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Multiview of Virtual Currency Adoption and Systemic Risks **An Action Research on Service Businesses in the UK**

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20th August 2014

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Multiview of Virtual Currency Adoption and Systemic Risks: An Action Research on Service Businesses in the UK

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1. Research Overview:

Our research focuses on the impact of Virtual Currency (VC) adoption on the British service businesses. We follow the systemic multiple perspectives theory (Linstone, 2010) to explore the Technical, Organizational, and Personal (TOP) changes that organizations conduct to issue Bitcoin account and use it as Cryptocurrency. Failing to manage such changes creates TOP risk and decrease the rate of adopting and accepting Bitcoin as alternative of physical cash.

According to Orlikowski (2008), both technologies and organizations are subject to huge changes in form and function. The spread of the Internet around the world, the Web 2.0 diffusion, and cloud computing together with the new technical and cultural predispositions of modern society, allowed a huge increase in the adoption of VC. This type of currency is traded on open source cyberspace (i.e. the mining) that aims for creating communications and interactions among traders (Guo et.al, 2011). Individuals and organizations use this currency as a computing power to pay for or exchange products/services and record these transactions in a public ledger. Access to Bitcoin can be through wallet software, personal computer, web application, but mostly through special Bitcoin mobile applications. In this virtual space, things like words, human relationships, data, and wealth are all computer-mediated. Today, the VCs are reducing the boundary between physical and virtual worlds, leading huge changes in many types of business including their technological, organizational, personal progressions. When adopting and modeling the surroundings of the Bitcoin we are no longer modeling open source software rather than we enter the world of business modeling (Carugati & Rossignoli, 2011). Both of the Bitcoin as (as an Information System) and the organizations (as Business Systems) will be planned to set up at the same time (Eriksson & Penker, 2000).

Service sector represents 80% of the British Economy in terms of trading and transaction size and 65% of the GDP (Office of National Statistics, 2012). Adopting virtual currency was a critical tool to improve the flexibility and competition among UK service firms to attract more customers and build a track their needs through electronic databases (Yermack, 2013). In the UK, there are only ten sectors that approved Bitcoin as a money substitute (The Telegraph, 10th Jan 2014). All of them are service industries such as transportation, entertainment, real estates, food, shipment, fashion, and placement (Office of National Statistics, 2013). Recently, Cumbria University adopted Bitcoin as a money substitute and had to conduct different technical, organizational, and personal changes to succeed (Times Higher Education, 21st 2014).

The environment of adopting Bitcoin represents a wicked problem situation that requires an inclusive Kantian approach to reconcile the disparate views of individuals, groups, and organizations that constitute this type of information society. "*People only see what they are*

prepared to see" (Ralph Waldo Emerson cited in Holmes, 2007). Interestingly enough that it has been said long time ago and we all know it very well, yet ironically people fail to accept, digest or even see other perspectives or different point of views other than their own (Mitroff & Linstone, 1993).

The “*Multiperspectives Theory*” developed by Harold Linstone in the mid eighties provides a concrete Kantian view that forces us to distinguish “*how we are looking*” from “*what we are looking at*” (Linstone, 1989; 321). In our research this theory shifted our attention from “*What are the challenges of adopting Bitcoin*” toward “*How different service businesses see these risks from different technical, organizational, and personal view*”. These three perspectives naturally present varying attributes and offers insights on a system that is unattainable with the others. Each perspective offers different archetype (See table 1) through which humans experience the world (and themselves) and order the world of phenomena, so that they are able to have experience (Mitroff, 1983: 84).

