional models and theory of service innovation and this study will highlight some of those fundamental models and why they don't fit in the Jordanian context.

A four-dimensional model introduced by Hertog (2000) with concept, technology, interface, and system for service delivery are the main dimensions of the model. The first element of the model 'concept' highlights and novelty of the concept that has been proposed and its impact on a specific market, instead of whole markets. The second element of technology that helps the firm's ineffective utilization is its resources for developing more services. The interface dimension amends the way that the firm interacts with the clients and the new amendment ensures better interaction than before and finally the system for service delivery helps understand how the service workers can be more productive and efficient in the

delivery of innovative services.   Miles (2008) explains the characteristics of these four-dimensions; like the intellectual characteristic of service innovation is in correlation with the concept, technology helps in technological advancements, and the remaining system for service delivery and the interface is focused on how firm and clients interact with each other.

After the development of Hertog's four-dimensional model, the diamond of innovation model came into the light.   Miles & Green (2008) as the developers of the model intended to focus on industries of creativity and how they can be explored with dimensions of the interface, product, concepts of cultural concepts, process production, methods of delivery, technological enhancements. The model enforced the importance of cultural concepts and process production.

The development of Miles and Green was later countered by another development of a model by Hertog (2010). This model included six-dimensions and new systems of delivery and concepts were introduced, i.e., technology, organizational infrastructure, new business alliances, potential customers, culture, and new revenue models. Hertog's both models had enough importance on the innovation concepts, interface, channels for delivery, and technology which indicates the importance of these factors in service innovations.

In terms of authenticity both the models proposed by Miles and Hertog can be used as a foundation for understanding innovation and its advertisement, but the six-dimensional model has more capacity to show advertising and highlight its concepts, as compared to the diamond

model. Therefore, it is deemed best to use Hertog's six-dimension model for understanding as it can be applied to several knowledge-intensive business services.

The dimensions mentioned in the six-dimension model are interconnected with each other and with the change in one dimension can induce a change in other dimensions as well which causes a chain reaction that needs to be monitored with care. A dimension like concept have understandable changes that can occur, but other elements need to be re-evaluated upon each change and it is more important because overlooking these dimensions has been quite common over the past.

The competitive edge that any organization has over the other is due to the presence of inimitable services That are provided by the company and these services can indeed be copied by other organizations, but the quality of those services cannot be matched as the delivery of the competitive opposition has all the elements of the model working in complete coordination and it is something which is very hard to achieve. It is obvious that all the models mentioned in the paper provided a deep understanding of the concept of dimensions of service Innovation but none of the models show how a change in one dimension occurs and how others experience that difference of change.

The current paper is structured to explore the embedded innovation in the mobile telecom sector and will explore other models of innovation. The models discussed above to understand innovation in terms of services. Other models will also be explored to see what happens when including end users within the process in which improved features of the

concept, process of innovation, and interfaces that will allow customers to use technologies, workshop for the development of the innovation activity. The paper will result in the development of the embedded innovation tin the mobile telecoms by focusing on the customers in the innovation process.

Schumpeter developed the theory of innovation and defined it as "the setting up of a new production function", that "covers the case of a new commodity, as well as those of a new form of organization such as a merger, of the opening up of new markets, and so on" (Schumpeter, 1939, p.84). Because of this broad meaning of innovation as introduced by Schumpeter, too often the innovation literature has taken more limited views by focusing on technological innovations. In the case of services, particularly due to the considerable role of customer interaction and the intangibility characteristic, a bias towards technological innovations is even more inadequate. A service innovation is a new service experience or service solution that consists of one or several of the following dimensions: new service concept, new customer interaction, new value system/business partners, new revenue model, new organizational or technological service delivery system. Miles (2009).

The first dimension is the service concept, also named the service offering (Frei, 2008). The service concept or offering describes the value that is created by the service provider in collaboration with the customer. Service innovations are seldom born in a firm lab as a result of an isolated research activity (Sundbo and Gallouj, 2000; den Hertog et al., 2006). On the contrary, most service innovations are an answer to a perceived unmet need of actual or potential customers or translating a technological option into a service proposition (Den Hertog, 2000; De Jong et al., 2010). For example, service innovation is best described as a

process of collective problem-solving in which learning within organizations and connection between organization play a key role.

Love and Mansury (2007) for example, suggested that firms' external linkages, particularly with customers, could significantly enhance service innovation performance. In this research, the definition of service innovation was adopted from Leiponen (2005) and defines service innovation as the completely new services most often introduced by firms that engage in external knowledge sourcing, particularly from customers and competitors. The paper will result in the development of the embedded innovation in the mobile telecoms by focusing on the customers perspective in the innovation process.

2.2.2 Innovation in Telecommunication Services

This section explains different factors, including technological and economic changes that shaped the telecoms industry during the last decade. In doing so, why address these changes at the global, Macro, and Meso levels It also discusses of this sector that the recent facts based on current theoretical and empirical studies to prove the accelerating changes and competitiveness in this sector.

Service innovation involves a unique service experience that consists of different dimensions such as a new customer interaction, a new service concept, a new business partner, an innovative business system, new technological or organisational service delivery system or a new revenue model (Skålén et al., 2015). Service innovation is best described as a process of

collective problem-solving in which learning within organisations and connection between organisation play a key role. Love and Mansury (2007) suggested that firms' external linkages, particularly with customers, can significantly enhance service innovation performance. This research adopted the definition of service innovation from Leiponen (2005) and defines service innovation as the completely new services most often introduced by firms that engage in external knowledge sourcing, particularly from customers and competitors.

Various studies have analysed the management practices of service innovation within the telecom sector. For example, Rahman et al (2015) proposed a framework and empirically validated the successful service innovation practices in telecom sector of developing regions. The proposed framework highlighted the significance of relationships between cross-functional communication, technological tools' implementation, overall innovation process, organisational culture, competitive pricing and performance. The empirical research results proposed that organisational culture and implementation of technological tools have a significant influence on the innovation process, cross-functional organisation and competition informed pricing. The researchers stressed the need to conduct further research for assessing the innovation management practices within the telecom sector of developing countries (Rahman et al, 2015).

This study has chosen the Jordanian telecom sector to analyse how embedded innovation enhances the overall service innovation in selected telecom industry. Firstly, the research will critically analyse the embedded innovation literature to identify and discuss a comprehensive framework. Later, empirical research will be executed based on this framework in the context of Jordanian telecom industry.

2.2.2.1. Global Perspective of Telecom's innovation

The global telecommunication market has experienced a continuous growth due to interconnected economy and digital sharing during last few decades. The technological advancements and ongoing innovations are mainly driving the ongoing transformations (Thamarapani, 2016). However, various telecom markets are struggling hard to keep the pace with changes as the convergence witnessed in last two decades is mainly driven by disruption instead of well-thought and well-planned strategies (Ojanpera et al., 2017). The current reports suggest that the intensifying competition has made the growth stagnant in various regions and profitability can only be earned by adopting innovation techniques to cut the cost and maximise the value of the offered services (Thamarapani, 2016). Although, the technological advancement is assisting organisations in integrating innovative business practices, still the organisations are facing difficulty in dealing with multifaceted challenges that require to embed innovation in each business process (Danish et al., 2016). The growing contribution of the telecom sector in global and regional economic development makes this industry an interesting case-study while exploring the effectiveness of innovation embeddedness. Here is the graphical presentation of revenue earned by global telecom market during last few decades. The analysts have forecasted the revenue growth during next two years also based on previous trend:

Table 2.1: Global penetration of mobile telecoms (2005-2019)
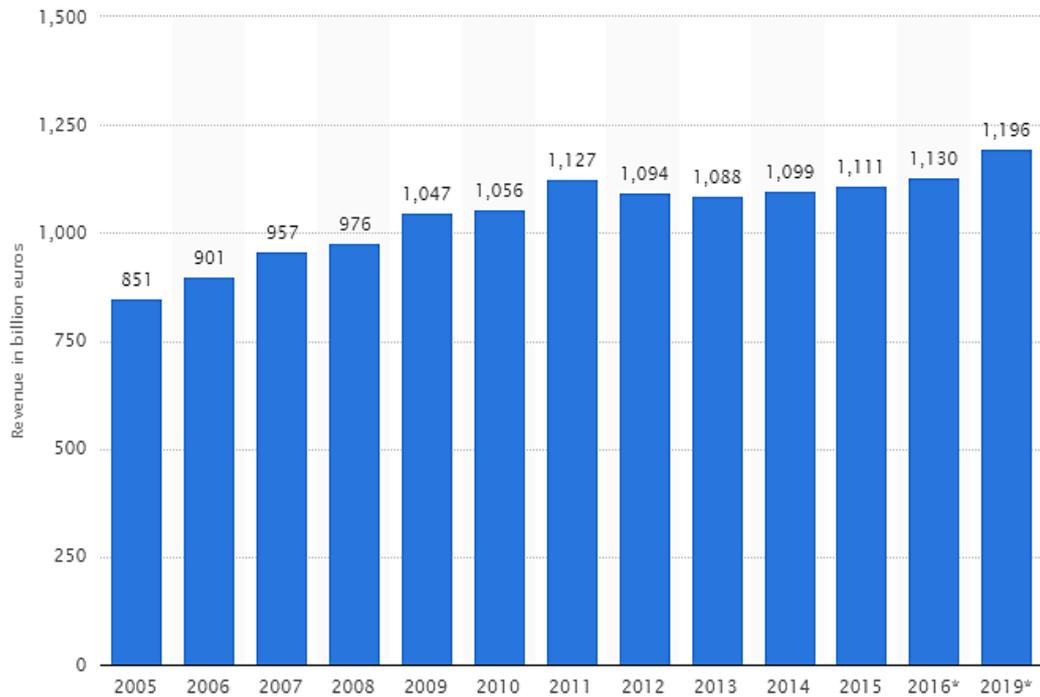
Source:(Statcia 2019)

The graph shows that the global telecom industry has experienced a profitability growth from 851 (billion euros) in 2005 to 1,196 (billion euros) in 2019 (expected). However, compared to the profitability, the mobile subscriptions have experienced more tremendous growth. In 2011, the mobile subscriptions were around 5.86 billion (around 62.9 percent of whole world population), whereas, the percentage is expected to reach 67 percent in 2019 (Statista, 2017). The slower profitability growth compared to the subscription rate suggests need to embed the innovation that can increase the business model effectiveness, resulting into a shared value for business as well as community.

The business environment of global telecom sector is characterised by the challenging tasks and high competition. Telecom enterprises need to foster innovation in the form of solutions, processes, services and products to ensure their long-term survival in a highly

turbulent scenario (Danish et al., 2016). A strong collaboration between different organisational units and external stakeholders is required to integrate a pro-innovation culture. An active interaction with the internal and external factors influencing the firm innovation can serve as the main engine for the innovation development (Gupta, Gupta & Jain, 2016).

Innovation literature highlights the need to align with R&D with other departments as R&D managers face difficulty in integrating the innovation and managing innovation projects that are surrounded by risk, uncertainty, and complexity (Parveen, Senin & Umar, 2015). In such a complex and competitive environment, an effectively diffused, integrated and embedded innovation can strengthen the competitive position of telecom organisations operating at local, regional, national or international level. The innovation system involves the creation, diffusion and use of knowledge to get and sustain and distinctive competitive edge over rivals (Abu, 2014).

Various drivers are inducing the telecom organisations to embed innovation into their organisational structure. Based on the Goffin and Mitchell (2010) findings, the first driver towards innovation is the technological advancement that includes the usage of existing technologies in new applications as well as using new technologies in services and products. Companies are required to respond to the technological advances quickly to be able to employ them in their products/services and stay ahead of their competitors. This proactive approach will enhance the organisational ability to identify and exploiting the new opportunity in the market (Habibi et. al., 2016).

The second driver that induces the telecom organisations to embed innovation in their business practices is changing demographics, attitudes and needs of customers. For example,

markets with older populations have different requirements than those dealing with younger populations (Olla and Patel, 2002). The third driver is intensified competition which is particularly challenging in Jordan where the telecommunications sector is dominated by three mobile phone providers.

Despite the monopoly, Jordan has steadily increased competition due to its regional superiority in communications development, low start-up costs and business-friendly environment attracting considerable investment in its ICT industry from Microsoft, Dell, IBM and France telecom (Export.gov 2016).

The fourth driver is the turbulent business environment. The shift in the mobile telecommunication industry and transformations have changed the business rules. The major challenges faced by telecommunication providers are the shifts from one simple voice service to a portfolio of mainly convergent data services (e.g. integration of voice, data, and Internet), from no or a few affiliations to multiple partnerships (Olla and Patel, 2002), from simple and linear links in the form of value chain to complex relationships in the form of value network (Peppard and Rylander, 2006), from homogeneous to heterogeneous customer demands, and from customers consuming modest services to customers continuously presuming advanced, high qualities services.

2.3. Innovation Systems

The simplest definition of systems is found in the Oxford English Dictionary as "*a set of things working together as parts of a mechanism or an interconnecting network; a complex whole*" (Oxford University Press, 1989). A system can be defined a set of interrelated components that follow an observable attribute. A system may be defined as "*a set or arrangement of things so related or connected as to form a unity or organic whole*" (Webster's Collegiate Dictionary). Systems engineers define a system as a set of interrelated components working toward a common objective. Innovation systems (IS) can be defined as actors or entities such as firms, other organisations, and institutions that interact in the generation, use and diffusion of new and economically useful- knowledge in the production process (Edquist 1997). **IS** is a concept introduced by (Freeman, 1987). Freeman defines IS as "*the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify, and diffuse new technologies.*" (Freeman, 1987).

Systems are made up of components, relationships, and components are the operating parts of a system. They can be of a variety of types: actors or organizations such as individuals, business firms, banks, universities, research institutes, and public policy agencies (or parts or groups of each). They also can be physical or technological artefacts. They can also be institutions in the form of legislative artefacts such as regulatory laws, traditions, and social norms (Carlsson et al, 2002). The function of an innovation system is to generate, diffuse, and utilize technology. The properties and behaviour of each component of the set influence the properties and behaviour of the set as a whole. At the same time, each component depends upon the properties and behaviour of at least one other component in the set. Because of this interdependence, the components cannot be divided into independent subsets; the system is

more than the sum of its parts (Blanchard and Fabrycky, 1990, p. 2). The question raised here is, for instance - what if a component is removed from a system or its characteristics changed? The other artefacts in the system will alter characteristics accordingly (Hughes, 1987, p. 51), and the relationships among them may also change - provided that the system is robust.

Relationships involve market as well as non-market links. Feedback (interaction) is what makes systems dynamic; without such feedback, the system is static. Put differently, the greater the interaction among the components of a system, the more dynamic it is. However, even a highly dynamic system may not be able to survive unless it evolves in the right direction. There are different definitions of what an innovation system is, what it comprises, and that is the reason why this research posits that the innovation system lacks learning, human actor. That is to say, the innovation system is incomplete, and it should include learning, engagement, collaboration with customers, humans, the surrounding environment etc.

For instance, Nelson gives the following definition of innovation system: "*a set of institutional factors that, together, plays the major role in influencing innovative performance.*"(Nelson, 1993, p. 4). Carlsson et al., on the other hand, develop the concept of a technological system of innovation but give a previous account of the state of the art of innovation systems. They suggest that for analytical purposes, it is "possible, at least in principle, to view a national system of innovation as the aggregate of a set of technological, sectoral or regional systems" (Carlsson et al., 2002, p. 236). Niosi et.al. Present what they call a 'workable concept' of a national system of innovation and define it as:

"the system of interacting private and public firms (either large or small), universities, and government agencies aiming at the production of science and technology within national borders. Interactions among these

units may be technical, commercial, legal, social, and financial, inasmuch as the goal of the interaction is development, protection, financing, or regulation of new science and technology" (Niosi, Saviotti, Bellon, & Crow, 1993, p. 212).

What remains certain in the idea of the IS approach is the systemic nature of innovation where private, public and academic actors forge complex relationships to trigger technical changes to enhance business competitiveness at the national level. However, no scholar has defined innovation as a system, rather they defined innovation as the tool, a competitive advantage, idea, practice, or material artifact perceived to be new by the relevant adoption firm Zaltman et al (1973).

In the next section, the researcher addresses the alternative models adopted in the Innovation Systems literature to conceptualise the embeddedness process in the telecommunication services.

2.4.   Models of Innovation Systems

This section revisits candidate models and conceptualization tools used in the Innovation Systems IS literature to find the relevant elements of Telecoms IS. It also compares and contrast between them to pave the road for building the conceptual model used in this thesis (See section 2.5).

2.4.1. Inclusive innovation

Inclusive innovation II is a socially focused innovation type that enables people from the lower social class to access quality products and services (Henkel, 2006). Many countries are encouraging service and product providers to utilise inclusive innovation to reach the entirety of their population and promote equity (Altenburg & Lundvall, 2009).

The concept of II is getting popular in the global telecom sector due to increased competition. However, inclusive innovation requires good planning, otherwise, companies may end up shutting down that part of business due to lack of enough sales to sustain the continued growth (Goyal, 2016). One of the main disadvantages of II is the need for high sales to sustain production (Henkel, 2006).

II feeds inconsistency, which is detrimental to a business venture. It consequently slows down decision-making practices in a firm due to the increased number of people involved (Altenburg & Lundvall, 2009). There are some common pitfalls to be avoided to increase the chances of success of II, including lack of support from the top management, focus on the wrong performance metrics, failure to hire talented executives, a partnership with the wrong organisations and using old models of business (Henkel, 2006).

2.4.2. Open innovation model

The conventional understanding of the organisational success highlights certain critical success factors that reflect the extent to which an organisation is innovative, including highly

competent staff, research and development division and a fault-tolerant corporate culture (Heeks, Foster & Nugroho, 2014). However, the contemporary era has made these elements inadequate to reflect a truly innovative organisation. Such kind of innovation is based on the close-innovation paradigm (Chesbrough, 2003).

The mitigating global boundaries, intensifying competition and changing customers' needs with escalating research and development costs superseded the closed innovation theories in recent past by open innovation paradigm (Gerybadze & Reger, 1999). The open innovation theories greatly emphasize on the external resources (Chesbrough, 2003). Veer et al (2013) described the open innovation as a collaborative and interactive process with external stakeholders.

Although, the open innovation theories offer various useful insights to organisations, such as strategically wise diversification of the research and development investments, easy entry to different markets, various resource acquisition advantages, broad-base ideas, enhancement in the organisation's internal learning capacity, easy transfer of external knowledge etc., the open innovation paradigm also has some limitations (Veer et al., 2013; Heeks, Foster & Nugroho, 2014). Ullrich & Vladova (2016) contended that innovation researchers widely discuss the positive benefits of open innovation, ignoring the unavoidable limitations. Various enterprises face different challenges while integrating the open innovation practices (Ullrich & Vladova, 2016). The next section will discuss in detail the open innovation limitations, and how those limitations motivate the innovation researchers to introduce concepts beyond open innovation.

Open innovation leads the organisations, and particularly the small and medium organisations towards uncertainty. Organisations must seek a right balance between negative consequences and possible positive effects. Ullrich & Vladova (2016) mentionthat the dark side of the open innovation has been less studied and less discussed. Moreover, inadequate discussion about the negative effects has resulted into lack of appropriate methods for minimising the associated limitations and finding a right balance, indicating a gap in the innovation literature. Diener, Piller & Brettel (2015) contendthat despite the high popularity of the open innovation, the theory's conventional approach is unable to meet the contemporary challenges of sustainability, accountability attribution to informal and formal actors, knowledge asymmetry and environmental transformations actively shaping the business conditions (Diener, Piller & Brettel, 2015).

A substantial evolution of open innovation is required to address the increasing complexity and transforming needs for circularity and higher frugality. The openness degree among different formal and informal external actors in various domains and at different community levels influence the firm's ability to harness the power of network management and co-creation for development of a distributed knowledge system (Veer, Lorenz & Blind, 2012). Based on the review of innovation literature, the researcher has found certain open innovation limitations.

Firstly, the integration of open innovation practices arise issues related to intellectual property rights. The intellectual property rights violation issue can affect the innovation development submitted by external actors. Moreover, it can also cause substantial costs because of any legal action taken against the firm.

Secondly, the open innovation can result into a sheer volume of ideas (Veer, Lorenz & Blind, 2012). Although, it is the strength of open innovation that it offers wide-ranging innovative ideas that can be used to maximise the value, however, the massive volume can hinder the reviewing process and make the decision process time consuming and difficult. Lack of appropriate collaboration strategy can lead the firms to abandon the open innovation practices (Veer, Lorenz & Blind, 2012).

Thirdly, the firms seeking to integrate the open innovation practices are required to develop a strong internal structure built over an organised mechanism for acting and accepting unsolicited and solicited submissions (Veer, Lorenz & Blind, 2012). Mostly, the firms lack such understanding that leads them towards failure, and ultimately rejecting the open innovation practices (Lazzarotti and Manzini, 2009). Other open innovation challenges include high process coordination and implementation costs, heavy reliance on the external knowledge that results into a loss of knowledge control (Lazzarotti and Manzini, 2009), loss of strategic power, creativity and flexibility (Grimaldi, Cricelli, Rogo & Iannarelli, 2012).

2.4.3. Open – Inclusive a hybrid model

The limitations of the open innovation have motivated the innovation researchers to propose different strategies and concepts that can minimise the weaknesses associated with the open innovation and maximise its strengths. The concept of open-inclusive innovation has also emerged to overcome the open-innovation limitations.

The escalating economic pressure and increasing environmental complexities have intensified the quest for frugal grassroots innovations in an interconnected world. The innovation researchers are introducing various models and concepts, such as open innovation, reverse innovation model, inclusive innovation, low-cost frugal innovation, embedded innovation etc. to quench the innovation thirst of proactive firms operating in highly turbulent markets (George, McGahan & Prabhu, 2012).

The open-inclusive innovation model involves the different dynamics of relationships between knowledge seekers and knowledge providers that make the whole system responsive, responsible and reciprocal (Gupta, 2016). The model further suggests that in open systems, the inclusive innovation costs go down, resulting into a more inclusive and symmetrical knowledge system. The innovative solutions help in addressing social, skill, sectoral, seasonal and spatial factors (Gupta, 2014). The open inclusive innovation system makes the resources affordable, accessible, adaptable and available to differentiated and varying user needs and endowments besides having a circular nature. However, the successful integration of the open-inclusive innovation requires a comprehensive understanding of the multifaceted interaction between intellectual, ethical, social and natural capital that lies in the innovation's institutional context (Gupta, 2016).

Before understanding the need to shift the focus from open innovation to embedded innovation paradigm, it is necessary to understand how previous innovation models facilitate the communication flow within the organizations, and whether these models offer adequate guidance to develop effective communication channels that can facilitate the knowledge flow from within and outside the organization, and how acquired knowledge can be used to set the basis for sustainable competitive advantage.

Open innovation allows the open sharing of knowledge, whereas inclusive innovation ensures the inclusion factor by collaborating with the poor communities. This innovation exchange among communities and corporations is guided by different efficiency and ethical considerations (George, McGahan & Prabhu, 2012). The available literature regards the openness of corporation to seek ideas from the outside with open-innovation policy, irrespective of that fact whether the organizations disclose how the collected information was used to strengthen the innovation foundation (Gupta, et al., 2016).

Von Hippel has disagreed in this regard as the researcher regards the willingness to use the obtained knowledge and openly share the innovation derivations as open innovation (Bogers and Bastian, 2010; von Hippel, 2005). Gupta et al (2016) have characterized the information exchanges into four different strands, low inside out and low outside in, high inside out and low inside in, low inside out and high outside in, and finally the high inside out and high outside in. The open inclusive innovation supports the high inside out and high inside in strand, but the theory doesn't provide adequate guidance to organizations about how such innovative culture could be crafted within the industry (Fleming & Waguespack, 2007). The emerging concept of embedded innovation best serves the purpose in this regard. However, before discussing how a shift from the dis-embeddedness to embeddedness can improve the innovation practices of Jordanian telecom organizations, this section will briefly describe four above mentioned innovation exchange strands:

The close innovation theories cultivated the low inside out and low outside in innovation culture. Within this culture, the organizations acted like an ostrich and management strongly resisted to share the information as knowledge was regarded as a source to get a

sustainable competitive advantage (Baden-Fuller, 1995). This innovation culture lacked the resilience and consequently the enterprises were highly vulnerable to market, institutional and climatic risks. However, the increasing environmental complexities made the survival of these organizations almost impossible and they either disappeared or acquired by proactive market players (Simanis and Hart, 2009). The low inside out and low outside in was eventually replaced by a new strand, low inside out, and high outside in. As the name indicates, the organizations realized the importance of two-way innovation exchange. However, the enterprises were still unwilling to openly share their innovation derivations. Now, the organizations adopted a sponge like behaviour (Poetz and Schreier 2012) and showed higher willingness to learn from outside and low willingness to share the way they convert knowledge into innovative organization capabilities (Laursen & Salter, 2004).

These crowdsourcing strategies are used by many large enterprises. However, these enterprises don't fully follow the open innovation principles due to their unwillingness to share information with external community. The innovation providers seldom know how their provided information was used by the company (Gupta et al 2016). Such kinds of institutional arrangements don't last very long as innovation providers lack the motivation to share when they don't know how provided knowledge will be used and to what extent the provided knowledge is useful. Eventually, this lack of motivation drives the innovation providers somewhere else (Gupta et al 2016).

The *third* innovation exchange strand "high inside out and low outside in" works in an opposite direction. Here, the enterprises adopt a pollinator behaviour. This innovation exchange model shares some resemblance with the open innovation theory. Tesla is an example of this innovation exchange strand (Quinn and Brachmann 2014; Dahlander & Gann, 2010).

Within this innovation environment, the knowledge public goods are created without reciprocity expectations. The research and development institutions share the produced innovative knowledge with outside world to let the whole community benefit from it. However, the abundance of knowledge causes some organizations to avoid learning from outside that could be fatal for long-term business survival (Dahlander & Gann, 2010).

Lastly, the high outside in and high inside out is the most favourable and ideal innovation exchange strand that results into development of highly innovative culture. It lets the innovation embed into each business process and drives the organizations to develop meaningful relationships with innovation providers and overall community (Gupta et al 2016). However, the cultivation of such innovative culture within any sector requires an open mind and heart.

The enterprises adopting this innovation exchange strand survive in the long-run and their development and growth relies on the continuous iterative cycle of sharing and learning (Abrol & Gupta, 2014). One example of this innovation strand is the "*Honey Bee network*", where like-minded individuals such as non-governmental organizations, entrepreneurs, policy makers, academicians, farmers, scholars and innovators connect and share the innovation derivations for collective betterment. It connects the people and facilitates the information flow by hybridising the open source model with closed stratified, IP-based innovation model (Abrol & Gupta, 2014).

The above discussion suggests that corporate leaders must consider the value of sharing ideas from outside and adopting a holistic view emerging from the grass-root level. However, it requires mutual responsibility and respect that can monitor the innovative ideas exchange

between informal and formal sectors. The researchers have introduced the notion of embeddedness to mark this transformation of integrating firms into communities to ensure high outside in and high inside out knowledge flow. Such community integration can assure the absorption of exploitable knowledge. It is important to note that notion of embeddedness is not a new term. It was introduced by Granovetter (1985) when the researcher emphasized the need to go beyond the open innovation to tackle the changing environmental needs. This notion conceptually embraces the ambidextrous capabilities of leveraging the institutional arrangements for accomplishing embedding process (O'Reilly and Tushman, 2008). Such institutional arrangements maybe mechanic, organic, exploitative, explorative or explicit in nature (Hafkesbrink and Evers, 2010; Tushman et al., 2002), considering the phase and nature of innovation process and relationship characteristics. After discussing the limitations of the open innovation theories, now the researcher will discuss how inclusive innovation theories provide the guidance for crafting a high outside in and high inside out innovation exchange environment.

The last two decades have witnessed the uncoupling, escalating social and economic development at global stage. However, despite the tremendous development, a large number of people are living below the poverty line (Chataway, Hanlin & Kaplinsky, 2014). The proactive organizations have taken the poverty alleviation as a challenge as well as a viable opportunity that could be beneficial for organization as well as overall society (Foster and Heeks, 2013). The emergence of "inclusive innovation" notion reflects this major shift from dis-embeddedness and exclusion to inclusiveness, a benign and partial form of embedded innovation. The main reason behind this shift is that enterprises are increasingly realizing that capital intensive nature of innovation trajectory that is destructive to environment, and only

creates values for the organization is one of major reasons behind escalating poverty and exclusion (Chataway, Hanlin & Kaplinsky, 2014).

Although, a re-orientation towards the inclusive innovation path can play highly important role in overcoming the escalating poverty and exclusion, the current inclusive innovation theories offer a partial and weak understanding of underlying phenomenon (Foster and Heeks, 2013). The inclusive innovation researchers have offered limited explanation of dynamics and nature of inclusive innovation and this conceptual gap has motivated the researchers to combine the open and inclusive theories for broadening the understanding.

The current inclusive innovation theories must be developed and understood in context of innovation cycle (Foster and Heeks, 2013). The roles played by poor people as consumers and innovation providers, and distinction between product and process innovation must also be clarified to maximize the effectiveness of inclusive innovation (Chataway, Hanlin & Kaplinsky, 2014). The innovation researchers must recognize the changing innovation needs of organizations and their increased interest towards exploring the bottom of the pyramid. Moreover, the consideration must also be given to understand the role played by growth trajectories in determining the innovation direction, and in facilitating the associations between poorest world community and rest of the world (Foster and Heeks, 2013). Chataway, Hanlin & Kaplinsky (2014) emphasized the need for an effectively balanced and holistic approach to the inclusive innovation that could facilitate the active innovation exchange among all stakeholders, resulting into effective deployment of resources to assist the recoupling of development and growth.

Based on the in-depth theoretical research, Altenburg & Lundvall (2009) proposed that positive developments in the innovation exchange environment requires the organizations to think beyond the inclusive innovation. Although, the inclusive innovation trajectory is positive, the scope is limited and there is considerable opportunity to broaden the scope and enhance direction and pace of inclusive innovation (Fressoli et al 2014).

The researchers further proposed that current inclusive innovation theories have not clarified the set of objectives for each innovation actor and there is a non-existent or weak grasp of different inclusive innovation elements, resulting into inability in introducing the collaborative synergistic innovation policies and accessing the low hanging fruit (Chataway, Hanlin & Kaplinsky, 2014). There is a need to develop a supportive and appropriate national innovation system that can direct the scare innovation resources in cost-effective manner.

To overcome the limitations of open and inclusive innovation, the theory of open-inclusive innovation has been introduced (Fressoli et al 2014). However, it is not a new theory or paradigm, but only a combination of previous innovation theories with an aim to minimise the weaknesses and leverage the strengths of both theories. The open-inclusive innovation paradigm suggests the organizations to ensure a high outside in and high inside out flow, however, this concept requires further refinement to overcome the conceptual limitations. This section has highlighted the major reasons for shifting the focus beyond open innovation. The researcher has analysed different arguments made by past researchers that stress the need to re-visit open and inclusive innovation theories due to their associated limitations. Next section will discuss the emerging embedded innovation paradigm and how this emerging concept helps the innovation researchers in overcoming the conceptual and practical limitations of open and inclusive innovation theories.

2.4.5. The Quadruple Helix Model and Open Innovation

Open innovation denotes the organisations' ability to make optimal use of external technologies and ideas to improve business performance and get a sustainable competitive advantage while letting the external organisations capitaliseon their unused innovative ideas (Villarreal & Calvo, 2015). In the telecom sector, open innovation enables the organisations to shorten the product lead time, de-risk the business model and inculcate innovation at a substantially low cost. The Quadruple Helix Model reflects different features of emerging innovation paradigm (Leydesdorff & Ivanova, 2016). The innovation policies in the telecom sector have confronted intense environmental pressure because of internal policy issues and external developments (Abu, 2014).

Response from the telecom organisations to these challenges includes abehavioural and structural renewal in innovation strategies having regional and local consequences (Danish et al., 2016). Parveen, Senin & Umar (2015) investigated the factors affecting the quadruple helix open innovation model in the telecom sector. The researchers also analysed the employees' organisational commitment as moderating variable while investigating the open innovation. The study confirmed a significant influence of organisational culture on the telecom organisations' open innovation practices. Researchers further proposed that the integration of open innovation in the telecom sector depends on the commitment of organisation, industry, society and government. It implies that the successful integration of innovation relies on the multi-actor organisational learning (Parveen, Senin & Umar, 2015).

2.4.6. Organisational Ambidexterity

Innovation literature has extensively discussed a shift from close to open innovation in different contexts. However, less attention has been paid to analyse the trust element in such innovation culture (Andriopoulos & Lewis, 2009). Probst, Raisch, and Tushman (2011) discussed the basic characteristics of the organisations' ambidextrous thinking and regarded the trust as an essential element for building healthy, professional relationships with stakeholders.

An autonomous teamwork signifies the framework that operates under a trust-based, open friendly environment and nurtures effective and constructive relationships (Raisch & Birkinshaw, 2008). Such trustworthy, creative, and participatory style creates a cohesion among different organisational actors, consequently creating a sense of commitment and belonging. Organisational ambidexterity relates to the dynamic associations leading towards mutual exploitation and exploration of knowledge to set the basis for an innovative organisational culture (Ferrary, 2011). These interconnected associations are construed in a cooperative attitude integrating current and new knowledge into innovative process, service and product development.

Salampasis, Mention & Torkkeli (2014) argued that role of trust in the propensity and openness to innovation is inevitable. It breaks the barriers within the organisation and facilitates the knowledge transfer through informal and formal communication channels. The creative communication with the internal and external organisational partners result into the establishment of a collaborative culture, which is a step towards embedded innovation (Salampasis, Mention & Torkkeli, 2014).

The next section critically analyse the previous firm innovation models to identify the limitations and suggestions made by past studies to improve the conceptualisation of our proposed embedded innovation system.

2.4.7. Regional Innovation Systems

This model has been adopted by firms recently as it centers around four factors described as the *business environment*, internal factors, research, and development, and finally the innovation support system. This model is applicable to different regions and industries. The concept of regional innovation support systems is driven by the increased intensity of local and international competition in mobile telecom.

The emergence of sectors, clusters, firms, and industries in many regions globally (Enright, 2001). In this case the importance of integration, partnership, suppliers, end-users, and regional resources in enhancing the innovation capability and competitiveness of firms and regions (Asheim et al., 2003). when firm-core competencies and learning processes will lead to regional competitive advantages if they are based on national capabilities such as specialized resources, skills, institutions, and share of common social and cultural values (Maskell, 2004). The value creation for end users is in the of regional innovation support systems concept encourages the rapid diffusion of ideas,

This model is based on integration and collaboration, with many actors involved in the

process, and the focus is purely on potential ideas for the end-user. The innovation flow is considered to be high inside out and high outside in, firms will integrate with the authorities in order to develop new ideas or reform policies. In this case, the value creation is relationship-based with actors involved within the process in such a system, actors are connected correctly, and every actor has a task allocated, the transparency and inclusivity have created business intimacy.

2.5. Conceptualizing Embedded innovation Systems in telecom

In this section, the researcher offers a roadmap for embedded innovation systems by compares and contrasts the abovementioned models of innovation systems based on the key elements of Simanis & Hart (2011) and Caneque & Hart (2017) (See Figure 2.2 in ***Section 2.4.6***).

In the contemporary era, the world has transformed from the *innovation 2.0* (open innovation) to the ***innovation 3.0*** (embedded innovation) to deal the environmental complexities (Milstein, London & Hart, 2007; Simanis & Hart, 2009; Caneque & Hart, 2017).

The emerging embedded innovation paradigm has not been thoroughly discussed in the innovation literature in the context of the telecom sector. This paradigm adopts a new approach to understand how modern business enterprises integrate the sustainability (Baldwin & Von Hippel, 2011). The embedded paradigm stresses the need to integrate the whole community while fostering the innovation. This unique perspective allows the organisations to get a distinct

competitive advantage by developing the trust and long-term relationships with the customers (Ferrary, 2011).

There are two types of innovation systems that stimulates embeddedness; *Structural* and *Agile* (See *Figure 2.1 & 2.2*) (Simanis and Hart, 2008 & 2009; Caneque & Hart, 2017).

Figure 2.1. Embedded Innovation Paradigm
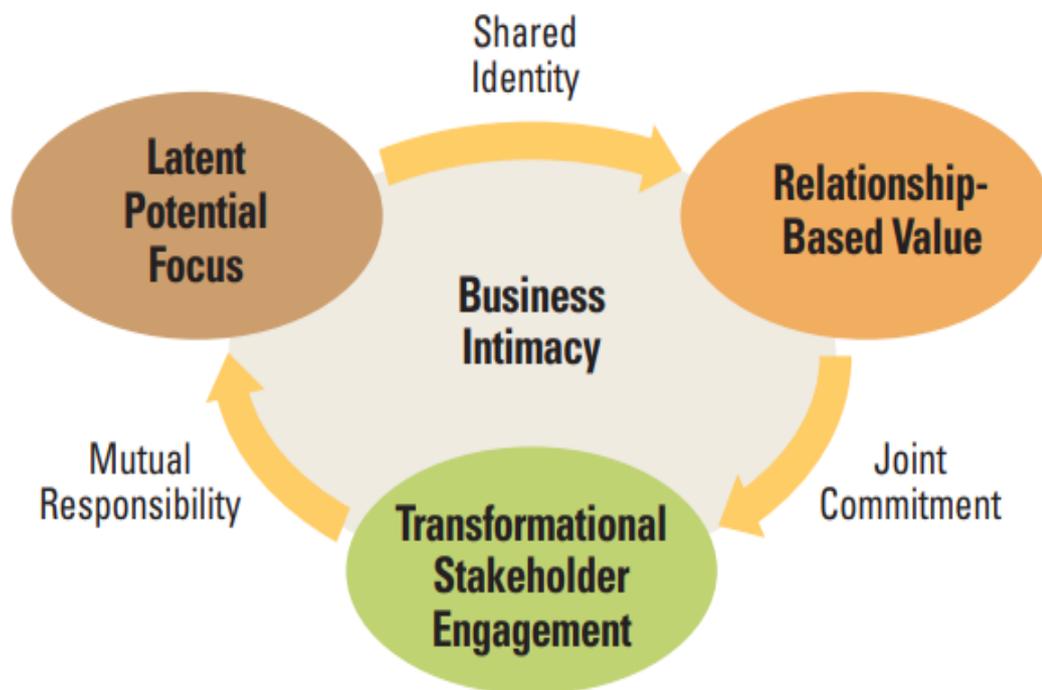
Source: (Simanis and Hart, 2008, p. 12)

The structural model of Innovation system demonstrates how an organisation that creates the relationship-based value through shared identity and ensures a transformational stakeholder engagement through joint commitment (Ferrary, 2011). The business organisation develops a sense of mutual responsibility and focuses on the latent needs of the customers

through effective communication (Baldwin & Von Hippel, 2011). In doing so, the embedded innovation paradigm suggests that current diversified economies have a potential that must be explored to capitalise the opportunity. It suggests building the close ties with the local community and build the customer loyalty based on mutual trust (Ferrary, 2011).

Figure 2.2. Structural Innovation Paradigm
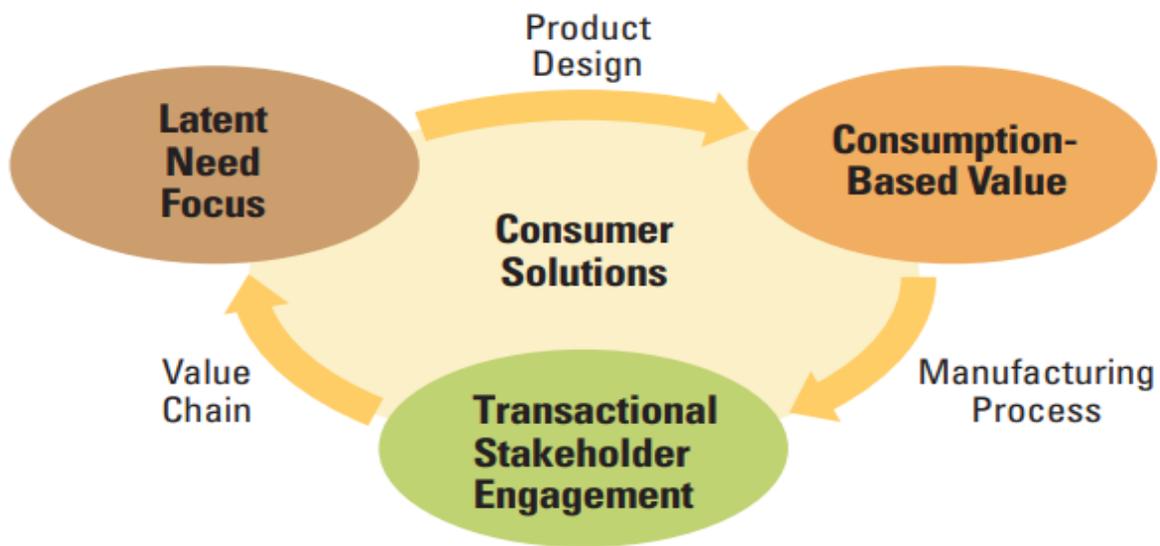
Source: (Simanis and Hart, 2008, p. 5).

It is the most important process for building customer loyalty at initial stage will guarantee the success of new product or service that has been designed to meet the latent customer needs (Simanis & Hart, 2009).

The second model is an agile model of innovation systems, which suggests the business develop and maintain a healthy relationship with the community (See Figure 2.2). The model

presents a strategically wise give and takes relationship with the customers and local community (Baldwin & Von Hippel, 2011).

Instead of business intimacy, here the core focus of the firm is to provide the consumer solutions. The model is based on a transactional rather than transformational stakeholder engagement, where the firm generates the consumption-based value through innovative product design (Baldwin & Von Hippel, 2011). This model doesn't ensure the business sustainability in the long-run due to lack of interaction with the community (Simanis & Hart, 2009).

Both models of embedded innovation suggest that implementing an innovation system is a continuous and iterative process that includes specific activities, key players, and resources. In the next section, the researcher elaborates this process further to brave the road for conceptualising the so called "Embedded Innovation System"

2.6. Process-Based View of Embedded Innovation

Simanis & Hart (2009) started this move towards an iterative model of embedded innovation. The authors emphasised that various industries such as military weapons, biotechnology, pharmaceuticals, semiconductors, disk drives, computers and telecommunication equipment are transforming from close to open innovation system. However, Anderson & Billou (2007) argued that the transformation from close to open ended innovation has complete and proactive organisations operating in highly competitive industries are heading towards embedded innovation system. These businesses are seeking the innovative

knowledge from unlikely sources and are making a strategic use of this knowledge to sustain a distinct competitive advantage (Simanis & Hart, 2009). In these organisations, the innovation locus has shifted outwards the centre of research and development department and has diffused into the web of interconnections that link these organisations to the outer world (Pitta, Guesalaga & Marshall, 2008).