Table 1: Characteristics of the TOP perspectives

Perspective	Technical (T)	Organisational (O)	Personal (P)
World view	<ul style="list-style-type: none"> • Science-technology& Socio-technical 	<ul style="list-style-type: none"> • Social entity: small to large, informal to formal 	<ul style="list-style-type: none"> • Individuation, the self
Goal	<ul style="list-style-type: none"> • Problem solving, Product 	<ul style="list-style-type: none"> • Action, stability, process 	<ul style="list-style-type: none"> • Power, influence, Prestige
Mode of Inquiry	<ul style="list-style-type: none"> • Sense-data, modelling, Analysis 	<ul style="list-style-type: none"> • Consensual and adversarial 	<ul style="list-style-type: none"> • Intuition, conditioned personal experience
Ethical basis	<ul style="list-style-type: none"> • Logic, rationality 	<ul style="list-style-type: none"> • Abstract concepts of Justice fairness. 	<ul style="list-style-type: none"> • Individual values /Morality
Planning Horizon	<ul style="list-style-type: none"> • Far 	<ul style="list-style-type: none"> • Intermediate 	<ul style="list-style-type: none"> • Short, with exception
Other characteristics	<ul style="list-style-type: none"> • Looks for cause and effect relationship. • Problem simplified, idealized. • Need for validation, replicability. • Claim of objectivity. • Optimization (seek best solution). • Quantification. • Trade-offs. • Use of averages, probabilities. • Uncertainties noted (on one hand....) 	<ul style="list-style-type: none"> • Agenda (problem of the moment). • Problem delegated and factored. • Political sensitivity, loyalties. • Reasonableness. • Satisficing (first acceptable solution). • Incremental change. • Standard operating procedures. • Compromise and bargaining. • Make use of or Avoid Uncertainties 	<ul style="list-style-type: none"> • Challenge and response. • Hierarchy of individual needs. • Filter out inconsistent images. • Need for beliefs. • Cope only with a few alternatives. • Fear of change • Leaders and followers • Creativity and vision by the few. • Need for certainty
Communications	<ul style="list-style-type: none"> • Technical report, briefing 	<ul style="list-style-type: none"> • Language differs for insiders, public 	<ul style="list-style-type: none"> • Personality important

Adopted from Linstone (1989: 313)

Before writing this proposal, we reviewed 20 journal articles and conducted pilot phone interviews with nine service firms adopted Bitcoin. This pilot was necessary to negotiate access and develop our interview guide for phase 1 of data collection. In figure 1 below, we present different TOP risks and changes required to manage them.

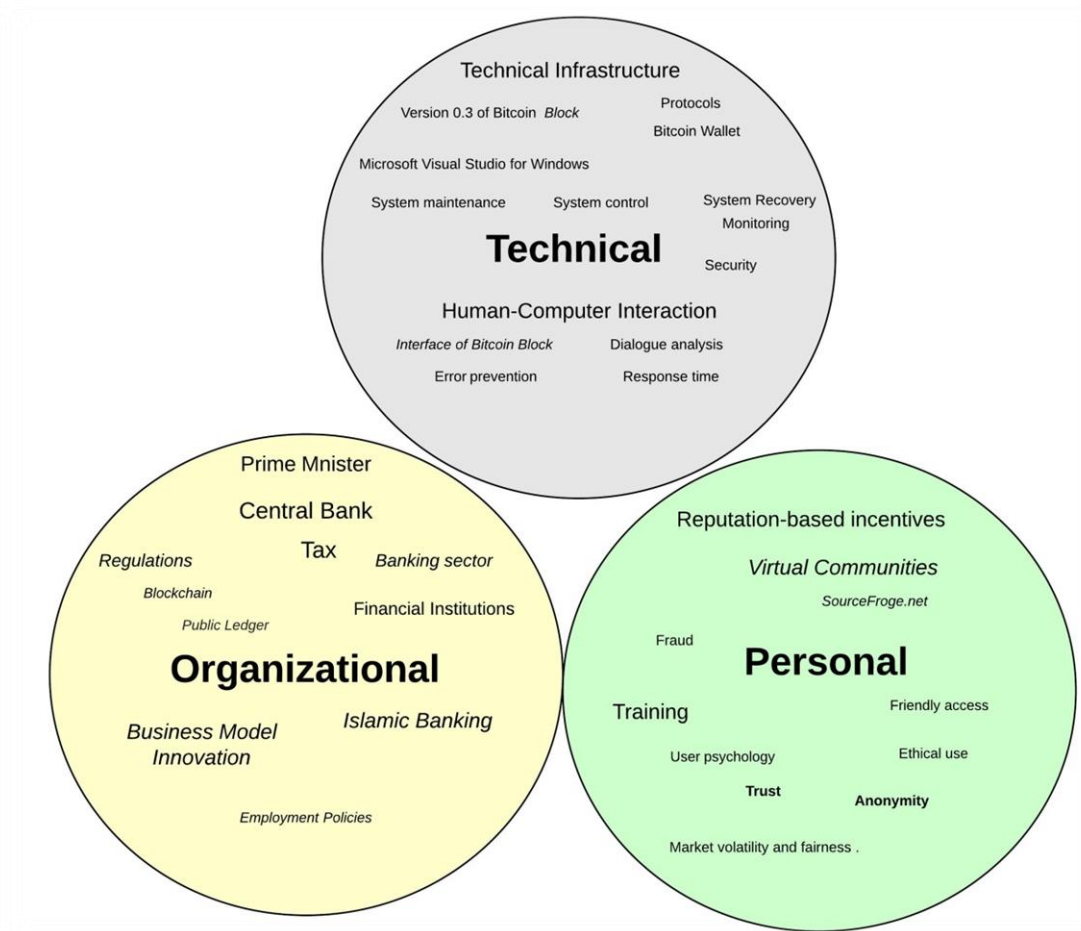
From the technical perspective, design of the ledger technologies imposes different reporting systems for business that adopt Bitcoin. Trading through Bitcoin mining in the UK (<https://bitbargain.co.uk/>) requires creating a virtual community for the firm and its staff and customers. This electronic median reflects the faster information sharing, processing, which need new work routines and bylaws.