Embedded innovation takes on a different approach to organisational development focused on creating sustainability (Doloreux, 2002). Embedded innovation aims at integrating an organisation with the society of the targeted population. Integration into the community enables an organisation to achieve a competitive advantage since it builds trust with the client that is key to the development of a long-term relationship and loyalty to the company (Pitta, Guesalaga & Marshall, 2008). The structural innovation model is the much older model that has been employed prior to the development of embedded innovation. Hence the two share some similarities that are essential to the understanding of the application of embedded innovation. The structural innovation model is guided by latent need. This means that it is market driven and focuses on the development of products that satisfy consumer needs. This model is very efficient in environments where the driving factor is consumption. However, the structural innovation model fails when it comes to the developing market or in traditional markets (Simanis & Hart, 2009).

Telecom industry's highly competitive environment seeks an innovative culture to strengthen the competitive positioning atnational and international stage (Abu, 2014). Various factors affect the shift towards an embedded innovation culture, including the organisational structure, customers, banks and financial institutions, research expenditure and public policy agencies (Getz et al., 2016). The innovation system also comprises technological or physical

artefact, or institutions in the form of legislative artefacts such as regulatory laws, traditions, and social norms (Carlssona 2002). The function of an innovation system is to generate, diffuse, and utilise technology.

The properties and behaviour of each component of the set influence the properties and behaviour of the set as a whole (Mittal, Momaya & Agrawal, 2013). At the same time, each component depends upon the properties and behaviour of at least one other component in the set. Because of this interdependence, the components cannot be divided into independent subsets; the system is more than the sum of its parts (Getz et al., 2016). This complex understanding of the interconnectedness sets the basis for the embedded innovation culture within an organisation (Mittal, Momaya & Agrawal, 2013).

The table below is an evaluation tool aimed at comparing the systems of innovation i.e. inclusive innovation, open innovation, quadrable helix, organizational ambidexterity, and regional innovation support. The key comparison criteria are based on Simon & Hart's systems of embeddedness and Stewart's Great Wheel of Innovation (See Simon & Hart, 2009 and Stewart, 2006). The identification of needs, value creation, stakeholder engagement, and business environment are used in this table to explain why the embedded innovation system encompasses all the merits of these systems.

The table below is an evaluation tool aimed at comparing the systems of innovation i.e. inclusive innovation, open innovation, quadrable helix, organizational ambidexterity, and regional innovation support. The key comparison criteria are based on Simon & Hart's systems of embeddedness and Stewart's Great Wheel of Innovation (See Simon & Hart, 2009 and

Stewart, 2006). The identification of needs, value creation, stakeholder engagement, and business environment are used in this table to explain why the embedded innovation system encompasses all the merits of these systems.

Table 2.2 Comparison of the Systems of Innovation

	Open Innovation	Inclusive Innovation	Quadrable Helix	Organisational Ambidexterity	Regional Innovation Support
Stakeholders Engagement (Transactional/Transformational)	Transactional	Transformational	Transformational	Transactional	Transformational
Focus (Potential/Needs)	Potential	Needs	Needs	Needs	Potential
Value Creation (Relationship-Based Value/Consumption-Based Value)	Relationship based value	Consumption-Based Value	Consumption-Based Value	Consumption-Based Value	Relationship-Based Value
Business Environment (Consumer solution/Business Intimacy)	Consumer solution	Consumer solution	Business intimacy	Consumer solution	Business Intimacy

2.6.1. Open Innovation

In recent times, inclusive innovation has become a socially focused type of innovation that enables people from lower social classes to access quality products and services (Henkel, 2006). Many countries are encouraging service and product providers to utilize inclusive innovation in order to reach the entirety of their population and to promote equity and fairness (Altenburg and Lundvall, 2009). The concept of inclusive innovation is becoming popular in the global telecom sector owing to increased competition.

Open innovation that helps engaging stakeholders is aimed at generating potential innovation from other actors, in which case the innovation flow is described as low inside out and high outside in, which only allows the minimum of innovation out and high innovation in (Dasgupta & Gupta, 2009). The relationship between them is not equal and only serves consumption goals, the firm pays less attention to value creation and is only concerned with product and service sales. In other words, the business environment has finally become motivated.

Nowadays, the firm's role is to look for ideas continually, sensing and seizing opportunities and interacting with stakeholders in order to generate potential innovation. In this case, the relationship with stakeholders is transactional and the firm gives less for more.

2.6.2. Inclusive Innovation

This type of innovation is socially focused innovation for the benefit of women, poor and disabled people, and ethnic minorities (Foster & Heeks, 2015). Inclusive innovation engages with stakeholders in the diffusion process, and not in that of idea generation. However, the relationship with stakeholders is transformational. The innovation flow is considered to be high inside out and high inside in and focuses on the people needs.

The value creation and the business environment in this aspect it's a mix of both for each aspect, is consumption-based value but at the same time creates value for the targeted audience, is seen as consumer solution and it create business intimacy for the targeted people. However, inclusive innovation requires good planning, otherwise companies may end up shutting down part of their business owing to lack of sales in order to sustain continued growth

(Goyal, 2016). One of the main disadvantages of inclusive innovation is the need for high sales to sustain production (Henkel, 2006). Inclusive innovation feeds inconsistency, which is detrimental to a business venture. It consequently slows down a firm's decision-making processes owing to the greater number of people involved (Altenburg and Lundvall, 2009).

There are some common pitfalls to be avoided in order to increase the chances of success with inclusive innovation, including lack of support from top management, a focus on the wrong performance metrics, failure to hire talented executives, partnership with the wrong organisations, and using old business models (Henkel, 2006).

2.6.3. Quadrable Helix

This combines four important actors, to wit civil society, government, firms, and knowledge institutions. This results in an open innovation-oriented approach to firms which the user take place in the innovation process. This type of innovation stresses the importance of establishing strong working relations with stakeholders and circulating knowledge amongst them. However, all co-operative action focuses on developing results for external users, so we conclude that customers are not included in the decision-making process and they see customers as source of data.

Despite the fact that innovation flow is high inside out high inside in, the relationship with customers is transformational. The quadruple helix is perfect for participation processes and for inviting society to contribute to possible solution which makes the value consumption based.

The firms adopting quadruple helix innovation system aim to work with stakeholders in a long-term perspective and owing to the openness and transparency within the process it creates business intimacy with stakeholders.

2.6.4. Organisational Ambidexterity

It is the organizations' ability to be efficient in its management of the current business environment and adaptable for coping with business changing demand just as being ambidextrous means being able to use both the left and right hand equally. Defined as an organization's ability to be aligned inefficient in its management of today's business demands as well as being adapted to changes in the environment at the same time, this term of organizational ambidexterity was first used by (Robert Duncan 1976).

This organizational concept arises where the firm takes care of current core business with its right hand while taking care of innovation with the left hand, as a physically separated business unit. Both are separate units with their own people and culture. They are also many pitfalls in this concept, the right-hand meddling with the business of the left hand, not having the right innovation managers for certain projects, misalignment with senior management and the lack of truly committed sponsorship.

The innovation flow is considered as low inside out and high outside in. In terms of engagement with stakeholders, the relationship is transactional and limited to whoever is needed at the time. This concept only focuses on what is needed in the market and depends on people demands and demands that influence firm innovativeness. Organizational ambidexterity requires organizations to use both exploration and exploitation techniques to be successful,

which can be very difficult for firms in a changing business environment. The concept has short term value because of tomorrow's changing demands and their innovation lies in consumer solutions.

2.6.5. Regional Innovation Support

This model has been adopted by firms recently as it centers around four factors described as business environment, internal factors, research, and development and finally the innovation support system (See Figure 3.1 in *Section 3.2.3*). This model is applicable to different regions and industries. The concept of regional innovation support systems is driven by the increased intensity of local and international competition in the mobile telecom. This model is based on Firm's theory of Innovation, where service providers develop and independent account of the regional ecosystem of innovation.

The emergence of sectors, clusters, firms and industries in many regions globally (Enright, 2001). In this case the importance of integration, partnership, suppliers, end users and regional resources in enhancing the innovation capability and competitiveness of firms and regions (Asheim et al., 2003). When firm-core competencies and learning processes will lead to regional competitive advantages if they are based on national capabilities such as specialized resources, skills, institutions and share of common social and cultural values (Maskell, 2004).

This model is based on integration and collaboration, with many actors involved in the process, and the focus is purely on potential ideas for the end user. The innovation flow is high inside-out and high-outside in, firms will integrate with the authorities in order to develop new ideas or reform policies. In this case, the value creation is relationship based with actors involved within the process. In such a system, actors are connected correctly, and every actor

has a task allocated, the transparency and inclusivity has created business intimacy.

2.7. Research Gaps

Van De Ven (2007) stated that the research problem includes two sides. The first sides represent the practical problems and the research motivation, while the second side represents the knowledge gaps. Easterby-Smith et.al (2018) emphasized that the research gap of a management discipline could be addressed at epistemological level, ontological level, and contextual level.

Level of Research Gap	Demonstration
Ontological Level	Innovation Systems The literature of innovation systems offers two types of innovation systems, namely, open system versus close system. However, it failed to address the hybrid system that includes lots of social constructed entities. Open innovation, inclusive innovation, triple helix, and regional innovation systems offer fixed categories of innovation resources and processes that need to be followed as a water drop model. However, the EI is an iterative model that offer contingency plans than fixed scenarios (Ulmanen & Bergek, 2021). Embedded Innovation The literature addresses how different is EI from the traditional models/approaches of innovation. However, it fails to theorise this approach. It also failed to define "embeddedness" as a process of value add (Lysek, 2019). Accordingly, the researcher will audit alternative theories of innovation to build a theory of EIS based on a case study.

Epistemological Level	Firm-Level Innovation
	Hassink's theory of firm-level innovation is limited to product innovation, but fails to address service innovation where there is a high level of customer engagement and agility of delivery. İzadi, Zarrabi & Zarrabi (2013) confirm that new models of firm-level innovation need to be designed to examine our understanding for radical innovation in the digital age.
Contextual Level	Service innovation in Jordanian Telecommunication
	Recent studies such as Ghaida (2018) confirmed the counter digital divide in the middle east, where more complex definition of service innovation is emerging in the telecommunication sector. However, there is a need to address the political and social factors that affect the way telecoms operate in local areas, while they have multinational capacity.

Conclusion

This chapter presents a thorough review of the existing innovation systems literature, past empirical studies, and innovation theories so that important insights might be determined, identify a conceptual model. Later, in *Chapter 3*, this model is tangled with a theory of innovation systems called "Firm-Level Innovation System" by Hassink (2001).

The first section of this chapter reviewed different definitions of Innovation, its types, and elements. The second section emphasized on the importance of service innovation in a dynamic market located in a developing context. This section mapped the key characteristics of service innovation and justifies the significance of telecommunication service that affects other sides of life in the developing world.

The third section addresses the systems thinking principles to define the so called "*Innovation systems*". In doing so, the resource-based versus process-based views of innovation systems is presented.

The fourth section offered a detailed review of the top cited models of innovation systems published during the last year and that address the key research words used in the secondary research *(See 4.4.1).*

The fifth section offered a conceptual model based on Simanis & Hart's process model of embedded innovation. As shown in ***Table 2.2***., inclusive innovation, open innovation, quadruple Helix, and Organizational ambidexterity are analysed in terms of their ability to engage stakeholders, create business needs, create value for the delivered product/service, and adaption to the business environment.

Chapter 3: Theoretical Framework

Introduction

The lack of theorising and understanding the embedded innovation systems is discussed in ***Chapter 1***. Accordingly, the literature review, or ***Chapter 2***, reviewed the key definitions of innovation, service innovation, and innovation systems. It also offers a systemic approach of innovation system in telecoms based on Simens & Hart (2008) that is used to compare between inclusive innovation, open innovation, quadruple Helix, Organisational ambidexterity, and regional innovation support models.

This chapter extends the theory building process by reviewing the top cited theories on the innovation systems literature, including Normative theories of Innovation, analyses different mechanisms/factors affecting the firm innovation system and identify important variables from the existing innovation literature to set the theoretical foundation for the underlying research. In doing so, the researcher audits candidate innovation systems theories, explain each of them, and address their fit as lenses for understanding the social phenomenon of embedded innovation system. models and emerging concepts to extract the most relevant elements/factors of embedded innovation systems that guided the fieldwork. The insightful discussion of different innovation theories, including models and concept will be based to conduct the empirical investigation and analyse the Jordanian telecom market.

The chapter will firstly discuss the open innovation theory, its limitations and strategies to overcome the associated limitations. Afterwards, the latest open-inclusive innovation theory is discussed, and the researcher demonstrates how it differs from the open innovation and what

are the possible limitations. The justification for going beyond the open innovation will be discussed and researcher will justify why contemporary organisations must embed the innovation to enhance the value.

Finally, the theoretical discussion will be based to analyse the Jordanian telecom market. The researcher will also identify the conceptual framework that will be based to conduct the empirical research.

3.1.   Embedded Innovation: Beyond Open and Inclusive Innovation

The embedded innovation paradigm is a transition beyond the open and inclusive innovation theories. However, at this stage, the concept requires rigorous refinement and exploration to transform into a new innovation-theory (Simanis & Hart, 2009). The embedded innovation concept overcomes the conceptual limitations of past innovation theories. It is a step ahead than close, open, and inclusive innovation theories (Hafkesbrink, Krause and Westermaier, 2010). On the continuum of embeddedness, the close innovation theories lie at one end of spectrum, open innovation theories lie somewhere in middle, and embedded innovation concept lies at the opposite end. It fosters an innovation embedded environment that results into a meaningful innovation exchange between innovation actors (Noordhoff et al., 2011).

3.1.1. A Shift from Dis-Embeddedness to Embeddedness

With the passage of time, the shift from dis-embeddedness to embeddedness has become visible (Hafkesbrink, Krause and Westermaier, 2010). The organizations are increasingly seeking to embed the innovation exchange into organizational processes so that meaningful collaborations with the stakeholders and innovation actors could be made (Rutten & Boekema, 2007). Schweisfurth (2012) proposes that embedded innovation paradigm assists the organizations in leveraging its relationships with community to its maximum potential (Schweisfurth, 2012). However, review of literature has revealed that innovation researchers have underexplored the potential of embedded innovation, and there is need to conduct in-depth exploration for refining and broadening the understanding about underlying phenomenon (Rutten & Boekema, 2007).

The embedded innovation stresses the importance of developing close ties with the local community and builds the customer loyalty based on mutual trust (Ferrary, 2011). Embedded innovation model guides the modern business enterprises to develop and sustain the meaningful relationships with all stakeholders and innovation providers and presents a strategically wise give and takes relationship with the customers and local community (Baldwin & Von Hippel, 2011). This model views the engagement with stakeholders as transformational rather than transactional and guides the organizations to develop a sense of mutual responsibility by focusing on the latent customers' needs through effective communication (Baldwin & Von Hippel, 2011). However, the lack of adequate exploration has limited the organizations' ability to adopt embedded innovation model in real world settings (Hafkesbrink, Krause and Westermaier, 2010).

The underlying research intends to explore the potential of emerging embedded innovation paradigm in improving the organizations functioning in highly competitive markets. Hafkesbrink & Schroll (2011) explored the embedded innovation concept and proposed that this emerging notion is particularly meaningful for small and medium business enterprises, or industries facing the resource constraint issues. Today, the digital economy along with a huge influx of small and medium organizations require innovation researchers to take a step ahead open innovation theory (Hafkesbrink & Schroll, 2011). Mostly, the open innovation has been discussed in context of large organizations that have enough resources and capacity to absorb the knowledge from outside and ensure the inside-out knowledge exploitation and technology transfer. Various successful examples of knowledge absorption strategies from external sources have been discussed by the past innovation researchers (Chesbrough, 2004). Contrarily, the embedded innovation focuses on the knowledge transfer abilities of small and medium enterprises (Hafkesbrink, Krause and Westermaier, 2010).

This innovation model leverages the collaborating nature of organizations during the innovation process when knowledge cycles are highly dynamic, and knowledge is widely distributed among innovation actors. Diener and Piller (2010) contend that embedded innovation offers more holistic view as it suits both large and small organizations. On the other hand, open innovation only suits large business enterprises, where management can sophisticatedly manage the whole open innovation process by using open innovation toolkits and lead-user approaches. Big enterprises use the innovation contests to create the adequate gravitational force for attracting innovation providers, whereas small and medium enterprises lack sufficient resources to leverage the benefits offered by open innovation (Hafkesbrink, Krause and Westermaier, 2010).

The knowledge sharing within the open innovation context relies on the multiple interactions between the innovation actors (Diener and Piller, 2010). On other hand, decentralized and individual small and medium enterprises that share the knowledge must develop multiple interactions with the local community to foster innovation. The organizations seek for a win-win situation by collaborating with the community (Hafkesbrink, Krause and Westermaier, 2010). The knowledge is collectively exploited within communities and networks etc. Diener and Piller (2010) regard the open innovation as a transition from the dis-embeddedness to embeddedness, that is, from close innovation to the embedded innovation. The emerging innovation paradigm develops a collaborative network or cluster of organizations with the local community that is adequately stable and flexible to embed the innovative knowledge and ensure the effective exploitation of collaborative learning within multi-agent system (Diener and Piller, 2010).

Considering the importance of embedded innovation for tackling the innovation needs of modern enterprises, this study intends to assess the embedded innovation practices of Jordanian telecom organization. The researcher will assess the willingness of telecom management to collaborate with a community and build a network that can facilitate the innovation exchange among different actors. For this purpose, the underlying research has adopted the theoretical framework proposed by Hassink (2001). This framework will be based to conduct the Jordanian telecom sector specific empirical research. The section will also analyse different components of theoretical framework considering existing literature.

3.1.2. Critical evaluation of Embedded Innovation Models

Review of literature reveals various studies that proposed innovation models to support the firm innovation and enhance their competitive position in a highly turbulent market (e.g. Phelps, 2010). For example, Seddighi (2015) assessed how firms operating in contemporary knowledge-based economies use the knowledge as competitive tool and an essential input to foster the innovation (Seddighi, 2015). In contemporary knowledge-based economies, the growth of firm relies on its ability to accumulate the knowledge through effective communication and collaboration with the stakeholders and integrating the technical change that consequently results into highly innovative activities (Hogan et al., 2011).

The ability to foster the innovation on continuous basis has become a must for survival of firms operating in competitive markets (Phelps, 2010). The concept of embedded innovation also emerges from this need of firm innovation. Continuous refinement and development of firms' core competencies play highly critical role in transforming the organisation into an innovative firm (Simanis & Hart, 2008).

While exploring the need to integrate the innovation for sustained success, Seddighi (2015) developed a conceptual framework for firm innovation. The researchers empirically evaluated and tested the model by collecting data from 128 firms. The study was executed in the North-East England. Based on empirical results, the researchers concluded that mostly the innovative firms spend heavy expenditure on the research and development activities (Seddighi, 2015). The conceptual model highlighted different factors affecting the firm innovation, including development and refinement of core competencies through informal and formal cooperative research and development activities within an incubator research and

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development cluster. The researchers based their model on the resource-based view theory (Seddighi, 2015).

It implies that firms must develop close ties with the external environmental actors to support their research and development activities and inadequate communication with external stakeholders cannot facilitate the innovation integrate within firm R&D (Ayuso et al., 2011).

The literature also suggests the need to form the knowledge clusters to improve firm innovation. Today, knowledge is acting as an important innovative input for productivity growth (Dasgupta & Gupta, 2009). Firms operating in isolation find it difficult to extract meaningful knowledge that can support the research and development activities (Child and Faulkener 1998). Cooperation among stakeholders and clustered firms results into high return through open sharing of knowledge and resources such as research and development activities, specialised labour and technology (Hill and Brennan 2000; Schmitz 2000; Ayuso et al., 2011).

Despite numerous models proposed by the innovation systems researchers and massive investment on research and development activities, innovation remains a challenging issue for various organisations and Jordanian telecom industry is one of them. The firms lack innovative practices, and frequently fail while integrating and promoting an innovative culture. Those who succeed, strive hard for sustenance (Ayyagari, Demirgüç-Kunt & Maksimovic, 2011). It indicates a need to shift to a new paradigm that can guide business organisations' innovation activities by adopting a holistic view. Pisano (2015) cites the inadequate innovation strategies as main reason behind failed or less successful execution.

3.2. Alternative theories of embedded innovation

This section offers a critical evaluation for three highly cited theories that the research found them relevant to address the research problem of understanding the mechanisms of embedded innovation in the telecommunication sector.

3.2.1. Normative Theories of Innovation

The main origin of the innovation can be considered as exogenous or even indigenous, which implies social construction of knowledge (internal). Regardless of the origin, the attempt for implementing the innovation within the organization may encounter the innate resistance for the normative evaluation. According to McAdam (2005) the constructs for the normative evaluation or normalization is basically referred as functionalist in comparison to the set of norms, routines and standards which mainly conforms to the corporate agenda and also requires the obedience from groups and individuals in prescribed manner. Hence, the normative evaluation is also considered as judgmental and multi-level. Furthermore, it is also considered as the espoused "normalized knowledge" or "common sense" that is specifically recognized by experts within an organization.

In light of Guler et al. (2002) it also refers to the isomorphism for normalization which depicts pressure for homogeneity through atavism and replication within the organization. However, it was concluded by Finnegan (2000) that the perspective of employees for the organiational values is rather encouraged to be normative. At the strategic level, the innovative plans and ideas are likely to challenge the wisdom of the senior management for the company. However, it is contended by Alvession and Deetz (2002) that the company's propensity for

arriving at the robust truth is mainly institutionalized by the homogenous norms which claims the innovative implementation. It has further been presented that the normative evaluation if innovation is focused on the effectual role which is exerted is the discipline of normalization and hence generated conflict with the innovators. Eventually the situation is exacerbated within the organization where the decision makers and owners are overly top-down with the approach that leads to further embedding for the normative culture.

3.2.2. Theory of Innovation Diffusion

The theory of DOI is useful in describing the adoption of a certain technology. Diffusion happens when opinions and information about a new technology are spread to potential users through various communication channels (Henkel, 2006). Rogers highlighted some factors that prevent the successful adoption of a new technology, including ineffective or poor communication channels and personal limitations of a potential client (Rogers, 2010).

Diffusion theory doesn't enable corporations to predict the extent to which an innovation is likely to be adopted which could lead to massive losses for the firm in case of over production. Another disadvantage of diffusion theory is its lack of catering to the flow from the customer (Sahney, 2015). Unlike open innovation, diffusion theories encourage the flow of the message from the receiver. This means that it does not consider user feedback. It instead focuses on persuading a user to adopt the product (Islam & Meade, 2015).

3.2.3. Theory of Firm level Innovation

The innovation literature is filled with the firm innovation models since the 1950s. The proliferation of innovation models suggests that each model purports to guide or explain the innovation process within industrial firms (Hobday, 2005). In this regard, the current research found a seminal study conducted by Rothwell. The researcher argues that the post-war era is defined by a series of technological innovation that occurred with the evolution of corporate innovation strategies (Rothwell, 1994).

It is important to note that the evolution to the next innovation model didn't occur by simply replacing or substituting the previous model. In most cases, models existed at the same time, while in other cases, components of two innovation models were mixed to introduce a third model that can better meet the innovation needs of corporate firms (Brem & Voigt, 2009).

Rothwell (1992) contends that these innovation models were the simplified presentations of the complex organisational processes. The development from one innovation model to the other is the reflection of transformations in the central perceptions of what defines the best business practices instead of the actual development (Brem & Voigt, 2009). Rothwell (1994) argues that the model appropriateness reflects into its ability to vary from industry to industry and among various innovation categories (such as incremental or radical). Researchers further argue that the organisational processes occurring within the organisations rely on the exogenous factors like speed of the technological development, prevailing competition and support from government and other legislative institutions (İzadi, Zarrabi & Zarrabi, 2013).

The earlier firm innovation models in 1950s were basically simple linear models as regarded the innovation as a sequential process rather than a complex process involving multiple relationships (Brem & Voigt, 2009). In 1960s and 70s, the demand-pull firm innovation models appeared on screen that resulted into development of various market led innovation theories. However, the major limitation of these models was their linear approach towards innovation integration like their predecessors (Mowery & Rosenberg, 1979). The demand-pull innovation models focused on the market research in identifying the viable opportunity and incurring the research and development expenditure to satisfy the identified need (Rothwell, 1994). The management's approach was short-sighted as they considered the marketplace as key source for ideas worthy of research and development but didn't focus on developing meaningful relationships with all stakeholders to establish a strong basis for innovation (Rothwell, 1992).

Later in 1970s, the demand-pull innovation models were succeeded by the interactive models. Now, management slowly started recognising the need to develop and strengthen the interactions with important environmental actors (Moulaert & Sekia, 2003). The results of empirical research of that time proposed that the market pull, and technology push linear innovation models were atypical and extreme cases of industrial innovation (Lundvall, 1988). However, the new interactive innovation models also adopted a myopic view as per Rosenberg and Mowery. The researchers contend that these firm innovation models were characterised by the interaction between technology and marketplace. The models lacked the focus on building meaningful relationships with stakeholders and society (Mowery & Rosenberg, 1979). Rothwell regards these models as linear, though they claimed to be non-sequential and non-linear (Rothwell, 1994). In 1980 decade, the innovation researchers proposed the integrated

innovation models that still lacked the non-linear characteristic despite non-sequential processes along with feedback loops (Moulaert & Sekia, 2003).

The post 1990 innovation models were the initiation of truly non-linear innovation approach. The networking and system integration models focused on the knowledge management and building relationships and networks to facilitate the firm learning process (Hobday, 2005). The management started realising the importance of developing close ties within and outside the firm to develop and sustain the competitive advantage (Rothwell, 1994). These models suggested that the innovation was fundamentally and generally a disseminated networking process (Moulaert & Sekia, 2003). Researchers suggest that these integrated networking innovation models were formulated based on the critical observations (during the decades of 1980s-1990) of an upsurge in partnerships, corporate alliances, research and development consortia and various types of joint ventures (Brem & Voigt, 2009).

These observations resulted into meaningful extensions to the previous generation integrated innovation models, and focused on developing the vertical relationships, such as making strategic alliance with the customers and supplies and making effective collaborations with the key competitors (İzadi, Zarrabi & Zarrabi, 2013). Rothwell argues that these extensions to the previous linear innovation models were made due to the time pressure for increasing the efficiency and speed to successfully launch new products to satisfy the ever-changing customer needs (Rothwell, 1994). The environmental turbulence further pressurised the management to enhance the efficiency of overall innovation network, including external collaborations, customers, suppliers, and in-house functions (İzadi, Zarrabi & Zarrabi, 2013).

Figure 3.1: Firm's Level Innovation System
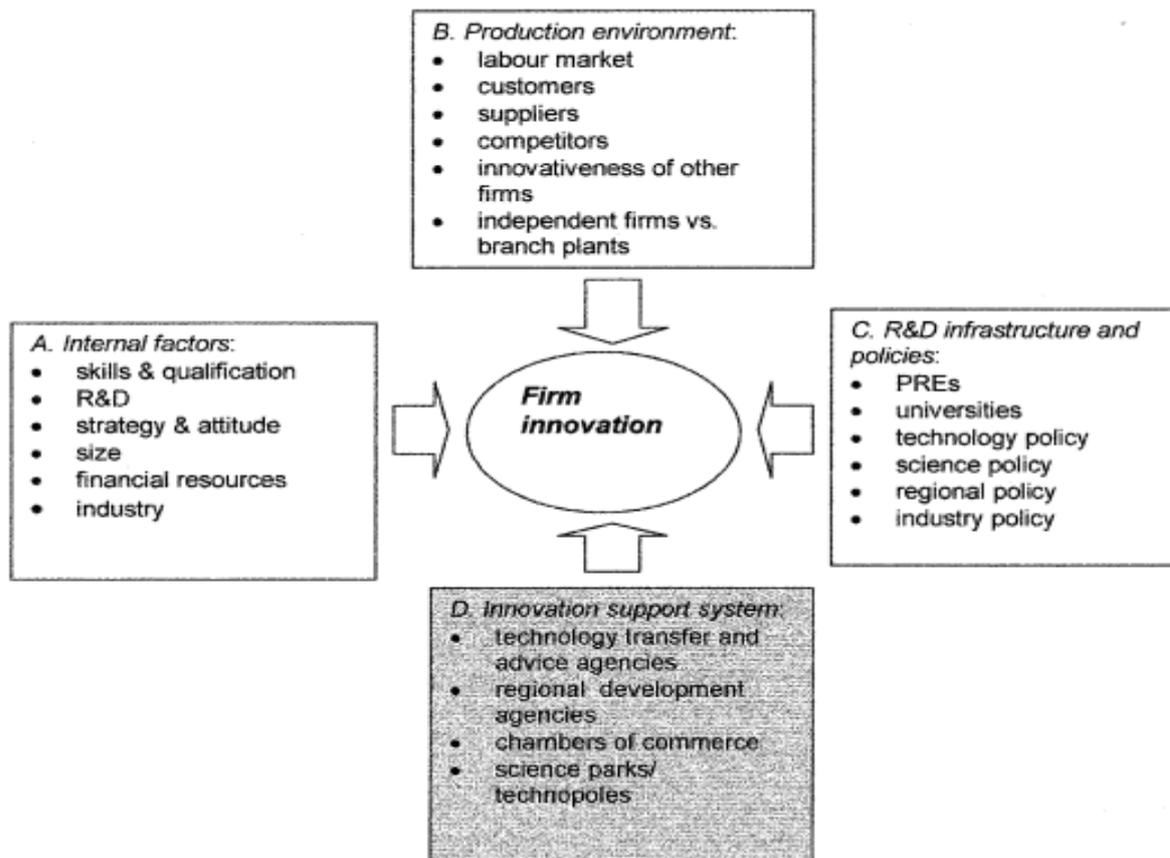
Source: Hassink (2001)

Hassink's framework is based on regional innovation support systems which have been adopted in South Korea. The framework was focused around four factors termed as product environment, internal factors, research and development and lastly the innovation support system. This framework has been used in the country of South Korea for the regional innovation. This framework was applicable for different industries who are operating as the SME-oriented companies focused on innovation support policies in South Korea. The framework emphasized on strengths of Korean SMEs and their innovation support which has been previously judged in the study Nugent (1994). The central idea which has been proposed in this framework is focused on the innovation and the spatial level of influences which innovation had on its sub-factors.

The positive thing about the model is that it highlights that regional authorities plays a significant role as compared to international and national authorities when it comes to the embedded innovation. Furthermore, the author has highlighted that the embedded innovation support system is clearly related to the regional development in South Korea along with their SMEs. Moreover, the framework has presented that the dirigiste system can be successful for the investment-driven stages when the country can achieve economic development which is mainly dependent on the large enterprises.

Furthermore, the support for South Korean SMEs towards embedded innovation is focused on replacing the outdated systems from the country. However, the framework is only focused on South Korean region which can further be intensified by considering other countries with respect to their SMEs. However, this framework has helped in understanding overall significance of embedded innovation because it covers every aspect which is related to innovation which is research and development, production factors, environment and internal factors. The most important aspect is the research and development because the innovation cannot be possible without an effective research and development which eventually leads to successful innovation of the organization. Furthermore, the model has provided with the guidance to the embedded innovation which helps in mastering the economic crisis and the factors which helps in bringing innovation driven growth of the firm. In addition to the above statement, the embedded innovation support system plays a significant role in the enhancement of innovation policies. This study has employed this framework to highlight the benefits and challenges faced by the Jordanian telecom industry in establishing diversified relationships with multiple environmental actors. This is the framework for firm-level innovation at an

organisation where the main determinants are research and development, business environment, innovation support system and the competency of the company.

3.3. Proposed Theoretical Framework

The theoretical framework has been adapted by the study conducted by Hassink (2001), upon the understanding and nature of the topic which is focused on exploring the mechanisms, drivers, and challenges of implementing embedded innovation systems in the Jordanian Telecommunication sector. The main variables of the study were research and development, skill qualification and core competency, business environment and innovation support system.

Figure 3.2: Firm-Level Embedded Innovation System
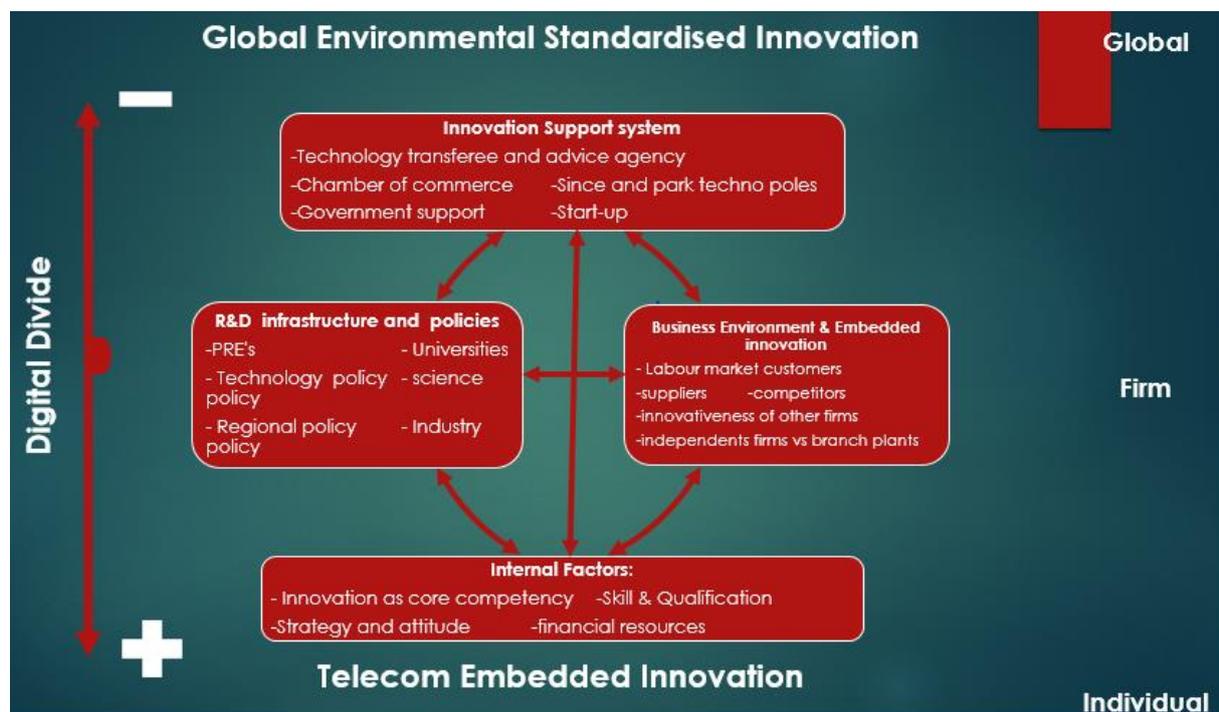
Adapted from Hassink (2001) & Simens and Hart (2009)

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Therefore, upon the understanding of the variables, the following theoretical framework has been designed, where the variables have been discussed in an in-depth manner in literature review section. The main research aim is to enhance the competitiveness of Jordanian telecom industry and ensure its survival in highly turbulent global telecom market by embedding the innovation and developing a positive environment to facilitate the innovation. Review of literature has identified that there is lack of adequate empirical evidence to explore the factors affecting the innovation within Jordanian telecom market. Various research studies have analysed different aspects of Jordanian telecom sector, such as Shanikat (2008) analysed the change in the organisational structure after the privatisation of Jordan telecom industry.

Khasawneh, Regan & Gillard (2011) analysed the adoption pattern of Jordanian telecom customers and overall diffusion of innovation in Jordan society. However, the researchers didn't focus on the telecom organisations and challenges faced by them while diffusing the innovation into their business operations.

Hajir et al (2015) analysed the role of knowledge management infrastructure in enhancing the Jordanian telecom companies' innovation practices. This research study has offered useful insights as researchers highlighted different factors affecting the innovation diffusion including overall physical environment, technological advancement, human resource practices, overall organisational structure and culture. The researchers concluded that Jordanian telecom organisations must develop an efficient knowledge management infrastructure and should invest in information technology for fostering such innovative environment. The researchers further contended that efficient knowledge management infrastructure is a must for integrating innovation and sustaining competitive edge in the long-run. However, the study didn't adopt a holistic approach to understand the role of different

factors affecting the innovation embeddedness in Jordanian telecom market. Moreover, researchers were unable to get an adequate response from the firms due to privacy issues. Quantitative research nature further hindered the researchers' ability to get in-depth insights. Insights were only taken from the management that weakens the reliability element. The study suggested the future researchers to adopt a holistic view while exploring the factors affecting the innovation within Jordanian telecom sector and overcome these limitations.

Hence, the underlying research has decided to employ the framework offered by Hassink (2001) as it includes different elements and presents a 360-degree view of the overall innovation environment. The framework guides researcher to collect data from multiple environmental actors, such as management customers and government officials and avoid relying on single data source to strengthen the reliability. The firm innovation model was basically proposed to enhance the innovation practices of South Korean businesses. The model helped the South Korea's initiatives to foster the innovation-driven growth and develop an innovation-supportive infrastructure. Review of literature has suggested the lack of sufficient empirical evidence for exploring the factors affecting the firms' innovation in Jordanian telecom industry. Although, some researchers have analysed the impact of some factors on innovation system, mostly the studies have either focused on the firms' internal factors such as organisational structure, organisational culture, or have analysed the customers' attitude towards innovative mobile devices (e.g. İzadi, Zarrabi & Zarrabi, 2013).

It suggests the need to adopt a holistic view and analyse the effect of multiple environmental factors of firms' innovativeness. The Embedded Innovation paradigm proposed that social embeddedness occurs because of complex linkages among environmental actors, and is facilitated by the efficient knowledge flow within the society (Simanis & Hart, 2009).

Hence, the current research has chosen this model to explore the innovation embeddedness of Jordanian telecom industry. Different dimensions of proposed model will be applied to the Jordanian context to highlight the motives, perceptions and challenges faced by the Jordanian telecom market players. Moreover, application of this model will also enable the researcher to adopt a holistic view and understand the interconnectedness among diversified stakeholders.

As mentioned earlier, although, review of literature also reveals other models to study the factors affecting the firm innovation, however, they lack some important dimensions and don't offer the complete view. For example, İzadi, Zarrabi & Zarrabi (2013) assessed different firm innovation models to evaluate the innovation system. The paper critically analysed the strengths and shortcomings of these models. Based on critical analysis, the researchers contended that chief contribution of such firm innovation models is that they assisted many countries in formulating effective, innovation-supportive strategies. However, innovation literature suggests that there is lack of adequate empirical evidence to support the theoretical underpinnings of these models. Among different models proposed by different researchers, this research has chosen the Hassink (2001) firm innovation model due to its inclusiveness of all major factors.

This section will explore the dimensions of the proposed framework in context of Jordan, and along with its application on the global level to extract important insights and widen the background information so that strong theoretical foundation could be set for conducting the empirical research. The framework can be applied to the organisations in the global level for increasing their efficiency towards the embedded innovation system.

3.3.1. Innovation support system

Innovation literature highlights the increasing influence of environmental factors in supporting the innovation (Lee et al., 2014). The innovation system depends on various factors such as government's policies towards entrepreneurship, technology transfer and advice agencies, current state of entrepreneurship and country's industrial, technological and regional development (Dutta & Lanvin, 2012). This research will analyse the Jordanian government's policy framework and ability of Jordanian telecom organisations to devise and implement innovative policies. Researchers propose that a shift from labour intensive, low technology, mass production industry to high-tech, skill and capital-intensive industry is important to support the regional innovation system (Lee et al., 2014). In an innovation-supportive environment, government as well as organisations emphasise on a decentralised governance at national and firm level (Dutta & Lanvin, 2012).

The current pace of Jordan towards such innovation supporting environment is slow but steady. Recent studies on the Jordanian innovation support system suggest that country is facing difficulties in integrating the innovation and its national innovation system is inefficient and underdeveloped (Abuhamad, 2014). Researchers contended that country's national innovation system is suffering from inadequate coordination among different components (Sultan & Soete, 2012). To develop an efficient innovation support system, the country requires to open-up towards global knowledge, make important reformations in the universities, invest on research and development activities, upgrade the research and development infrastructure, establish incubation systems and facilitate the knowledge transfer to embed the innovation into corporate environment (Sultan, 2010). Such innovation embedded national and organisational

culture can play significant role in the national and regional economic development (Abuhamad, 2014).

Researchers also recommend that Jordan needs to build a comprehensive knowledge network, formulate an effective innovation policy, develop its human resource and promote information and communication technologies to support such culture (Sultan & Soete, 2012). Nation's competitiveness doesn't rely on a single company or an industry, but on overall innovation system of all major industries. Stimulating innovation and research is one of major tasks of national economic development. An innovation embedded organisational and national culture not only enhances the performance of a single sector, but in the long run, it results into full employment, sustainable economic development and positive balance of payments (GTZ, 2009). The underlying study will empirically analyse the Jordan's organisational and national innovation support system and its impact on the telecom industry.

Overall, the current situation of the Jordan's national innovation support system is not satisfactory to facilitate the transformation towards the emerging innovation 3.0 paradigm. The Embedded Innovation paradigm stresses the need of collective learning and social embeddedness that mainly depends on the untraded interdependencies and tacit knowledge (Boyer, 2003). Resultantly, a dialectical association formulates between the space and innovation. However, such interconnectedness is dependent on the institutional, cultural and social realm for successful innovation (Simanis & Hart, 2009). Various studies have identified conditions and factors affecting the socially embedded firm innovation, such as industry nature, industry competitiveness, technological advancement, communication and knowledge-sharing processes, government support and expenditure on research and development activities (Crescenzi & Rodríguez-Pose, 2011). In context of Jordan, above discussion suggests that lack

of comprehensive knowledge framework, inadequate institutional support, risk averse attitude of financial institutions and inadequate research and development expenditure erect barriers towards such socially embedded innovation (Sultan & Soete, 2012).

Hence, empirical research is required to highlight the benefits that this emerging innovation paradigm can offer to businesses and overall society so that Jordanian government and telecom organisations can be convinced to revise their strategies and facilitate the industry's transformation towards new paradigm to preserve its competitiveness at local and regional stage.

3.3.2. R&D Infrastructure and Policies

Recent initiatives taken by the Jordanian government such as free trade agreements and development of strategic commercial partnerships with the neighbouring countries (Turkey and USA) have supported the national innovation system of Jordan (Sultan & Soete, 2012). The country also availed membership of Agadir FTA and is heading towards breaking the barriers to sustainable economic development (JMoP, 2011). Moreover, the foundation of University of Jordan in 1962 and development of industrial research centre were the milestone achievements in strengthening the national innovation system. The government has also developed 5-year national research strategic plan to strengthen the research and development activities (HCST, 2011).