Access to Bitcoin wallet and the mining cyberspace is facilitated through web and mobile applications. Each of them reflects different dialogue and interfaces sequence. How businesses change their electronic payment systems in a way that become easy for them to synchronize with Bitcoin wallet. How they change their payment and record keeping policies to facilitate the technological changes. Further, businesses need to plan how to prevent system errors, response time, and maintain the system periodically. System control, recovery, and monitoring are also significant technical issues that businesses need to plan while adopting Bitcoin.

From the organizational perspective, we will explore how service firms create new value propositions for Bitcoin customers than to direct branch customers (Grinberg, 2011). How they attach new payment system such as peer-to-peer communities with no third parties involved as EBC, Fed, and other government organizations. Public institutions and many governments around the world are facing hard work due to the difficulties of regulating a system coming from the evolution of IT and cryptography. In fact, Bitcoin system is able to substitute public institutions as EBC and Fed controls and guarantees, with crypto proofs (e.g. Block chain). Our participants emphasized that Bitcoin is attracting more customers from the informal economy where they do not have formal bank accounts rather than electronic payment platforms such as Pingit, Ukash, Neteller, OKPay, NoChex, NatWest Pay Your Contact, and Paym. They argue that Bitcoin should advantage the regulators by tracking the informal economy and securing additional sources of taxes. On the other side, the central bank and fellow financial institutions argue that money laundering and operational risks in managing deposits will destroy the financial system in the country (Kaplanov, 2012). Bankers think of Bitcoin as a threat, while one of our participants (from Pakistan) argues that Bitcoin can improve the practices of Islamic banking and help David Cameron's strategy of transforming London to the biggest Islamic banking city to attract the middle East investments (UK Trade & Investment, 2013; The Independent, 29th Oct 2013). Suppliers of service firms and other partners in the supply chains need to change the contractual terms and receivables documentation cycles to reflect shorter lead-time and flexible payment procedures.

From the personal view, we question the distinction between cultural and technological preferences of a society (Abrahamson, 2011). These two elements, in fact, influence the digital artifacts (e.g. Bitcoin) used by the businesses and society. For the authors technologies are also subject to periods of gradual evolution. There are some areas in which we can find really exciting applications of VC that also demonstrate the similarities between virtual and real world (Orlikowski & Scott, 2008). Our participants refer to personal issues such as reputation-based incentives, trust, fraud, public media, social networks, anonymity, and privacy as key risks that face them when adopting Bitcoin (Bogliolo et.al, 2102). The three perspectives complement each other and offer a rich picture of systemic risks associated with Bitcoin adoption (Reid & Harrigan, 2013; Blundell-Wignall, 2014).

Figure 1: TOP Views of Adopting Bitcoin in the Service Companies in the UK



The authors' pilot study

2. Research Methodology:

2.1. Research Approach and Design:

To consider different views we follow *inductive action research* to understand the TOP risks associated with Bitcoin adoption by service businesses. This includes deploying qualitative data collection methods to produce a grounded framework (Glaser & Strauss, 1967). This process of generating theory comes through dense descriptions of the themes of subjective meanings that actors attach to their behavior, then via testing causal hypotheses deduced from a pre-set theory. In this approach, researchers follow a reflective process model that contrast between “*what we know from theory*” and “*what we found in the action experiment*” (Baskerville and Wood-Harper, 1998). Our research does not aim to build theoretical themes, however, some replication features will be revealed for how best a Bitcoin adoption strategy

can be applied and a systemic model for risk management can be developed (Reason & Bradbury, 2013).