Last few decades have observed an increased interest of Jordanian government towards promoting information and communication technologies in different sectors (Jordan ICT Forum, 2010). These recent developments have resulted into increased digital penetration

improved education and a stimulated demand for different internet services. The initiatives have directly affected the Jordanian telecommunication sector. However, more initiatives are required to address the challenges faced by the Jordanian business environment and ICT industry (Sultan, 2010). Although, mobile penetration has increased during last few years, but telecommunication services are not well-developed, penetration lacks redundancy and broadband internet access is highly expensive. Many Jordanians still cannot afford to own a PC or an expensive mobile device (Moh'd Al-adaileh, 2009). Regulatory and legal hurdles also hinder the innovation and ICT integration in different sectors. The Jordanian government lacks a mature vision and understanding of ICT. UNESCO (2010) reported that Jordan's high-tech exports are very low compared to other manufacturing exports. High technology is an essential element for fostering the innovation, stabilising the inward foreign direct investment and overall economic development (Sultan & Soete, 2012).

An innovation embedded environment enables the flow of information and technology among different environmental actors for the betterment of organisation, stakeholders, community and overall country (Bozzola, Swanson & Ting, 2016). The interconnectedness among institutions, enterprises and people is key to embedded innovation (Sultan & Soete, 2012). Innovation researchers propose that technology and innovation development is the outcome of complicated web of relationships among different system components, including research institutes, government, universities, business enterprises and regional community (Antonioli, Mancinelli & Mazzanti, 2013). Results of some empirical studies suggest that Jordanian government officials are well-aware of the need to embed the innovation and improve national innovation system by facilitating the technology and knowledge flow within the system (Sultan & Soete, 2012). The lack of coordination among different ministries and government institutions hinder the actors' ability to implement their own innovation programs.

Some analysts contend that lack of documented innovation policy can be a reason behind lack of innovation in Jordanian business environment (Sultan, 2010).

The heterogeneous research and development framework of Jordan comprises many private and public universities and the focus of R&D projects is on ICT, nanotechnology, biotechnology, energy and water (Akash et al., 2016). Technology transfer is under-developed. Interestingly, Jordan has highest number of researchers in Arab world and is among 3 Arab countries in terms of research publications (UNESCO Science Report, 2010). However, inadequate technology transfer hinders the researchers' innovative abilities. Current Jordanian research centres like National Energy Research Centre and Princes Haya Biotechnology Centre face financial challenges due to lack of adequate support from institutions (GTZ, 2010). Jordanian incubators network is flourishing but is only producing a moderate result. There is inadequate financial support and young entrepreneurs migrate at a later stage for better earnings (Sultan & Soete, 2012).

3.3.3. Business Environment & Embedded innovation

Overall business environment and competition nature in different industries also affect the innovation system. When businesses adopt red ocean competition strategy, the negative competitive barriers hinder the innovation process (Sultan & Soete, 2012). Whereas blue ocean strategy enables the businesses to cooperate with each other and develop a web of networks to foster innovation. Analysis of Jordanian business environment reveals that Jordanian economy heavily relies on the small business enterprises. Ministry of trade and industry proposes that 92 percent of Jordanian business enterprises are micro firms, 7.4 percent are small and medium

firms and only 0.6 percent are large enterprises (Al-Jinini et al, 2019) 2091). Various studies have confirmed that Jordanian business environment lacks the innovation and small firms resist adopting innovative practices. Studies also confirm that region's political system doesn't support the innovation and Jordanian business enterprises mostly lack the financial support and technology oriented human resource (Sultan, 2010).

In 2010. Jordan was ranked as 100 out of 183 for business activities, it was ranked 127 for getting credit and 125 for starting business. Jordanian entrepreneurs mostly face the capital and risk related problems. Strict budget constraints discourage most of institutions from supporting the entrepreneurs. Jordanian engineers' association and chamber of commerce experts stressed the institutional support for inculcating innovation (Abuhamad, 2014). Some analysts confirm that Jordanian chamber of commerce provides adequate support to other institutions and arranges training programs for financial, legal and management affairs (Sultan, 2010). However, on overall environmental analysis suggests that business environment needs to embed innovation for achieving economic efficiency (Sultan & Soete, 2012). The economy of Jordan mainly relies on its service sector that constitutes around 67 percent of the gross domestic product. Rest 33 percent is divided into industry and agricultural sector with respective proportions of 3 percent and 29 percent respectively. The Jordanian government shows a vigorous attitude towards incentivising the business and foreign investment growth. Recently, the influx of around 800,000 Syrian refugees have further increased the pressure on Jordanian economy, stressing the need to increase current business efficiency.

Talking about the business environment of Jordanian service sector, a recent report published by the Schiff, Schmidt & Troncoso (2015) suggest that despite government rigorous initiatives to promote and stabilise the business environment, the region has yet to develop an

innovation supportive environment. Schiff, Schmidt & Troncoso (2015) further contended that incremental process improvements in key business sectors can push-up the Jordan's ranking in terms of healthy business environment. Almahamid, Awwad & McAdams (2010) report that Jordanian business environment has badly affected from last three decades due to major fluctuations in the global economic and business environment. However, the region has some core strengths whose effective capitalisation can bring major progression in Jordanian economy (Almahamid, Awwad & McAdams, 2010).

Overall, the Jordanian business environment doesn't provide enough support for socially inclusive embedded innovation. Research evidence suggests that Jordanian business sector adopts risk averse attitude, particularly the financial institutions that consequently affect the firm innovation. The application of embedded innovation paradigmimposes significant challenges when organisations are inflexible, government is not supportive and financial institutions hold a highly risk-averse attitude. Unfortunately, the Jordanian business environment is characterised by all these factors. Analysts have repeatedly suggested the Jordanian government and market players to revise their business strategies to ensuring long-term survival. For example, Elsheikh, Cullen & Hobbs (2008) contended that Jordanian telecom sector lacks the innovation and is still employing the outdated business practices. Such unwillingness towards innovation integration can cause serious problems for industry in future.

However, literature also identified some studies, which report that Jordanian telecom organisations have started taking knowledge creation initiatives to foster the innovation and build an effective knowledge sharing framework. For example, Kanaan & Gharibeh (2013) conducted an empirical investigation and reported that Jordanian telecom organisations are actively engaging with the employees to conduct the productive knowledge and information

sharing activities. Employees' willingness to share knowledge for innovation is also vital, as it is an important part of sending and receiving knowledge in between them (Abdelrahman, Papamichail, Wood-Harper, 2016). The research also reported a direct positive effect of knowledge sharing activities on the employee satisfaction, and consequently improved organisational performance (Kanaan & Gharibeh, 2013).

The underlying study derives the motivation from these results as if collaboration with the employees for innovation integration and knowledge creation can offer positive results, then effective collaboration with the stakeholders for innovation embeddedness can not only enhance the firm performance, but can also improve the industry practices, consequently resulting into substantially increased contribution towards local and regional economic development. Currently, the telecom market has already achieved maximum adoption rate and opportunities for the market players have significantly declined due to decreased growth chances. Hence, the embedded innovation is not an option, but has become a requirement in highly saturated Jordanian telecom industry (Alomari & Elrehail, 2013).

3.3.4. Internal factors

A brief analysis of Jordanian telecom market has been described in next section to highlight the internal factors affecting the innovation embeddedness. The underlying study will conduct a comprehensive empirical analysis to understand how these factors are playing their role in heading towards innovation 3.0.

3.3.4.1. Skills, Competition and Strategies

The country has an abundance of information technology specialists whose skills are yet under-capitalised by business sector (Almahamid, Awwad & McAdams, 2010). Interestingly, Jordanian economy is considered as among most open economies in North African and Middle East region. It has resulted into emergence of non-traditional business sectors such as tourism, telecom and information technology. Despite such valuable assets, the country still needs to take effective initiatives for creating a healthy and innovation supportive business environment (Schiff, Schmidt & Troncoso, 2015).

Zabadi (2016) recommended the Jordanian firms develop multiple communication channels and integrate sustainability by collaborating with the community to ensure their survival in highly competitive global telecom industry (Zabadi, 2016). Developing telecom sector of Jordan that is already facing resource constraints should devise innovative knowledge management strategies to deal the economic and environmental challenges. Hajir et al., (2015) contended that knowledge management infrastructure has a significant effect on the innovation and recommended future researchers to conduct an in-depth investigation and explore other factors affecting the firm's innovation practices (Hajir et al., 2015). The underlying research will fill this gap and focus on identifying different factors that affect the embedded innovation in Jordanian telecom market.

In contemporary era, the telecom sector has gained significant importance for the national economic development and makes a substantial contribution to the gross domestic product (Hardan & Shatnawi, 2013). In Jordan, the industry is among the most competitive business sectors at local and regional level. The increased importance requires market players to build multiple ties with the environmental actors and embed innovation into business processes for preserving competitiveness. The sustainability of the Jordanian telecom market depends on the

telecom operators' ability to develop a connecting web among stakeholders and ensure financial stability. Alomari & Elrehail (2013) shared the statistics of telecommunication regulatory commission, which report that Jordanian telecom market is losing its ability to grow its revenue as penetration rate has exceeded 120 percent. Considering these statistics and intensifying competition within the industry, the telecom operators must revise their traditional business strategies and embed the innovation to ensure the long-term survival. Hardan & Shatnawi (2013) reports that Jordan holds the 1st rank according to the competition index followed by Saudi Arabia, Palestine, Oman, Egypt, Morocco, Iraq, Tunisia, Yemen, Bahrain, Algeria, Sudan, Mauritania, Kuwait, Qatar, UAE, Syria, Libya and Lebanon (Hardan & Shatnawi, 2013).

3.3.4.2.   Innovation as core competency

Review of literature identified various studies that explored how Jordanian telecom organisations are using the innovation as a tool to enhance their competitiveness in the market and bring operational efficiencies (Zabadi, 2016). Although, studies have focused on different organisational dimensions and haven't adopted a holistic view, almost all have contended that organisations are seeking ways to sustain the competitive advantage through innovative business practices. For example, Alamro & Rowley (2011) conducted an empirical investigation and reported that Jordanian telecom organisations are adopting innovative branding strategies to attract the customers. Although, the study specifically focused on the branding, based on semi-structured interviews with telecom senior management, the study concluded that effective branding strategy depends on the firms' ability to adopt a holistic view, build open relationships with the stakeholders to get important knowledge and focus on

multiple dimensions, such as brand architecture, brand values, brand identity, brand personality and brand positioning (Alamro & Rowley, 2011). The researchers specifically highlighted the importance of opening multiple communication channels and integrating innovation into business operations for formulation of successful branding strategies in telecom market. Opening of multiple communication channels, developing open relationships with multiple stakeholders and adopting the holistic view are among the most important principles of embedded innovation.

Another study conducted by Hajir et al., (2015) proposed that Jordanian firms' innovation embeddedness relies on their ability to integrate the advanced technology and refine their knowledge management abilities. The researchers agreed with Alamro and Rowley (2015) by commenting that building close relationships with stakeholders is highly important for sustaining the position in the market. The study identified some factors that directly affect the firms' ability to integrate innovation and build an innovation supportive knowledge management infrastructure, including organisational structure, workplace environment, communication with the stakeholders and technological advancement (Hajir et al., 2015). However, Al-Hyari, Al-Weshah & Alnsour (2012) and many other studies report that Jordan has weak financial support system for the development of new business enterprises. Firms face strict financial constraints that hinder their ability to adopt innovative solutions to existing challenges. The Jordanian government must formulate effective policies to develop the financial support system for innovative ventures. Reports further suggest that financial grant for the capital-intensive firms is very limited (Sultan & Soete, 2012).

Jordanian banks are highly risk averse and conservative while making investment decisions. The ineffective current legislations resulted into underdevelopment of venture

capital instrument. These factors also affect the telecom organisations and discourage them from making radical, innovative decisions (Sultan & Soete, 2012). A shift towards embedded innovation requires radical change in the thinking and decision-making pattern of organisations. To make this happen, the government and overall environmental support is crucial. It is not only the problem of big market players but have badly affected the start-up firms (Noordhoff et al. 2011).

These challenges also affect the managements' ability to incur substantial expenditure on research and development activities, which is crucial for the successful transformation towards emerging innovation 3.0 paradigm, that is, embedded innovation (Sultan & Soete, 2012).Al-Hyari, Al-Weshah & Alnsour (2012) reports that currently, the public funded programs for the corporate research and development activities are insufficient. These are among the main reasons why Jordanian telecom industry lacks the innovative practices despite highly competent human resource, increased penetration rate and integration of advanced technology (Alamro & Rowley, 2011).

Conclusion

This chapter presented the process of developing theoretical framework that helps as a lens to understand a phenomenon. The first section of this chapter discussed the shift from dis-embedded to embedded and offers an insight on the recent trends of embeddedness in telecommunication services in developing countries.

The study in hand covered widely accepted alternative theories in innovation. Theoretical frameworks are helpful in research because they assist the researcher to classify and blend multiple elements of a phenomenon into an organise and consistent manner. The first section discussed how embedded innovation is a transition beyond open and inclusive innovation, phases were explained in terms of the shift from dis-embeddedness to embeddedness.

The literature review reveals various studies that proposed innovation models to support the firm innovation and enhance their competitive position in the market. furthermore, the researcher explored various alternatives theories and models of embedded innovation such as the normative theories of innovation, theory of innovation diffusion and lastly the theory of firm level innovation in order.

Multiple theories have been considered and rejected based on their strengths, weaknesses, basic concept and along with their contribution, design and principles as well as the research questions and objectives. Theories of innovation diffusion, theory of firm level and normative theories of innovations were all rejected due to their strength, weaknesses and various limitations. The researcher evaluated and analysed Robert Hassink model (2001), as result the researcher adopted the framework presented because dirigiste system can be successful for the Jordanian context and environment.

The chapter described the most appropriate model that would be helpful for this research, and finally the researcher has determined elements from literature and theories into a suitable framework to fit with the Jordanian context. The proposed framework will guide the

study process and to help in developing the research design, also the framework will provide a foundation for any future study in the embedded innovation in mobile telecom sector.

The next section will critically analyse the previous firm innovation models to identify the limitations and suggestions made by past studies to improve the conceptualisation of our proposed embedded innovation system.

Insufficient research has been done by the previous researchers in the context of the telecom sector. The underlying research will empirically analyse the challenges faced by Jordanian telecom sector in embedding the innovation and enhancing overall performance.

Chapter 4: Research Methodology

Introduction

This study intends to investigate the trends, processes, challenges, and benefits, of embedded innovation in the Jordanian telecom industry. Accordingly, this Chapter is a step forward to assess the relevant data collection and analysis methods that fits within the interpretative nature of the so called "embedded innovation systems". Within the design of multiple cases studies, this chapter addresses the alternative research approaches and justify the choice of qualitative research methods. This research approaches helped the researcher to capture the participants perception through judgemental statements that explain the trends, processes, benefits, and challenges of customer's embeddedness in the telecom service.

The case study design enabled the researcher to get an in-depth understanding of the actors' behavioural pattern and the participants interactions in the process of embeddedness (Sekaran, 2003; Cresswell, 2012; Yin, 2013).

Semi-structured interviews is the data collection methods and the purposive sample was adopted to interview a wide set of telecoms professionals who are involved in the embedded innovation process. The template analysis (Kling, 2009) was adopted to analyse the interviews' transcription. An initial and tree coding were developed and explained at the end of this chapter.

4.1. Research Philosophy

Research philosophy is the search for information and the nature of that information (Saunders et al, 2007). The purpose of understanding research philosophy before doing any research is to gain greater understanding and wider point of research before developing methodologies (Carson et al, 2001). Furthermore, the philosophical position taken by the researcher provides an early guideline, allowing the researcher to take appropriate research alternatives such as analysis/interpretation, research questions and methods (Quinn et al, 2007).

In other words, philosophy is about how you illustrate the knowledge claim. Somekh and Lewin (2005) differentiated research between two categories. Scientific research that is construct on research of discovery and the second one is social science research, in which social scientists observe or discover facts about the social enquiry. If the presented research problem is attributed as a field in social science, it is deemed that social constructionist philosophical positions are appropriate at this stage. These include as Blaikie (2007) asserted, the behaviour of social actors that are embedded within a named social phenomenon. It is also argued that commencing the research from a thoroughly comprehendible philosophical position is the sole appropriate approach for empirical social research (Blaikie, 2007).

This research has chosen the interpretive research paradigm to provide the philosophical foundation to the underlying research. Under the guidance of interpretive research paradigm, the researcher will be able to gain substantial and in-depth understanding and perception of the telecom professionals on embedded innovation challenges, trends and

motives. Moreover, the research has mainly adopted this approach in order to have a great comprehension on the extent EI can improve telecommunication services in Jordan.

TerreBlanche & Durrheim (1999) have defined research paradigm as a philosophy and comprehensive system of various interconnected research practices that describe the nature of investigation along three important methodological components, (i.e., ontology, epistemology, and methodology. It reflects overall research culture comprising beliefs, values and assumptions held by researchers regarding the nature of research (TerreBlanche & Durrheim, 1999). The concept of research paradigm encompasses a framework of understanding, beliefs and perception of various theories entailing methods and philosophies. Hence, according to Johnson and Christensen (2010), the research paradigm will allow the researcher to explain all assumptions built during this study.   However, it is important to note that researcher's knowledge and thinking about the subject significantly influences the research paradigm with regards to tools and methods deployed in the study. The next section explains the chosen research paradigm and provides a detailed justification for it.

The research aims to analyse the effect of a phenomenon which is EI It is important to identify the epistemological assumption that will be suggested for the research and how the phenomenon is explored. The literature review highlighting different philosophical positions will help to explain the philosophical position. There are critics and followers of various research approaches. Further discussion is to explain the suitability of various philosophical positions and select the most appropriate perspective. In order to select appropriate research philosophical approach, Ritchie et al (2013) argues that one way is tackle singular philosophical approach with its theoretical perspective and the second way is to be uncritically eclectic by joining between approaches. Following critically analysing various philosophical

positions, Empiricism appear appropriate at first. Empiricists argue that knowledge created from general to specific, which follows an inductive research strategy. Moreover, it requires some reasoning from facts or experience. The philosophical positions consider that knowledge can be acquired from experience (Markie, 2013). Considering the use of previous theories within the research is very essential, as it will be used as guidance when undertaking research.

Karl Popper's theory of falsification argues that some new theories are created can replace the old ones; However, there are some theories will be accepted and not criticised. Karl popper view could be considered and classed as a positivist and as a realist. Nevertheless, interpretivist argue that the construction of social science world is a continuing process, and every theory can still be investigated once accepted, (Popper, 2013). The current literature that clarifies variant philosophical approaches describes interpretivism as the two sides offer variant philosophical positions. The existing literature review of interpretivism and positivism will help to justify the suitable philosophical approach.

4.1.1. Positivism: Alternative Philosopy

This philosophy has been considered as relations from discussions and relations to sociology, events which describes a relation between variables. Following knowledge is spawn by the means of comparative analysis between existing variables (Lin, 1998). Positivism starts on the foundation of ontology that shows individual extrinsic reality. Such approach suggests that the social scientist is a natural access to the real world. However, when it comes to implement the theory, it is argued that positivist use previous theories in order to create hypotheses. Positivism is structured and rigorous, while interpretivism methods are recognised as providing researchers with a greater degree of flexibility, which tends to be shunned by

positivists and positivism methods (Myers 2007). Positivism is not consistent with interpretivism; however these must not be considered contrary in valid form, whilst using mixed methods is applicable.

The positivism philosophy is effective as it can continuously add on existing research and knowledge and using the conclusion of prior research or the recommendations which have been suggested to develop research and develop databases. This also can be beneficial to expand on an existing theory by using a quantitative approach and the appropriate process or notion conducted through motivated research can be conducted using the appropriate method in order to identify such relationship. However, there is a possible weakness of this approach in any research completely dependent on the research findings that have already been and ideas that already suggested facts rather than theory, for the reason that quantitative approach should add on what has already been accepted in order to generate new knowledge, however assumptions should be avoided (Kothari, 2014).

The ontological consideration that is associated with positivism is objectivism, which clearly claim the social phenomenon meanings are relying on the interpretation of collective behaviours that are involved (Easterby-smith et al, 2012). Frequently, positivist undertake a deductive strategy where they presume that premises are true and valid therefore the conclusion should be true. Further argued that deductivists do not distinguish between theoretical language and observational language as to inductivist. The practice of deduction begins with theory and then a hypothesis is approved to test a particular hypothesis, data is collected and finally hypothesis is confirmed or declined in terms of figures and facts (Bryman and Bell, 2007).

Blaikie (1993) illustrate that knowledge is validated exclusively when it relies on observations extrinsic to reality, while universal principality is somehow existing in our world but not simply observed within studies, specifically quantitative studies through positivist approach. In the meantime, the analyst confirm that positivism based on the value of truth and reason, however this should not be taken for granted whereas qualitative research validity is weakened by such assumptions.

Hatch and Cunliffe (2006) investigated the assumptions of positivism, claiming that the perspective presume that what happens within the world societies can be investigated and discovered within grouping, experimental and assessment of people behaviours within a 10 organisation in order to assess the patterned series of interrelationships existing between people and groups. Crossan (2003) stated that positivist philosophy recognise truth in a perspective different to the interpretivist approach, while the human aspect of human factors such as behaviour, emotions and actions is neglected within their perspectives.

Positivist do not consider that social realities are introduced with interpretation and justification deduced from social actors, they disapprove generalisation and consider one reality (Bryman and Bell,2007). Also, Ritchie (2013) demonstrated it is crucial sometimes to conduct only positivist approach, and regardless of the amount of data collected, reports and figures' generalisation is mostly conducted to reach a conclusion.

4.4.2. Interpretivism: Proposed Philosophy

This research aims to highlight the challenges being faced by Jordanian telecom organisations and assess their perceptions towards EI for the accomplishment of business objectives in a highly saturated market. In doing so the researcher will explore the mechanism and processes to build a system for EI. Hence, the current research has chosen the qualitative research approach. So, out of two main research paradigms, i-e, positivism and interpretivism, the research paradigm that complements the qualitative study nature is interpretivism.

The positivist approach attempts to apply methods and principle of natural science to examine the social behaviour of participants by comprehending and explaining reality (Bates, & Khasawneh, 2004). Positivism heavily relies on scientific principles and method to gain insight and knowledge during the study. It doesn't allow the subjective interpretation of reality and offers results on logical grounds, under restrictive interpretation (Denzin & Lincoln, 2011). On the other hand, interpretivism attempts to understand social behaviour of participants from the participants stand and interpret the meaning through the participants view the world (Bates, & Khasawneh, 2004).

It underpins the belief that reality is socially constructed rather than influenced and determined by external forces. Hence participants' experience and mind-set ought to be understood. For instance, this research study will attempt to understand the perceptions of respondents (in this case, it will be the managerial staff of Jordanian telecom organisations) regarding the EI. Moreover, the study will investigate the experiences of telecom managers to identify factors that facilitate or hinder the innovation process within the organisation. The

approach will enable the researcher to understand how participants make sense of their own experiences and recognise the process of interpretation.

In order to assess the perceptions of telecom professionals regarding EI in Jordan and investigate the motives, challenges, and processes of EI in the Jordanian telecoms market, the interpretive approach will guide the researcher to conduct an in-depth investigation, identify explicit as well as implicit factors that shape the perception and affect the motives and base the findings on subjective, yet informed interpretation. Viewpoints of managerial staff of Jordanian telecom organisations will be presented in the form of various themes. An effective compare and contrast of qualitatively generated themes will answer the study's research questions.

4.1.2.1. Justification for Adopting Interpretivism Philosophy

In order to provide the justification for chosen research paradigm, the researcher will compare positivist and interpretive research approaches in the context of underlying research. In the positivism approach, the researcher believes in the use of highly structure empirical testing of hypothesis, facts and statistical analysis to determine relationships between variables. No allowance for human interpretations is given in the positivist approach. Variables must be quantified in a way that they can be statistically observed.

If a researcher will choose positivist research paradigm, the quantitative survey will produce limited information and would restrict the researcher's ability to explore and understand the participants' experiences. On the other hand, the interpretive approach will enable the researcher to conduct in-depth interviews to investigate social occurrences like behaviours, experiences, and attitudes (Dawson, 2002; Malterud, 2001).

The main justification for choosing the interpretive research paradigm is that it allows the researcher to fully explore the phenomenon and extract in-depth insights without imposing any methodological restriction. The questions of why and how directed to the participants cannot be fully answered through positivist approach due to interpretive restrictions. Hence, the most suitable approach to answer such questions is interpretivism. The phenomenology although time consuming and hectic to analyse compared to positivism is appropriate to this research study which is qualitative in nature (Bogers, 2011). Under the guidance of interpretive research paradigm, the researcher will be able to gain substantial and in-depth understanding and perception of the telecom professionals on embedded innovation challenges, trends and motives. Moreover, the research has mainly adopted this approach in order to have a great comprehension on the extent EI can improve telecommunication services in Jordan.

4.2. Research Approach

This section discusses the alternative approaches, including quantitative methods, mixed methods, and qualitative methods. Then, it justifies the choice of the qualitative approach as a fit for this research. In academic research, researchers can choose between two research approaches that is quantitative and qualitative.

4.2.1 Quantitative Approach

Quantitative research methods are predominantly focused on obtaining hard facts, numbers, statistics and data which are subsequently used to substantiate predetermined hypotheses (Willis 2007). These methods are typically rooted in Positivistic research, applied

most commonly in mathematics and the hard sciences, given the focus on testing and experiments (Myers 2007). At the opposing end of the spectrum then, sits qualitative methods, qualitative methods differ from their quantitative counterparts in that rather than being preoccupied with hard facts and statistical data (Creswell 2009).

Figure 4.1. Research Approaches in Business & Management
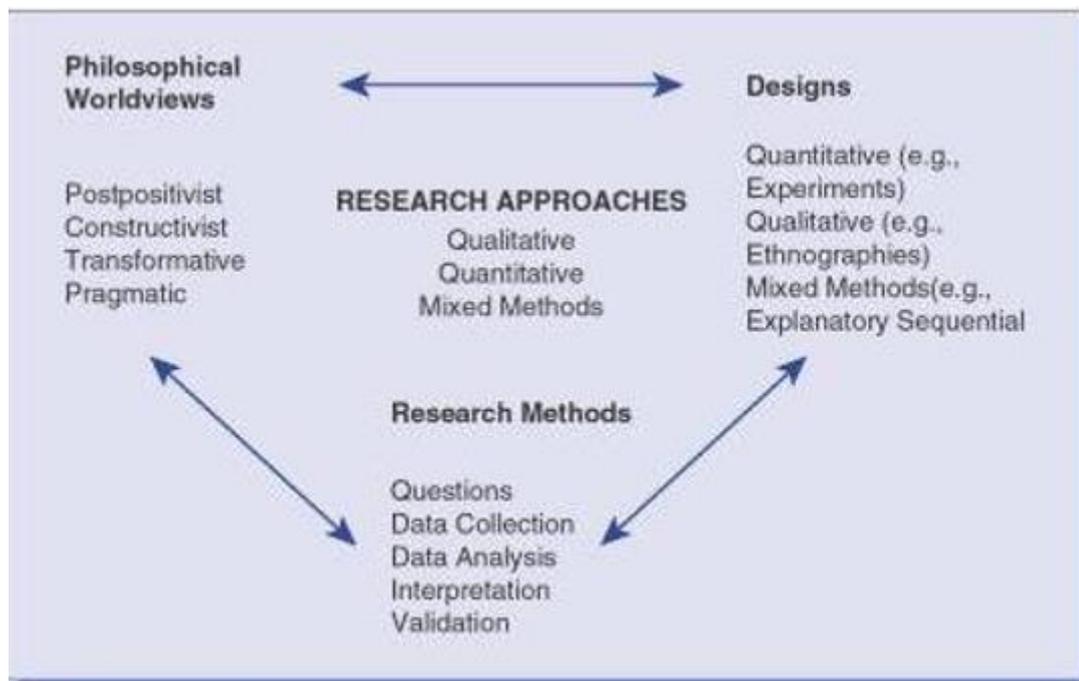
Source: (Creswell, 2014)

The quantitative research approach is used when study has to be conducted on a vast area and a huge number of participants are needed to be analysed to cover better generalisability Alpha phenomena as compared to qualitative in which a small area is covered but with more in-depth analysis. Mainly the instruments used to analyse quantitative data or statistical and can include the use of SPSS do deduct theories and test than based on numerical data which

provides better control over alternative explanations and many miles are various research biasness and better generalisability of the population that is being researched.

The quantitative approach is deductive and includes hypothesis testing by the proposition of different variables and their examination in terms of the relationship. The variables in quantitative research are measured with the help of a quantitative data analysis software or tool in the form of numerical data which is further analysed with other statistical procedures. The theoretical constructs and their values are not represented by the numbers on which the quantitative research focuses on. The social phenomenon, which is constructed by the stakeholders involved in the process, therefore the quantitative approach isn't suitable for this study. The data collection process questionnaires, service, laboratory experiments, and other numerical methods are the most frequently used instruments for quantitative research.

4.2.2 Mixed methods approach

The mixed-methods approach highlights the researcher's option in which he selects both qualitative and quantitative as his research approach by the combination of philosophical and strategical aspects of both. The data collection process in a mixed-method approach includes both qualitative and quantitative instruments, like interviews for the qualitative research aspect and surveys for the quantitative research aspect.

A mixed-method approach is chosen when a researcher believes that his research requires both of these approaches in order to create a better representation of his research

objectives and research questions, and in doing so he covers the depth offered by qualitative research and the area offered by quantitative research (Miles and Huberman, 1994).

4.2.3 Proposed Qualitative Approach

Qualitative methods are focused on obtaining insight, understanding as well as being more reflective when examining the research domain as well as overall experiences of research participants (Myers, 2019). Oates (2006) regards qualitative methods as being more insightful, in that they can provide a 'richer' insight into a research domain when compared to its numerically focused counterpart. In this respect, whilst quantitative methods tend to be rooted in positivism, qualitative research methods are often reflective of the principles of the Interpretivist research philosophy (Oates 2006). Interpretivism is therefore preoccupied with 'interpreting' the research domain and has commonly been applied in the social sciences, where the aim is to understand social phenomenon and human emotion (Oates 2006). As a result of this, research approaches and methods grounded in the Interpretivist paradigm are likely to allow researchers to gain better insight into the views, perceptions, and attitudes of research participants (Myers, 2019).

Unlike quantitative methods which are structured, and rigorous, qualitative methods are recognised as providing researchers with a greater degree of flexibility, ultimately providing researchers with greater flexibility as the methods encourages interpretation, which tends to be shunned by positivist and quantitative methods (Myers, 2019).

Qualitative research focuses on feelings, opinions, perceptions and experiences of respondents. Stating differently, this research approach discovers the reality, significance and tenacity (Creswell, 2013). Qualitative research approach is interpretive and emphasises on in-depth comprehension of underlying phenomenon (Saunders et al., 2014).

4.2.3.1.Justification of Adopting Qualitative Approach

The researcher adopts a qualitative approach when the aim of study is to decode, translate, describe and agree with the meaning rather than frequency of certain naturally occurring phenomena in the social context.

In case of current research, the interpretive perspective will explore the embedded innovation influence on telecommunication services, and it would be an appropriate approach in which experiences and perceptions of telecom managerial staff could be examined and evaluated. Furthermore, qualitative approach facilitates the researcher to concentrate on understanding what is happening in the context of a specific phenomenon and further enhance interpretation of data. Therefore, to examine the extent to which EI can improve the telecommunication services in Jordan market; the research will collect the qualitative insights from telecom organisations and the clients using the telecommunication services.

Recognising the diversity of underlying phenomenon, the researcher has decided to adopt the qualitative research technique to extract in-depth and meaningful insights from respondents. Moreover, the successful accomplishment of research objectives requires input from various sources. Hence, the researcher will adopt a multimethod qualitative approach

where data will be collected from the ministry of telecoms staff, middle and senior management of telecom companies and Jordanian customers. Moreover, the researcher will also adopt multiple case-study approaches to conducting an organisation specific in-depth investigation of three telecom organisations selected for the research. An effective comparison and contrast of these organisations will determine their levels of adoption on embedded innovation and how this has influenced their service innovation.

The justification for selecting the multimethod approach is that when different research methods are combined to explore an underlying phenomenon, they generate more reliable and richer results (Mingers, 2001). Single research methods have their drawbacks and advantages but when different research methods are appropriately combined, it enables the researcher to minimise the limitations and maximise the advantages providing results with higher accuracy.

4.3. Research Design

The business and management literature refer to alternative research designs that could be used in interpretative research and address a socially constructed phenomena such as the process of EI. In this section, the researcher addresses the alternative research design that have been adopted in the Innovation systems, namely, action research, ethnography, and case study designs. In doing so, he points out the advantages and disadvantages of each design. The last part of this section explains which mode of "Case Study Design" is adopted and why this design and this mode offers a better understanding of the "Embedded Innovation Systems".

4.3.1. Action Research

It is a process of research that solve proximate practical problem and extends the knowledge of researcher based on practices (Avison & Myers, 2001; Docherty et al.,2014). There are different ways of action research and they have been explored through the collaboration of researcher and practitioners to overcome the certain situations (Baskerville & Wood-Harper, 1998). This way got enough attraction from researcher in field of innovation (Myers, 2001; Aslam et.al, 2020).

A study done be Rapoport (1970) have explained action research as it provides its contribution to deal with practical and sudden problems of people and the social science's goal is to collaborate within mutually agreed ethical framework.

In case of action research, the researcher works closely with an interactive group of people and becomes a change agent to improve a situation in particular setting. The researcher's role become more subjective as s/he gets more involved in the change process than becoming a change facilitator. Action researcher poses skills of management and ability to understand group dynamics to implement action plans. This kind of studies are commonly used for development of community, organizational management, agriculture, education, and innovation. One of the basic requisites is the formation of a dedicated group of people who are open to new ideas, communicate effectively, to accept and implement change. The change process includes four steps: acting, reflecting, observing and planning.

This process might take many loops until optimum results would be obtained. The change loops help in the development of organisational routines and processes to enhance the overall innovation management process (Keresztes & Endresz, 2020).

Oates (2006) emphasises that action research addresses a particular phenomenon on which change is necessary to shift the status Quo. Oates's views and change, an interactive cycle of planning, acting, reflecting, working together with practitioners, many of data generated methods and action and research outcomes. Conversely, the action research also has criticised due to many of disadvantages that include inability to come up with solid cause and impacting relationships, lack of rigour, outcomes are hard to generalize to other situations and have serious concerns over consultancy.

In line with the words of silverman (2006), the action research is worthy in a way that it can be used to solve a specific issue in specific time and situation which requires specific knowledge, and it limited its usage generally. It is also claimed that the action research is one of the strongest methods, but it loses its importance due the decline in the subjectivity of researcher and its lack of usage (Baskerville & Wood-Harper, 1996).

The action research requires more of authority and influence to get the access to the institutions. The action research takes more time as compared to other research design and requires a higher level of participation of participants. Due to these disadvantages the action research found to be unsuitable for this study and limited time and access related issues were also one of the causes. *The researcher should be a change agent with power to propose action*

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plans. In the present study the researcher didn't exercise such power and would rather an independent observer.

4.3.2 Ethnography

Ethnographic research is a qualitative method of research in which the researcher originates the research from the discipline of social and cultural anthropology. By using this strategy, the researcher spends a considerable amount of time in the research field and observes the lives of the people who are under study. Myers and Avison (2002) argued that the basic aim is to place the phenomena under investigation in their social and cultural context. Creswell (2009) has defined the ethnography as that enquiry approach in which the researcher investigates and knows about the people of and other aspects of a culture in the natural settings and collects data by observing people and conducting interviews of them.

The basic advantage of this approach is that it is very flexible and evolves around the realities of the field under the natural settings. It also helps evaluate and analyse problem more thoroughly than using other strategies. But on the other hand, the basic disadvantage of this strategy is that it is very time consuming and uses less systematic procedures. Tacchi (2006) concluded that most of the cultural related changes involve the use of the ethnographic method. The emphasis is on describing and interpreting cultural behaviour and the ethnographer has to spend a lot of time in the field. For this purpose, ethnographer needs a generous amount of time in the field in order to observe and understand the lifestyle, culture, habits and believes of people of the targeted group.

To achieve this goal the researcher needs to participate in social events of the groups, taking notes, asking questions about their practices, conducting interviews, analysing their actions and then writing a brief descriptive report about the group. Recently, Ethnography has expanded to include scientific approaches subtypes with different theoretical orientations and aims, such as structural functionalism, cultural and cognitive anthropology, symbolic interactionism, critical theory and cultural studies (Atkinson and Hammersely, 1994; Creswell, 2007).

In addition to this Grills (1998), argued that one of the biggest limitations in approach is of the time as it consumes more time than other approaches because it has to cater both the field time to observe and collect data but needs more time to analyse it critically and after evolution rewriting it in the best possible way. Another drawback of this approach is that it provides a niche approach or lack of breadth because it mainly focuses of observation and at a time only one behaviour can be observed properly. This strategy of research is not helpful for the type of studies where the researcher needs different perspectives or need to observe several behaviours at the time. The researcher is not a mobile telecom employee and can only be there for limited time due to university deadlines and this approach requires more time than other type of approaches, therefore this approach is rejected.

4.3.3. Case Study

The case study methodology, defined as "*an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context*" (Yin, 2009, p.18). The Case study is another commonly used research technique which used to get a better

understanding of the problem by looking in-depth in it and having a multi-perspective of a complex problem. This research technique is established for extensive wide range of disciplines especially in the field of social sciences. It is detailed study about a certain thing, person, subject, group or place etc. and it uses qualitative research techniques to provide in-depth analysis of the problem. Sometimes it also uses quantitative methods for evaluation of a problem.

Case studies are conducted to find out the causes of success or failure of a business, person, organization or thing which matters to the public at large (Yin, 2011). These studies help to identify the main reasons contributing the results and helps to solve problems at before implementing the new business plan. Sometimes pilot studies are also conducted as case studies to check a bigger plan at an initial phase. It helps to identify the problems and weakness of the plan also highlights the positives and helps to make a better plan. Companies and different organization use case studies and pilot projects to initiate the bigger projects and to capture the maximum potential users (Yin, 2018).

Benbasat et al. (1987) have concluded that a case study research investigates an underlying issue in its natural settings by using different data collection methods to gather all the necessary information from the participants/sources of the study. Case studies does not include the new experiments and it may work under the given boundaries and there is no flexibility in it (Yin, 2009).

There are different types of case studies under which the results of these studies can be generalized for a specific group of people. Exploratory case studies are done for pilot projects to initiate a program at massive level. These study highlights the issue which can occur through

implementation of plan and provides a chance to get more accurate results and suggests the best measurements which are suitable for the plan being implemented.

The cumulative case study helps cut the research budget and provides deeper understanding of the research problem through use of previous studies and helps to generalize the results for the larger group. It also helps to save more time than other strategies (Eisenhardt & Graebner, 2007). There are some other types which are used according to the research topic, selected group or by the choice of the researcher.

Flyvbjerg, (2011) points out the key advantages and disadvantages of case study design as listed in *table 4.1*. The basic advantage of a case study is, it takes less time, and it is very less costly. It is very efficient while the secondary data is expensive and very time consuming and difficult to gather. It also allows a research to gather a lot of details which cannot be easily gathered by using the other research designs. Case studies helps the researchers and scientists to adopt new ideas and develop new hypothesis which could be beneficial for later experiments.

The biggest criticism over case studies is of biasness as it main focuses over a person, thing or phenomena and the experimenter or data collector can be biased which can overall ruin or manipulate the results of the study. Another disadvantage of the case study design is that it is very difficult to identify single element or a cause which has contributed to the innovation failure of success. Another big criticism is that the result of case studies can be generalised for public at large but they are for specific group of people.

A multiple case study has a more complex design and implementation process as compared to a single case study due to the large data collection and area of the context (M. Saunders, Lewis,

& Thornhill, 2015). The findings that are derived from a multiple case study are more trustworthy in terms of validation and reliability, therefore this has to be given much attention and preference because the design of the case study depends on how the phenomena are tackled.

Table 4.1. The strength and weakness of the case study Design

Case Study		
Strengths	•	Dept
	•	High conceptual validity
	•	Understanding of Context and process
	•	Understanding of what causes a phenomenon, linking causes and outcomes
	•	Fostering new hypotheses and new research question
Weaknesses	•	Selection bias may override or understate relationships
	•	Weak understanding of occurrence in population of phenomena under study
	•	Statistical significance often unknown or unclear

Source: Bent Flyvbjerg (2011)

EI is a complex phenomenon and the case studies associated with it are equally complex in nature which demands the whole procedure to be done in a real-world setting so that an empirical study can be conducted to achieve the objectives. For such purpose, a multiple case study design is undertaken by the current study which includes three telecommunication providers in mobile sectors and in the context of Jordan.

Figure 4.2: Types of Case Studies Design
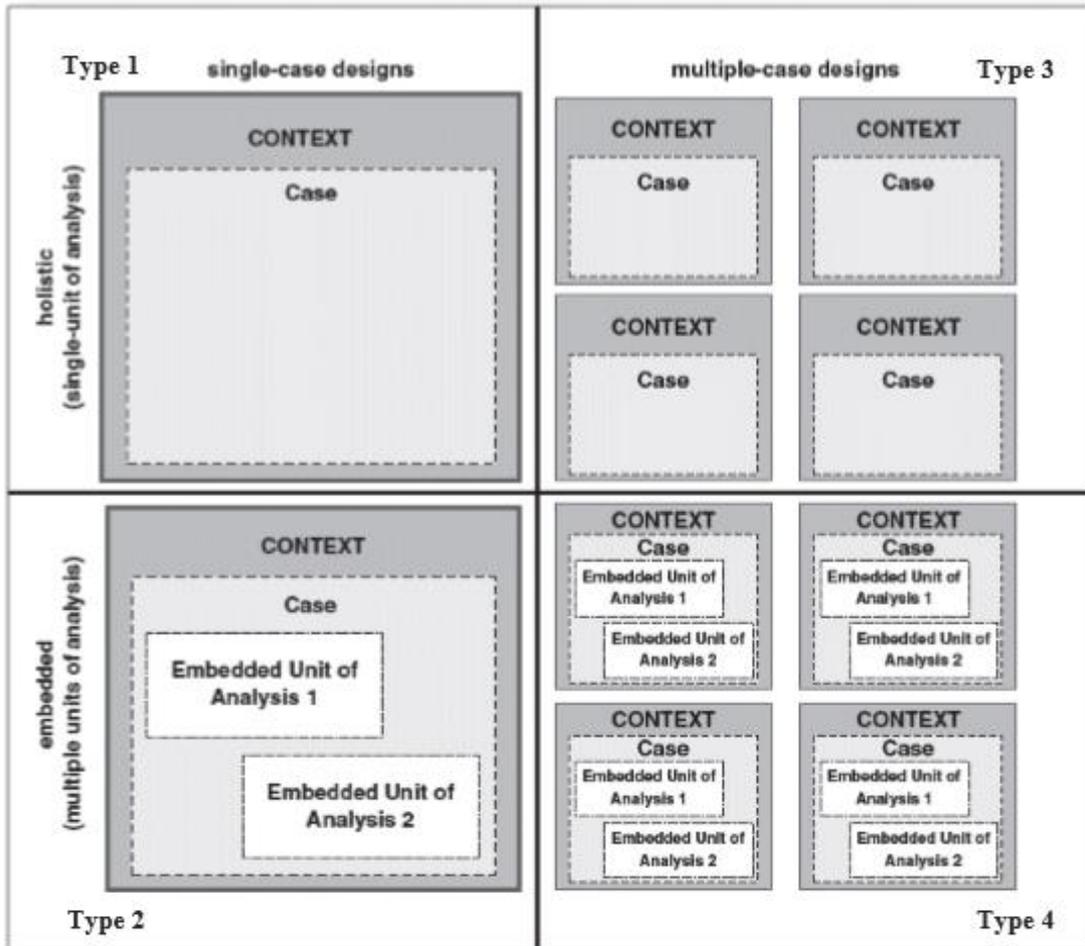
Source: (Yin, 2014, pp. 50)

By conducting a multiple case study, the researcher will be able to explore and examine the phenomena in more than one case and with more than normal participants which will allow these cases to be studied by contrasting and comparing them with each other, which will result in different scenarios of similarities and differences among the cases (Tight & Yin, 2016). Since multiple case studies allow exploration of much wider aspects and help develop new theoretical concepts and when the evidence is intensely grounded, the multiple case study approach develops more convincing theories (Thomas, 2020). It is due to this reason that multiple case studies are selected so that an analysis of such depth can be done of the phenomena.

4.3.3.1. Rationale of Case Study

Different methods of research were being used before the case studies, but the case study design enables the researchers to dig deep the issue and after evaluation provide an in-depth analysis over the that issue. Benbasat et al. (1987), discussed that interpretative case study is a well-established method, which helps to study the EI and helps in evaluation an analysis of data. While Hartley (2004) explained the phenomena of case studies as a brief investigation with the collected data which have been collected over the period of time. In addition to this, the researcher argued that it is the most suitable method for the questions which needs a detailed understating of the process because of information in a rich and brief manner.

Yin (2009) has concluded in his research that a case study research includes both single and multiple case studies, the researcher can use both types of studies by using multiple resources for data collection, and solution arises by the multiple case studies research is more powerful than others. (Lee 1989; Yin 2003) also supports the notion of using multiple case studies and suggests that single case study's research results cannot be generalized and results cannot be used for various settings while the multiple case studies research provides a leverage to researcher to check those results in various setting and after a thorough check up these results can be generalized.

Furthermore, Yin (2009) discussed that a case study research should be used when the research needs to answer the "why" and "how" questions. The researcher cannot alter the behaviours of the people who are part of the study. When the researcher wants to cover

contextual conditions because he believes that they are relevant to the phenomenon under investigation. Or the boundaries are not clear between the phenomenon and context

While concluding this section, the researcher emphasises that case study design is a helpful tool in the field of social sciences and it can be very useful when it is difficult to obtain a big sample for a qualitative and quantitative research. It also helps to save more time and money than the other research techniques. In less amount of time and money researchers can get in-depth information about the issue and after analysing it they can suggest solution to the problem. There is also a lot of criticism of biasness and manipulation of results over case study but despite of all the criticism researcher tends to use case studies methods when they need to dig out the problem of real life and contemporary world's social issues, problems and in different fields of social sciences.

4.3.3.1. The Case of Embedded Innovation in Jordanian Telecoms

This section points out the key stakeholders involved in the Jordanian Telecommunication sector and helps addressing the study population and the research sample later on.

The research mainly investigates the perceptions and motives of telecom professionals regarding EI and challenges faced by them in its integration. The research assesses "***the extent to which innovation can improve the telecommunication services in the Jordanian market***". Hence, the target sample (see ***Table 4.3***) was planned to involve the telecom companies who are the core providers of telecommunication service in Jordan. The data will be collected from managerial staff of selected organizations Interviewees included senior managers and chief

executives of the telecommunication companies in Jordan. In order to get informed and meaningful insights, the researcher set the criteria of experienced and senior practicing managers in telecommunication services for target audience. The targeted interviews represented all major network telecommunication operators in the Jordan's market thus providing different opinions and experience related to telecommunication embedded innovation. The entire population was able to be represented by limited number of players due to the nature of telecommunication industry in Jordan, thus potentially avoiding errors of bias and making the research outcomes more acceptable.

The researcher collected his data from different information sources to validate the research findings. Semi-structured interviewing approach will be used to collect the data and rationale for choosing semi-structured approach is that it allows the researcher to use the probing technique while maintaining an overall structure. Interviews will be conducted with senior management of each selected organisation. For this purpose, researcher plans to interview branch manager, chief operating officer and chief strategy and business development.

The reason for interviewing these three persons is that they could share important strategic information about how their organisation is integrating the EI and what is the impact upon overall service innovation. Information from this source will be highly valuable for the execution of this research as it will identify the strategic priorities of organisation with regards to EI. Each interview will last for 40 to 45 minutes.

As three organisations have been selected, therefore, researcher will conduct nine interviews from three organisations. The researcher will also interview the ministry of telecom representatives and Telecoms director in the ministry of trade. The reason for choosing this

information source is that they will offer meaningful insights related to governmental support for information access to laws, employability index, up-to-date vat and tax rate and other procedural factors to sustain in the host nation. After conducting the semi-structured interviews, the researcher will conduct focus-group discussions with the middle and operational management to explore the operational policies for multinational telecoms firms.

For this purpose, 3 focus groups will be conducted in each organisation. Each focus group would last for approximately 1.5 hours. Operational manager, research and development manager, marketing manager, finance manager, customer relationship manager and two existing end users will be included to execute the focus group.

The reason for selecting focus groups is related to the fact that it will help the researcher in investigation complex behaviour of the participants. Moreover, the selection of focus group will help in getting key information from the participants of the research and further help in discovering about the different set of people think and feel about recent trends and challenges which are the part of telecommunication industry of Jordan. In addition to the above statement, the focus groups help the researcher in obtaining detailed information about the group's perception and opinions regarding the Jordanian telecommunication industry and how the companies are performing. Moreover, the key information will be derived from the research participants who will help in providing a broader range of insights about the feelings related to trends and challenges associated with the telecommunication industry of Jordan.

The reason for including these individuals is that they will jointly offer a holistic view by sharing important information related to various business aspects. For instance, finance manager will be able to discuss resource constraints and costs associated with EI that make the

integration process challenging, marketing manager will be able to discuss the marketing related issues that hinder the embedded innovation, research and development manager might share important knowledge that could be used to facilitate the integration of EI within the organisation. Lastly, knowledge from customers is always considered a valuable resource for organisations. End users can offer useful insights to their organisations for enhancing the innovation process.

4.4. Data Collection Methods

The study has collected the data from reliable sources to validate the research. The semi-structured interviewing approach used to collect the data. The semi-structured approach uses probing technique to maintain an overall structure. The interviews were conducted with senior management of each selected organization. For this purpose, the study planned to interview branch manager, chief operating officer, chief strategy officer and business development officer.

The reason for interviewing these participants is that they share important strategic information about the integration of the EI and evaluate its impact on overall SI. The Information from the mentioned source is highly valuable for the study as it identifies the strategic priorities of organisation about EI. The duration of each interview lasted for 40 to 45 minutes.

4.4.1. Secondary Research

This section explains the review settings that followed to build the literature review in *Chapters 2* & **6**, and to highlight the key research gaps and shape the final research questions. It also explains the design for the archival analysis that represents the key sources of case background, and the research context in *Chapter 5*.

4.4.1.1. Framing Literature Review

A research topic needs a significant quantity of literature related to it, in terms of theories and methodologies, all of which are demonstrated in the form of a literature review which presents the understanding of the topic that the researcher possesses (Meng & Berger, 2019). The process of literature review starts with the comprehensive summaries of previous research on the topic under study. This is done by critically analyzing scholarly articles, books, and other relevant sources.

Several databases and keywords were used to find and analyze scholarly articles related to innovation, intellectual capital, change, and resistance to change and all the innovation models. (See table 4.2). The literature review is thematic and will systematically lead to the issue and topic under study and the time progression of the collected data will be ignored. The literature review will be quoted as the points are made rather than following the timeline.

The literature review will develop a narrative which starts from the introduction of the key components under study: a generic definition of innovation, intellectual capital that is

required for the generation of embedded innovativeness, and its three components of human capital, structural capital, and relational capital. As well, it will look at the change that is brought by innovation and how that change can bring resistance which acts as a challenge for embedded innovativeness.

The literature narrows to the recent trends in embedded innovation, factors affecting organizational innovation, and the challenges that are influencing embedded innovation. Table 4.2 is a presentation of how the literature, for the terms being studied, has been searched via research databases that have been commonly used in the IS literature.

Table 4.2: Literature Review Settings

Databases	Step 1 (Keywords)	Step 2 (Keywords)		Step 3 (Keywords)
Web of Science	Innovation	Innovation Systems,	AND	Innovation Systems AND Embedded Innovation
		Service Innovation,	AND	
		Embedded Innovation,	AND	
		Intellectual Capital	AND	
		Organizational change		
Jstor	Innovation Systems in Subject	Innovation Systems,	AND	Innovation Systems AND Embedded Innovation
		Service Innovation,	AND	
		Embedded Innovation,	AND	
		Intellectual Capital	AND	
		Organizational change		

Emerald Insight	Innovation Systems Articles and Chapters	Innovation Systems, AND Service Innovation, AND Embedded Innovation, AND Intellectual Capital AND Organizational change	Innovation Systems AND Embedded Innovation

4.1.1.1. Steps for Refining of Papers:

Table 4.2 shows that literature has been taken from those sources which had a high match to the keywords. The following part of the literature will show a systematic process of refining and searching literature from the three databases.

(1) Web of Science:

    i.   Web of Science was the priority for choosing first choice because of its intense detailed archives and multiple searching methods. Searching yielded a number of relevant articles through the use of keywords including ["Innovation & "Innovation Systems"], ["Service Innovation" & "Embedded Innovation"], ["Innovation" & "Intellectual Capital" & "Organizational change"].

    ii.   In Topics, 'AND' Boolean was chosen without the selection of period or the database of Web of Science Core Collection.

iii. Further cutting was done in order to get the articles to come down to the exact keywords. Even though the keywords being used were the same as before, the filter 'Open Access' was used to refine the chosen articles.

iv. Finally, the papers were selected by choosing titles which matched the research topic. The articles which had keywords related to even one of the concepts studies were selected for further scrutiny. The abstracts provided enough data to highlight their importance and contribution.

(2) Jstor:

i. Jstor was the second choice. It yielded numerous relevant articles through the use of keywords:" innovation", "Innovation Systems", "Service Innovation", "Inclusive Innovation", "Embedded Innovation", "intellectual capital", "resistance to change," and "embedded innovation." In Topics, the use of 'AND' Boolean was chosen without the selection of period.

ii. Further cutting was done by the selection of the Content type was selected for "Journals" with the subject selected to the exact keywords. Several articles were filtered from the articles in the journals.

iii. Finally, the selected papers had keywords common with the research. The abstracts proved their relevance. and they are abstract proved their relevancy to the paper.

(3) Emerald Insight (JIC):

i. An advanced search was done for articles. "Innovation," as a key word, was searched in the first row and the option of and ''anywhere'' was chosen. 'AND' Boolean was used then "Embedded Innovation", and "Intellectual Capital".

ii. Later, AND "resistance to change" AND "embedded innovation" were inserted. "Articles and chapters" were selected as the content type. Timespan was not given preference because of the nature of the literature.

iii. Accessible articles were taken into consideration after choosing the 'open access' option.

iv. In the end, a variety of articles were chosen based on relevancy. This was established by reading the abstract and matching keywords with the title of the articles.

4.4.1.2. Framing Archival Analysis

In addition to the semi-structured interviews, another source of information will be used for this research, called archival documents. These archival documents have been taken from the innovation projects in the form of minutes, official publications, brochures, literature, and journals to be critically analyzed by the researcher and upon not having satisfactory data collection the researcher will also review official publications, websites, and online newspapers to have more clarity over the collected data (Tight & Yin, 2016).

Only readable content on the telecommunications companies in Jordan is not utilized for the research but the audios and videos that have been obtained from various resources and mass media, have also been used for the analysis.

The archival analysis covered meeting minutes, corporate reports, and independent publications and news papers during the last 10 years. In doing so, the researcher managed to

build companies narratives (See *section 5.2*) and maps the key players and factors that affect the Jordanian Telecommunication market and how EI are managed by the telecoms.

Although, this study adopts the provider's perspective or Firm-Level Innovation, independent reports from the world bank, ministry of telecommunication, chamber of commerce, and telecommunication regulatory authorities have been taken into consideration to compare between the telecoms' view with stakeholders' views and offer an objective/balanced interpretation of the phenomenon.

4.4.2 Interviewing

Interviews involve direct polls with research participants in order to ascertain their opinion into the research topic (Silverman 2010). In this respect, interviewers typically have limited control over the answers of respondents however the degree of control varies depending on the type of interview adopted by the researcher. To this extent, if the interviewer adopts a structured approach, a degree of control is forfeited as structured approaches to interviews are taken in order to ensure consistency, particularly when a large sample of respondents in involved on the research (Silverman 2010).

As such, an added degree of control is regained however when a semi-structured approach is adopted, this increases control as the researcher is able to steer the interview in the direction s/he wishes to, in order to ensure that the data gathered is in line with the aims and

objectives of the research (Silverman 2010).

Structured interviews therefore follow a rigid pattern in which predetermined question are posed to interviews, this does ensure consistency as deviation is not permitted (Willis 2007). Unstructured interviews however are not driven by any organised agenda and instead allows for dialogue and interaction to emerge, like normal conversation (Willis 2007). Semi-structured interviews however rest between structured and unstructured interview forms as interviewees are permitted to digress when necessary; this approach also serves to eliminates any researcher bias that may influence the data however also allows for issues to be explored which may not have been part of the original agenda (Creswell, 2009).

As far as advantages and disadvantages are concerned, these remain in keeping with the nature of qualitative data. As such, given the reliance upon individuals to provide their own opinion and views, the extent to which high quality data will be obtained is subject to the interviewee's individual experiences and attitudes (Creswell, 2009). Furthermore, the quality of data is also shaped by participant traits, such as the ability to articulate and express oneself (Oates 2006). Interviews are particularly advantageous as they allow for ambiguity to be cleared up as well as gauge the reactions of the interviewee to certain questions (Creswell 2009). Disadvantages however once again relate to the fact that researcher bias may creep in as interviewee statements require subjectivity to interpret (Willis 2007). Further disadvantages relate to the time required to complete interviews- the quality and richness is likely to be impacted by interviews that may be rushed.

4.4.2.1. Interviewing Sampling Technique

The researcher has selected the non-probability sampling to draw the required number of respondents. The *purposive sampling* is a form of non-probability sampling and is called judgement sampling, where individuals are selected with a specific purpose in mind. Purposive sampling technique allows the researcher to draw respondents with specific characteristics and also, it's the most practical approach for exploratory studies (Saunders, Lewis & Thornhill, 2012; Saunders & Townsend, 2016).

Purposive Sampling was utilised to select participants, in this case, interviewees would be selected based on their managerial position and experience with the organisation (Sim & Saunders et.al, 2018). Similarly, government officials would be selected based on their representative position, more specifically innovation managers participants will reflect the other side of embedded innovation. However, in this case the sample was relatively large, and the interviewees were selected on most informative basis.

Research & Development (R&D) Manager's and senior management level staff were chosen based on their highly knowledge of the innovation, years of experience, nationality, and the sources of their innovative activity. Senior managers were interviewed in Zain mobile company and R&D make up a significant ratio of the entire sample. The participants have a good understanding of the organisation practices, process of innovation, innovation implementations.

R&D managers are responsible for the service innovation development. The researcher set the criteria that only senior experienced managers that are directly involved in the key strategic and operational activities will be interviewed. In underlying case, the researcher

intends to explore the insights from management, customers and policy makers. For the pilot study, the researcher only considered the management of Jordanian telecom organisations. The purposive sampling allowed the researcher to collect data from senior manager working in the research and development.

The *senior innovation operational manager*, and telecom company manager who can offer the useful insights in this regard. The researcher selected Zain mobile telecom out of three Zain, Orange and Umnia. Zain was selected for being the first and leading in Jordan, after specifying the criteria, the study used the quota sampling technique to select the final sample size for this research.

The researcher set following criteria to set the quota: firstly, the manager would have spent several years in the telecom industry and secondly, the manager will be native Jordanian as she/he will have greater understanding of the local Jordanian telecom market and latest information about the innovation exchange issues being faced by the Jordanian firms (Mason, 2010). With the help of purposive sampling technique, the researcher identified that on average there were 37 managers in three organizations that filled the pre-set criteria of relevant experience and seniority. To conduct the pilot study, the researcher further refined this size by employing the quota sampling technique as the sample is very large.

The native Jordanian telecom managers working in the R&D department with years of industry experience brought the sample size down to three out of five managers; the researcher conducted the pilot study interviews with only 3 managers from Zain. Accessing participants needed a lot of effort, the researcher had travelled to Jordan and conducted the snowball sampling first and proved to be ineffective at the start of the study as none of the participant referred to specific departments or firm. The researcher used various techniques to gain access

to the sample such as personal connections and previous colleagues who are involved in innovation and proved the most fruitful.

Table 4.3: Sample of Semi-Structured Interviews

Organization	Code of Participants	No. of participants	Position	Justification
Umniah	U1, U2, U3	3	Operations Manager	The operation manager has experience in fostering innovation in the telecommunication industry
	U4	1	R&D Manager	The R&D manager has skills and knowledge to research ways to innovate
	U5,U6,U7,U8	4	Marketing Manager	The marketing manager has adequate knowledge and experience in marketing and management of innovation
	U9,U10	2	Finance Manager	The financial manager does financial management of innovativeness
	U11	1	Customer Relationship Manager	The customer relationship manager maintains relationship with customers and introduce innovativeness to customers

Zain	Z1, Z2,Z3	3	Operations Manager	The operation manager has experience in fostering innovation in the telecommunication industry
	Z4,Z5,Z6,Z7	4	R&D Manager	The R&D manager has skills and knowledge to research the ways to innovate
	Z8 &Z9	2	Marketing Manager	The marketing manager have adequate knowledge and experience in marketing and management of innovation
	Z10 & Z11	4	Finance Manager	The financial manager does financial management of innovativeness
	Z12 & Z13	3	Customer Relationship Manager	The customer relationship manager maintains relationship with customers and introduce innovativeness to customers.
Orange	O1,O2,O3,O4,O5	5	Operations Manager	The operation manager has experience in fostering innovation in the telecommunication industry.

O6	1	R&D Manager	The R&D manager has skills and knowledge to research the ways to innovate.
O7,O8,O9	3	Marketing Manager	The marketing manager has adequate knowledge and experience in marketing and management of innovation.
O10,O11	2	Finance Manager	The financial manager does financial management of innovativeness.
O12,O13	2	Customer relationship management	The customer relationship manager maintains relationship with customers and introduce innovativeness to customers.

The pilot consisted of 3 managers 1 – on 1 with the research & development, innovation operational manager and division head. Before the start of the interview the researcher introduced himself and explained the purpose of the interview and explained the term imbedded innovation.

Semi-structured interviewing technique was adopted to extract the important insights. Next section will explain the key interview findings obtained during the interview.

4.4.3. Focus Group

The focus group is popular qualitative technique, which includes a small group of people who sit together, guided by a moderator through a spontaneous discussion to get information about the problem. It is technique to gain information from small sample of respondents (Burns & Bush, 2014). The researcher asks few general questions and note down their point of view. Normally, focus group is consist of four to six people (Creswell, 2012).

After conducting the semi-structured interviews, the study has conducted focus-group discussions with the middle and operational management to explore the operational policies of multinational telecoms firms. For this purpose, 3 focus groups were conducted in each organization. Each focus group session was for approximately one and half hours. The operational manager, research and development (R&D) manager, marketing manager, finance manager, customer relationship manager and two existing end users were included to execute the focus group.

The focus group play important role to facilitate the researcher to investigate complex behavior of the participants. Moreover, the selection of focus group helps to get key information from the participants and assist in discovering the different sets of feelings and thinking of people about trends and challenges of the organizations. In context of this study, the focus groups help the researcher to obtain detailed information about the group's perception and opinions regarding the performance of Jordanian telecommunication industry.

The individuals of focus group offer a holistic view by sharing important information related to diverse business aspects. Such as, finance manager discusses the resource constraints and costs associated with EI that challenge the integration process, marketing manager discusses the marketing related issues that hinder the embedded innovation, research and development manager shares key insights that is useable to facilitate the integration of EI within the organization. On other hand, end users an offer useful perceptiveness about their organizations to enhance the innovation process.

Focus group methodology most usually prescribes a group discussion, not dissimilar to interview techniques, which involves a number of participants who are presented with an agenda or theme which they readily discuss (Barbour 2007). As such, the methodology allows said participants to discuss and explore the issues and themes of the research in question, and through opinion and discussion, offer differing perspectives and solutions (Hennink 2007). In that respect, focus groups allow for a greater sense of clarity amongst and between participants, and helps to further organisational goals (Krueger and Casey 2009, Barbour 2007).

Unlike interviews, which normally involve the only the researcher and solitary interviewee, focus groups revolve around several participants, who are free to talk amongst

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themselves, while the researcher observes or occasionally provides conversational prompts (Barbour 2007). The standout advantage of this is that the data gathered can be deep and extensive, allowing for a greater range of information that conventional interviews may not (Wilkinson 2004). The qualitative nature of focus groups is one that yields more in-depth data in regard to feelings and emotions of participants or whole groups [such as ethnic minorities], which makes it possible to observe and collect varying perceptions and understandings, which may not be as easy, or perhaps possible when compared with one-on-one interviews (Wilkinson 2004).

Kitzinger (2005) claims that focus groups are the 'ideal' research methodology in terms of opinion, experiences, emotions and perceptions (Kitzinger 2005). Kitzinger further goes on to suggest that the forms of communication that are displayed within focus groups are nigh impossible to retrieve using positivist, more scientific methods such as questionnaires and surveys, as well as one-on-one interviews which cannot result in the playful, argumentative or joking forms of communication, which often yield deep rich information (Kitzinger 2005, Wilkinson 2004). In light of this, it is no wonder that scholars such as Kitzinger state that focus groups are unique in their ability to demonstrate

> "*diverse perspectives since focus groups function within the social network of groups.....Crucially then, focus groups discover 'how accounts are articulated, censured, opposed, and changed through social interaction and how this relates to peer communication and group norms*" (Kitzinger 2005:58).

As already mentioned, the individual experiences and points of view highlighted by employing focus groups allow of a plethora of understandings and perceptions in regard to a particular topic, or research area in question, to be conveyed to the researcher (Krueger and Casey 2009). In that sense, the method makes it possible to correlate understandings and perspectives of particular research topics with differing social groups, such as ethnicity, gender

and social class (Conradson 2005). In addition, focus groups allow the distinction between people's actions and speech to be studied and observed – that is to say, if people really carry out what they say they would (i.e to practice what they preach).

Many scholars in favour of focus groups often highlight the multiple lines of communication which arise from focus group work (Hennink, 2007, Kitzinger, 2005, Conradson, 2005). Many individuals find interviews intimidation, boring or uncomfortable. The presence of a stranger or researcher often results in anxiety, yielding poor and misinterpreted data (Kitzinger, 2005). Group interviews, however, allow for participants to be at a greater level of comfort, with those who are of the same social class or ethnic background, as well as often resulting in 'enjoyable interaction' between the participants involved (Barbour, 2007). Finally, one of focus groups' greatest advantages is the manner in which participants responses can be yielded as discussions and events evolve, allowing for a greater stream of discourse from which to extract data and information (Barbour, 2007).

Like any methodology, focus group work is not without its disadvantages. These include management and coordination issues, which often play a role in focus group work failure. In addition, analysis of the data extracted from focus group work, while being broad and rich, is incredibly hard to analyse and understand (Stewart et al, 2007). Furthermore, one of the striking criticisms of focus groups is the fact that participants may very well lie or agree with the majority from fear of rejection or bullying (Stewart et al 2007, Morgan 2002, Kreuger and Casey 2009).

4.4.3.1 Focus Group Sampling Technique

A focus group is like a group interview in which people with a similar working environment are interviewed and can include from any workshop, department, or any sector of the organization (Ozanne, Strauss, & Corbin, 1992). For the current research, the focus groups included all the participants that came from research and development, customer relationship Department, start-ups, customers, operation department, and others.

All the participants are engaged in a discussion in which their point of view has been taken about the chosen topic and the main aim of doing such activity is to introduce the group to the phenomena that have been impacting their organization (with their awareness or unawareness) so that common advantages and disadvantages about the phenomenon can be understood. The data collected from the focus group also provide limitations of the studied phenomena within the context.

The process of data collection from the focus group started by making questions that will be asked from the participants about innovation processes that are being done in their organization. The participants were initially introduced to the purpose of the study and how the study will benefit the economic development of the country and help grow organizations in terms of embedded innovativeness (See *Table 4.4* below).

The participants when systematically asked questions to ensure a better narrative of the answers and even though all the answers were more recorded, the researcher still wrote

important points during the interviews to ensure that the procedure does not lose its direction. The recorded data was later transcribed and send back to the participants for their verification and authentication. The findings represent many perceptions of the interviewees that participated in the focus group event.

Table 4.4. Focus Groups Method

	Organisation	Group Participants	Date	Duration
Focus Group 1	Zain Mobile	3x customers 2 x start -ups 1x R&D officer 1 X Innovation officer 1x Customer relationship rep	03/03/2019	130 Min
Focus Group 2	Umniah Mobile	2 x customers 3 x Start-ups 1 x Innovation officer 1 X Operation Manager 1 X customer servicer rep	12/03/2019	160 Min
Focus Group 3	Orange Mobile	2x customers 1 x start-ups 2 x service innovation officer 1 x Marketing officer	05/04/2019	120 Min

4.4. Data Analysis Methods

Data analysis takes care of the research quality which refers to the completeness and the accuracy of the research paper. By completeness, we mean that the paper covers all the areas that the problem has to offer. The accuracy of the paper is shown in the analysis chapter of the paper. When we talk about the quality of the data for qualitative research technique, we check two-man aspects, i.e., the completeness of the data collected and the accuracy/relevancy of the data that has been collected for the research.

First, we describe data, data is the replica of the actual/real, it is also sometimes called "Artifacts", i.e., artificial of actual. This data can be in the form of text, image, sound, etc. Any data which represents greater accountability towards actual is good quality data. For any research data collection, a necessary step is to carry down a process of checking the validity and reliability of the research. The researcher ensures the quality of the research based on the prior experiences of the participants that are interviewed.

Data was thoroughly collected, openness was shown by both the parties during the interview, also to make sure that the data of the research is quality based; it was kept in mind that the data which will be collected through interview questions should relate to theory in the research. Also, the references are provided to the previous literature by the researchers, to make the data complete and accurate.

The presentation of data analysis falls into the research findings chapter, which gives the whole study a meaning and builds up the deep understanding of the phenomenon (Lewis, 2015). Data analysis is followed after the success of the data collection process in which the data is compiled and transcribed as per the proposed methodological designs. The collected data is analyzed in the data analysis chapter by following a specific pattern for the selected methodological approach (Catterall, 2000), for qualitative research the data analysis might include coding the transcribed data and then developing the themes. Meanwhile, for quantitative research, the data analysis might include the use of quantitative data analysis software for getting numerical values for the data achieved through questionnaires and then developing a numerical value to show the relation between the variables.

The quantitative data analysis targets to make a vast mass of collected data and provide are generalizable representation far this selected population and qualitative data analysis target the extraction of meaning from the collected data by providing an in-depth understanding of the phenomenon being represented in the form of themes and theories (Ozanne et al., 1992; Saldaña, 2009). In other words, quantitative data analysis can be done by a graphical representation which might include percentages and changes shown through charts or quantity distribution represented by confidence intervals. And qualitative data is shown by the development of themes in all the cases which is later correlated with the result of quantitatively achieved data.

The main difference between the analysis of the two research approaches is that the qualitative data is being analyzed by the researcher at every stage of the data collection process and the data collected for the quantitative approach can only be processed or analyzed at the end of the data collection (Lewis, 2015; Saunders et al., 2018; Thomas, 2020). Since the researcher could collect all the data during the analysis, he is able to shift his direction (if need be) towards something that he has not focused on before and this is where qualitative research against more important than quantitative research.

The qualitative data collection and its analysis has been considered as difficult as compare to quantitative data analysis and collection (Tellis, 1997; Thorne, 2000). Another issue with qualitative study is preparation of reports. The interpretive study requires that reports should be based on people's interpretations although it may not be bases on facts and figures

(Walsham, 1995). Furthermore, qualitative data include many forms that can be audios, documents, videos, observations and field notes and to maintain the quality of study the statistical techniques are rarely used not frequently (Parikh, 2002).

The analysis of qualitative data requires strong interpretations in systematic manner because qualitative study produce big amount of data (Yin, 1984) It is further added by (Parikh, 2002) that analysis should be clearly defined, precised, following specific procedures because interpretation can rely on emotion, intuition and experience. Therefore, it must be made sure that analysis should be scientific and more to humanistic side. One of the reasons to do qualitative study is that it understands participants through focus groups, interviews and general talks. Moreover, qualitative study also recommended by Yin (2009) as it not only help in collection of stated data but also study reactions and impressions of participants which make study more worthy. The study in hand incorporated all possible aspect of qualitative study to completely understand the phenomena and investigated from participants' perspective Kaplan and Maxwell (1994). 4.5.1. Techniques for data analysis

There is no standard way of using a data analysis technique but rather any technique which can help in developing the man constructs of the research are considered as effective and for that reason, the current research will a four-step analytic technique for qualitative data (Lester & Lochmiller, 2020; Saunders et al., 2016).

1. Data categories and their development
2. The process of determination of different units that will fall under these categories
3. Understanding the enter relationship between data categories
4. And finally, the conclusion, followed by a properly developed scheme

The initial framework presented in ***Chapter 3***, is used to deduct the research data into initial codes. Then, the researcher, followed the inductive data analysis approach to add tree/branch codes and develop the final theoretical framework accordingly.

4.5.2. Approaches to qualitative data analysis

There are two types of approaches when it comes to analysing the data. The first one includes an inductive approach in which the collected data is read in detail and different themes and concepts are derived from the data based on interpretations provided in the data. The inductive approach uses a framework to investigate the data and group the concepts. This fact has been supported by Strauss and Corbin's (1998) "*The researcher begins with an area of study and allows the theory to emerge from the data*" p. 12.

And the second one, the deductive approach allows the researcher to examine the data collected as tries to figure whether the assumptions and hypothesis are consistent with the data are not. For this approach, the collected data is maintaining in the form of groups and then examined for differences and similarities, and for such purposes, the deductive approach involves a predetermined framework for the data analysis process. It is due to that predetermined framework that the researcher can analyse the interview transcripts structurally in mixed methods.

4.5.3. Thematic Analysis

The interpretive nature of the current research highly infects how the data collection process is conducted and how the collected data is going to be analysed. The responses gathered by the researcher are in coherence with the questions and how those questions systematically answer the complex phenomena behind the interview questions is the priority and the research will focus on the different modes of analysis that will be used can include various techniques and methods to gather the qualitative data an interpreted for analysis.

There are three main stages in our data analysis Section for qualitative research: reduction of the data, displaying the data, and finally extraction of the conclusion with proper verification and reliability. Reduction of the data is how the collected data is reduced an organized, since the data collected is raw in the form of transcripts, field notes, and observations, it does not represent any proper direction and it falls into the researcher's responsibilities to guide it using codes and summaries to identify the relevant data and discard the irrelevant data. This process helps in the eradication of many irrelevant data that can misguide the research conclusion.

The data achieved after the reduction procedure can be displayed in the form of metrics and networks, which is the second stage of data analysis. The networks help not only the researcher but also the reviewers in understanding how a phenomenon systematically took place. This is followed by the third stage in which networks also help in a proper conclusion development which is supported by the references of other researchers who reached similar results, which increases the validity of the conclusion.

4.5.3.1. Thematic Coding procedures

The process of analysis needs to be done in multiple phases which starts from the conduction of interviews which are regarded and later those audio files are the transcript and sent back to the participants of the interviews. Upon getting their consent the researcher thematically paragraphs those transcripts by the act of coding which is a process of generating themes in a raw piece of data. The process of coding develops chords which can be words or phrases, whole paragraphs are single sentence is, based on the type of coding used by the researcher. Since the codes represent the topic, they should reflect relevant data without any overlaps.

After the coding process, the themes are merged and discarded on the basis of relevancy and later categorized to answer research questions through ideas. The coding process date took place according to the framework of Firm-Level Embedded Innovation Systems. The table drawn below provides a comprehensive summary of the activities that were carried out during the analysis.

The factors represented by the initial framework (See Section 3.3) guided the process of data analysis and the four categories mentioned in the framework was used to identify topics and domains that need to be investigated. Therefore, the interpretation of the data collected from interviews and archival documents.

Table 4.5: Summary of activities for data analysis/mode of analysis

Steps	Data Analysis
Step 1	Translation and transcription of the interviews.
Step 2	Managing the data in a way that best serves the research questions and objectives.
Step 3	Coding the collected data and developing themes.
Step 4	Developing a mind map of the coding (***Initial Coding***).
Step 5	Identifying critical events and developing activities during the projects and Develop ***tree coding***.
Step 6	Gaps identification by following Firm-Level Embedded Innovation System's framework.
Step 7	Focusing on Innovation Systems projects and how events took place during their implementation. The narration of each event in the light of transcriptions of the interview. Then develop the ***final coding***, based on which the researcher developed the discussion chapter and the final framework.

4.5.3.1. Data Coding

The initial coding shown the figure below. It includes a deductive approach of data analysis where the key themes were built around the proposed framework. Four key themes have been proposed based on our extensive literature review and the integration between the regional innovation model and the theory of firm-level innovation. These themes represent the key mechanisms of EIS.

Figure 4.3: Initial Thematic Coding
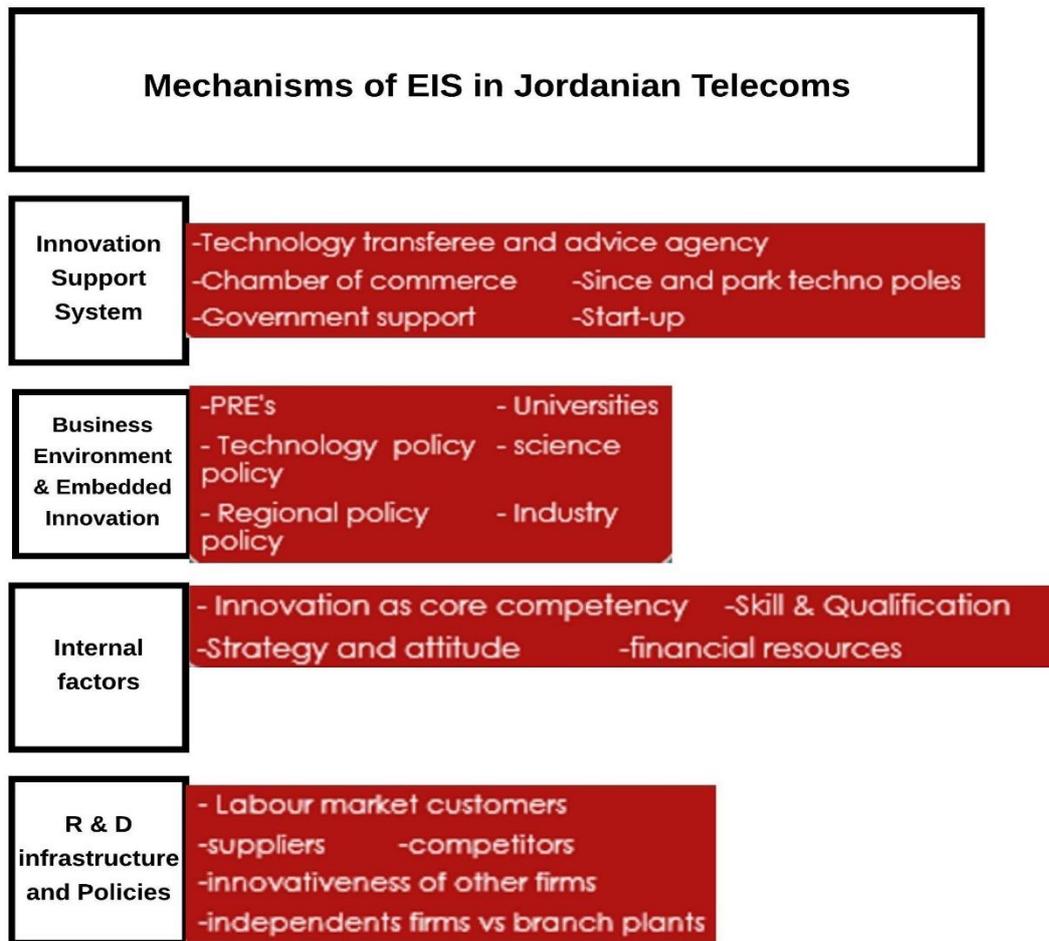
After cateogrising the frequent words in the transcripts into these four themes. Further coding has been conducted to induce emerging sub-themes (See Figure 4.4). This enabled the research to address the drivers and challenges facing the telecoms professionals while developing the EIS in Jordan. The green nodes in figure 4.4 point to the drivers of telecoms operators towards developing an EIS during the four stages proposed in figure 4.3.

Figure 4.4: Tree thematic Coding
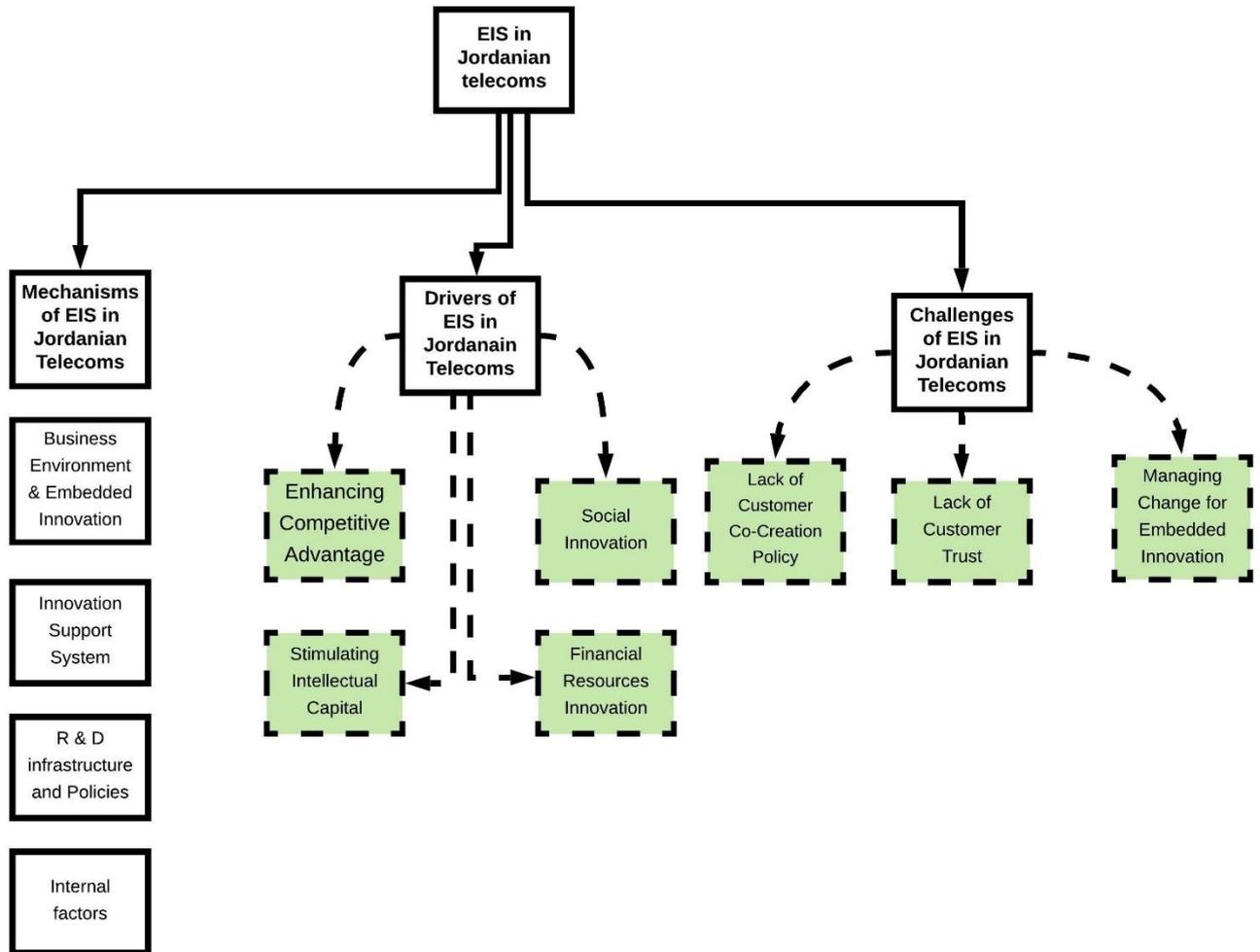
The final coding shown in figure 4.5 demonstrates new sub-themes that represent a theoretical contribution to the firm-level innovation theory. Bridging ties was found in the interviews with the top executives who use their Jordanian inheritance to build public-private-partnership and in build corporate social responsibility initiatives.