Our research includes two phases of data collection. In the first stage, we will conduct semi-structured interviews (Denzin & Lincoln, 2011) with finance, IT, and CRM executives working with service firms working in the UK. Out of the ten businesses approved Bitcoin, a quota sample of nine firms have been selected (Miles & Huberman, 1994) (See table 2).

Table 2: Research Methods - Phase 1

Service Firms	Service Industries	Rationale
<u>takeaway.com</u>	Online delivery service	<p>Why?</p> <p>Our team aim to interview finance and IT executives as well as customer service managers to understand their individual outlook and observations of frequently experienced event in order to gain a deeper understanding of TOP risk and needed transformation.</p> <p>How?</p> <p>Industry-based Quota sampling In total, we negotiated 27 interviews in 9 service firms in the UK.</p>
<u>Saw Mill Cafe in Stratford</u>	Café shops and drinking services	
<u>The White Lion in Norwich</u>	Real estates services	
<u>8 Ball Bikes website</u>	Sport and entertainment services	
<u>Herefordshire taxi driver Daniel Hart</u>	Transportation services	
<u>Imperica</u>	Printing & Stationery	
<u>Girl Meets Dress</u>	Fashion services	
<u>East London Man With a Van</u>	Shipment services	
<u>Makers Academy</u>	Career & Placement services	

This stage of data collection is expected to take place between November 2014 and Jan 2015. Interview guide has been developed, but will be examined further on two participants to ratify it. There are three versions of the interview guide that target finance executives, IT executives, and customer service executives. The interviews will also include some questions about demographic characteristics, cultural issues, financial performance, and technical breakdowns. The average time of interview is expected to be 30 minutes and a copy of the interview transcription will be sent back to participants to make sure a rich picture (Checkland & Poulter, 2010) of the situation and problems is agreed.

The output of phase 1 is a conceptual framework that clarifies the essential technical, organizational, and personal changes that service firms need to conduct when adopting Bitcoin. Template analysis using NVivo software will be used to analyze data along with drawing rich picture of different technical, organizational, and personal perspectives (See Harrop, Gillies and Wood-Harper, 2012). GraphPad is computerized data analysis software that will be used to draw factors analysis of our numerical (economic and

demographic) indicators. Such analysis will offer insight on the relationship between adoption of Bitcoin and the firm's performance and the overall contribution to the GDP of the service sector in the UK.

In the second phase, we use our conceptual framework as a lens to understand the ongoing action project in Cumbria University. Professor Jem Bendell at the University founded an institute for leadership and sustainability that deliver two courses addressing the role of complementary currencies in economic and social systems. These two courses are titled as "Certificate of Achievement in Sustainable Exchange" and "Postgraduate Certificate in Sustainable Leadership". In between Jul-Sep 2015, we will conduct periodical semi-interviews and observations with a sample of three academics (the chair and two program directors), three administrative staff (IT, tuitions, and admission managers), and students enrolled in those two courses.

Data collected at this stage, will help us comparing and contrasting between TOP risks in education and other service business. Then a final framework will be developed to guide policy makers and practitioners on how to successfully adopt Bitcoin and conduct the appropriate transformations to manage the TOP risks (Brito & Castillo, 2013). .

2.2. Project team and their involvement:

Our team includes three investigators who will collaboratively perform the research tasks listed in table 3 to deliver a high quality research up to the world class standards.

Mostafa Mohamad will act as a principle investigator with his accumulated experience with virtual and electronic payment technologies. His recent journal peer-reviewed journals and book contributions highlight the role of complementary currencies and alternative payment tool in economic and social systems. Mohamad has experience leading participatory action research projects that aim to explore the socio-technical issues of information system development in the networked society. This august Mohamad has been granted the best paper award at the Academy of Management (AoM) presenting his work at the IFIP WG 8.2. Prior to his award, he got a grant from the National Science Foundation of the United States for his doctoral research presented at the AoM OCIS group in 2012.

Trevor Wood-Harper is a co-investigator who has almost four decades experience in the areas of information system development, system thinking, and action research. In addition to his 210 publications, he is an associate editor of the European Journal of Information Systems and continues on the Information Systems Journal. Wood-Harper led many successful research projects as a founding chair of £100,000 of the Computing and Information Systems at the University of Salford in 1990.