Figure 4.5: Final Thematic Coding
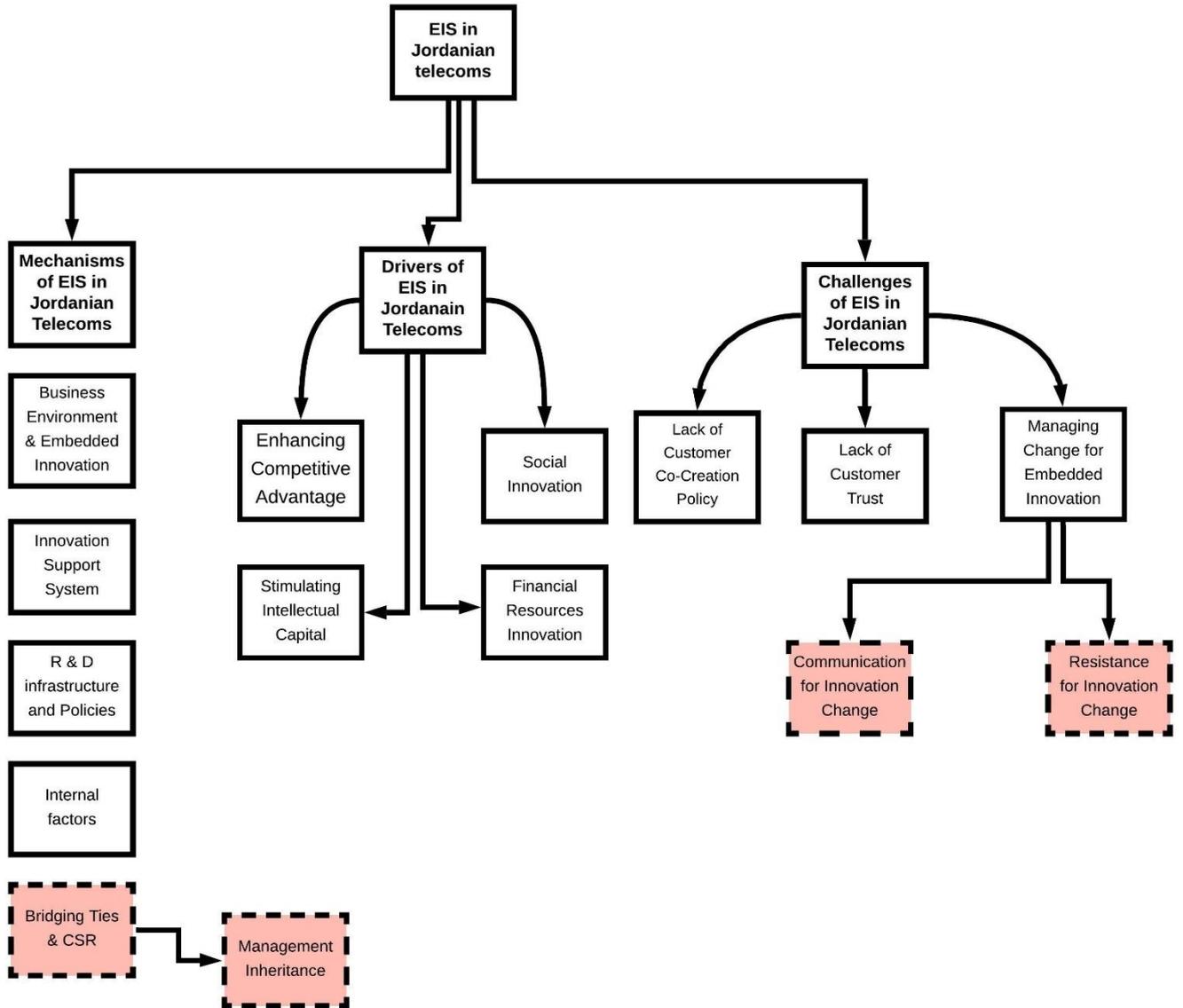
4.6 Research Evaluation Criteria

There are a great number of strategies that can be used to evaluate the quality of

research. According to Guba and Lincoln (1994), it is important for a study to specify the way of research and terms to access the quality of qualitative study. There are two proposed way which is trustworthiness and authenticity. This study explains both in following topics.

4.6.1 Validity

The validity highlights the extent to which targeted phenomenon presented. In other words, validity can be explained as accuracy of responses towards a measurement (Burns & Bush, 2014). The validity not only ensure that accuracy of measurement but also studies the effect on instrument on results. In case of qualitative study, validity can be determining from the questions asked in interview and their effects on the results (Salkind, 2012). For this purpose, the researcher would have to be very careful while designing the questions for interviews and interpreting them (Wolcott, 1990).

The researcher has considered the reliability and validity factor during the design phase of research, assessing the overall quality of the research and analysing outcomes. In qualitative research, the "validity" is ensured in terms of appropriateness of the processes, tools and employed research techniques (Creswell, 2013). Validity is dependent upon whether the research questions are valid for the desired results and whether the researcher has made appropriate methodological choices (research philosophy, research approach, data collection method, sampling technique) to achieve the study objectives and answer the research questions (Maxwell, 2012). In this case, all methodological choices made by the researcher are well-aligned and complement each other.

In order to ensure the reliability and robustness, this research adopted multiple –case research design. Researchers have proposed that multiple case study approach results into enhanced robustness of results (Yin, 2013). Hence, much effort was focused on gaining access and applying this study to all three telecommunication operators in Jordan. The design to apply the research in multiple cases within the same industry supports the validity of the research by providing valid and practical outcomes and trustworthiness through the Jordan telecommunication market (Pharaon, 2010).

Moreover, to enhance the validity and reliability, peer researchers were involved in the reviewing and providing feedback on the interview questions, data gathered and the subsequent outcomes in order to enhance analysis and overall construction of the realities in terms of the sample selected. Investigator triangulation proved useful taking into accounts the ideas and explanations provided by the scholars examining the research participants.

The peer examiner was well informed in the area of motives, challenges and process of embedded innovation. Triangulation supported by many academics in the field was believed to help in achieving validity, trustworthiness and reliability. Hence, a number of approaches utilized in the study such as interviews and focus groups were to ensure a greater degree of reliable, diverse and valid construction of reality (Pharaon, 2010). A great deal of personal effort was applied during data analysis in order to maintain the quality by incorporating all relevant evidence and interpretation and through highlighting an essential part of the research. The research relied on peer assessments and inter-code reliability checks to increase validity and reliability of the cross-case qualitative research outcomes.

In case of this study, the questions were prepared vigilantly, the researcher listened to

participants and prepared the reports. Moreover, all the collected data analyzed in proper manners and in lined it with statements. In this study, it is made sure that validity of research should be maintained.

4.6.2 Reliability

The reliability measures the extent to which provided study is reliable. According to Salkind (2012), reliability only occurs when a test done on any phenomenon more than once and finds same results. In other words, it can be explained as consistency of the data. It is further added by Creswell (2012), a good study should have the observation that are reliable. The factors that play important role in establishing reliability of research are clarity of questions, procedure of testing the data and fairness of participants (Rudner, 1993).

4.6.3 Trustworthiness

The trustworthiness highlights the value of study and it also indicate its worth. According to Bryman (2011), the trustworthiness has four criteria that are credibility, transferability, dependability and confirmability. As per description of Lincoln and Guba (1985), the four steps of trustworthiness explained in following paragraphs.

The creditability of research can be referred as acceptability of research by others. The researcher should ensure that research is being established by good practices and research finding are based on true results and make sure the persons got well understood who did interviewed.

The transferability refers to thick description of study. The qualitative study normally revolves around small group of people sharing certain characteristics. The qualitative finding are normally oriented towards the contextual uniqueness. Therefore, it should be ensured that the findings of the study should be rich enough to transfer to contexts. It is argued that qualitative study should produce in a way that its findings may be applicable in other culture, context or in same context but at different time.

The dependability of study refers to audit approach. It explains that all record of research must be kept for validation purpose. The records including formation of research, selection of participants, transcription of interviews, peer selection and data analysis. Whereas it is also stated that measuring dependability of a study in management and social sciences is not considered as appropriate technique because qualitative study has extremely large data sets. The last phase of trustworthiness is confirmability. It explains that researcher should be in good faith while doing research and not inclined or biased due to personal values.

4.6.4. Research Ethics

The research requires some ethical considerations either it is qualitative or quantitative. Whereas ethical issue in qualitative study raise some complex issues and therefore, these issues should be considered throughout the study. Due to depth of qualitative studies, ethical consideration is crucial. The researcher should make it sure that all ethical concerns were considered including confidentiality, privacy and consent of participants. During data collection, it was made sure that participants have no pressure over them, and their participation should be voluntary. The misleading or irrelevant questions were not asked from participants

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and no attempt was done to force them to for biased answers. Moreover, it is very important for interviews that questions should be easy to understand and there should not be any kind of complex question that confuse the participants. The participants were allowed to speak over the question of their choice. The qualitative research require justice in interviews. Everyone needs recommended time and not favoritism in interviews. The research requires interviews in professional environment, and it is also taken in account to make interviews professionally and researcher avoided from any kind of harm or abuse to participant in order to make them feel relax and calm so truthful data could obtain. For the ease of participants, the questionnaire was handed over to them in written so in case on any ambiguity the participant could discuss. Prior consent was taken from participants before interviews.

The ethical consideration of qualitative research not only focus on interview part of study, but it covers it as whole. It requires from researcher to record data honestly and carefully. It also urges researcher to use appropriate tools and manners while doing data analysis and presenting the results. It must be ensured that results should be provided without altering or manipulating the data either results are in favor of study or not. The research question should be matched with objective of study and irrelevant question should not ask. Moreover, the participation should be voluntary, and participant should have rights to leave the interview if they don't find it convenient for them.

During this study, all ethical considerations were taken into account by the researcher and researcher made it sure that there should not any kind of mistake or compromised ethical issues. Furthermore, an ethical clearance was obtained from the university before data collection and all mentioned protocols being followed. After the data collection and screening process, report was submitted to department and department didn't find any kind of

misconduct, violence of terms, complains from employees, manager or any organization and general public.

Conclusion

The business and management literature refer to alternative research designs that could be used in interpretative research and address a socially constructed phenomena such as the process of embedded innovation. In this section, the researcher addresses the alternative research design that have been adopted in the Innovation systems, namely, action research, ethnography, and case study designs. In doing so, he points out the advantages and disadvantages of each design. The last part of this section explains which mode of "Case Study Design" is adopted and why this design and this mode offers a better understanding of the "Embedded Innovation Systems".

This Chapter explained the research process, including methods of data collection and analysis, which is targeted at developing theoritical framework and theorizing the emerging embedded innovation system. The process through which a particular subject can be studied elaborately for better understanding in order to make future predictions.

The approaches that form the philosophical basis of research include qualitative and quantitative approaches. The quantitative is also called positivist approach while qualitative is a post-positivist approach. However, a clear divergency exists between the two approaches. Positivism deals with a clear quantitative approach to investigating phenomena and does not offer a required instrument for measuring human behaviours sufficiently. On the other hand, qualitative approach seeks to explore phenomena and its instruments use more flexible style in

eliciting and categorizing responses to questions. It also adopts semi-structured methods such as indebt interviews, focus groups and participant observation. It involves analysing and interpreting texts and interviews in order to discover meaningful patterns descriptive of a particular phenomenon (Auerbach & Silverstein, 2003).

Qualitative research analysis appears to be the suitable method for this research. This method could be used to gather in-depth data by discovering the meaning of the business problem and reconstructing the stories of participants on a conceptual level (Guba & Lincoln, 1994). The qualitative method is appropriate for this research because it will be able to interpret the nature of the context by answering the problem being explored (Yates and Leggett, 2016). This approach has several obvious strengths, *firstly*, because it examines issues in detail. Researchers conducting interviews are also not restricted. They have the advantage of asking any question in real time. As the research takes a new direction, the research framework can be revised to match existing new information. In order words, participant's response affects how, and which questions the researcher asks next. In addition, the data collections and research questions are adjusted according to the knowledge obtained. Moreover, data from qualitative research has been found to be more compelling and powerful as opposed to quantitative data, which dwells more on numbers.

Qualitative research also has its limitations. The quality of the research depends entirely on the researcher. Cases exist where the researcher's personal ideologies and perspectives affect the quality of the discourse. Their presence in data gathering may also influence the subjects' responses. Qualitative data is often voluminous thus, it takes the time to analyse and interpret it. However, the quantitative method is not the chosen method for the study because quantitative methods are used to correlate data between variables (Horsewood, 2011). For the

purpose of this study, the quantitative method is not appropriate because researchers use a quantitative method to test hypotheses (Palinkas et al., 2015). Additionally, the mixed method also is not an ideal approach for this study. Mixed method approach enables researchers to juxtapose qualitative and quantitative techniques to explore the research question (Hay, 2016).

The current research adopted the qualitative research approach that complements the qualitative study nature is interpretivism. To examine the extent to which embedded innovation can improve the telecommunication services in Jordan market; the research will collect the qualitative insights from telecom organisations and the clients using the telecommunication services. Moreover, the researcher will also adopt multiple case-study approaches to conducting an organisation specific in-depth investigation of three telecom organisations selected for the research.

An effective comparison and contrast of these organisations will determine their levels of adoption on embedded innovation and how this has influenced their service innovation. Semi-structured interviewing approach will be used to collect the data and rationale for choosing semi-structured approach is that it allows the researcher to use the probing technique while maintaining an overall structure. Interview will be conducted with senior management of each selected organisation. For this purpose, researcher plans to interview branch manager, chief operating officer and chief strategy and business development. The researcher has selected the purposive sampling technique to draw the required number of respondents.

The template analysis technique was adopted in this research to build the initial and tree coding. Both deductive and inductive data analysis approaches were adopted to build the final theoretical framework (See Chapter 6).

Chapter 5: Case studies & Analysis

Introduction

This chapter highlights the research context of the Jordanian mobile telecom sector and how different the three major telecoms build up embeddedness mechanism in their services. This chapter relies on archival analysis to report the interpretations and case profile of each unit of analysis. Plus, the interview data is presented in the case profiles to address the participants' perception towards the motives, mechanisms, challenges, and impact of embedded innovation. The interviews were conducted with Operation Managers, R&D managers, Marketing Managers, Finance Managers, and Customer Relationship Managers of mobile telecoms in Jordan.

This chapter presents the case of embedded innovation in telecoms based on the proposed framework for Firm-Level Embedded Innovation System that is discussed in *Chapter 3 (See Figure 5.1).* While this chapter presents a rich picture of the embedded innovation systems in Jordanian telecoms through a multi-cases research design, the discussion *Chapter 6* presents a cross-sectional comparison and contrasts between the findings and the literature findings.

This research process is appropriate for theory building via exploratory case study research (Eisenhardt & Graebner, 2007). The key sources of data used in this chapter are archival analysis and semi-structured interviews (See *Chapter 4*). This Chapter contributes

towards answering *Sub-RQ1* & *Sub-RQ2*. In doing so, it starts by addressing the mechanism and status of telecommunication services in Jordan and the level of competition in this market. The second section presents the key elements/mechanism of Embedded Innovation Systems in the selected Telecoms based on the proposed framework.

Figure 5.1. Proposed Framework of Firm-Level of Embedded Innovation Systems

Innovation support System:
-Technology transfer and advice agency
- Chamber of commerce
- Science parks and techno poles
-Startups
-Government Supports

R&D Infrastructure And Policies
- Universities
- Technology policy
- Science policy
- Regional policy
- Industry policy

Firm-level Embedded Innovation System

Production Environment:
-Labour market
-Customers
-Suppliers
-Competitors
-Innovativeness of other firms

Internal Factors:
- Innovation as core competency
- Skill & Qualification
- Strategy and attitude
- Financial resources
 industry

5.1. The Jordanian Telecommunication Market

In the Middle East region, the Jordanian telecom sector is a billion-dollar highly

competitive markets (Inta, 2014). A recent index developed by the Arab advisory group has highlighted the Jordanian telecom market as the second highest competitive sector in the Middle East region (Budde.com, 2020). Jordan has only 6 million population, highly level of literacy, but limited financial and physical resources (TRC, 2020). The accelerating competition among three monopolistic mobile telecoms companies (strictly Orange, Zain and Umniah) has contributed to the economic development of the country (Zabadi, 2016). The Jordanian telecom sector has enjoyed fast and substantial growth over the last few years (Inta, 2014).

The governing body of this sector is the telecommunication regulatory commission (TRC) that was formed in 1996 to ensure the compliance of telecom with government policies, monitoring regulatory policies, customer protection policies and undertaking ICT objectives imposed by the government (TRC.gov).

The market share of Zain Telecom is %40, Orange Telecom is % 36, while Umniah only holds % 29 (TRC, 2020). The smartphone penetration of over 60% and most users access over the top (OTT) messaging apps through this device. The excessive use of messaging applications has impacted the usage of short message services (SMS), which has impacted the revenues of the three big companies in recent years. Both, of the accelerating competition and high penetration rate have led to price focused strategies and the need for service innovation (Al-Zoubi, 2013).

Telecoms analysts estimate that data service, mobile and fixed lines core markets produce an annual revenue of approximately $1.18bn (JD836.5m). This is equal to 13.5 percent of Jordan's gross domestic product (Inta, 2014). The sector is changing radically due to a

combination of globalization, market forces, and innovative technologies. Unlike many Arab countries, the Jordanian government has a relatively liberal attitude towards Internet access (Al-Zoubi, 2013). This has led to a decline in SMS revenues in recent years worldwide (Budde.com, 2016). Meanwhile, 'liberalization' and 'privatization' represent two prominent developments within the telecommunication global environment in recent years (Chan-Olmsted and Jamison, 2001).

Over the last two decades, the telecommunications sector has undergone extensive changes, including competition structure, customer protection regulations, management inheritance, and Corporate Social Responsibility size (Zabadi, 2016). Such change made innovation a necessity and embedding telecoms as well as other stakeholders in the innovation process essential (Qawasmeh and Bataineh, 2010). The basic services provided in the Jordanian market are airtime calls, messaging, airtime balance transfer and mobile data unlike the Western telecom organizations that offer highly advanced services for their customers (Hajir et al., 2015). The Jordanian telecom sector plays a significant role in national economic development; however, the industry is currently facing challenges related to embed non-traditional stakeholders in the innovation processes and enhance the co-creation in the telecommunication services (Qawasmeh and Bataineh, 2010; Hajir et al., 2015).

In earlier times, telecommunications services were provided under monopoly conditions through government entities that represented the roles of both operator and regulator at once (Al-Zoubi, 2013). The increasing competition and rapid pace of innovation in information and communications technologies (ICT) led to another stage of hyper competition among the three telecoms and to market liberalisation (Peiro et al., 2016).

Jordan began to liberalize its telecommunications sector in 1995 when a new telecommunications law was passed by the telecommunications regulatory committee (TRC) (Qawasmeh and Bataineh, 2010). The provision of telecommunications services in Jordan (PTSJ) is viewed as advanced compared to other Middle Eastern and North African (MENA) markets (Peiró et al., 2016). It included the distinct base of information technology and the professional and experienced skills the PTSJ possesses, foreign investments, number of mobile network operators (MNOs), penetration rate that exceeded 120% and market liberalization (TRC, 2012). The current stage of deregulation that PTSJ has witnessed reflects an advanced level of liberalization in which PTSJ is viewed as "*one of the most open telecommunications markets in the Middle East*" (Qawasmeh and Bataineh, 2010, p.30).

The study proposed that there is a need to increase investment in innovation and knowledge management practices and to develop an innovation supportive infrastructure to manage and utilize the extracted knowledge in organization. It is also argued that it is important for the Jordanian telecom organizations to embed innovation into their culture to preserve their competitive position in a highly turbulent scenario (Almasri et al., 2011).

5.2. Cases Profiles

This section offers a systemic understanding of the embedded innovation in the Jordanian telecommunication industry. Based on the researcher's interpretation of the interview data and direct quotes from the research participants, this section addresses the challenges, benefits, and mechanisms of embedded innovation in these Telecoms. The structure of this section follows individual discussion for each Telecommunication Corporation as a

multiple case design (within the case study strategy) that is discussed in ***Chapter 4***. The discussion of these cases also includes the role of R&D, infrastructure and policies, innovation and support system, business environment and embeddedness, and internal factors as main factors of firm level embedded innovation systems.

5.2.1. Case A: Zain Telecommunication

Zain was the second telecom entrant to the market that was founded in year 1995 and was first operator for mobile services as the only provider on the market. Later, two competitors entered the market, Orange and Umniah, and due to high competition Zain was forced to pay more attention to innovation in services and products.

5.2.1.1. Zain Innovation Campus (ZINC)

To obtain a competitive advantage, Zain took the initiative to support entrepreneurs in the region under the name Zain Innovation Campus (ZINC). ZINC is the first of its kind in the country and is equipped with the latest technologies to incorporate innovators and start-up owners. The chief executive officer (CEO) is a Jordanian national and a has strong relationship with the government and Zain also makes a heavy contribution to the economy.

The organisation has created advantages and access to the country's resources. Zain selected King Hussein Business Park as the site for ZINC because the park already featured an incubation mechanism that provided access to entrepreneurs and experienced regional players.

Furthermore, King Hussein Business Park also has an extensive history of global-level entrepreneurship.

Zain has strategic partnerships with experienced players in the field, as well as similar business platforms, both in the region and around the world. It includes the 500 American Start-ups, which is one of the biggest incubators worldwide, and British Coventry University. a global hub for entrepreneurship and innovation support. These initiatives would help Zain to prosper and bring innovation to their products and services.

5.2.1.2. Innovation Support System

This section links the business environment discussed above in section 5.1 with the "*Innovation Support System*" as the first element in the overall "*Embedded Innovation Systems*". The data in this section is based on the semi-structured interviews and the archival analysis.

5.2.1.2.1. Technology Transfer and Advice Agency

This innovation hub project was established in 2013 to promote new telecommunication technologies via a multi-stakeholder's platform targeting Jordanian Youth. The aim of this project is to support new ideas in an environment that was equipped with the latest technologies to break down groups of young (educated) inventors into design workshops, and build-up the relevant events and activities to commercialize their ideas. Participant *Z4* confirms that "*This project helps those young inventors transfer foreign technologies*

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(Hardware and Software) into Zain's telecommunication platform".

5.2.1.2.2. Chamber of Commerce Roleplay

The Chamber of Commerce is the second millstone in Zain's Innovation Support System. It is a non-governmental and an economically orientated stakeholder that offers a logistical support and intellectual property registration process.

> *"This institution provides us with the required expertise at a national level to innovate our service design and enhance our competitiveness by extending collaboration with private and governmental organization who might have a vested interest in Zain's services"* (Said by **Z10**).

Z12 also emphasizes that, "*this Chamber play an essential role in the legislation of customer protection and the procedures followed in customers design focus groups*". Furthermore, it has a Zain can innovate their departments, products, services and offering through the support of the Chamber of Commerce as it would register their intellectual property and may offer them logistical advice.

5.2.1.2.3. Science Parks

Jordan has taken steps towards innovation and endeavoring to be the Silicon Valley of the Middle East and wants to position itself as a tech hub by introducing innovation hubs and platforms. Science parks provide support to innovators, talented brains and start-ups with expert commercialization and intellectual property services. It also includes patenting and scout programmes that include Jordanian entrepreneurship and innovation association JEIA, IPARK,

The Queen Rania Center for Entrepreneurship (QRCE), crown prince foundation Tech works, King Abdullah II fund for development (KAAYIA), and Innovative Jordan campaign by King Abdullah II fund for development (KAFD).

The aim is to encourage investment in start-ups and to get innovators involved in technology projects. Another organization, "*Oasis500, enables innovators and start-ups to transfer their viable ideas into scalable businesses*" (Said by *Z1*). The Zinc project of Zain innovation campus is an independent business platform aimed at supporting innovators and start-ups to meet, connect, interact and work to activate ideas (Zain Co, 23rd Apr 2020). The science parks play their role as a backbone to the innovation system. These multiple kinds of projects can facilitate Zain boosting its innovation systems.

5.2.1.2.4. Start-up Support

Zinc sponsors and partners with technology-oriented start-ups and provides the opportunity for free use of Zinc Hub and other platforms. "*We help start-up businesses to the marketize their services and educate them on how to develop their business deployment strategy, and in turn, we own shares in their business and become strategic partners*" (Said by Z9). The start-up can bring new ideas which would be low cost for Zain to implement and Zain can derive innovation systems from their ideas.

5.2.1.2.5. Government Support

Government support is a crucial factor for innovation as mobile telecoms require government approval to introduce innovative ideas or services. In the context of Jordan,

government polices decrease the ability to engage in innovation and only support firms for the first three years. Thus, government bureaucracy and protocols should be overhauled to make the process more flexible for mobile telecoms. However, "*Zain receives more support compare to other mobile telecoms in the country*" (Said by **Z11**). The support of the government is a major competitive point for Zain as its organization is based on the Jordanian level and their strong relationship with government would raise their innovation capacity.

5.2.1.2.6. Public-Private Partnership

Peer Learning Camp is another element of Zain's innovation support system, where the company partner with the Jordanian directorate of general security to deliver Professional training through advanced learning technology. This platform is available for high schools, colleges, and applied science institutions. Zain orchestrate a wide set of public resources such as fast Internet, universities' equipment and offices, Zain's workspaces, software, screens to display projects and interact with learners via smart tablets, VLE rooms (JrodanTimes.com, 24th Sep 2018). Participant **Z2**, emphasized on "*the accelerating value of this platform for creating employability skills that helps Zain recruit qualified graduates in foster the embeddedness in their service innovation strategy*". Networks and collaboration were created to benefit and improve in current business practices (Abualqumboz, 2013).

5.2.1.3. R&D Infrastructure and Polices

5.2.1.3.1. Research Establishment

A Jordanian, non-profit organisation, **Ebtikar** (means creativity in Arabic), has been established in 1987, for the training and development of youth, especially in the creativity and innovation field. "*This organization is supervised by our technical educational services and the higher council for science and technology*" (Said by *Z3*). Zain also provides support to them in terms of consultancy and advice to overcome challenges. The youth normally comes up with great ideas and works hard to explore them in depth. Ebtikar is responsible for youth training and trained personnel would be an asset for their innovation process.

5.2.1.3.2. Monarchy Motivation

King Abduallah has launched a royal award for youth Innovation and Achievement (KAAYIA) This award is granted for public-private partnership initiatives that enables youth R & D skills in their early career stages.

This element of R&D infrastructure is regulated by the ministry of higher education and includes laws and regulations to finance, organize, and protect such initiatives.

In Zain, "*we work closely with public universities to set sessional development programmes to deliver service design, product development, Networking and cybersecurity training to facilitate R&D activities in our services. And in doing so, we include groups of customers, Technical support officers, R&D specialist to improve our services*" (Said by *Z5*).

"*Such awards promote R&D skills to become an institutional and national culture and later helps telecoms to embed innovative ideas in their services design and delivery efficiently*" (Said by *Z6*).

5.2.1.3.3. Technology and Science Policy

The Higher Council for Science and Technology (HCST) that identifies five main areas of R& D infrastructure; the organizational model; legislation, human resources, IT policies, and financial policies. The Jordanian telecoms have access to these five areas of R & D infrastructure and work closely with the ministry of information and communication technology (MOICT) and the telecommunication regulatory commission (TRC).

Zain have a permanent member seating in the HCST panel and contributes to the technology and science policy. In return, the council offers Zain a platform for knowledge networks in telecommunication services regarding science, technology, and research. There are several policy measurements and support schemes, including funding innovation programmes by the new government to support innovation in Zain.

"*Our CEO is a permanent member of the HCST and he manages to secure a massive budget for R&D support and influenced the council to reform the telecommunication policies*" (Said by *Z7*).

5.3.1.3.4. Industry, National and Regional Policy

In context of Telecoms *Industry*, the innovation policies system operates at an industry, national and regional level. In the case of industry level policy, Zain pushes the government to be more supportive regarding intellectual or property rights (Investor Opinion, 24th Jan 2020). In the case of the national level, polices and regulation have been adopted by the government to promote innovation, compete in global markets and to be an innovative nation.

Zain urged the Jordanian government to reshape the national policy framework and comprehend the importance of the private sector, especially big mobile telecom giants (Investor Opinion, 24th Jan 2020).

> "*We have taken advantage of this policy to promote our innovative system and embed governmental officers in our service innovation initiatives*" (Said by Z6).

> "*The competitiveness in the Jordanian telecommunication industry pushes all telecoms to expand their network with non-traditional stakeholders and explore technical advancements in the market*" (Said by Z8).

In the case of *regional policy*, initiatives have also been taken by the Jordanian government such as Free Trade Agreements (FTA) and development of strategic commercial partnerships with neighboring countries (Turkey and USA) have supported Jordan's national innovation system. This policy is inclusive and calls for open contribution of other countries to partner in the R&D infrastructure.

Jordan is inviting people from all around the world to support their economy. The country also availed itself of membership of Agadir FTA. The high-speed Internet, 5G, broadband infrastructure, national broadband network based on fiber and reliable, accessible, and comprehensive telecoms infrastructure has been installed to boost mobile telecoms and to meet Jordan's innovation economy goals.

Jordan must modify its policy and make it easier for firms to bring in new technology to improve the innovation infrastructure. In general, Jordan already has a well-developed mobile sector with three major regional players, and it is well supported by 4G networks, and

mobile telecoms are preparing themselves for 5G network, but the government has not yet agreed to it due to policy concerns. Considering such of policies, Zain can use the abovementioned technologies in an innovative way.

5.2.1.3.5. Technological Advances

An innovation embedded environment facilitates the flow of ICTs among different environmental actors to strengthen the relationships between organizations, stakeholders, community, and the country.

Jordan has taken major steps regarding technology in practical and dynamic way imitating the developed economies approach. Zain, uses the latest technology to improve the quality of their services and enhance customer satisfaction. On one hand, Participant *Z13*, "*confirmed that Zain follows very complex procedures for introducing new technology that facilitate customer services*". On another hand, participant *Z9*, "*believe that the company has an extended organizational hierarchy that makes it difficult for quick technology transfer and upgrade of any marketing analytics software*".

Reaffirming this challenge, "*When firms come up with new technology in the country, the Jordanian government reviews it critically and makes sure that it will not have a negative effect on people, the environment or national security*" (Said by *Z11*). "*The complex procedures, high taxes, customs tariffs, and paperwork involved make it hard for organizations to introduce new technology*" (Said by *Z10*).

In this situation, Zain can have a competitive edge through innovation because the complex procedures will not let any organization easily introduce their service. Being a market

giant and having a good relationship with the government, Zain can use this situation in its favor.

5.2.1.3.6. Universities

Jordan's education system consists of 10 public and 17 private universities, which by law must allocate 5% of their net profit towards innovation research. A lack of funding is an obstacle for universities to use their resources fully. In this regard, Zain is sponsoring research and helping universities to implement some creative learning systems and their outcome would help Zain to support their innovation systems.

5.2.1.4. Business Environment and Embedded Innovation

5.2.1.4.1. Labour

The labour market is crucial for any country. Around 36% of Jordanians hold a bachelor's degree and above (Investor Opinion, 24th Jan 2020). The large number of educated workforces is an added advantage for the mobile telecom sector in terms of recruitment. In Zain, we "*pay attention to the continuous development of their human resources to develop new services and enhance innovation*" (Said by **Z13**).

5.2.1.4.2. Market

Jordan has a stable market due to its political stability, having a high growth rate of

population and inflow of refugees from Iraq, Syria, Palestine, Egypt, Libya, Yemen, and Lebanon. The mobile industry in Jordan is very challenging. However, Zain is the market leader in the country and holds 36% of market share while competing with two other mobile providers (Zain Co, 2020).

Zain provides innovative services and products such as smart security systems, car trackers, online money transfers, services for deaf people, online payments, voice balance, top up mobiles, Internet dongles, and Smart2GO devices that allow customers to switch their existing televisions into smart TVs, enabling them to access Internet and social media, browse emails and read news through their TV. Zain has room to improve its services due to extensive product offerings.

5.2.1.4.3. Suppliers

Both local and non-local suppliers are rich external sources of innovation for the telecom sector. The collaboration with suppliers can create knowledge, resources, and ideas. Zain telecom can ask their suppliers to play a role in innovation.

5.2.1.4.4. Partners

The organisations play a vital role in the innovation process at firm level. Zain has formulated many strategic partnership agreements. Recently, they signed an agreement with MasterCard to improve the digital payment services offered through Zain cash mobile wallet service (). Collaboration with partners expands the network and provides room for innovative

ideas. Zain can gather ideas from them by sharing information to expand their innovation processes.

5.2.1.4.5. Customers

Zain was the first mobile telecoms provider in Jordan and had no competition in its early years. It presented itself as the national brand and currently has 3.7 million active users (Zain Jo, 2020). The target customers of Zain are those with high-income who can afford their high prices, including politicians, government sector employees and businesspeople.

Zain understand that they are supposed to provide premium quality to customers to maintain their custom for longer periods and they introduced general packet radio service for the first time, which was an innovative step for them. After that, Zain introduced a multimedia messaging service first time in the Middle East region.

Zain is dependent on internal and external sources to enhance embedded innovation, including ideas from R&D, staff and management, competitors, suppliers, partners, and competitors. All these sources generate ideas and work comprehensively together. However, as Zain has previously brought about innovativeness based on customer needs, it can again take ideas from customers to change their innovation system and produce innovative customer-oriented services.

5.2.1.4.6. Competitors

There are three major mobile service providers in the Jordanian market who offer relatively similar services and have a large market share. The competition has benefited users

because of a price war between Zain, Orange and Umniah. The organizations are keen to provide innovative services and here Zain has a competitive edge over the rest. Because it was the first mobile provider it has the most experience in serving customers' needs.

The organizations that aim to be innovative must have open channels of communication to learn from other firms either locally or internationally. Zain has collaborated with multiple firms, departments and projects and they can learn innovative ideas from such practices.

5.2.1.5. Internal Factors

5.2.1.5.1. Innovation as Core Competency

Intense competition, customer demands and rapid changes in customer needs encourage firms to use innovative tools to enhance innovation levels to survive in a saturated market. Zain's innovation core values are also related to an embedded innovation approach and it encourages all staff to carry out efforts to introduce innovative services and products.

5.2.1.5.2. Skills and Qualifications

Jordanian qualified labour has a good reputation in many industries, including the mobile telecom services, due to their highly skilled nature. The human resources process is challenging and rewarding due to the intensive competition in the market. "*The criteria to get job with Zain is very tough and applicants must have at least a bachelor's degree, previous work experience, meet all the skills required and go through standard tests*" (Said by Customer Service Rep in F1).

Zain focuses on continuous development of their human resources and prepares their employees to deal with market challenges, rapid changes in innovation and to enhance their market position and improve the service. "*The skilled employees play a core role in the innovation process and build a snowball impact in extending the embeddedness culture in Zain*" (Said by *Z2*).

5.2.1.5.3. Financial resources

Financial resources are vital for competitive performance and to introduce innovation in services, products, skills creation, and knowledge. However, "*we find that financial aspect to be their main challenge and barrier to maintaining innovation due to high taxes*" (*F1* with Zain officers). Zain has struggled with the financial costs of innovation and has allocated some budget for innovation. This budget is to cover taxes, the recruitment of highly experienced, skilled employees and to recruit innovation-conscious leaders to process the innovation. In Zain, "*we enhance our embedded innovation through the smart use of resources by following innovative finance approach such crowdsourcing*" (Said by **Z5**). The aim "*is to set service design workshop and engage customers and operating officers in the service innovation*" (Said by **Z12**).

5.2.2. Case B: Orange Telecommunication

5.2.2.1. Orange University Innovation Lab (OUIL)

The brand name of Orange telecoms is under the ownership of a French telecommunication. Orange was established in Jordan by Hutchison Telecommunications in 1994 as the sole provider of landlines (Alamro & Rowley, 2011).

Orange operates under the ownership of a French telecommunications company in 2000. It started its operation in Jordan as the only provider of landlines services and the only global telecommunications company in Jordan. (Orange-Jordan, 2020).

France Telecom became owner of 51 percent of Orange shares, rest of shares are divided between the Jordanian Army, Social security Corporation, the Noor financial investment company, security agencies and 7 percent available for exchange in the Amman Stock Exchange. Orange telecom is a strategic partner with multiple network providers in the region of Jordan.

5.2.2.2. Innovation Support System

5.2.2.2.1. Technology Transfer and Advice agency

One of the main advantages for Orange telecom is having more access to technology because they are a multinational firm. "*We perform as an agency to find technical solutions for network issues and introduce new software and corporate solutions*" (Said by *O2*). Orange "*partners with strategic stakeholders in the market such as the Jordanian Army, the Social Security Corporation in Jordan, the Noor Financial Investment Company, and the security agencies in Jordan*" (Said by *O1*). The partners of Orange telecom are embedded in the service innovation through their contribution of technological advances.

Part of the technology transfer is the importing of network towers to strength the signal and extend the telecommunication coverage into new geographical areas. "*The community resistance installing these towers is huge due to the rummers about their destructive impact on human health*" (***F2***, customer of Orange). Accordingly, extending new services to new area is challenging sometimes. So, "*recruiting customers in the service innovation workshops is essential to enhance their feelings of service ownership*" (Said by ***O13***). *We also appoint some loayl customers as fieldwork operators who act as technical representatives to facilitate the technology transfer in the community*" (Said by ***O4***).

5.2.2.2.2. Science Parks

Orange believes in youth and their importance for service innovation and society wellbeing in general (Orange Co, 2020). Participant ***O6***, emphasized that "*Orange sponsor seasonal events and initiatives in public universities to launch innovation competitions*". Each of these universities have different industry partnership plan and training programmes for their graduates. "*Princes Sumaya university is our key supplier of young talented entrepreneurs who propose innovative ideas for telecommunication services*" (Said by ***O3***). The Young Innovation Champion initiative recruited 52 candidates through the University's employability team, 8 out of which were shortlisted due to their promising project for digital transformation in SMEs sector. "*One of these projects was the use of AI mobile marketing in Orange services that aimed for cross-selling of m-payment services for loyal customers*" (Said by ***O6***).

Orange has sponsored many projects with partnership at different universities. It understands the importance of training youth in the university before inviting them to work for

them after graduation.

5.2.2.2.3. Government Support

Orange collaborated with the government to enhance levels of innovative services and obtain government approval for providing services in the market. For example, "Orange is keen to offer a service for their mobile users to receive traffic congestion information, but the government has rejected this service" (Said by *O10*). Support from government for such policies is limited, which hinders Orange's innovation plans.

5.2.2.3. R & D Infrastructure

5.2.2.3.1. Universities

Yarmouk university is a strategic partner for Orange. Yarmouk Innovation Lab is the output of this partnership which is an important supply of young professionals who work in different innovation projects announced by Orange. "*Our company announce auctions for specific projets and offer them for suppliers*" (Said by *O3*).

"*Yarmouk university supply our company with specialized programmes where graduates study math, English, problem solving communication, and networks design. Student are allocated into groups and hosted into projects. Each project team is supervised by an academic mentor and industry mentor*" (Said by *O6*).

They receive a specialized six month-long course and polish their entrepreneurship and personal skills during the period. The students work on their projects and learn soft digital and

entreprenuer skills from high qualified professional trainers from Orange Jordan. Later, Orange can get benefit from their ideas related to digital innovation.

Al Balqa university is another strategic partner for Orange. "*The graduate students work on their graduation projects in this well-equipped lab, which also provides them the opportunity to nourish new ideas that are also beneficial for Orange*" (Said by **O5**). Furthermore, Orange has sponsored the HUB, which is renovated and provided with all the needed equipment. The students can study, have meetings, and share their ideas in an excellent educational environment.

Moreover, in the University of Jordan, Orange has renovated two student halls in the faculty of arts and equipped them with the latest learning technology so that students can have a different, unique learning experience. In addition to this, Orange Jordan established its free Wi-Fi Green Area in Princess Sumaya University for Technology (PSUT). Orange Jordan has allocated tables and benches around Orange Green Area, free Wi-Fi, tablets, computers, screens and designing software to promote innovation amongst the students.

Orange CEO, Thierry Marigny, announced that Orange had launched digital centres in different areas of Jordan. The companies would continue its efforts to contribute to the development of the host country, stemming from being a leading local company in providing mobile services across all cities and governorates. Marigny said that Orange has taken the initiative with His Majesty King Abdullah II's vision to transform Jordan into an innovative society and settled its five-year corporate strategy 'Essentials 2020'.

Orange has also signed several agreements with different firms to confirm that they will equip ten digital centres in multiple cities. Marigny talked about the importance of these centres

and offered people to use innovative service in more professional manner, provide an opportunity for innovation, job creation, and promotion of their products online which will result in greater accessibility, higher incomes, and an improved standard of living.

Marigny introduced the partners of this principal project: the ministry of communications and information technology (MOICT), the national information technology centre (NITC) and the Jordanian Hashemite fund for human development (JOHUD) – the centre is expected to be completed by the end of 2020. The centres have computers, spacious modern facilities and training workshops on various topics requested by citizens. The centre aims to serve society, targeting youth and start-ups, providing training in the latest technologies, which can help them to come up with great innovative products.

5.2.2.3.2. Technology and Science Policy

The Jordanian government encourages mobile telecoms to invest in competitive and innovative products and services. Orange plays a significant part of this strategy through the enhancement of embedded innovation and by expanding their technology strategy beyond the local market. Participant **O10** emphasized that, "*the accelerating increment governmental taxes affected Orange the most, due to the currency exchange rate where the company transfer their western technologies into the Jordanian market*". However, "*Orange Jordan is a subsidiary of Orang.Co and do not aim for profit, while exploring technological advances*" (Said by **O11**).

It provides an opportunity for Orange to play in the domestic market, using domestic resources and introducing innovative products. Due to the restrictions and high taxes, it would be hard for Orange to innovate, but the organization should smartly manage their resources and

utilize domestic resources.

5.2.2.4. Business Environment and Embedded Innovation

5.2.2.4.1. Customers

In Orange, "*we focus on the corporate market, mega government projects and the exclusive supply of internet broadband services in Jordan*" (Said by **O7**). Orange corporation take customers' choice into account but following customers' feedback is limited to some extent. The reason is that they are importing innovation from headquarter in France and the embedded innovation requires to follow the end users need and market trends.

5.2.2.4.2. Labour

Orange is keen to hire talented candidates as compare to other firms. The company's employee's motivation scheme is point-based system that attracts innovative labour who meet Orange's balanced scorecard. This is system is project-based and the employee's performance is evaluated again the score card and KPIs of each project they are involved in. is The salaries, pension, bonuses, stability, social status, it gives them advantage to pick the best talents in the country and attract talented managers from competitors. The talented team of Orange can enhance its innovativeness level.

5.2.2.4.3. Market

The Jordan is considered as a developing country. The mobile telecom sector of Jordan provides services and products similar as compare to other developing countries. Here, Orange have a competitive edge. It has the strong links with the European market and have headquarter located in France. It can help Orange to show presence in multiple markets, learn from developed market and introduce innovative products accordingly in Jordan. There is another advantage of Orange is to have sales channels of multinational firms and non-profit organisations who working to help refugees in Jordan. They perceive that Orange is an international brand and well known in the west. It encourages the refugees and western people living in Jordan to work and use services of Orange, it benefits the organization to have advance technologies through the embedded innovation process. Due to mentioned reasons, Orange have great access to big data of international markets.

5.2.2.5. Internal Factors

5.2.2.5.1. Innovation as a Core Competency

Orange consider Innovation as a important strategy to compete in the Jordanian market. The understands that if they are unable to deliver innovative products and services they would be driven out of the market.

The core competency of Orange mobile is driving socio-economic development by innovative digital services and aiming to become a green mobile telecom by adopting and promoting energy and ecological transformation**.**

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5.2.3.5.2. Skills and Qualification

Orange Jordan has a special department to enrich employee's experiences, providing training to all employees to be more creative, teaching them the skills and supporting new ideas (Orange - Jordan, 2020). It makes employees confident to work on innovations and give their input regarding it.

5.2.3. Case C: Umniah Telecommunication

5.2.3.1 Umniah Innovation Tank (UIT)

Umniah is the third telecom service provider in Jordanian market from the year 2005. The total of 98% of the shares are owned by a Bahraini company called (Batleco) (Umniah Co, 15 Apr 2020). It offers broadband service, landline services, mobile and networked IT services to the public and private sector. It provides products and services to individuals, public sectors, private sector, domestic, worldwide mobile telecom providers, multinational firms, as well as to local government. Although, Umniah isn't Jordanian company but they have strong relationship with their customers and has very good understanding of customers' needs. The targeted population of Umniah is the people with low pay and youths from the public and the army. Umniah have intense competition with Zain and Orange.

Therefore, they offer lower prices to attract more customers. However, Umniah unable to offer premium quality as compare to Zain and Orange but still it provides good quality. Umniah positioned itself as innovative company and established itself in short span of time. The company cares about people, their needs, introduce the service innovation process and the latest technology for youths at affordable price. The youth is more inclined toward innovative and new technology in Jordan and it can benefit to Umniah to introduce new innovative services.

5.2.3.2. Innovation Support System

5.2.3.2.1. Technology transfer & advice agency policy

Umniah imports the technology from other countries and introduce it to Jordan with the help of government based on the condition to be sell to at affordable prices to the army and youths. Umniah offers consultancy and technical advice to the army to increase the level of service of the army and in return it may get lessons from their innovative ideas.

5.2.3.2.2. Science Parks and Techno Poles

There is an innovation incubator located in the King Hussein Business Park named as Tank is introduced for Jordanian youths and start-ups. It offers extension programs, financial and legal consultation, intensive training activities, office space, international access, Marketing, mentorship, networking, access to finance, business development and vocational licenses facilitation. it Fosters a culture of entrepreneurship and innovation, while

simultaneously reinforcing its leading role in the country by motivating Jordanian entrepreneurs and companies.

The Tank is a business incubator for entrepreneurial companies and provided them dedicated office space, intensive training activities, provided them the legal and financial advices, business development, marketing, and mentorship. One role of the Tank is to introduce entrepreneurs to investors to support them in securing sponsoring, helping them upgrade their services and working for developed society and economic sustainability. The tank can play an important role by bridging between Umniah and young entrepreneurs which would help Umniah to get updated ideas and know the gaps where Umniah can introduce innovative services.

5.2.3.2.3. Strategy & Attitude

Umniah believes in designing and implementing innovative services and products for their customers, to contribute to innovative kingdom, enhance customers' experience due to innovativeness and ensure their loyalty. This strategy and attitude help the organization to strengthen their position in the marketplace.

5.2.3.2.4. Government Support

Umniah also has strong links with the government which make importing of new technologies to the country easier for them and provide them access to rich resources of data. Furthermore, it is easy for Umniah to get policy support from the government because the Air

force government department is one of the big customers of Umniah. Due to these advantages, it is comparatively easy for Umniah to introduce competitive products.

5.2.3.3. R & D Infrastructure

5.2.3.3.1. Technology, Industry, Regional & Science Policy

The government provide sufficient policy support to Umniah. Therefore, the organization is focused to provide innovative services to people in order to maintain its position and get strong base of maximum number of customers. These policies also can be an aid for Umniah to get leverage while introducing innovativeness. Umniah, established a post and telegraph department to offer Telecommunications services. Later, the telecommunications services were transformed to wire and wireless channels.

First ministry of telecommunications under the name of the Ministry of Telegraph and Telephony. In 1961, the ministry of telecommunication introduced its first automatic telephone service. Then In 1971, the Jordanian government established the telecommunications corporation (TCC). Their main responsibility was to take care for the various telecommunications services. From 1973 to 1985 the telecommunications in Jordan has improved greatly, due to the increase of oil prices in the Gulf States; but Jordan benefitted from expatriates' remittances.

The government used the resultant extra revenue to fund public investment. The first paging company in Jordan was established in 1988. In 1993, the Jordanian government announced for the first time, private sector investment in telecommunications projects. In 1994, the first mobile phone licence was given to the Fastlink Company (currently Zain). The real privatization process started in 1997, when the TCC changed to a government-owned company operating on a commercial basis. In 1999, French

Telecom (Orange) bought 40% of Jordan TCC, and was granted the second mobile Phone license in Jordan, Mobilcom (currently Orange). In 2000, Jordan became a member of WTO; this obliged Jordan to liberalise its Telecommunication sector by 2004. In 2003, a third mobile phone company, Xpress, 19 Telecomunications and Jordan and the Middle Fast was established. This was followed in 2006, by a fourth. Umniah. In 2006, French Telecom bought the rest of the TCC shares (Telecommunications Regulatory Commission Jordan, 2010).

Today, Jordan has good telecommunications infrastructure. She has over 369,145 telephone landlines, around 8,731,760 million mobile phone users, over 5,099,674 million internet users, and over 30,656 internet hosts (CIA, 2020; 2019 estimates). As of 2020, she had 34 FM radio stations and 8 television stations. Fibre optics are employed on all trunk lines; she has cable links to Saudi Arabia and microwave radio relay links to Egypt and Syria. She has 33 satellite-Earth stations. Since 1995, all non-fixed line services have been open to private competition, and since 2005 all her telecommunications have been, too. Need paraphrasing. The mobile telecom company Xpress was in the Jordanian market, but later bankrupt (Alamro and Rowley, 2011). The market, therefore, takes the form of an internal competition rather than there being continuous threats.

5.2.3.4. Business Environment and Embedded Innovation

5.2.3.4.1. Suppliers

Umniah has Big supply channel locally and internationally which helped them to import the technology before their competitor. Umniah get benefit of having strong link in international market which helped them to introduce innovative technology before then Zain and Orange. This is major advantage for the organization which help them to maintain their position in the competitive market with comparatively less resources than others.

5.2.3.4.2. Labour

Umniah entered to the market by having the vision to fulfil customers' needs and wants. Umniah offered attractive packages to the managers at competitors' business. the persons were there experienced and have knowledge to deal with market and it helped the organization in many ways. Moreover, Umniah also recruited the managers from best colleges of Jordan Who had great knowledge and experience about innovation and due to this Umniah made possible their survival in the market. It is crucial for organization to have experienced managers to innovate, introduce new products and services in the marketplace to bring the organization to the next level.

5.2.3.4.3. Customers

The R&D department of Umniah focus on idea generation from its customers as it is having high engagements with youths and customers and focused on the technical perspective of innovation and making decision.

The employees of Umniah understands that customers are the cornerstone of innovation generation. They offer ideas through surveys, suggestions recommendations and in other many ways and Umniah offers solutions or modifications. The brand name is "Umniah" while translating in English its meaning would be "wish". Umniah makes sure to account the wishes of customers.

5.2.3.4.4. Partners

Technologies are becoming more complex in mobile telecommunication industries. The innovation development process cannot be a solo act but must be a group of activities (Dodgson et al. 2008; Tidd & Bessant 2009). Therefore, it is important for technical firms, especially their R&D departments, to concentrate on external links and construct networks for developing their innovations (Freeman 1991).

Umniah and Jordan Electric Power Company (JEPCO) signed a strategic partnership agreement to operate an over-ground fibre-optic network. One of the largest technological infrastructural projects in Jordan by establishing an over-ground fibre-optic network running in parallel to the electrical grids operated by JEPCO. This network was established to benefit then connections and automation of number of power substations and in the installation of smart counters throughout various areas in Amman. Moreover, the network allowed JEPCO to

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remotely manage electrical grids in various areas. The partnership of both organizations resulted in the delivery of cutting-edge internet services to various areas (Umniah – Jordan 2018). Umniah, Zain and Orange started partnership with Edraak Queen Rania foundation (QRF) that is a non-profit educational platform of online course.

It is considered as the first revolution in education and learning, they offer live broadcasting of short online courses delivered by practitioners and professionals from variety industries spanning the arts and sciences. Based on the argument, the partnership can be an added advantage and also can be source of innovation.

5.2.3.4.5. Market

Umniah was entered to the market in 2005 and they are well aware that the ideas can be generated by keeping eye on market trends from the market. Umniah see the market as source of ideas and stimulate the company innovation process.

5.2.3.4.6. Competitors

The innovativeness of other firms can urge organizations to take steps towards innovation through the technologies based on internal and external knowledge.

For example, Zain and Master cards has issued payment service for their prepaid cards of customers and linked it to Zain cash mobile wallet (Zain Jo, 2020). The mobile users have facility to use the card locally and internationally wherever Master card is acceptable. The customers can shop online and withdraw cash from ATMs. Umniah learnt from Zain and used

the same technology but for different purpose. They introduced Mahfazti which is a mobile wallet solution that provides a secure way to make payments directly from a mobile phone. Users can send money to other mobile wallet users too (Person-to-Person transfers), pay merchants, and even pay their utility bills. The research and development activities play an important role in acquiring and sustaining the competitive advantage of firms and Umniah's are specialist in this department. Furthermore, Umniah can use mix their research teams' efforts and new technology and they would be able to provide more innovative products.

5.2.3.5.Internal Factors

5.2.3.5.1. Competency as a Core Strategy

The intense competition in market urge organization to be innovative all the time for their survival. Umniah has built innovation networks in the Jordanian market through collaboration with international big mobile telecom. The main reason of these collaborations is to adopt innovation activities and doing research to bring that practices in Jordanian market. Umniah understands the competitors' threats and strengths which motivates it to be innovative firm in the form of goods or service or could be in in new ways of dealing with suppliers, competitors or distribution.

The employees of Umniah admitted that they are not the biggest mobile telecommunication service in the region, and may other mobile telecoms be ahead of us in some innovative services. However, we actively explore the collaborating opportunities domestically and internationally to enhance the innovation. The extension of innovation network is necessary to offer uniqueness in service and products for their survival in the competitive market.

Umniah Understand the value of capable and experience employees. Therefore, Umniah focused on competency as their core strategy. It helped Umniah to achieve its targets and fulfil customers need and wants.

Conclusion

This Chapter presents the key research findings and explains the mechanism and elements of embedded innovation in Zain, Orange, and Umniah. It flows form the case selection in Chapter 4 and the initial framework proposed in Chapter 3.

Section 5.1. emphasises on the dynamic nature of Jordanian telecommunication market and the accelerating competition among the three telecoms. Service Innovation was found essential to override the traditional competitiveness strategies such as price penetration, and service differentiation. Accordingly, a historical reflection of the Jordanian telecommunication market is presented.

Section 5.2. start with case A, Zain Telecommunication Corporation as the market lead, then Orange and Umniah. The embeddedness mechanisms and key elements vary from a company to another based on their strategic orientation and ability to manage change.

Zain provides innovative services and products such as smart security systems, car trackers, online money transfers, services for deaf people, online payments, voice balance, top

up mobiles, Internet dongles, and Smart2GO devices that allow customers to switch their existing televisions into smart TVs, enabling them to access Internet and social media, browse emails and read news through their TV. Zain has room to improve its services due to extensive product offerings. In doing so, the company invest on its indigenous knowledge of the Jordanian market and the culture of innovation among their employees, customers, and business partners. The chief executive officer (CEO) is a Jordanian national and a has strong relationship with the government and Zain also makes a heavy contribution to the economy.

The organization has created advantages and access to the country's resources. Zain selected King Hussein Business Park as the site for ZINC because the park already featured an incubation mechanism that provided access to entrepreneurs and experienced regional players. Furthermore, King Hussein Business Park also has an extensive history of global-level entrepreneurship.

Zain has strategic partnerships with experienced players in the field, as well as similar business platforms, both in the region and around the world. It includes the 500 American Start-ups, which is one of the biggest incubators worldwide, and British Coventry University. a global hub for entrepreneurship and innovation support. These initiatives would help Zain to prosper and bring innovation to their products and services.

Chapter 6: Research Discussion

Introduction

This chapter offers a thorough discussion of the research findings across the three cases and compare it with the literature review findings. It includes sections to address the key elements of embedded innovation system, including Business Environment, Internal factors, R & D Infrastructure, and Innovation Support Systems (See *Figure 5.1*). Then, it raises other elements that was found in the three Jordanian telecoms and do not exist in previous studies. Examples of these elements are service cocreation, bridging ties, public engagement, social innovation, financial service innovation, and understanding innovation change.

The second and third sections of this chapter offer an answer for *Sub-RQ3: What are the key drivers and challenges that encounters the implementation of Embedded Innovation Systems in Jordanian Telecoms?*

Section 6.2 addresses the drivers of embedded Innovation, including stimulation of competitive advantage and financial service innovation. In this section, the research findings are contrasted with the relevant literature to justify the addition of these two elements to the final framework (See *Figure 6.3*)

Section 6.3 discusses the key challenges facing the implementation of the Firm-Level Embedded Innovation Systems in the Jordanian Telecoms. Examples of these challenges are lack of understanding innovation change and lack of customer trust in the innovative services offered by the telecoms.

Section 6.4 discusses the final framework and the theory development process based on Eisenhardt & Graebner (2007) (See ***Figure 6.3***).

6.1. Embedded Innovation Systems in Jordanian Telecoms

To develop a comprehensive understanding of embedded innovation in the Jordanian telecommunication industry, the researcher ensured that each of the questions asked to the respondents was analysed. The rationale of this approach was to develop a comprehensive understanding on the challenges and benefits of embedded innovation in the Jordanian telecommunication industry. The study has focused on the case of Zain Telecom. However, it was assumed that the research findings could be generalised to represent the prevailing situation in the Jordanian telecommunication industry. To gain insight on the extent to which embedded innovation is integrated in the Jordanian telecommunication industry, the study sought to explore the current situation in the industry regarding integration of innovation and creativity.

The analysis was undertaken in relation to the theoretical framework proposed by Hassink (2001). The rationale of employing the proposed theoretical framework was to gain insight on the trends and challenges inherent in the Jordanian Telecommunication sector. In light of this, the core variables that were examined relate to research and development infrastructure and policies, innovation and support system, business environment and embeddedness, and internal factors.

6.1.1. Business Environment and Embedded Innovation

The research study sought to gain insight on the current environment in the Jordanian telecommunication industry in relation to innovation and creativity. The respondents were of the view that innovation and creativity is yet to reach its potential. However, they were of the view that it could innovation and creativity in the sector could be improved. In responding to this question, the respondents identified several challenges that are hindering innovation and creativity in the industry.

The respondents identified lack of innovation and unwillingness of management to invest in innovative activities due to unclear return on investment is one of the biggest challenges. In addition to this, the respondents identified the prevalence of government's unfriendly policies as a major factor hampering profitability of the telecommunication companies hence making them to experience financial constraints. The rapid developmnet of the business environment, coupled with changes in customer demands, as well as the external and internal environment, necessitates reshaping organisational resources and capabilities in order to ensure their survival in a competitive market through effective use of human and financial resources. (Gogokhia & Berulava, 2021). Businesses must be allowed to operate in an atmosphere that is conducive to their success. However,there will be more pressure on businesses as Jordan's economy suffers from COVID-19 therefore the government will increase taxes on businesess.

The lack of predecitiblity businesses and investor perceive in terms of regulations is unceartind and unequal. The incintives offered to mobile telecoms do not align with the current environment and also discussing issuing a fourth mobile telecom licences to investors is. The business environment encourages investment in mobile telecoms and technology however,

require multiple approvals and varifications and there are government entities involved in the business environment. **U6** *stated "when the government under prussuer and need money they impose new taxes on us and citizens, they will cut down on expenses which will effect innovation programes".*

The overall impact is that the telecommunication companies are experiencing difficulty in investing in innovation and telecommunication. One of the policies that the respondents identified that is posing a major challenge in the industry includes the recent increase in taxation, which has adversely affected the telecom companies' financial capability and hence their investment in innovative and creative activities.

Although participants **U11**, **Z11**, and **O12** see all customers as source of information about other mobile providers. The research findings showed that customers are missing in the telecommunication companies' innovation strategy. The Jordanian telecommunication companies have not adequately integrated customers' as a source of knowledge and ideas in their innovation strategy. One of the respondents argued that their company has in the past received suggestion from individuals characterised by physical disability to introduce video call service for such customers. However, the suggestion was never transferred to the company's management for further consideration.

Additionally, some of the respondents said that the customers do not know who to speak to when they have innovative ideas to share with the company's management. However, the respondents argued that their company is working towards delivering unmatched customer experience and have set the period ranging from 2017 to 2020 as the period within which this goal will be achieved. Despite the fact that most of the Jordanian telecommunication companies

are working towards improving this element, the response illustrates existence of a significant gap with reference to the extent to which the telecommunication companies have integrated the business environment as one of the key components of their pursuit for embedded innovation.

The staff must pass these suggestions and competitors' updates to their research and development departments, who are charged with the responsibility of conducting further analysis and studies in order to develop new or improved products/services. The telecommunication companies should consider exploiting the ideas and knowledge received from their daily interaction with customers. By reviewing their feedback regarding the products and services received from the telecommunication industry, they will be able to undertake the requisite adjustments in their operation. However, P1 said our company system can't accommodate all this information from individuals. One of the respondents was asked about whether their company has developed a mobile product targeting blind individuals similar to that of Orange Company. In his response, the respondent argued that their company will hopefully develop such a product by 2020.

The lack of techno labs, university and government support makes it difficult but as we have an internal system that keeps every customer note then we would be capable of using this information and analyse it to make use of it in our company only consider ideas that the staff were asked to produce but not ideas that the staff volunteered if it's down to me it would be different but this high power distance provides headquarter the authority to accept and ignore ideas, so I think we have policy issues, new administrative system and technological innovations will support us to be more customers focused.

Participants **U10**, **O11**, and **Z11** raised very interesting point about the business environment. In his view, the government tax and other expenses and commission that the

company pays to third parties and dealers, the cost per acquisitions cost us 10.00 JD to 13.00 JD and the return of investment take long time to be gained as the average return revenue per customer is very low average of 7.00 JD per customer which is very low comparing to mobile penetration number in Jordan 12000000 million mobile subscription.

The respondent affirms that there are a large number of mobile users and low revenue. This arises from the tax the companies and the customers pay. For example, when customer buys the 10.00 JD top up, the tax increases the cost to 17.00 JD. The customer is further required to pay tax when he or she buys any app online. The foreign direct investors are required to pay holding tax, TRC, sales tax so all this has an impact on our innovation budget.

Respondents **U3**, **U8**, **U9**, **U11**, and **U7** said that, Umniah have made significant improvements to their structure, practices, and management and marketing techniques they also implemented several process innovations, both administrative and technological. The administrative innovations included establishing new branches, providing more facilities in the waiting halls, creating new posts and establishing new or improving existing departments. These improvements reduce the workload for the staff and enhance customers' ability to access their services easily.

Respondents recommended a fourth mobile telecom may improve the business environment and the innovation level. However, mobile telecom representatives stated that a fourth operator is too much for the Jordanian market and the government is offering more and generous incentives to attract potential operators which leads to more competitive pressure.

Participant Z2 stated that *" bringing a new mobile operator will create more pressure, limited opportunities and market confusion which will not add value to customers but could possibly bring innovative services".* The CTR point view of a fourth mobile operator is to enhance the innovation by creating competition and introducing new technologies and appropriate that meet the needs of the Jordanian population innovative services.

Participants **U3, Z5, and O3** suggested that the social interaction among individuals and suppliers, competitors creates new knowledge in organisations and thereby increases their capacity to innovate. Participant **U9** suggested that the government should play the maestro role here and convert all the knowledge and resources into more systematic will positively influence innovation"

Based on the research findings the Jordanian business environment doesn't seem to be supportive for the mechanisms and tools of embedded innovation. However, it includes the necessary resources that could be orchestrated to plan for embeddedness awareness. There are different incomplete initiatives towards embedded innovation by Jordanian Telecoms that braves the road for a national level of embedded innovation. Zain Telecoms, for instance, takes advantage of healthcare needs to offer public services by fighting COVID-19 and by offering mobile clinic to track the pandemic spread during and after the lockdown. They fitted mobile Clinics equipped with medical examination tools paediatric treatments specialist.

The telecommunication advances of Zain Mobile helped Geographical tracking of Covid-19 Patients. Orange's embedded innovation could grow better in the area of FinTech and innovation financial services. Umniah's dominance in the Army telecommunication services created different pillars, different customers, and different types of partnerships.

Overall, the business environment seems to be dynamic and opening towards new players, new market opportunities, and new types of service innovation.

6.1.2. Innovation Support System

The first factor being considered in the framework is innovation support system and the viewpoint of the participants **U4**, **O6**, **Z8** about the current innovation support system in Jordan exist. However, the issues here are the taxes and the high competitions between three firms and 8 million users, the tax is a major issue which it limits the spending caps for customers, and it makes hard for mobile operators to seek another innovative solution. According to Lopes & Farias, 2020) Governance mechanism has been a positive strategy approach for enhancing innovation. However, in order for this approach to be effective, governance structures that contribute to stakeholder participation and the attainment of the desired objectives must be established. The Jordanian government lacks facilitating networking, providing full institutional support, working closely with mobile telecoms.

The viewpoint of one of the managers in Umniah telecom "for example if you bring an innovative idea or solution to a problem, we will pay a lot of taxes and cost per customer acquisitions for each is high, we pay the internet tax, the Global System for Mobile communication (GSM) taxes. For example, "*the mobile top up scratch card worth one Jordanian dinar JD, but the customer pays 1.46 JD for it, its %46 percent tax the customer must pay. Also, we pay income tax, and many other expenses, it's hard for us to bring new innovative solutions especially based on to buy the solution as complete always we go for*

revenue share." This perspective was further supported by respondents *U5, U6, U7, U8, Z9,* and *O9*.

Another problem that was identified in the industry by **O6** relate to the fact that technology transfer and advice agency are imported from the west or Far East and the local ones are not always trusted. The government support is changing depends on the parliament as you know of regular change of the government and more specifically the chamber of commerce, so this political unrest has an impact on our innovation strategy and the environments.

The research study further sought to understand the level of government support with regard to innovation in the industry. In respect to this, the researcher enquired about the amount of financial support that the government allocates for innovation in the industry. In respect to this issue the respondents were asked about the amount of government budget that is allocated for science and park techno poles and whether the amount is sufficient for the Jordanian telecommunication industry. The respondents were asked whether the government supports the highly skilled and educated labour in the industry.

In response to this, the respondents argued that the budget is not sufficient. As such, the industry does not benefit adequately from the government budget. In addition to this, the respondents argued that despite having their own techno labs, their effectiveness in supporting innovation is limited because of limited funds. The high taxes we pay limits the innovativeness of the industry. The majority agreed that government bureaucracy is excessive and the ambiguity in terms of procedures also the hold of knowledge unless we put them under pressure. In their view, the respondents argued that government bureaucracy and regulations

significantly limit the development of the Jordanian telecommunication sector in comparison to telecommunication sectors in the Western countries.

One of the respondents identified Orange, which is a western telecommunication company operating in Jordan as one of the players in the Jordanian telecommunication industry. In his view, the respondent argued that Orange is characterised by remarkable success with regard to innovation support. As such, it is considerably difficult for Jordanian telecommunication companies to compete with the foreign companies in terms of innovation. The respondents further argued that the sector does not receive support from the Jordanian Chamber of Commerce with regard to new ideas or issuing licences.

One of the respondents affirmed that they are having trouble in the process of receiving government approval in their companies' quest to install fibre optical cable. Moreover, one of the respondents accentuated that start-ups have trouble in accessing government support from large companies and the government because of lack of trust between large firms and start-ups. One of the respondents from Orange argued that company policies and everything else related to the company's operation and partnership with external parties must be approved by the head quarter in France and shareholders and from third party on intellectual property rights.

The respondent was of the view that receiving support from the large companies is very critical in enhancing the establishment of start-up telecommunication companies. This move would be very essential in enhancing the growth of the Jordanian telecommunication industry.

Almost all participant said that the industry depends on internal and external sources to generate ideas but not always the end users included in the process. Respondent P1 affirmed

that "the external source were the ideas of customers and start-ups and the internal sources were the ideas of staff and management and they worked comprehensively together, and the company has put incentive for innovative ideas. The external sources were considered the most important source, the marketing research transfers the ideas to the R&D department to develop these ideas to become more valuable to us.

6.1.3.R & D infrastructure and Policies

A sample of the R&D manager, Innovation operational manager and Telecom Company Manager were interviewed to highlight and explore the challenges to a depth of understanding and authenticity. The research questions attempted to explain the current environment of the Jordanian telecom industry in terms of innovation challenges, embedded innovation opportunities and to what extent they collaborate with the community, relatively under the research area.

The research findings showed that the Jordanian government appreciates the importance of innovation and development in the country. As such, major efforts have been undertaken to improve the industry's infrastructure through innovation. One of the fundamental issues that the telecommunication companies and the government is focused on includes promoting innovation through research and development. In respect to this, the Jordanian government has established institutions of higher learning in order to foster research and development.

In Jordan there are 24 universities out of which 10 are public universities and 14 are private with technical advisory centers in each university to provide consultancy service. However, the managers stated that the government are not getting the best of its facilities. For example, there is no system or government programs to connect them with private sectors to ensure that innovation is undertaken in collaboration between the private and the public sectors.

Participants of Focus Group 1, 2 & 3 seem to agree on the following statement "*if the government adopt innovation strategy as official government policy and work with private sectors closely without corruption we will be ahead of Europe, we have the brains I don't see why not*". The governmental polices does not fit with the company's innovation ambitions. As such, there is need for reforms on research and development infrastructure and policies in the sector. Jordan's digital economy ambitions require a relible, highspeed and comprehensive telecommunications infrastructure. The market has a highly developed mobile sector dominated by three multinational companies , as well as a large long-term evolution LTE network infrastructure. The introduction of LTE services resulted in a significant increase in data income for mobile telecom operators MNO's, who are continuing to extend their data offerings. In addition, the sector is preparing for the next wave of fifth mobile telecom generation 5G and internet of things IoT/ machine to machine M2M advancements. The country is aiming to improve its fixed broadband infrastructure, as the country's current penetration levels are still low. Although a nationwide fiber-based broadband network is being built, the bulk of users still use digital subcribers DSL. (Global news, 2020)

Despite the revolution in the Jordanian mobile telecom sector the government can't cope with increased demand. Mobile telecom representative from focus group 2 stated *" Most people in Jordan has tow sim cards especially business men and there has been no enough*

capacity to cope with such demands, for example the E-government program was launched in 2001 and since then there are 18 active services provided by e-government which facing challenges, shortages, errors of implementing them, the digital gap between communities, lack of legalization laws, lack of policies, sufficient ICT applications and infrastructure, corruption, constant changing in ICT's ministers, lack of telecommunications towers, high tariff on telecommunication towers, people in the countryside struggle to receive signal and have to drive miles to receive a signal, the government will charge us a lot of money to install towers and we have to pay high tariff per minute regardless of the return on investment, we cant depends on DSL . Participant explaining further *"the government policies don't encourage us to install cell phone towers in the countryside because of high tariffs, in some areas people don't have access to mobile signals and in some areas the cell phone towers cant cope with the pressure.I wonder how they are going to establish another 80 e-govermnet services, are they capable of doing so without us? The government monopoly of such sector has to stop".*

6.1.4. Internal factors

Despite the huge potential of Jordanian telecom market, the research study showed that the top management doesn't have any vision for embedding the innovation. Other challenges commonly discussed by the participants were lack of innovation labs, government restrictions, high tax rates and lack of collaboration with key stakeholders. One of the respondents argued that the Jordanian telecommunication companies do not have and inclusive internal system and when working with too many departments, this has bad impact on the knowledge transfer between employees. The telecommunication companies' internal environment is further characterised by the requirement for parties to get authorisation in regard to innovation, which mainly involve long process. Thus, the prevalence of bureaucracy hinders embeddedness of

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innovation in the industry. The telecommunication companies do not have a department that only do innovation or specialised in innovation only.

The respondents mentioned that other than the external environmental issues, the Jordanian telecom organisation also face the internal resistance and to some extent, prefer to collaborate with the stakeholders by employing traditional collaboration techniques. Moreover, when they were asked about their readiness to operate in an environment characterised by high inside out and high outside in knowledge flow, the respondents commented that current organisational structure and policies might resist while functioning in such environment, and other than external environment, major transformations in the internal organisational environment are also required to overcome the structural resistance.

6.1.5. Bridging Ties and CSR

Edrak is a bridging ties initiative where Orange, Zain and Umniah mobile telecoms extended their resources, knowledge, and relationships to innovate new educational service. This non-for-profit organisation was established in year 2013 to develop Virtual Learning Platform that serves the wide Jordanian population with professional and executive education. Based on a call from her majesty "Queen Rania", the three telecoms dedicated their competitive advantage to develop a massive open online course (MOOC) platform. The name dedicated to this initiative is Queen Rania Foundation or (QRF).

Orange Telecoms utilised their massive infrastructure to develop an integrated enterprise system that consolidate Harvard-MIT consortium, edX platforms, MITX, and UC

BerkelyX to establish a free Arab MMOOC platform. Orange's advanced innovation in Virtual Reality, Educational Games, and other learning technologies could set the base for vital opportunities that can be part of a necessary revolution in education and learning. Also, Orange has adopted the strategy of public engagements as way to identify the requirements for innovation and policies assisting it. They propose utilising a service or product. Finally, Umniah have taken the initiative to provide safe and free internet to 2652 school, 112 directorates, and 69 administrative buildings. ***U6*** stated *"Bridging ties with Google and other mobile telecom operators has internationally lead to build the Blue-Raman submarine cable, which will connect Italy and India via Aqaba-Jordan. The value network we have contribute to economy as well as us".* Bridging ties (diverse) or bonding networks are more beneficial to foster innovation". (Lyu, He, Zhu, & Li, 2019)

Zain taken the role of creating a platform to recruit high calibre of professionals and academic to enhance the population's industrial knowledge and soft skills, also offering original Arabic courses - developed by QRF - to further enrich Arab education. Multidisciplinary has been considered in the recruitment process by selecting experts with huge experience in innovation facilitation. By product of this contribution Zain could get qualified trainees who can help the company to enhance the embedded innovation for other services than education. Also, Zain has devoted their advertising channels, especially the football league sponsorships, to spread the word amongst people in order to promote itself and Edrak. The high level of technologies adopted in public engagement take into consideration the non-online user.

Umniah is in charge of the initiative outreach through an awareness plan and logistical support for Edrak learners. They are using their local customer service centres and branches as training centres for Edrak learners. platform will enable the Arab world to take advantage of the international interest in regional affairs to tell its own story to the world. Arab university professors and regional experts can use the platform to give courses in English about the region and its history. This will serve to inform a global audience that is interested in the region's development.

6.1.5.1. Management Inheritance

Zain's CEO is Jordanian national and has been the CEO of Zain since 2011. This has helped the company to establish connections with government representative and to that make things easier for the firm. Meanwhile, Orange in Jordan tends to change their CEO every three years, and must be French national, which does not give the CEO time to understand the markets and establish connections to help them to connect easily with resources.

Umniah is following in Zain's footsteps by employing a Jordanian national, in 2005, who has had rich experience with the European and Asian markets. He has made many changes and managed to establish connections locally and internationally, bringing new technologies and services to the company.

6.2. Drivers of Embedded Innovation in Jordanian Telecoms

This section offers a partial answer for Sub-RQ2 by addressing service competitive advantage strategies, stimulating intellectual capital of innovation systems, enhancing social innovation, and enhancing financial service innovation.

6.2.1. Enhancing Competitive Advantage

This section is mainly based on firm's perspective for gaining further insight. As discussed in *Chapter 5*, Innovation extremely considered importance for preserve of competitive advantage. However, recent researchers contend that Innovation theory has lost its relevance with contemporary era to a great extent. Today, we are living in an era where digitalisation of information has made it almost impossible for organisations to attain and sustain embeddedness, competitive advantage in the long run. Recent theories emphasize on innovation and collaborative innovation. The theorists contend that it is not possible to develop the innovation in a vacuum (Adner, 2006). They further argue that EI requires a complicated structure of supportive technologies, infrastructure, stakeholders and services that an organisation cannot handle without collaborating with other parties. The debate is not only a hot research topic in academia, but, contemporary organisations pursuing innovation are also showing extreme concern, as their survival in a highly turbulent environment has become challenging than ever before. These organisations are struggling to choose between the collaborative innovation strategies or EI. In latter case, they can probably miss out the advantages of supportive partnership and collaboration with customers, suppliers and competitors.

"Competition is essential to the innovation process and to capitalist economic development more generally. But so is cooperation. The challenge to policy analysts and to managers is to find the right balance of competition and cooperation, and the appropriate institutional structures within which competition and cooperation ought to take place." (Teece, 1990, p. 1).

The high competition development of service innovation in Jordan, has provided mobile telecoms with opportunities to provide customers new services, by embedding the end users in the innovation process. Mobile telecoms in Jordan now aims to embed innovation to achieve customer retention and to gain competitive edge. Designing innovation strategy in the context of enhancing competitive edge results in positive changes in the competitive advantage (Ismael & Sağsan, 2020) Customers now engage in workshops conducted by mobile telecoms in order to understand customers better, the embeddedness success within mobile telecoms depends on how can maintain and establish sustainable collaboration with their stakeholders either formal or informal. Orange regard customer requirements as being the firm's first priority and class the customers as the spirit of embedded innovation. The researcher gathered from the interviews with the mobile telecom participants is that mobile telecoms adopt dynamic techniques to gain competitive advantage in a dynamic competitive business environment is one the most aspect to ensuring survival. Mobile telecom providers transformed itself from a traditional network operator selling undifferentiated data and phone services to an experience provider offering financial services, payment transfer and various services to its consumers.

Major corporates from various sectors in Jordan seeks to collaborate with mobile telecoms to develop bespoke develop programmes and applications for them, more specifically financial firms and banks.

As mentioned in the findings & chapter 2, the market condition is encouraging and beneficial for mobile telecoms take advantage of market opportunities however, mobile telecoms are facing many issues such as high taxes, Mobile telecoms response to such issue is they are trying to make the Jordanian government responsible for innovation and stating that high taxes hindering innovation. Umniah are embedding innovation in everything they do, and innovation is everyone's job, referring to the findings Umniah is building networks multiple sectors in Jordan with a core strategy based on embedding the innovation in each activity, now it has positioned itself as innovative firm in the financial technology within short period of time. Zain has always been a head in the industry because of it has a strong bond with customers and partners by providing them reasonable prices and staying up-to-date with global innovation trends and by offering different requirements and customised services.

6.2.2. Stimulating Intellectual Capital

The research findings refer to the intellectual capital as one of the key drivers which is also confirmed in the entrepreneurship literature, but not yet in the innovation systems literature. In *Section 6.2.3*, the researcher discusses how intellectual capital as a driver for embedded innovation led to the necessity to manage innovation change knowledge as a source of intellectual capital. It is necessary to understand how innovation is developed by intellectual capital and its role. Furthermore, the resistance which can be occurred as a result of innovation is also necessary to understand because the concept of innovation, innovation systems, and the application of embedded innovativeness is of no use if they are not applied effectively and efficiently.

Intellectual capital brings innovation. Innovation brings change. Change brings resistance. And, and the effective use of models of innovation system can help to minimise resistance and ensure effective utilization of embedded innovation (Baden-Fuller & Haefliger, 2013; Sánchez-Prieto et al., 2019a). Therefore, the following sections will further explore the various variables and terms in the study concerning earlier scholars. The sections contain in-depth assessments of the concept of innovation, innovation systems, and the application of embedded innovativeness. The last heading of literature includes innovation system models.

The phenomena of companies struggling as organisms for survival within their internal environment are known as embedded innovation (Adams et al., 2006). The method of embedding with other organisms while focusing on employees--human capital (Hannah, 1987), customers-- relational capital (Al-Jinini et al., 2019a), and the organization--structural capital (Dumay & Garanina, 2013) is also known as embedded innovation. It cannot exist without intellectual capital which is a combination of all the components of embedded innovation.

The intangible assets with innovativeness, customer confidence, positive brand image, and organizational culture, with the addition of effective management skills, are called intellectual capital ((Hanson, 1988; Abd-Elrahman. et al.,2020). An extensive definition concludes the intellectual capital to be the difference between the market value of the company and its book value. Resources are based on the knowledge that contributes to the sustainable competitive advantage for the company (Ordóñez de Pablos, 2003).

An organisation is comprised of two types of assets: one is called a tangible asset and the other an intangible asset (Kujansivu & Lönnqvist, 2007). Both types shape the organizational value and shape the company's competitive advantage (Guthrie et al., 2003).

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Intellectual capital is one of intangible assets that builds the company's know-how and readiness for innovation (Dahlgaard et al., 2019; Vuolle et al., 2009).

Intellectual capital is a tool that can be a grave threat to competitors (María Viedma Marti, 2001). For example, Microsoft, a multi-billion-dollar company, has shares which are of greater worth than its book value. It is the intellectual capital that Microsoft possesses which makes its share value greater than its book value (Penman, 2009). The same applies to Apple, known for not providing dividends to its shareholders, which has a high share value. Intellectual capital (IC) is what gives these companies the right to manipulate the shareholders' interests as per their benefits (García-Ayuso Covarsí et al., 2004). Participant **U5** stated that "*Orange is recognised as the leading company in terms of Intellectual capital In my times there I found IC difficult to evaluate, people will not be able to see this but once they work somewhere else*".Participant affirmed **Z7** on IC "*We see IC as process to stimulate innovativeness, value creation, competitive edge value creation*".

In order to understand the concept of intellectual capital, one must perceive a business as a learning organization that consists of inventors of processes, products, and services (Edvinsson & Malone, 1997). Orange, Zain, and Umniah corporations developed a wide variety of embeddedness mechanisms to facilitate sharing of innovation knowledge between the service providers and non-traditional stakeholders to enhance their overall competitive advantage, including customer experience (Schiuma, 2001). So, in this research, we argue that Intellectual capital is an invisible asset that shapes the knowledge flow among the key elements of the embedded innovation systems in telecoms. The researcher found out based on the interviews held with mobile telecoms IC is crucial for influencing the firm innovativeness.

6.2.2.1. Components of Intellectual Capital

As per Sveiby (1997), intellectual capital has mainly three components. *Firstly*, human capital refers to human competence, which is the ability to act in various circumstances for the sake of enhancing tangible and intangible assets of an organization (Hanson, 1988; Abd-El-Rahman. et al.,2020). . It is considered as an intangible asset, but an individual's competence is not something that the company can count in the balance sheet, since an intangible asset is something that only the individual can possess and is the major cause of innovation in any organization (Caddy, 2000; Etzkowitz, 2003; Hormiga et al., 2011a; Stam, 2009). In Zain, Orange, and Umniah the mechanism for recruiting graduate innovators, maintaining employee's loyalty towards innovation, numerous compensations are examples of intellectual capital in Jordanian Telecoms. **Z4** stated *"We are not isolated from the global and local trends in terms of innovation in services, we are able to innovate and meet changing needs of customers"*.

The second component is internal capital, which covers all the patents and models inside an organization, including the technology and administrative systems used, and it comes under the heading of internal capital (Dasgupta et al., 2009). An organisation is a combination of people and internal capital (Bougon et al., 1977). Owned by the organisation, these factors are created by the employees using the tool of innovation and are in the company's possession. The organizational culture also represents an internal structure (Curado, 2008).

Finally, the external capital is the relationship with the suppliers,customers and ISO . This includes trademarks, brand names, as well as the reputation enjoyed by the company. (Guthrie et al., 2003) External capital is uncertain and the assurance regarding it is somewhat low as compared to internal capital (Stein, 1997). Given that the reputation of a company is forever hanging by a thread, the value of the external capital increases with the company's ability to solve the customer's problems (Kermally, 2002). **O9** revealed *"Orange obtained*

international quality certificates from ISO and complied with their requirements".

Developing assets of an organization is one of the manager's prime duties. However, matters become complicated where an organization's most valuable assets are not material objects such as machines but are intangible and therefore invisible) (Hanson, 1988; Abd-Elrahman. et al.,2020). Every employee in an organization who possesses an intellect is a knowledge worker (Noriega et al., 2013a) and is highly qualified, which justifies the existence of embedded innovations (Castelli, 2012). The task of knowledge workers consists in converting information into knowledge, and for such companies, their most valuable assets are intangible assets (Guthrie et al., 2003).

The role of a manager is of the highest importance, in the sense that managers need to work in an environment of uncertainty and challenges. The manager needs to maintain a state of equilibrium between internal and external structures (McRae, 2006). Let us take as an example a cosmetics company. If the manager directs his people's efforts internally, internal intangible structures (embedded innovation) produce better product designs and methods aimed at creating a new product (Marinova & Phillimore, 2003), whereas, if directed externally, this will result in the creation of intangible external structures such as customer relationships, etc. (Baden-Fuller & Haefliger, 2013). The

Managing intellectual capital in order to generate embedded innovation consists of (a) analyzing existent knowledge, improving it, and making it as much learnable as possible to ensure long term benefit for the enterprise, and ultimately generate embedded innovation – this can also be described as structural capital (Freeman & Engel, 2007), (b) creating an environment best suited for the employees to perform to the best of their ability (Nicholls & Dees, 2015), (c) identifying the sources that could be beneficial for the company's organizational structure (Gunday et al., 2011), (d) optimizing resources whilst releasing cycles

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for existing and future initiatives (Castelli, 2012) and (e) finally, assessing what kind of risks are inherent in the organization and how to devise a strategy for the minimization of such risks in order to protect the firm's intellectual assets (Brunold & Durst, 2012). Intellectual capital can furthermore be broken down into the following three clear components (Nick Bontis, 1998): (1) Human Capital; (2) Structural Capital; (3) Relational Capital

6.2.2.1.1. Human Capital

For a long time, human resources were merely part of the administration, but in the current era, it is acknowledged as constituting a core value for any corporation. People management is what the company's future is dependent upon (Coulson-Thomas, 1998). Even though the concept of human capital appears to be a new one, it was introduced as early as 1691, when Sir William Petty valued human capital as an example of England's power (Kiker, 1966).