Ronald Ramlogan is a co-investigator who has an extensive expertise as an economist and innovation systems specialist. Previously, he led research projects funded by the ESRC and others funded by the Centre for research in Innovation and Competition at Manchester Business School. He has highly cited journal papers in the areas of evolutionary and complex systems with an empirical emphasis on innovations in medical technology. Recently, he

conducted a research about the new perspectives on the place of the economy in society. His expertise covers the political economy, multinational corporations, ICT adoption in emerging economics, and Innovation in the education sector.

Table 3: Roles of the team members

Mostafa Mohamad (PI)	Trevor Wood-Harper (CI)	Ronald Ramlogan (CI)
<ul style="list-style-type: none"> · Manage the overall budget, according to the agreed plan with the SWIFT institute the co-investigators. · Negotiate access to interviews and data collections for the overall project. · Complete the required ethical approvals. · Conduct interviews and manage day-to-day research activities. · Develop coding, data capture, check for accuracy of data entry. · Manage the NVivo and GraphPad databases to establish and maintain data files. · Deliver the final written draft publications and continuously consult the co-investigators. · Sign all relevant contracts and copyrights for the SWIFT institute. 	<ul style="list-style-type: none"> · Conduct some interviews with the chair and top faculties at Cumbria University. · Analyze the data-based on his expertise in action research and advise the co-investigators on how to proceed further. · Suggest other theoretical lenses and critically evaluate the fit between data analysis and conceptualization. · Help auditing the overall scientific integrity. · Invite top professors and practitioners of e-commerce and digital finance to challenge our findings and create a debatable publication serious about the topic. · Encourage collaboration with other academic institutions in USA to compare and contrast between our findings in the UK and the more mature service firms in the USA. 	<ul style="list-style-type: none"> · Conducts the factors analysis for all economic and technical indicators. · Implements experimental protocol in our intervention at Cumbria University. · Deliver economic conceptualisation for the data, and disseminate it in relevant channels to get early feedback. · Use his extensive professional network to negotiate access to British Petroleum and other manufacturing firms where he worked and who currently plan to use Bitcoin. · Help publishing the final results in top international journals (in the area of economics and innovation) under the umbrella of the SWIFT institute and after their permission.

3. Potential Contribution:

Our research explores the required transformations from TOP perspectives to help professionals and policy makers highlight the systemic risk associated with adopting Bitcoin as a “money substitute”. In doing so, this research offers three outputs as follow:

- a. A systemic literature review of the TOP risks associated with Bitcoin adoption in service firms.

- b. A conceptual framework of successful adoption of Bitcoin and managing systemic risk in service firms.
- c. A Conceptual framework of successful adoption of Bitcoin and managing systemic risk in education services.
- d. Factors analysis of TOP risks and the contribution to the GDP in service sectors.

All together contribute to the growing body of literature on the impact of virtual currency (as IT enabler) on business practices and the overall society (e.g. Ritter & Gemünden, 2004; Banker 2006; Shin, 2008). For Bitcoin in particular, our research uncovers the innovative ways that service firms re-engineer their processes to manage the TOP risks and build a sustainable ecosystem (Nakamoto, 2008; Barber et.al, 2012; Blundell-Wignall, 2014; Holdgaard, 2014).

4. Research Timetable:

Our research is expected to take place between October 2014 and January 2016 as shown in table 4 below. All team members will be involved to conduct these activities according to a preset budget. 30-40% of the total budget will be allocated as salaries in a monthly base, while 50% will be dedicated to the fieldwork and data analysis. 10-20% will be dedicated to writing-up, conference presentations, and journal submissions.

Table 4: Timetable for the research activities

Research Activity/Time	October 2014	November 2014	December 2014	January 2015	February 2015	March 2015	April 2015	May 2015	June 2015	July 2015	August 2015	September 2015	October 2015	November 2015	December 2015	January 2016
Writing the first draft literature review and completing the ethical approval																
Data Collection (Phase 1)																
Qualitative Data Analysis and building the conceptual framework (Successful adoption of Bitcoin and managing systemic risk)																
Quantitative Data Analysis (Factors analysis and GraphPad statistical coding and presentation)																
Data Collection (Phase 2)																
Qualitative Data Analysis (Revised framework for Bitcoin adoption in educational services)																
Writing Up and Submission of final draft																

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