The concept of human capital is dependent on one central principle, 'investment made in people can turn them into assets', which is also the concept behind embedded innovation. The process of its generation starts with the employees and continues from there (Shah & Steinberg, 2019a). Approaches towards human capital should be mapped, assessed, and implemented in a way that is in the best interest of the company's organisational needs, particularly in order to maximise the benefits of embedded innovation (Strebel, 2009a).

Human capital, even though it operates on a much broader scale and focuses on employee retention and performance management by managing their needs, remains a subset of traditional human resources (Bowman & Toms, 2010), and managing human capital affects embedded innovation directly, since it includes obtaining, analyzing and reporting on data,

which gives guidance to the frontline and corporate level management when it comes to adding value to people management as regards its strategic, investment and operational decisions (Michael Armstrong, 2006).

TRC receives 5000 complaints a year on average from customers who aren't satisfied with mobile telecom operators. According to focus group **O3** customer stated *"based on the number of complaints on mobile telecom operators, shows that telecoms solely concenrned about revenues and don't have designated teams to deal with complaints without having to raise complaints with TRC, 4000 complaints regarding data allowance top ups which can be resolved by mobile telecoms providers the other 1000 complaints is regarding the network towers faults which can be resolved if towers installed in some where needed however, each tower will cost 60.000 JD to install and the return of investment is low so its not worth the investment from our prespective as we still have to pay the government tariff"*. The main concept of human capital is problem solving, skills, qualities, basically it is a set of intangible qualities those staff must bring to the mobile telecom

6.2.2.1.2. Structural Capital

Researchers have a keen interest in innovation because it represents the key to success in the modern economy. Behind any business competitiveness, innovation is credited with being the major driving force in the present-day economy (Castelli, 2012; Sveiby, 1997). Innovation helps companies develop opportunities much faster than their competitors, and enjoy faster growth (Castelli, 2012). **U7** stated *"from my own experience and through working with Zain, Orange and Umnia, each one of them has their own trademark, procedures,*

processes, patents, policies, capabilities and information systems however, they depends on the quality of management in exchanging views in improving the way they do things for the better and do not rely on one person".

Even though human capital is regarded as vital when it comes to the development of EI, it remains a fact that when employees leave the organization, the human capital leaves with them (Garcia-Parra et al., 2009). This is the essence of structural capital, which is a warehouse of knowledge, databases, routines, manuals, and policies, which are all examples of structural capital (Garicano & Wu, 2012a). In other words, it can maintain and protect the process of innovation.

When employees leave the company, what remains is structural capital (Roos et al., 2004a). Cohen & Kaimenakis (2007) explain that, unlike human capital, structural capital is owned by the organizations as it can be shared and repeated where necessary. Intellectual capital is the knowledge that is mostly created by the working environment (Bukowitz & Petrash, 1997). As demonstrated in Chapter 5, Zain, Orange, and Umniah employees have developed a wide set of innovation embeddedness ingredients and processes in order to gain competitive advantage in different market segments.

Intangible assets cannot be traded; hence their value cannot be assessed – as is the case with tangible assets; however, mergers or acquisitions present a different situation in this regard. Structural capital is a type of knowledge generated by the organization and cannot be separated from its entity, (Joshi et al., 2013). Bontis (1998), an organization having poor structural capital will find it hard to utilize its resources to full capacity. This study will show that structural capital consists of the following three components: Infrastructure, Data and

Information, and Procedures and Policies.

Figure 6.1: Models of intellectual capital valuation-A comparative evaluation
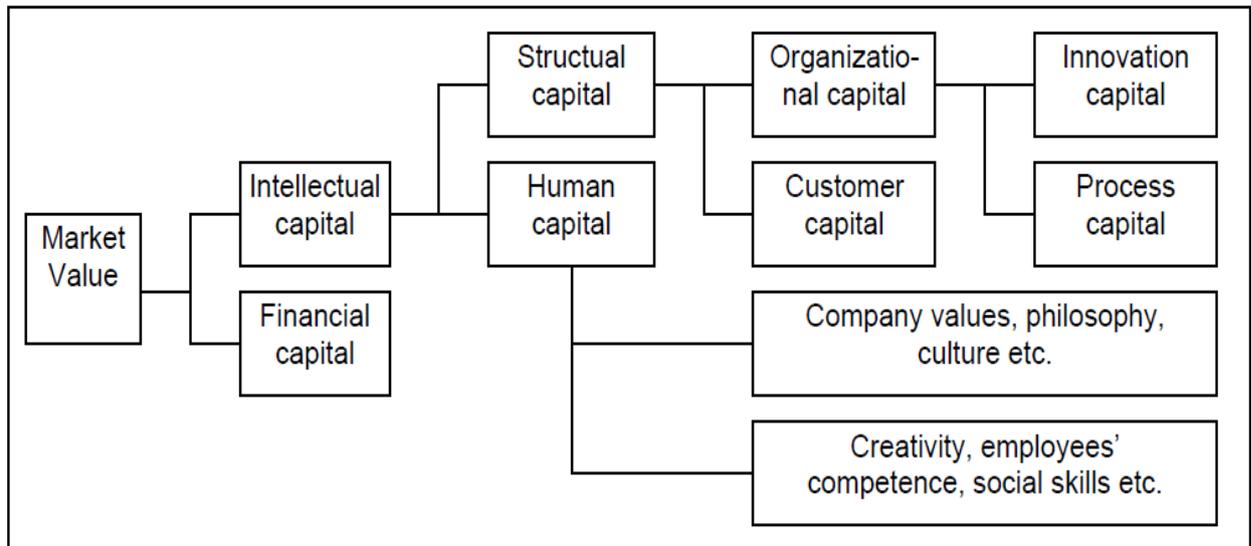
Source: (Işik et al., 2013, p23).

The process of developing, accepting, and implementing new ideas is called innovation (Castelli, 2012) and the components of the structural capital allow organizations to do just that (Aramburu & Sáenz, 2011). Structural capital is one of the three components of intellectual capital, and can itself be broken down into two components, namely, *organizational capital* and *customer capital*. The following chart should identify the components of Structural Capital (Işik et al., 2013).

6.2.2.1.2.1. Organizational Capital

The assembling and utilization of the accumulation and use of exclusive information aimed at enhancing efficiency of production within a firm is called organizational capital, and is a highly significant element in the firm's value (Leana & Van Buren, 1999).

This capital includes all such elements as operate independently of the employees, and any structure that assists employees in becoming more creative and productive is included in the firm's organizational capital (Fang et al., 2011).

The following are some examples of organizational capital found in Jordanian Telecoms are;

Mission & Vision: Zain targets employees who work in public organizations and military sector, while Orange targets individual customers at high- and middle-income classes. customers

Organizational Structure: Orange follows a decentralized structure due to its international expansion, while Zain and Umniah built their hierarchy and communication channels with regional and local partners to simulate service innovation.

Principles and Policies: The three Jordanian telecoms managed to build institutional norms ofEI supported with the relevant infrastructure and motivation and performance measurement systems.

Our research findings pointed out other types of Organizational Capital such as process capital, and innovation capital. The former consists of all the techniques, processes and programs that assist the delivery of the new services as well as their enhancement (Davidsson

& Honig, 2003). MFS provided using same technical infrastructure and same market but following innovative process and different types of managerial innovation (or Process capital). The later, innovation Capital,

This consists of intellectual property, along with other intangible assets (Mcelroy, 2002; Tsai & Ghoshal, 1998; Wu et al., 2008). Protected commercial rights, such as patents, trademarks, copyright, etc. are good examples of innovation capital.

6.2.2.1.2.2. Customer Capital

Customer capital is the value of relationships built between the customers and the firm (Nick Bontis et al., 2000; Dhaliwal et al., 2016; Gourio & Rudanko, 2014; Luo & Homburg, 2007). It is something that is reflected in the customer's loyalty to the firm and its products. It is one of three components of intellectual capital which is not shown on the balance sheet.

As Bontis (1998, p66) mentions that "*employees may have a high level of innovation intellect, but their true potential cannot be unleashed if the organization has poor systems and procedures to track the employee's actions*". Knowledge deposits of any kind are included in structural capital, such as ideas, routines, handbooks, and databases, (De Pablos, 2003) and without them innovation cannot take place.

Structural capital is what organizes information systems that can create business intellect, yet it is largely dependent on human capital since it is the key factor in developing it. But even though it is influenced by human capital, structural capital is independent of human capital (Yoo et al., 2004). Patents represent the best example of this, since they are created by

human capital, yet they are owned by the company.

Structural capital differs from one organization to another, given that it represents organizational-level knowledge (Dumay, 2012). This is the reason why each organization has its own level of innovation, and the differences in their innovation is what gives them a competitive advantage (Aramburu & Sáenz, 2011). Structural capital becomes part of the firm because of meta-learning procedures called institutionalization (Fisher & Atkinson-Grosjean, 2002a). It harbors routines, organizational culture, etc. which systemize and maintain data and knowledge.

6.2.2.1.3. Relational Capital

Relational capital is the third element of intellectual capital and is defined as the capacity of the organization to interact with the parties involved in the business and to motivate the creation of wealth by human and structural capital enhancement (Anderson, 2001). EI itself cannot achieve anything if it does not have the required motivation on the part of others to carry out the ideas that have been produced. This is where relational capital is helpful.

Every kind of relationship, be it with competitors, stakeholders, potential investors, suppliers, or trade associations, is included in relational capital (Nick Bontis et al., 1999). One of the main components of relational capital is referred to as 'customer capital' and known as the company's "market orientations" (Homburg et al., 2008). It is the creation and dissemination of market intelligence, along with action based on the current and future needs of customers (Kohli & Jaworski, 1990).

Figure 6.2: Making sense of intellectual capital
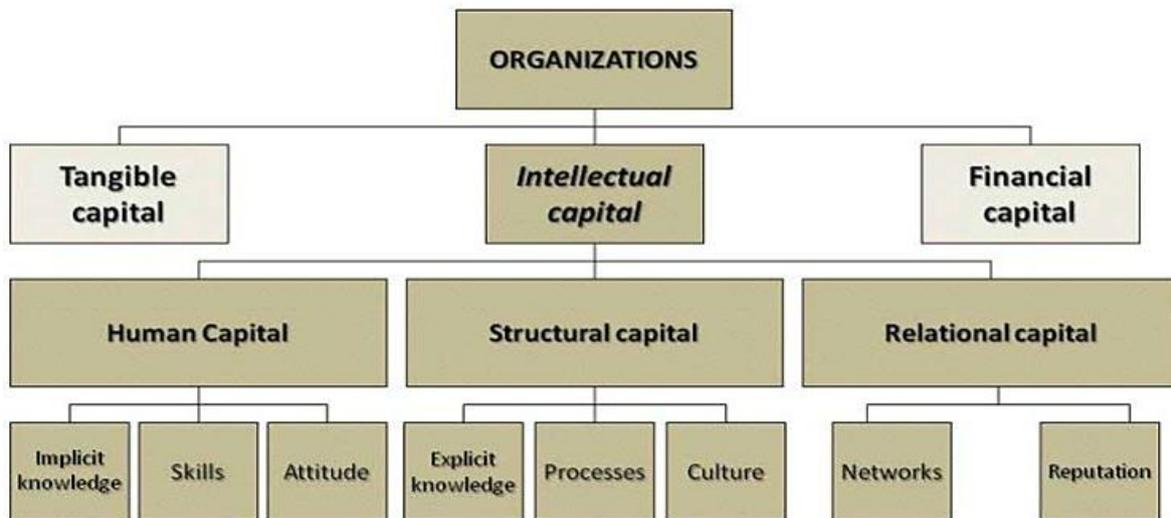
The research findings have proven that good relationships between the telecoms and its stakeholders drive success and performance as confirmed by Ling-Yee & Ogunmokun (2001). Intellectual capital is divided into three types: human capital, structural capital, and relational capital (Nick Bontis et al., 1999; Curado, 2008). Andriessen (2004) provides a diagrammatic representation of the components of intellectual capital, shown in Figure 6.2.

To focus on the importance of intangible assets besides financial measures is the main idea behind the concept of intellectual capital and, being one of the three primary components of intellectual capital, relational capital focuses on the inherited value which comes from the relationships with customers, suppliers, and other major players.

Relational capital and embedded innovation go side by side because it is a category of intellectual capital that emphases the intangible value that exists owing to the organization's

relationship with its business partners and with the external parties that contribute towards the fulfillment of the company's needs (Dahlgaard et al., 2019).

It is a universally-known fact that a successful company is that which has strong business relations (Al-Jinini et al., 2019a). However, current relations are not the only important ones; future sustainability and long-lasting customers are equally important, this is where innovation becomes profitable (Kermally, 2002). Relational capital has high significance in those companies which are well connected and can anticipate future developments and respond in an efficient manner.

In today's world, where some companies are dependent on other businesses in order to help create the final product or provide services aimed at saving costs (Castelli, 2012; Kujansivu & Lönnqvist, 2007), they are increasing their dependency on other parties (Hawryszkiewycz, 2009). In such cases, to ensure a stable future, companies must invest a serious quantity of resources for the selection of the right partners (Al-Jinini et al., 2019b; Dealtry, 2008).

To manage relationships and the risks involved when dealing with the external parties is equally important for the company (Ke et al., 2010). This is the entire purpose of relational capital. The latter does not merely assist in building a better reputation (Clardy, 2005); it also helps to increase the value of the company brand (Harvey & Lusch, 1999). Some of parties involved in relationship capital can be.

- Customers   - Suppliers   -Brand

- Contracts   -External Networks   -Stakeholders

There are three components of Relational Capital, including product value, brand value, and relations value.

Product value: If innovation creates products and services, analysis is necessary in order to evaluate the value of those goods or services (Edvinsson & Malone, 1997). Such value is assessed where the price for a product is set and is dependent on the cost of production plus the market value, as well as what the focus or target group of customers assess the value of the product to be (Casadesus-Masanell & Zhu, 2013).

Brand value: The financial worth of the brand is called brand value (Van Zyl, 2005). In order to calculate brand value, its worth is estimated in the market, meaning how much someone will pay if it comes to purchasing the brand.

Relational value: It is known as the extent of the value given to the customers by those whose view is important in the mind of the customer (Stofberg et al., 2019). An example of this is customer expectation that the service providers take good care of him/her, and upon acting as per expectation the relation value increases and it decreases where the opposite occurs.

It is important to measure the relational capital with a view to enhancing the firm's organizational success. Some of the measurement methods are stated below (Kujansivu & Lönnqvist, 2007).

-Feedback from the customers   -Satisfaction Survey from the customer

-The frequency of orders from the same customers, indicating loyalty

-Market Research that indicates brand reputation and knowledge

-Marketing investments

-Delivery timing that shows the nature of the relationship with the supplier

The stakeholders' relationship with the company's reputation and brand are core components here, as well as trust, transparency, and commitment. No matter what the size of the business may be, relational capital has its own benefits (Guthrie, Ricceri, & Dumay, 2012; Hormiga, Batista-Canino, & Sánchez-Medina, 2011)

When starting a new venture, knowing the right people for the right job at the right time is crucial for its success, (Hormiga et al., 2011). The effect of relational capital on the brand of a company should never be underestimated. The firm's reputation and brand are among the dimensions that affect its rational capital and for many companies, the brand is one of the core marketing elements.(Carmeli & Tishler, 2004). Many of the companies are known to invest a great deal of money and resources in brand building. Various options are considered in order to create a strong brand that could convey the true image of the company, in order to benefit the business in its method of communication, (Homburg et al., 2008).

The value of the innovation resides in the fact that it will enable businesses to generate further profits going forward (Adner, 2006; Manjón, 2020)). In the light of factors such as globalization and rapid advances, it is essential that relational capital should have a strategic significance that will not only support embedded innovation, but also help to generate it (Belussi et al., 2010). Although a firm's success is attributed to its intellectual capital as a driving force (Bontis et al., 1999), there has been little research on the connection between intellectual capital and innovation, and therefore there is lack of research on how to measure

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the impact of intellectual capital on innovation (Bontis, 2016).

6.2.3. Social Innovation

Adams and Hess (2008) define social innovation as an idea representing social change or a process that has distinctive preconditions and stages and those preconditions and stages can be understood and acted upon to promote innovation."

> *"The concept refers to the capacity of society (through not-for-profit organisations, charities, social movements and community groups, as well for-profit enterprises) to address needs unmet due to the failure or absence of markets or state provision. The nature of the 'innovation' can be in the content (what action is taken) or the process of provision (how needs are met)"* (Baglioni and Sinclair, 2014: 409).

To gain a competitive advantage, Zain took the initiative to support entrepreneurs in the region and named that project the Zain innovation campus (ZINC). The ZINC is first of its own kind in Jordan and it is equipped with the latest technologies to incorporate innovators and start-ups owners.

While at Orange, the completion of work on the project at the company's solar power plant in the Naour region was celebrated in a national conference in the presence of the following telecoms executives:

- Dr. Eng. Ghazi Jabour, Chairman of the Board of Commissioners of the Telecommunications Sector Regulatory Authority, Chairman of the Board of Directors of Orange Jordan.

- Dr. Shabib Ammari, Deputy CEO of Orange Group Gervay Bilissi, and the CEO of Orange East Middle and Africa Elon Ndiaye.

- Mr Jerome Hayek, Executive Vice President / Chief Operating Officer of Orange Middle East and Africa

- Mr Terry Marini, Orange CEO

- Mr Ruslan Diraniyeh, Orange's Executive Vice President / Executive Director of Finance and Strategy.

- Mr Karim Kawar, Chairman of Kawar Investment Company and Chairman of the Board of Directors of Shams Telecom;

- Mr Ghawar Energy implemented the project. The French Ambassador Veronique Voland-Anini participated in the ceremony, in addition to the General Director of the Irbid Governorate Electricity Company, the General Director of the Electricity Distribution Company, the General Director of the National Electricity Company, and the General Director of the Samra Electricity Generation Company.

Minister Zawati said, during the ceremony said:

> "*Today we are inaugurating a new important project through which the company seeks to reduce the costs of electricity consumption and converting to a green company. It also contributes to our commitment to achieving our strategic goal of strengthening local energy sources and embodies the concerted efforts of the public and private sectors, our keenness, and our commitment to the directives of His Majesty King Abdullah*".

The second is to move towards sustainable local energy that achieves self-reliance and contributes to achieving sustainable development goals and reduces operational costs through

clean energy. While at Umniah, BTECAR Consulting and the German Jordanian University-Program Innovation Camp; Entrepreneurship (GJU PIE) together with the Impact Week Team from Germany organized the Impact Leaders Program and Competition using Design Thinking over virtual platforms and remote communication technologies. The event took place in cooperation with several Jordanian universities, schools, and companies. The program was initiated to contribute to solving some challenges related to Education and Community during the lockdown which emerged during the coronavirus pandemic. The program involved is based on Design Thinking and Human centre approach.

Today, society has a consistent potential for creation and innovation, including business innovation and social innovation (Hamdi & Kosarizadeh, 2015; Kulshrestha & Jain, 2018). The nature of business innovation is to generate revenue and to serve the population, yet some types of innovation serves society and impacts performance, as well.

For example, Zain initiated an innovation program called 'Zain innovation campus (ZINC)' which is well recognized for its novelty and the support it produces for young entrepreneurs. ZINC Is well equipped with the latest technology and is aware of the technological benefits for the incorporation of startup owners and other innovators. Because of ZINC, the company initiated a chain of events that introduced a new innovation category in which the population can be served and the standard of living improved: this is called social innovation. **Z8** stated, *" We consider all ZINC members as valuable human capital, we offer the skills that can match our technical skills".* He added *" the human capital resources is very impratnant in this competitive market, the recruitment process and selection process is very complicatied and can go beyond the applicants professional competences".*

Meanwhile, Orange has initiated a new project that not only reduced the cost of electricity but, also, has converted the whole organization to using green energy. It was done for the good of the company and public and the environment by creating learning capabilities for future generations. **O1** stated *"the collaboration, relationship, exchange, and sharing of information with other industries, external stakeholders can teach us new things such as the electricity cost savings, also creats new services and products.*

The widespread reach of the project fulfills the needs of the customers by reducing the cost of services and unemployment since a significant workforce is needed. Finally, Umniah initiated a social innovation project the COVID-19 global epidemic which has helped schools, universities, and businesses that have been severely affected by the virus. They have worked to continue to improve education and the situation in which their communities find themselves.

6.2.4. Financial Resources Innovation

Financial resources are vital for competitive performance and to introduce innovation in services, products, skills creation, and knowledge. However, managers at Zain find the financial aspect to be their main challenge and barrier to maintaining innovation due to high taxes. The rsearcher gathered from the interviews that mobile telcoms has made significant

development in the area of digital financial services, collaborating with Central Bank of Jordan's. The Jordanian government has established a Ministry of Digital Economy and Entrepreneurship to support future digital development. Motivations, benifits and advantages, and difficulties of Mobile Money Systems (MMS) influence financial inclusion and enhance its sustainability in today's changing economy. MNOs have recently begun to operate as financial service providers in order to reach the unbanked customers in jordan.

Financial resources are vital for competitive performance and to introduce innovation in services, products, skills creation, and knowledge. However, managers at Zain find the financial aspect to be their main challenge and barrier to maintaining innovation due to high taxes. Zain has struggled with the financial costs of innovation and has allocated some budget for innovation. This budget is to cover taxes, the recruitment of highly experienced, skilled employees and to recruit innovation-conscious leaders to process the innovation. Zain can enhance their innovation through the smart use of resources.

A lack of funding is an obstacle for universities to use their resources fully. In this regard, Zain is sponsoring research and helping universities to implement some creative learning systems and their outcome would help Zain to support their innovation systems.

Financial service innovation can be tangible as well as intangible (Teece, Pisano, and Shuen, 1997) and helps companies to create valuable capabilities that lead to new or updated processes, services, or products. Ultimately, they create competitive advantages over other organizations (Teece and Pisano, 1994). With the limitation of valuable resources, mobile telecoms must find ways of acquiring and efficiently deploying such resources. Recent studies point to the importance of effective and efficient resource deployment to achieve innovation.

Zain collaborated with Mastercard, introducing payment services for their customers. For example during the Covid-19 pandamic when the government applied a full lockdown the three mobile telecoms encouraged mobile users to use their digital platforms (online services). Offering customers special data offers when using E-shops and mobile financial services to compensate the revenue drop during lockdown. Another example Orange and Umniah Zain for example introduced mobile financial services (MFS) apps as a digital tool to assist minimise the revenue declines. Both offering refill top-ups using its MFS application. Customers may top up their accounts immediately using the app rather than purchasing a voucher from a real store. Previous studies such as Mohamad et.al (2014) confirmed the progressive role of mobile operators such as Vodafone Egypt in supporting the financial inclusion in the middleeast by developing financial technologies. While that study emphasized on the public-private partnership to successfully deploy mobile financial services, the present study emphasizes that financial innovation is a promising market for the Jordanian mobile operators due to the market saturation in standard mobile communication services.

The prepaid cards are linked to the Zain cash mobile wallet. Mobile users can buy and use the card locally or internationally wherever MasterCard is accepted. And, of course, customers can shop online and withdraw cash from Automatic Transfer Machines (ATMs). Umniah learned from Zain and used the same technology for a different purpose. They they introduced the prepaid card, Mahfazti. Orange focused on innovative financial services and have created an inclusive electronic wallet which is a digital alternative to conducting and managing all financial services and transactions.

6.3. Challenges of Embedded Innovation in Jordanian Telecoms

In this section, the researcher discusses the key challenges of *managing innovation change*, *lack of trust*, difficulty of *service co-creation* by embedding customers. The implementation of embedded innovation system is a continuous process as found in the research findings. This process is not a water drop model than an iterative one that follows different paths in each telecom. The process is shaped by the surrounding environment and market conditions. Accordingly, it faces lots of challenges, but this section addresses the most important challenges that face the Jordanian Telecoms and the embedded innovation as a culture (Noordhoff et al., 2011).

This is the prime reason for conducting this research to fill the gap and make a substantial contribution to the existing innovation literature (Hassink, 2001). Review of literature has highlighted some studies that highlighted factors affecting the firms' efforts to collaborate with the community (Boyer, 2003). The main challenge in embedding the innovation is building a common understanding that mostly doesn't exist at an initial stage. However, a persistent effort to collaborate and facilitate the knowledge flow results into gradual evolution of mutual trust and shared understanding (Edquist, 2010).

Researchers also contend that existing organisational structure hinders the innovation embedding process as strict hierarchy and inflexible structure strongly resists the collaboration with the external stakeholders through formal and informal communication channels (Simanis & Hart, 2008). Hence, a strong alignment between the organisational structure and innovation

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culture is a prerequisite for the EI (Noordhoff et al., 2011). Leal-Rodríguez et al., (2014) argued that the resistance from the inner organisational forces is stronger than the external environment while integrating innovation and creativity within a traditional organisation. It implies that before heading towards an embedded innovation culture, a firm should create an awareness among employees to minimise the internal resistance (Edquist, 2010). Insufficient research has been done by the previous researchers in the context of the telecom sector. The underlying research will empirically analyse the challenges faced by Jordanian telecom sector in embedding the innovation and enhancing overall performance.

6.3.1. Managing Change for Embedded Innovation

There can be little doubt that every organization wishes to free itself from the circle of survival and venture into the world of growth and success (Mačerinskienė et al., 2016) . They need to access and accept the 'new reality and understand when the time has come for change. They do so with the blessing of innovation (Baregheh et al., 2009; Senge, 1997). There are two types of change, planned change and emergent change (Bateh, Castaneda, & Farah, 2013; McKay, 1993; Noriega, Heppell, Bonet, & Heppell, 2013). Planned change not only gives time for preparation but also shows itself to be quite useful, as it gives the management the opportunity to form better-prepared employees (McKay, 1993).

Owing to factors such as EI (and some external factors), change is currently emergent, and in today's competitive environment it is almost impossible to even survive without accepting change (Dent & Goldberg, 1999; Senge, 1997). For that to happen there has to be an

effective and efficient utilization of human capital. But there is another factor for change, and it is known to bring with it resistance, which is the opposite of innovation and progression (Strebel, 2009; Zwick, 2002).

Resistance is a phenomenon of which every organization is aware and is well known to the management as such, but they are unable to understand the true depth of this resistance and how to deal with it (Agboola & Salawu, 2010; Grama & Todericiu, 2017), because it not only destroys the work ethic of the organization but also impairs further progress. Therefore, an understanding of the change in question is as necessary as the understanding of innovation itself.

There are mainly three views as to what an organization is made of, Firstly, the organization is made up of routines. Secondly organizational actions are history dependent. Finally, organizations are oriented towards targets (Levitt, B.March, 2011).When it comes to innovation, one can say that change is the most desirable outcome the management hopes for – yet it is very hard to achieve (Allison & Martiny, 2008; Amabile, 1988).

Having much higher failure-to-success ratio a makes the innovation process harder, since change has a habit of appearing to be reluctant (Miller & Friesen, 1982). When activating innovation plans for organizational change, managers attempt to improve their quality management, their downsizing policies, and their customer value (relational capital) (Kotter & Schlesinger, 2008). To this end, they need motivated and enthusiastic employees (human capital) who not only accept change but also allow plan for change to be a success. However, the phenomenon called 'communication-gap, causes implementation plans to fail and to obtain unusual results because the lack of communication with employees makes it hard for the

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initiatives for change to be implemented (Garicano & Wu, 2012). This is because the employees are not fully aware of it and hence, when they reach a stage of distress and exhaustion as a result, they retaliate against the initiatives that result from embedded innovativeness and hence cause resistance (Strebel, 2009). **O5** stated *"MNOs focus more on data transmissions and technology innovation however, we can't solely rely on it",our management is network orchestrators"*.

6.2.3.1. Communication for Innovation Change

Communication can be defined as an exchange of information through a certain a medium, from one point to another, in a manner that can be understood efficiently (Gratchev & Gratchev, 2019). Communication plays a vital role in the success of project management and is said to be its lifeblood (Nakada et al., 2018). The success and failure of any project depends largely on the efficiency of communication networks, established between the project management team and stakeholders.

According to the research, 90% of the time spent by the manager is on communication (Schwalbe, 2012) and yet it has been found that nearly all projects experience a breakdown in communication networks (Daim et al., 2012). It is important to understand the role of communication in fostering embedded innovation. The following section contains a brief explanation of an important aspect of the successful management of innovation projects, i.e. the concept of communication and the procedures required for effective communication during the initiation of the project, so that major obstacles can be avoided, and the success rate of the project can be increased.

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The success of an innovation project depends on the ability on the part of the project manager and the organization to communicate effectively (Inayat et al., 2015). The process of project management starts with the initiation, planning, launching, evaluation, and completion of the project (PMI, 2008). None of these can be achieved without a proper communication channel between the manager, stakeholders, and the team (Schwalbe, 2012).

The initiation process is a complex one because each member of the team requires special attention and a different style of communication (Strebel, 2009) which is also the case with stakeholders, as they need to be dealt with differently from the team (Kurtz, 2012). Since the manager is the only connection between an innovation plan and the organization, the skill of effective communication becomes more of a necessity then a want (Zulch, 2014). **U3** stated *"Nowadays changes are the norms in mobile telecoms, constant communication internally and externally must be effective during idea generation and the innovation process"*.

O11 affirmed *"In terms of managing change we take the lead during the change internally and externally, we orchestrate the process. At some point we didn't have the platforms and tools that facilitate communications wit our external partners during the change, we are in a better position here coparing to others"*.

Any successful innovation plan requires effective communication between two main groups of people: the team that initiates the plan and the stakeholders. The latter expect the presentation of the project's aims and objectives to be outlined on a project board which will also highlight overall progress made (Smithers & Long, 1972). The management must ensure clear directions to the team in relation to the tasks and activities they have to perform, whilst regularly reporting on progress (Bhatia & Bhatia, 2011; Smithers & Long, 1972).

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The participant **Z7** stated *"The focus on the coordination and follow-up procedures with the stakeholders involved during the change in order to achieve a smooth change and prevent resistance"*.

The various innovation models provide guidance for analysis which is sufficiently understood in order to prioritize the tasks that have to be allocated among the parties involved. The higher management do not need to know every small detail, and usually have details of the progress made by the innovation plan communicated to them, as well as important matters such as budget limitations and other technicalities (Kurtz, 2012). Therefore, an innovation management plan is developed that organizes and documents the communication that is expected to take place. For the project in hand, a communication management plan should provide information on a wide variety of activities (See Table 6.1).

Table 6.1: Key Activities of Communication Management Plan
• The requirements on the part of the stakeholders, in relation to the innovation plan, to provide the appropriate information as per the demands made by the stakeholders (Kurtz, 2012).
• Planning regarding that which has to be communicated, which will include the format, details, and content (Lester, 2007).
• A proper pipeline through which the information will flow between the team members throughout the project. This includes generating the information, who needs to obtain that information, and what are the types of information that are needed (PMI 2019).
• Proper use of communication channels such as emails, reports and memos (Senescu et al., 2013).
• A well-developed schedule for meetings and other regular communications (McCormick, 2012).
• A monitoring process that determines when the issues need to be resolved by higher-level management because the low-level management fails to resolve them in the event of resistance or any other complications (PMI, 2014).

- Creating, utilizing, and managing the information needed for the innovation process (McGregor, 2018).

- Guidelines for updating the communications management plan on the basis of the progress made by the innovation plan (Piscopo, 2015).

It has been shown throughout history that organizations that happen to have a core competency seem to adopt innovative changes easily (Kotter & Schlesinger, 2008). Yet quite the opposite happens if they ignore the need for change and their core competency becomes their core reluctance. No matter how big or small the innovation initiatives are, their success invariably depends on the behavior of the management. Failure occurs not just because of a lack of communication but also because of a poor choice of innovation model.

The models are highly differentiated based on constraints of time, the scope and nature of the innovation, and cost. From the increase in the failure rate of change in organizations, it clearly emerges that the concept of change is not yet understood by organizational management. Resistance is not necessarily an evil thing (Moran & Brightman, 2000); it can also provide an opportunity for the management to understand not only the process of innovation and the change it brings about, but also how it could provide success in the long run. Any complex organization becomes affected by both internal and external factors that might include:

- The market atmosphere and position of the organization.

- The ranking the firm has within the market.

- The position of the organization as regards the technological aspects.

- Governmental laws, rules, and regulations.

- Society, the economy, and other factors.

6.2.3.2. Resistance for Innovation Change

The timing of the initiatives for change that are demanded by innovation is largely dictated by the environment in which the organization exists (Andriopoulos, 2001; Birkinshaw et al., 2008), or indeed by specific organizational developments (Greenwood & Hinings, 1988). The reason for change can be a number of issues. It might be that the top-level managers deem it necessary, that the organization seeks to acquire certain core-competencies or indeed other factors, such as.

- Innovation for organizational growth (Garicano & Wu, 2012).
- Communications, electronics, consumer demand and markets, and speed of completion as to the technological aspects (Castelli, 2012; Fisher & Atkinson-Grosjean, 2002b)
- Globalization, which is responsible for information, money and goods moving around (Reiche, Stahl, Mendenhall, & Oddou, 2016). It is also responsible for shaping a market and for the rise and downfall of market leaders (Birkinshaw et al., 2008).
- Changes in practices, which are taking place faster than ever.
- The Speed-Product life cycles which used to be measured in years are not being measured in months and in people's lives in which we run as fast as we can just to keep it up (Agarwal & Gort, 2002; Dobers & Hesse, 2009; Hayes & Wheelwright, 1979; Niemann et al., 2009).
- And the managers who seek stability and order are creating more complexity and paradox as a result of the changes.

Innovation brings change and change brings resistance. In this context, resistance is that

which is aimed at any phenomenon that hinders a process, either at the beginning or during the development that seeks to maintain the change (Pardo Del Val & Martínez Fuentes, 2003). Employee resistance can assume dimensions (Strebel, 2009),

- Formal (Employee and Employer relationship).

- Psychological (Individual personal commitment to him/herself and to the company's objectives).

- Social (Organizational Culture, assessing whether what is claimed by the company actually exists).

Throughout history, the major cause for the failure of initiatives for change has been resistance to change (Folger & Skarlicki, 1999). Resistance can be used as a standard of evaluation as to where the company stands, because resistance is capable of highlighting the fragile aspects of an organization which were otherwise invisible to the manager. Resistance to change is not the fundamental problem to be solved. Rather, any resistance is usually a symptom of more basic problems underlying a particular situation. As per Judson (1996) resistance can therefore serve as a warning signal determining the timing of technological change.

Ever since the age of industrialization, the level of competition has risen with every year that passes (Bernasconi, 2005; Haigh, 2014). It is no surprise that there was a time once when organizations met the need of customers. However, in this modern era where the most obvious and imminent change is technological (Hekkert et al., 2007), companies not only fulfill but also create the customer's demand through the tool of innovation (H. W. Chesbrough & Appleyard, 2007a). As for the companies that lack this asset – they just tend to keep going and

survive by any means necessary (Senge, 1997).

According to Peter M Senge (1997), "*It is not merely enough to survive*". Organizations that wish not only to survive but also to thrive and obtain growth tend to take a proactive, rather than a reactive, approach and give preference to the organization acquiring knowledge and skills, as well as embedded innovation (Adams et al., 2006; Schott & Sedaghat, 2014). Time and again the one thing change initiators fail to realize is that for any innovation to take place, they need to have a workforce that not only anticipates change but also prepare itself for it (Roos, Fernström, & Pike, 2004) and in order to become a kind of organization which implements innovation and change one has to become a learning organization (Capaldi, 1992; March, 1991).

A learning Organization is one while encourages the creation of knowledge and innovation through exchanges of ideas and experiences (Capaldi, 1992; Choppin, 1997; Mohr & Dichter, 2001). A learning organization encourages its workforce to question established patterns and to experiment on their own, which is the very essence of innovation. They are organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together (Argote & Miron-Spektor, 2011; Leaton, 1991).

A learning organization is a place where people know their true potential and the value of their contribution in an environment where critics are welcomed, and open feedback is given (Bayraktar, 2019). A culture in which steps leading to instant failure are taken in a struggle to save time which also enables them to reach success in minimal time.

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Picasso said, 'good artists borrow, great artists steal'. In order for an organization to gain a level at which they can actually steal their competitor's ideas (because most companies have their own edge owing to their innovative steps, but their main ideas are already in existence) and gain competitive advantage, one must have a workforce with sufficient skill and knowledge to pull it off (Daft, 2007; Rivard, 2002). An organization needs to expand its level and look for employees who can do what they desire, even if this requires diversity.

Globalization is responsible for many competencies and most innovation initiatives companies take involve internationalization (Knobel, Patricia Simões, & Henrique de Brito Cruz, 2013; Kramar, Evans, Pucik, & Barsoux, 2004; Tadaki & Tremewan, 2013). Internationalization is the process of creating a product that is capable of meeting the needs of customers in countries other than that in which the company operates (Buckley & Ghauri, 1999).

We are dealing here with a systematic process of moving the market from local to international platforms, increasing sales, and reducing the cost of manufacturing (Buckner & Stein, 2020). This process can further lead to globalization and may affect the economy of the entire country (J. Knight, 2004). Internationalization has gained popularity among local companies over the past few decades and is the long-term goal for every organization that operates domestically (Keohane & Milner, 1996).

If a national organization goes multinational it will embark on a series of complex actions which will create resistance (Lewis, 2014) at every turn, as many employees with less awareness and narrow minds tend to react to the plan in which they have to work with people of other religions and nationalities, given that a large-scale organization definitely requires

diversity.

Diversity will necessitate a common language which is to be spoken in the organization (Reiche et al., 2016), and it has to be a language generated from a well-established organizational culture (Allison & Martiny, 2008). Wellbeing and efficiency are at risk where the organization leans towards diversity (K. M. Thomas et al., 2004; R. Thomas & Hardy, 2011). Resistance at such a level can be a brutal experience not only for the managers, but also for the company's organizational health, as employees resist by absenteeism (Uwannah, 2015) and the quality of work deteriorates with every increasing the cost and in the turnover rate (Olsen, 2016).

Employees with incentives such as targets and bonuses tend to work well even if they do not speak a common language, but they know the language code of the organization (K. M. Thomas et al., 2004). Obtaining feedback from employees with each initiative might work well, but the feedback relating to change has always been obtained from the stakeholders and not from the employees (Lewis, 2014; Strebel, 2009b). As a result, probing the change in question is not enough and it can never be as precise as one would wish, because if employees are asked they will not provide a true picture owing to social and political pressures (Airo et al., 2012). Communication is a factor which can never be explained enough, it is the root to all successes and failures. By "communicating" we actually mean that communication should be part of the organisation's culture, which makes for a better understanding of knowledge management (Shoham & Perry, 2009).

Knowledge management is a phenomenon which implies that the right knowledge to the right person at the right time and right place can be beneficial to a degree which leaves all

parties satisfied (Dalkir, 2011, 2013; Gold et al., 2001; Management, 2003; Project Management Institute, 2008; Teece et al., 2009). It means that the management, employees and customers will be satisfied as to what has been dealt with efficiently.

To elaborate further on this issue, it can be anticipated that for a change plan to work and not face any resistance, proper knowledge of the matter in question has to be obtained, as the lack of knowledge will raise resistance and conflicts to an unrecoverable level of damage to the organizational structure (Yilmaz & Kilicoglu, 2013). Knowledge management drives the organization towards a path of profitability, innovation, improved efficiency, and core-competency (Shah & Steinberg, 2019),

It is not entirely true that employees resist change (Oreg, 2003). A company that has been in a position where it has taken successful initiatives for innovation is less likely to face resistance (Self & Schraeder, 2009). Resistance develops on a low level, and if it ignores the micro-indicators to that effect the management unintentionally heralds a bigger storm. However, reacting to every signal of resistance gives the management the appearance of a bully (O'Connor, 1993).

Salesman and Author, Zig Ziglar said, "There is only one thing worse than training employees and losing them, and that's not training them and keeping them". Training of employees invariably proves to be extremely beneficial to the organization (Nyerere & Friso, 2013). Trained and experienced employees are empowered and confident enough to deal with serious issues such as change (Sánchez-Prieto et al., 2019b). Hence the management tries to train its employees in such a way that normal innovational initiatives do not cause any discomfort to the employees as they remain prepared to deal with such events because they are

capable of predicting the change that follows those initiatives caused by embedded innovation.

One of the steps taken by the management to tackle resistance is to provide employees with a sense of security (Yilmaz & Kilicoglu, 2013), because some innovative schemes result in employee turnover (Morrell et al., 2004). This is done by launching career growth schemes (Weng et al., 2010) which not only give employees confidence but also the hope of a better future career provided they train in order to accommodate the change and the obstacles it brings with it. The other way to deal with resistance is to motivate and compensate employees (Manso, 2011).

Employees become demotivated merely because they have to change their way of working (Hon et al., 2014) and because the new initiatives for innovational change will inhibit their way of working. The other major reason is the interaction with their colleagues. This is the human factor. When asked what are their most precious moments in the workplace it has always been the company of peers and the memories they share (Hon et al., 2014). So, given that innovative initiatives tend to transform the current environment into the kind of environment that is needed to make it a success, that environment may not have the space for "older hands" and could call for new blood, given that the latter brings energy, ideas, and quality as well as quantity (Collins & Kehoe, 2008; Gaillard et al., 2008).

It is a proven phenomenon that in order to motivate employees, the best strategy is by compensation (Dayan & Balleine, 2002). Cash had been and always will be the ultimate source of motivation for employees. On the other hand, many employees are not seduced by money – they require benefits (modern technology and equipment) and services (peon, driver, etc.). To any competent management, it comes as no surprise that, when introducing new innovation

plans, one must provide better salaries or at least a reward system that motivates the employee sufficiently to ensure that he/she will try to cope with the situation (Castelli, 2012; Wood, 2000).

The height of immaturity occurs where an initiative is taken, and the management just believes that everything will go as planned. Motivation is of ultimate importance in the modern business environment, as it has a critical part to play in achieving the organization's goals. Motivation includes giving close attention to the employees and discovering how they can be motivated (Armstrong, 2006).

Where we refer to plans for change, we mean innovative steps taken by the management in order to obtain a competitive advantage. Employee resistance creates a wall between innovation and success. Hence, expecting resistance while planning to prevent or avoid it has to be one of the issues which that management should keep in view (Zwick, 2002).

Embedded innovation demands a relationship between management and employee which is called industrial relations (Cholette, 2017; Crouch, 2010; Etzkowitz & Leydesdorff, 2000). Management has to deal with employees' trade unions, which are established in the name of employment rights and strictly follow the applicable labour law (Deming et al., 2016). For every step management takes, they take into consideration the trade unions' view in order to prevent resistance in the form of lockdown and strikes.

From an industrial point of view, the only action capable of creating resistance is a failure to provide a basic need, which many refer to as merely three factors – food, clothing, and shelter. So when the management uses the tool of innovation to introduce new policies and plans for a better industrial or organizational structure, without giving preference to the

demands of labour and imposing new plans without providing the necessary incentives, there can be no doubt that this creates havoc among the employees and resistance is born (Strebel, 2009).

The worst part of this is that even though management anticipates such a response from employees, they do nothing to prevent it (Folger & Skarlicki, 1999; Lewis, 2014; Strebel, 2009). Turnover rates increase, profits turn to losses, companies go bankrupt, and the act of innovation which intends to provide growth, instead provides decline in the company's status. This condition indicates a level of pure incompetence in the part of the leadership (Hon et al., 2014). Hence a leader acquires the dimension of the pumping heart of an organization who knows which area of the organizational body needs blood.

The importance of effective leadership can never be overestimated as the entire base of an organization is built on it. The success or failure of any innovation plan depends on, firstly, the leadership, and then on the employees (Bovey & Hede, 2001; O'Connor, 1993; Strebel, 2009). The leadership cannot just create innovative changes and then expect others to follow. The leader needs to balance the change with the culture and provide a visible path to pursue (Smith, 2006).

Leadership styles matter a great deal here, and with each aspect of innovation there is a different leadership style to follow (Crossan & Apaydin, 2010; Gumusluoglu & Ilsev, 2009; Rosing et al., 2011; Vilà, 2007). Let us assume that the organizational environment calls, not for a strict, but for a cooperative leader, then the latter takes on a servant or participative leadership style. Transformational leadership is required when employees need an icon to follow, they need a motivational role model rather than compensation (Yammarino & Bass,

1990). The idea is to apply as many styles of leadership as possible at different levels of the organization for the better achievement of the company's goals (Erwin & Garman, 2010).

The leader's task begins when he/she decides to initiate an innovative plan and wants no resistance to it. The core factor of the communication gap needs to be kept in view here. A communication gap can be filled by communicating the vision set by the innovation plan and the way in which each employee's efforts contribute towards that achievement (Vilà, 2007). In so doing, the employees will get to know their worth and how their efforts are necessary in order that the vision may become a reality.

It is the duty of top-level management to balance human and organizational needs (Bovey & Hede, 2001). The employees should know that the management cares for them as much as they care about their own organizational need. Since the core aspects related to innovation are intellectual capital and resistance that the innovation brings, the relevant literature will primarily focus on what innovation is needed, whilst at the same time explaining the various innovation systems and their models.

6.3.2. Lack of Customer Trust

The trust element in such an innovation culture is very crucial (Andriopoulos & Lewis, 2009). Probst, Raisch, and Tushman (2011) discussed the basic characteristics of the organisations' ambidextrous thinking and regarded the trust as an essential element for building healthy, professional relationships with stakeholders. Sometimes lacks an autonomous

teamwork signifies the framework that operates under a trust-based, open friendly environment and nurtures effective and constructive relationships (Raisch & Birkinshaw, 2008).

Mobile telecom representatives from the three focus groups (See *Section 4.4.3*) agreed that *"trust is a major issue in the mobile telecom industry, especially in innovation activities"*. The norms such as the trustworthy, creative, and participatory style create cohesion among different organisational actors, consequently creating a sense of commitment and belonging, however, according to a start-up representative from the focus group stated: "*some stakeholders don't collaborate because they don't trust big firms"*.

Trust relates to mutual exploitation and exploration of ideas to set the basis for an innovative organisational culture (Ferrary, 2011). These interconnected associations are construed in a cooperative attitude integrating current and new knowledge into innovative process, service, and product development. Salampasis, Mention & Torkkeli (2014) argued that the role of trust in the propensity and openness to innovation is inevitable. It breaks the barriers within the organisation and facilitates the idea transfer through informal and formal communication channels. The creative communication with the internal and external organisational partners results in the establishment of a collaborative culture, which is a step towards embedded innovation (Salampasis, Mention & Torkkeli, 2014).

After conducting the three focus groups, the researcher found that participants mentioned that the three mobile telecom operators asked customers with non-smart mobile phones to "*disconnect their service if they don't upgrade to smart phone device*". The mobile telecom operator representative explained "*the purpose of such policy is to understand our customers*

better and for customers to take advantage of the services they offer". From the customer perspective it is seen as a form of greed and financial gain "*they are trying to make more money from us, so they can market their products and monitor us. Such policy could have an impact on all non-smart mobile users for example in Jordan most self-employed and small business owners use these prepaid non-smart phones to receive phone calls as they don't like landlines and much cheaper but now they want take this from us"*.

Jordan's three mobile telecom companies were told by the ministry of industry to terminate policy of disconnecting prepaid (pay as you go) lines the day following the expiration date as it disturbed the "market mechanism and free competition". Focus group participants stated such policy could limit subscribers' options. Focus group **U2** customer said *"previously the three mobile telecom operators granted us to get incoming calls even after one month of the subscription's expiration date, in order to get the service back we have to immediately top up our phone"*. TRC had referred the complaint to the trade and supply and had called the mobile telecom providers to end such policy based on the competitiveness law which prevents competition.

Another challenge when engaging in innovation is the dramatic changes that accrue during innovation such as processes and routines. According to the innovation officer from Umniah said "*our main challenge we face from other telecommunications operator is they want to dominate the whole market due to their strong connections with the government and communications channels"*. Participant **O1** said, "*Building new value chains and collaborating with potential Co-operators must be authorised by the head quarter in France*". However, the study has found that all the organisations under discussion are keen to engage the public.

They are taking different initiatives to collaborate with stakeholders. In addition to this, participants **Z5** & **Z6** revealed

"*We are unable to identify uncertainties during service innovation activities from multiple perspectives, firstly the government could stop the project from developing further for national security or change of government policy, from competitor's perspective a similar service in the local market or internationally is dominated by the certain provider which they refuse to collaborate with us because of trust concerns*".

For example, "*From the partner's perspectives the co-operator needs to deliver what they promise us, occasionally fail to do so*". In addition to this "*start-ups don't want to engage with us due to the lack of trust property especially when they have new ideas*". Start-ups from three focus groups have agreed with the statement above and confirmed that trust is a huge problem that start-up face in Jordan. Start-up participants from Orange (In **Focus Group 1**) stated "*start-up would rather join the small business in developing ideas because they can file patents during the R&D process but with large firms it is impossible*".

Innovation officer from Zain (**Focus Group 1**), confirmed "*when we collaborate with star-ups, they have to sign a document stating that we have the intellectual property of the idea because at the time you don't know the business value of such an idea, but we take the risk and it's an investment for us*". Participant **O6** added "*for most of the idea development it is necessary to report to the headquarter board regularly which time consuming for us, they review our progress and analyse it daily*". Umniah innovation officer reported "*internal challenges such constructing the R&D had an impact on their innovation development, our counterpart orange and Zain have been in the market before us with the advantage of experienced human capital, Umniah didn't have the experienced staff members at the time, however, managed to attract talented staff from Zain & Orange because of how HR promoted themselves in the job market by promoting security and trust*".

Another issue is the lack of country infrastructure capabilities, such as shared data platforms where companies can analyse customer behaviour for innovation services, for example, big data, and cloud computing. Umniah customer service officer revealed "*every firm has their own innovation network for developing innovative services and serve different type of customers. However, Zain benefited from collaborating with the government, local authorities and influential large firms in Jordan, also Zain benefited from using local resources for R&D*". The Innovation officer from Orange (Focus Group 3) added "*an external collaboration between R&D in Orange and the ministry of telecommunication & IT, TRC benefited Orange to build links with the government than to be considered as the main service provider*". In contrary, Umniah entered the market last and struggled to establish partners or even customers. This has resulted in giving out free products and services to customers. This approach is generally accepted and positively rewarded by society, however it is essentially flawed. Simply donating products and services enhances the sense of a lack of ownership but on the other hand products often get misused and are not maintained.

One of the solutions to this problem is employing embedded innovation. Instead of focusing on the latent needs that ought to be fulfilled, Umniah later embedded innovation systems and focused on latent potential. The latent potential is determined by building relationships with the local community, stakeholders, partnerships etc. These creations are meaningful relationships that enable a corporation to build trust and develop a sense of belonging in society and with stakeholders.

The building of a relationship enables the organisation to determine consumer needs and to protect their client base from cheap knockoffs which consequently builds the consumer's loyalty. The embedded Innovation system creates a give and takes relationship in society.

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The firm provides a solution, and this enables other enterprises to come up around the solution provided (Simanis, & Hart, 2008). This leads to the creation of a local economy adding value to the lives of the community. It also builds a sense of responsibility and creates an awareness of the community members on the part your organisation has in the development of growing brand loyalty.

6.3.3. Lack of Customer Co-Creation Policy

The service co-creation is not achieved by the firm itself, but as a result of its collaborative process involving a number of actors and influences by end users. (Phillips et al., 2006; Chesbrough, 2004). Zain is mastering the service co-creation collaborative process because it plays an important role in successful EI. In the case of Zain, it has entered into a service cocreation process by combining Jordan's operation with the Palestinian operator PALTEL. It was evident that Orange achieves service co-creation through firm learning within networks from stakeholders and with an exchange of information and ideas not only flowing inwards but, also, outwards from Orange. Focus group 3 participant explained that Co-Creation isn't limited to end users exclusively for example "*Orange's E-shop provides consumers attractive pricing plans and delivers their services via Aramex with a two-working-day delivery guarantee. BCashy, a cash-on-delivery payment service, has collaborated with Orange. Customers may use Orange's E-shop to purchase mobile and fixed service plans, devices, and accessories, and then pay cash on delivery. Orange caters to a broader range of consumers, including prepaid customers without bank cards and those who want to pay in cash after getting a product or service rather than online. During the start of the Covid-19 pandemic, the telecom introduced its MFS service, dubbed "Orange Money," to allow consumers to quickly replenish their prepaid allowances and conduct multiple transactions*".

Orange has joined with FATE Exports for access to their services. Umniah pursues this approach with all stakeholders as part of the innovation process. However, other actors are isolated from the decision-making process. In case of Umniah, they understand the worth of service co-creation and have joined liaised with Plug and Play, a California-based start-up accelerator, to reach young entrepreneurs. Focus group 2 participant affirmed that co-creation from Umniah's perspective " firstly we wouldn't be able to deliver innovative services without our strategic partners for example all of Umniah mobile plans and services are available through the company's online store, data allowances have been added to some pricing plans, customers can buy online by using master card. In addition, the telecom provides free home delivery and a money-back guarantee. Customers can also use Umniah's MFS application, Mahfazti, to top up their prepaid lines and make other transactions.

6.4. Final Framework & Theory Building Process

In this section, the researcher explains the process through which he developed the final theoretical framework that fills the research gap and contributes for the firm-level innovation theory. As explained in Chapter 1 & 7, the key theoretical contribution is theorizing the process of EIS by mixing the theory of Firm-Level Innovation by Hassink (2001) and the Agile/Embedded Innovation Paradigm by Simens & Hart (2008).

This research followed Eisenhardt's theory development model. In doing so, the researcher started the study by identifying the research problem that lays in the lack of

understanding of EIS and how it could be applied by Jordanian Telecoms and other service organisations that have similar characteristics.

Then, the researcher set initial research questions to guide his literature review. Based on the key concepts and research words from the problem definition, the researcher used three research databases to conduct the literature review. The review findings helped the research map the key concepts, definitions, models, and theories.

Based on the review of the top cited models of IS , including open innovation, inclusive innovation, quadrable helix, organisational ambidexterity, and the regional innovation support system. The key merits of each model have been identified the possibility of each one towards being a lens for agile/embedded innovation systems. (See *Table 2.2*). The regional innovation support system best fits as a conceptual lens due to its ability to achieve "Transformational Stakeholders Engagement", "Focuses on customer's Needs", "Relationship-Based Value Creation", "Business Intimacy in the Business Environment". The end of *Section 2.6* and *Figure 3.1* provide *Framework 1*, which is called a conceptual framework for EI.

However, the researcher dedicated **Chapter 3**, to explore the top cited theories of innovation systems to enhance the conceptual framework and turn it into a *proposed theoretical framework* (Van De Ven, 2007). *Framework 2* offers a firm-level embedded innovation system as an iterative process. This framework found the best fit to offer a theorization of the firm perspective of how several stakeholders get engaged/embedded in the service innovation

process. ***Framework 2*** was the base for the data collection and the deductive coding for the interviews and focus groups transcript.

The data collection out of semi-structured interviews and focus groups were the third stage in the theory building process. Starting from the archival analysis, the researcher managed to frame the research background and the key characteristics on telecoms innovation in Jordan. The case selection and justification of this selection was a key activity in the third stage.

The fourth stage of theory development was the inductive (tree and advanced) coding of the interviews and focus groups transcripts. ***Framework 3*** (See Figure 6.3) represents the final theoretical framework for process-based firm-level embedded innovation systems. The researcher found new factors that shapes the implementation of firm-level embedded innovation systems. Factors such as bridging ties and CSR was quite evident during the COVID-19 crises. The Jordanian Telecoms played a critical role in tracking the first wave of the pandemic and transforming the start-ups with advanced technologies.

The discussion of the key drivers of embedded innovation systems revealed important factors such as "*intellectual capital of innovation knowledge*". As shown in ***Figure 6.3***,

Figure 6.3. Firm-Level Embedded Innovation Systems

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intellectual capital increases based on the four elements of the embedded innovation systems. Because intellectual capital includes human capital, structural capital, and relational capital, it could arise from several sets of the four elements of firm-level embedded innovation systems.

Framework 3 clearly defined the drawbacks of disembedded innovative systems. Based on the literature, this framework explains the shift from a disembedded to an embedded framework. It has been well defined in this study that an embedded innovation framework suits the Jordanian telecom sector best. The study has focused on the factors associated with the proposed framework, which includes innovation support systems (technology transfer, chamber of commerce, start-up, since and technology parks), business environment and embedded innovation (Labor market, competitors, supplier, customers) as well as internal factors (innovation and core competency, skill and qualification, financial resources, strategy and attitude). The study has proposed that this framework should apply in Zain, Orange and Umniah for innovation purposes, and is supported with reference to the literature.

Whereas, after communicating with managers of the Jordanian telecom sector, the latter explained some issues that required this study to incorporate few more factors that are i) bringing in ties (this includes the role of strengthening relationships with each other, ii) service cocreation (this includes the emergence of innovative ideas while operating cocreation of services with stakeholders), iii) Public engagement (this includes engaging the public for innovation purposes, iv) Social innovation (this includes the rule of social work, campus and services for innovation), v) Management of inheritance (inheritance management is the systematic method of using the assets that have been carried down by the previous leaders, and using those assets in a manner that would benefit the organization), vi) Financial services

innovation (this includes the financial service innovation project that aims to promote financial services and products that not only construct new financial structures but also provide the customers with the financial interactions), and vii) Corporate social responsibility (this includes corporate social responsibility aimed at the acts of the company that facilitate the society and the telecom organization). Moreover, the added factors are listed below for more of a clearer view. Based on the above-mentioned factors, the study has proposed a new theoretical framework that would help to understand the embedded innovation systems in the Jordanian telecom sector.

Conclusion

This Chapter offer the critical stage of theory building where the research findings are compared with the literature review to identify the research contribution (See *Figure 6.3*).

Section 6.1 discusses how the three telecoms implements embedded innovation systems in their business/production environment. Then, how these Jordanian telecoms create innovation support system and R&D infrastructure. The internal factors such as partnership and customer co-creation have led to the emergence of new factors. Corporate Social Responsibility found evident in creating an embedded innovation system in Jordanian Telecoms. Personal ties and extended professional networks for telecoms professionals found critical in Jordanian Telecoms sectors as a developing context.

Section 6.2. discusses the key drivers for implementing embedded innovation systems and raises the issues of competitive advantage, intellectual capital, social innovation, and financial service innovation.

Section 6.3 discusses the challenges of implementing the embedded innovation systems by raising the lack of trust, challenges of service co-creation, and managing the innovation change process.

Section 6.4 demonstrates the overall theory development process, including the *conceptual framework 1*, the *theoretical framework 2*, and the final *firm-level embedded innovation framework 3*.

Chapter 7: Conclusion & Research Contribution

Introduction

This Chapter summarises the overall research contribution and demonstrates the way the key research questions have been answered along the secondary and primary research stages. Then, it offers future recommendations on how to improve the research quality and operationalise the practical findings into future cases for embedded Innovation in telecoms.

The conclusion is the final chapter of the paper in which the whole cause of the research is summarized under a single heading. With the presentation of research methodology and how it helped in the conduction of the data collection process the chapters above stated the findings of the study that game as a result of an in-depth analysis due to which the objectives of the study got fulfilled.

The conclusion also highlights how the research has fulfilled the knowledge gap that was critically derived from the literature in the selected area and how that filled knowledge gap can benefit methodological, conceptual, and theoretical contributions in the research. Furthermore, the limitations of the study are also stated which gives an inside into what the future study can be. The chapter finalises after giving the recommendations of how the concerned parties can improve what the research is based on.

7.1. Answering Research Questions:

7.1.1. Sub-Q1: Embedded Innovation Systems from a Firm-Level Perspective

The background section in ***Chapter 1*** presents the first answer for this Sub-RQ. In doing so, a brief about the Jordanian telecommunication market is discussed.

Chapter 2 presents the second part of the answer along five sections. *First section* introduces the key concepts of Innovation, the following section further describes and explains the various variables and terms in this study with reference to earlier scholars. The *second section* contains an in-depth assessment of the concept of service innovation, its characteristics, innovation systems and the application of embedded innovativeness. The *third section* explores the common definitions of innovation systems, its elements and the impact of systems thinking on the service innovation.

The *fourth section*, explains the top cited models and scholarly schools of thoughts in the area of service innovation systems, including (II), (OI), hybrid model, Quadruple Helix, Organisational Ambidexterity, and regional innovation support. The advantages and disadvantages of each model is discussed, and a justification audit is provided to explain why each of them have been considers and why it has not been enough to guide the data collection and the rest of the study.

The *fifth section* elaborates the process of implementing of (EIS). In doing so, the research follows Simanis & Hart (2008 & 2011) embedded/agile innovation paradigm to compare between the abovementioned models of innovation systems.

The last attempt for answering this question, is presented in ***Chapter 4***, where the case selection is justified, and the research participants are listed following a stakeholder analysis of the Jordanian telecommunication sector. The critical telecoms professionals highlighted in the embedded innovation system are R&D executives, Marketing executives, finance executives, customer relationship executives, and operations executives.

7.1.2. Sub-Q2: The key elements of Firm-Level Embedded Innovation Systems

The first part of answering this sub-RQ is presented in ***Chapter 3*** where four elements of firm-level innovation system are presented.

This chapter extends the theory building process by reviewing the top cited theories on the innovation systems literature, including Normative theories of Innovation, analyses different mechanisms/factors affecting the firm innovation system and identify important variables from the existing innovation literature to set the theoretical foundation for the underlying research. In doing so, the researcher audits candidate innovation systems theories, explain each of them, and address their fit as lenses for understanding the social phenomenon of embedded innovation system. models and emerging concepts to extract the most relevant elements/factors of embedded innovation systems that guided the fieldwork. The insightful

discussion of different innovation theories, including models and concept will be based to conduct the empirical investigation and analyse the Jordanian telecom market.

The chapter firstly discusses the open innovation theory, its limitations and strategies to overcome the associated limitations. Afterwards, the latest open-inclusive innovation theory is discussed, and the researcher demonstrates how it differs from the open innovation and what are the possible limitations. The justification for going beyond the open innovation will be discussed and researcher will justify why contemporary organisations must embed the innovation to enhance the value. Finally, the theoretical framework 1 is presented and critically evaluated.

The second part of answering this Sub-RQ2 is presented in **Chapter 4** where the deductive and inductive coding is conducted to draw the elements of embedded innovation as perceived by the telecoms' executives.

The third part of answering this Sub-RQ2 is presented in **Chapter 6**. Section 6.1 discusses how the three telecoms implements embedded innovation systems in their business/production environment. Then, how these Jordanian telecoms create innovation support system and R&D infrastructure. The internal factors such as partnership and customer co-creation have led to the emergence of new factors. Corporate Social Responsibility found evident in creating an embedded innovation system in Jordanian Telecoms. Personal ties and extended professional networks for telecoms professionals found critical in Jordanian Telecoms sectors as a developing context.

Framework 3 clearly defined the drawbacks of disembedded innovative systems. Based on the literature, this framework explaines the shift from a disembedded to an embedded framework. It has been well defined in this study that an embedded innovation framework suits the Jordanian telecom sector best. The study has focused on the factors associated with the proposed framework, which includes innovation support systems (technology transfer, chamber of commerce, start-up, since and technology parks), business environment and embedded innovation (Labor market, competitors, supplier, customers) as well as internal factors (innovation and core competency, skill and qualification, financial resources, strategy and attitude). The study has proposed that this framework should apply in Zain, Orange and Umniah for innovation purposes, and is supported with reference to the literature.

Whereas, after communicating with managers of the Jordanian telecom sector, the latter explained some issues that required this study to incorporate few more factors that are i) bringing in ties (this includes the role of strengthening relationships with each other, ii) service cocreation (this includes the emergence of innovative ideas while operating cocreation of services with stakeholders), iii) Public engagement (this includes engaging the public for innovation purposes, iv) Social innovation (this includes the rule of social work, campus and services for innovation), v) Management of inheritance (inheritance management is the systematic method of using the assets that have been carried down by the previous leaders, and using those assets in a manner that would benefit the organization), vi) Financial services innovation (this includes the financial service innovation project that aims to promote financial services and products that not only construct new financial structures but also provide the customers with the financial interactions), and vii) Corporate social responsibility (this includes

corporate social responsibility aimed at the acts of the company that facilitate the society and the telecom organization). Moreover, the added factors are listed below for a clearer view

Based on the above-mentioned factors, the study has proposed a new theoretical framework that would help to understand the embedded innovation systems in the Jordanian telecom sector.

7.1.3. Sub-Q3: Drivers & Challenges of EIS

7.1.3.1. Drivers of EIS

The first part of answering this Sub-RQ3 is presented in *Chapter 5* and then extended in *Chapter 6*. Enhancing competitive advantage, social innovation, intellectual capital, and financial service innovation.

Competitive Advantage: This section is mainly based on firm's perspective for gaining further insight. As discussed in *Chapter 5*, Innovation considered extremely importance for preserve of competitive advantage. However, recent researchers contend that Innovation theory has lost its relevance with contemporary era to a great extent. Today, we are living in an era where digitalisation of information has made it almost impossible for organisations to attain and sustain embeddedness, competitive advantage in the long run. Recent theories emphasize on innovation and collaborative innovation. The theorists contend that it is not possible to

develop the innovation in a vacuum (Adner, 2006). They further argue that EI requires a complicated structure of supportive technologies, infrastructure, stakeholders and services that an organisation cannot handle without collaborating with other parties. The debate is not only a hot research topic in academia, but, contemporary organisations pursuing innovation are also showing extreme concern, as their survival in a highly turbulent environment has become challenging than ever before. These organisations are struggling to choose between the collaborative innovation strategies or EI. In latter case, they can probably miss out the advantages of supportive partnership and collaboration with customers, suppliers and competitors.

> *"Competition is essential to the innovation process and to capitalist economic development more generally. But so is cooperation. The challenge to policy analysts and to managers is to find the right balance of competition and cooperation, and the appropriate institutional structures within which competition and cooperation ought to take place."* (Teece, 1990, p. 1).

The high competition development of service innovation in Jordan, has provided mobile telecoms with opportunities to provide customers new services, by embedding the end users in the innovation process. Mobile telecoms in Jordan now aims to embed innovation to achieve customer retention. Customers now engage in workshops conducted by mobile telecoms in order to understand customers better, the embeddedness success within mobile telecoms depends on how can maintain and establish sustainable collaboration with their stakeholders either formal or informal. Orange regard customer requirements as being the firm's first priority and class the customers as the spirit of embedded innovation.

Major corporates from various sectors in Jordan seeks to collaborate with mobile telecoms to develop bespoke develop programmes and applications for them, more specifically financial firms and banks. The market condition is encouraging and beneficial for mobile

telecoms take advantage of market opportunities however, mobile telecoms are facing many issues such as high taxes, Mobile telecoms response to such issue is they are trying to make the Jordanian government responsible for innovation and stating that high taxes hindering innovation. Umniah are embedding innovation in everything they do and innovation is everyone's job, referring back to the findings Umniah is building networks multiple sectors in Jordan with a core strategy based on embedding the innovation in each activity, now it has positioned itself as innovative firm in the financial technology within short period of time. Zain has always been a head in the industry because of it has a strong bond with customers and partners by providing them reasonable prices and staying up-to-date with innovation trends and by offering different requirements and customized services.

Social Innovation: as discussed in section 6.2.3, Adams and Hess (2008) define social innovation as an idea representing social change or a process that has distinctive preconditions and stages and those preconditions and stages can be understood and acted upon to promote innovation."

> *"The concept refers to the capacity of society (through not-for-profit organisations, charities, social movements and community groups, as well for-profit enterprises) to address needs unmet due to the failure or absence of markets or state provision. The nature of the 'innovation' can be in the content (what action is taken) or the process of provision (how needs are met)"* (Baglioni and Sinclair, 2014: 409).

To gain a competitive advantage, Zain took the initiative to support entrepreneurs in the region and named that project the Zain innovation campus (ZINC). The ZINC is first of its own kind in Jordan and it is equipped with the latest technologies to incorporate innovators and start-ups owners.

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Intellectual Capital: The research findings refer to the intellectual capital as one of the key drivers which is also confirmed in the entrepreneurship literature, but not yet in the innovation systems literature. In *Section 6.2.3*, the researcher discusses how intellectual capital as a driver for embedded innovation led to the necessity to manage innovation change knowledge as a source of intellectual capital. It is necessary to understand how innovation is developed by intellectual capital and its role. Furthermore, the resistance which can be occurred as a result of innovation is also necessary to understand because the concept of innovation, innovation systems, and the application of embedded innovativeness is of no use if they are not applied effectively and efficiently.

Intellectual capital brings innovation. Innovation brings change. Change brings resistance. And, and the effective use of models of innovation system can help to minimise resistance and ensure effective utilization of embedded innovation (Baden-Fuller & Haefliger, 2013; Sánchez-Prieto et al., 2019a). Therefore, the following sections will further explore the various variables and terms in the study concerning earlier scholars. The sections contain in-depth assessments of the concept of innovation, innovation systems, and the application of embedded innovativeness. The last heading of literature includes innovation system models.

The phenomena of companies struggling as organisms for survival within their internal environment are known as embedded innovation (Adams et al., 2006). The method of embedding with other organisms while focusing on employees--human capital (Hannah, 1987), customers-- relational capital (Al-Jinini et al., 2019a), and the organization--structural capital (Dumay & Garanina, 2013) is also known as embedded innovation. It cannot exist without intellectual capital which is a combination of all the components of embedded innovation.

The intangible assets with innovativeness, customer confidence, positive brand image, and organizational culture, with the addition of effective management skills, are called intellectual capital (Hanson, 1988). An extensive definition concludes the intellectual capital to be the difference between the market value of the company and its book value. Resources are based on the knowledge that contributes to the sustainable competitive advantage for the company (Ordóñez de Pablos, 2003).

An organization is comprised of two types of assets: one is called a tangible asset and the other an intangible asset (Kujansivu & Lönnqvist, 2007). Both types shape the organizational value and shape the company's competitive advantage (Guthrie et al., 2003). Intellectual capital is one of intangible assets that builds the company's know-how and readiness for innovation (Dahlgaard et al., 2019; Vuolle et al., 2009).

Intellectual capital is a tool that can be a grave threat to competitors (María Viedma Marti, 2001). For example, Microsoft, a multi-billion-dollar company, has shares which are of greater worth than its book value. It is the intellectual capital that Microsoft possesses which makes its share value greater than its book value (Penman, 2009). The same applies to Apple, known for not providing dividends to its shareholders, which has a high share value. Intellectual capital is what gives these companies the right to manipulate the shareholders' interests as per their benefits (García-Ayuso Covarsí et al., 2004).

In order to understand the concept of intellectual capital, one must perceive a business as a learning organization that consists of inventors of processes, products, and services (Edvinsson & Malone, 1997). Orange, Zain, and Umniah corporations developed a wide variety of embeddedness mechanism to facilitate sharing of innovation knowledge between the

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service providers and non-traditional stakeholders to enhance their overall competitive advantage, including customer's experience (Schiuma, 2001). So, in this research we argue that Intellectual capital is an invisible asset that shapes the knowledge flow among the key elements of the embedded innovation systems in telecoms.

7.1.3.2. Challenges of EIS

As discussed in *Section 6.3*, the implementation of EIS is a continuous process as found in the research findings. This process is not a water drop model than an iterative one that follows different paths in each telecom. The process is shaped by the surrounding environment and market conditions. Accordingly, it faces lots of challenges, but this section addresses the most important challenges that face the Jordanian Telecoms and the EI as a culture (Noordhoff et al., 2011).

This is the prime reason for conducting this research to fill the gap and make a substantial contribution to the existing innovation literature (Hassink, 2001). Review of literature has highlighted some studies that highlighted factors affecting the firms' efforts to collaborate with the community (Boyer, 2003). The main challenge in embedding the innovation is building a common understanding that mostly doesn't exist at an initial stage. However, a persistent effort to collaborate and facilitate the knowledge flow results into gradual evolution of mutual trust and shared understanding (Edquist, 2010).

Researchers also contend that existing organisational structure hinders the innovation embedding process as strict hierarchy and inflexible structure strongly resists the collaboration

with the external stakeholders through formal and informal communication channels (Simanis & Hart, 2008). Hence, a strong alignment between the organisational structure and innovation culture is a prerequisite for the embedded innovation (Noordhoff et al., 2011). Leal-Rodríguez et al., (2014) argued that the resistance from the inner organisational forces is stronger than the external environment while integrating innovation and creativity within a traditional organisation. It implies that before heading towards an embedded innovation culture, a firm should create an awareness among employees to minimise the internal resistance (Edquist, 2010). Insufficient research has been done by the previous researchers in the context of the telecom sector. The underlying research will empirically analyse the challenges faced by Jordanian telecom sector in embedding the innovation and enhancing overall performance.

Managing Innovation Change: Owing to factors such as embedded innovation (and some external factors), change is currently emergent, and in today's competitive environment it is almost impossible to even survive without accepting change (Dent & Goldberg, 1999; Senge, 1997). For that to happen there has to be an effective and efficient utilization of human capital. But there is another factor for change, and it is known to bring with it resistance, which is the opposite of innovation and progression (Strebel, 2009; Zwick, 2002).

Resistance is a phenomenon of which every organization is aware and is well known to the management as such, but they are unable to understand the true depth of this resistance and how to deal with it (Agboola & Salawu, 2010; Grama & Todericiu, 2017), because it not only destroys the work ethic of the organization but also impairs further progress. Therefore, an understanding of the change in question is as necessary as the understanding of innovation itself.

There are mainly three views as to what an organization is made of, Firstly, the organization is made up of routines. Secondly organizational actions are history dependent. Finally, organizations are oriented towards targets (Levitt, B.March, 2011).When it comes to innovation, one can say that change is the most desirable outcome the management hopes for – yet it is very hard to achieve (Allison & Martiny, 2008; Amabile, 1988).

Lack of trust: As discussed in *section 6.3.2*., the trust element in such an innovation culture is very crucial (Andriopoulos & Lewis, 2009). Probst, Raisch, and Tushman (2011) discussed the basic characteristics of the organisations' ambidextrous thinking and regarded the trust as an essential element for building healthy, professional relationships with stakeholders. Sometimes lacks an autonomous teamwork signifies the framework that operates under a trust-based, open friendly environment and nurtures effective and constructive relationships (Raisch & Birkinshaw, 2008).

Mobile telecom representatives from the three focus groups (See *Section 4.4.3*) agreed that *"trust is a major issue in the mobile telecom industry, especially in innovation activities"*. The norms such as the trustworthy, creative, and participatory style create cohesion among different organisational actors, consequently creating a sense of commitment and belonging, however, according to a start-up representative from the focus group stated: "*some stakeholders don't collaborate because they don't trust big firms"*.

Trust relates to mutual exploitation and exploration of ideas to set the basis for an innovative organisational culture (Ferrary, 2011). These interconnected associations are construed in a cooperative attitude integrating current and new knowledge into innovative process, service, and product development. Salampasis, Mention & Torkkeli (2014) argued

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that the role of trust in the propensity and openness to innovation is inevitable. It breaks the barriers within the organisation and facilitates the idea transfer through informal and formal communication channels. The creative communication with the internal and external organisational partners results in the establishment of a collaborative culture, which is a step towards embedded innovation (Salampasis, Mention & Torkkeli, 2014).

7.2. Theoretical Contribution

This research followed Eisenhardt's theory development model. In doing so, the researcher started the study by identifying the research problem that lays in the lack of understanding of (EIS) and how it could be applied by Jordanian Telecoms and other service organisations that have similar characteristics.

Then, the researcher set initial research questions to guide his literature review. Based on the key concepts and research words from the problem definition, the researcher used three research databases to conduct the literature review. The review findings helped the research map the key concepts, definitions, models, and theories.

Based on the review of the top cited models of Innovation systems, including open innovation, inclusive innovation, quadrable helix, organisational ambidexterity, and the regional innovation support system. The key merits of each model have been identified the

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possibility of each one towards being a lens for agile/embedded innovation systems is identified (See *Table 2.2*). The regional innovation support system the best fit as a conceptual lens due to its ability to achieve "Transformational Stakeholders Engagement", "Focuses on customer's Needs", "Relationship-Based Value Creation", "Business Intimacy in the Business Environment". The end of *Section 2.6* and *Figure 3.1* provide *Framework 1*, which is called a conceptual framework for embedded Innovation Systems.

However, the researcher dedicated **Chapter 3**, to explore the top cited theories of innovation systems to enhance the conceptual framework and turn it into a *proposed theoretical framework* (Van De Ven, 2007). *Framework 2* offers a firm-level embedded innovation system as a iterative process. This framework found the best fit to offer a theorization of the firm perspective of how several stakeholders get engaged/embedded in the service innovation process. *Framework 2* was the base for the data collection and the deductive coding for the interviews and focus groups transcript.

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researcher found new factors that shapes the implementation of firm-level embedded innovation system. Factors such as bridging ties and CSR was quite evident during COVID19 crises. The Jordanian Telecoms played a critical role in tracking the first wave of the pandemic and transforming the start-ups with advanced technologies.

The discussion of the key drivers of embedded innovation systems revealed important factors such as "*intellectual capital of innovation knowledge*". As shown in **Figure 6.3**, intellectual capital increases based on the four elements of the embedded innovation systems. Because intellectual capital includes human capital, structural capital, and relational capital, it could arise from several sets of the four elements of firm-level embedded innovation systems.

Framework 3 clearly defined the drawbacks of disembedded innovative systems. Based on the literature, this framework explaines the shift from a disembedded to an embedded framework. It has been well defined in this study that an embedded innovation framework suits the Jordanian telecom sector best. The study has focused on the factors associated with the proposed framework, which includes innovation support systems (technology transfer, chamber of commerce, start-up, since and technology parks), business environment and embedded innovation (Labor market, competitors, supplier, customers) as well as internal factors (innovation and core competency, skill and qualification, financial resources, strategy and attitude). The study has proposed that this framework should apply in Zain, Orange and Umniah for innovation purposes, and is supported with reference to the literature.

Whereas, after communicating with managers of the Jordanian telecom sector, the latter explained some issues that required this study to incorporate few more factors that are i)

bringing in ties (this includes the role of strengthening relationships with each other, ii) service cocreation (this includes the emergence of innovative ideas while operating cocreation of services with stakeholders), iii) Public engagement (this includes engaging the public for innovation purposes, iv) Social innovation (this includes the rule of social work, campus and services for innovation), v) Management of inheritance (inheritance management is the systematic method of using the assets that have been carried down by the previous leaders, and using those assets in a manner that would benefit the organization), vi) Financial services innovation (this includes the financial service innovation project that aims to promote financial services and products that not only construct new financial structures but also provide the customers with the financial interactions), and vii) Corporate social responsibility (this includes corporate social responsibility aimed at the acts of the company that facilitate the society and the telecom organization). Moreover, the added factors are listed below for a clearer view

Based on the above-mentioned factors, the study has proposed a new theoretical framework that would help to understand the embedded innovation systems in the Jordanian telecom sector.

The result is expected to fill the gap in Embedded Innovation EI theory and how it can be implemented, managed and accepted by stakeholders. It offers a deep understanding of how EI theory can be tailored to skilled based industry such as telecommunication and to a developing context such as Jordan. Our study will highlight the context related issues that could be changed to fit the developing context and then replicated in similar countries in the MENA region. Also, another major contribution for this research is to draw a conclusion into a framework presenting the critical success factors and other pre-requisites essential for multi

case analysis, in which the ingredients of this proposed framework were taken from in-depth data collection used specifically for this empirical study.

7.3. Practical contribution

The key findings of this thesis can be of benefit to 60% of the community in Jordan and in terms of customised products and services as well as helping with unemployment problems which help make use of the skilful market and will also help attract investors to Jordan within the telecommunication industry and information communication technology (ICT).

This will help practitioners as well as those who are in the field of consultancy, who are in charge of the service and product innovation. Also, it will enable them to develop a better understanding of what factors could possibly be an obstacle and a driving factor to both success and failure analysis, in which it helps them to move forward with a better awareness of the major challenges, issues, barriers and obtain superior positions and to be more competitive in the challenging business environment. The study aims to develop a collaboration framework between the mobile telecoms in Jordan and some TV channel stations in order to provide customers TVs channels, sport, film channels like how they do perform in the United Kingdom.

This study will provide meaningful insights to the comprehension of the role of embedded innovation in enhancing service innovation in the telecom sector. The researcher will offer new insights by identifying different government (telecom policies and procedures, relevant regulations, tax rates, other incentives) and organisational aspects (including information technology, human capital, organisational structure, and organisational culture) that facilitate or hinder the integration of embedded innovation Jordanian telecom sector. The

research will contribute to the existing body of knowledge by creating a linkage between embedded and service innovation based on empirical evidence. The research results will be highly meaningful for the management of selected telecom organisations for refining their innovation system practices by collaborating with the external environmental actors to gain meaningful insights. The strategic application of such market insights can transform it into business intelligence that defines, gathers, analyses and distributes the intelligence about competitors, customers and products/services. It can also be relevant in any other important environmental aspect with an aim to assist the management in their strategic decision-making process.

Moreover, findings will enhance the management's ability to exploit competitive positioning through embedded innovation. The researcher will fundamentally examine the challenges, benefits, processes and motives of telecommunication organisations for embedded innovation in the context of Jordan. In addition, it will determine the extent embedded innovation would improve the telecommunication services in the Jordan market. Overall, the research will fulfil its main motives to understand the concept of embedded technology within the Jordanian telecommunication industry, expand the knowledge of embedded innovation and subsequently improve the telecommunication service in Jordan, and influence the policy makers and regulatory authorities in creating an innovation friendly environment in the telecommunication industry in Jordan.

Briefly summarising the research purpose and its theoretical and practical contribution, the underlying research will analyse the Jordanian telecom organisations' innovation practices to evaluate the fit between dis-embeddedness and embeddedness. The researcher will adopt a holistic approach and will collect data from three main entities, firm, community and

government. "Firm" will include the Jordanian telecom management. The exploration of the managerial perceptions will suggest important insights to determine the extent to which firms' structure can embed the innovation, and what could be possible challenges.

The overview of prevailing legislations will also determine the intensity legislative pressure that could be faced while adopting the embedded innovation practices. Finally, the viewpoints of "community" will determine whether the customers, suppliers and other business partners are willing to collaborate with each other to produce the shared value and create opportunities in a highly competitive market. It is clear from the discussion that each empirical research dimension will make a significant contribution in achieving research objective that is, enhancing the performance of Jordanian telecom industry by embedding innovation. Findings will also be useful to refine the embedded innovation concept that is still emerging and requires rigorous testing before transforming into a tested and verified model. The results will help the researchers, analysts and policymakers to understand where the Jordanian telecom industry fits on the embeddedness continuum. The purpose will be to locate the current positioning and develop strategies to shift towards embeddedness.

7.4. Research Limitations

This study has made several contributions in literature and provided key insights for researchers and practitioners. But this study is not free from limitations. These should be considered while interpreting conclusion based on it.

- The study was done in the Jordanian telecom sector of Jordan. For future studies, any other country can be considered. It is possible that different country data could

provide different results. If the study concerns another country - either it will endorse the results of this study or, if different results emerge, a comparison can be done, and the study will become aware of the reasons of it.

- The study is being done in the Jordanian telecom sector and involves its customer. This innovation model can be studied in relation to other sector of Jordanian industry.

- This study is based on the qualitative method, and an interviews strategy has been adopted. Interviews have some limitations. The qualitative study is based on experiences and has no statistical representation. Therefore, future studies could use the quantitative method. Because the quantitative method normally uses validated measurement methods and close ended questions. So, there are fewer chances of misleading conclusions. Moreover, this study also could consider mixed method approach at some future date.

- For this study, the cross section design method was adopted. It means that these data were collected earlier from the interviews. It is unsure whether or not there could be any change in results after specific time period. Therefore, a longitudinal study is suggested for future studies. Data will be from different times and may provide different results.

- The study in hand has focused on the organizational perspective. For the purpose of data collection, the study has focused on managerial staff and chief executives. Future studies could consider lower staff as well. Furthermore, for future studies, customers can be also be considered.

- The study has incorporated innovation aspects of the Jordanian telecom sector. In future studies, other aspects can be focused upon, including human resource practices and knowledge management or any other related areas.

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7.5. Future Recommendations/ future research

The research was conducted in the context of multinational telecommunication companies to understand and explore challenges, processes, and motives for embedded innovation. The research utilized multiple case study approach in the context of the telecommunications environment and this approach helped in correlating with the literature of the research concept. This also discovered a few new themes possible which have been properly identified and discussed. The newly founded teams are derived from the concepts of embedded innovation and how their mechanisms work in mobile telecommunications. The findings of the research will highlight some issues that need to be considered in the sector of telecommunication, in light of the embedded innovation phenomenon. A new theoretical framework has been proposed by the researcher as endorsed by the findings.

And finally, for the purpose of future research, that has to be an in-depth study of multiple cases in the future to ensure whether the findings provided in the current study are still valid and reliable in the future also. The consistency of the findings of this research should be checked by future researchers and for doing so, in-depth studies should be undertaken in the complex environment of mobile telecommunications.

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