

Communications of the Association for Information Systems

CAIS 

Moving Forward: Emerging Themes in Financial Services Technologies' Adoption

Asif Qumer Gill

FEIT, School of Software, University of Technology, Sydney

asif.gill@uts.edu.au

Deborah Bunker

Discipline of Business Information Systems, University of Sydney

Philip Seltsikas

Discipline of Business Information Systems, University of Sydney

Abstract:

Financial services technologies (FST) are core to the continuous transformation of financial services organizations (FSO). To date, however, there has been a lack of empirical research into FST adoption against the backdrop of the recent financial crisis. The aim of this article is to re-examine how FSO are currently positioned to take advantage of emerging FST. We emphasize that this article is forward looking rather than providing a commentary on the state-of-the-art in technology adoption research. This research has been conducted by applying an exploratory qualitative study method where interview transcripts from thirty recent interviews of FSO technology executives and CIOs were analysed by using a thematic network analysis tool. This analysis uncovered nineteen basic, eight organizing and two global FST adoption research themes along with their links to FST adoption objectives; challenges; customer centricity; human resources; outsourcing; and overall IT strategy maintenance. This research has both practical and theoretical research implications serving as a resource base for FSO and researchers to set future research priorities and directions. Emerging themes presented in this article are intended to facilitate research directions by shedding light on the areas of greatest value and potential return in FST adoption.

Keywords: Cloud Computing; Enterprise Architecture; Financial Services; IT Strategy; Mobile Computing; Social Computing.

Volume xx, Article x, pp. xx-xx, Month Year

The manuscript was received mm/dd/yyyy and was with the authors x months for y revisions. [Note: this box is used only for peer-reviewed papers.]

I. INTRODUCTION

The financial services industry comprises of a number of FSO that offer a well-developed range of financial products and services to their customers [Schneider and Sledge, 2011]. FSO operate in a complex, fast-paced and highly regulated environment where technology is considered an integral component of their operating environment [Cooper, 2006; Sharma, Lavery and Polyanskiy, 2010]. This is because FSO require the support of sound, sophisticated and transparent FST for their day-to-day business operations, management and governance [Mylonakis, 2007]. FST are core to the continuous transformation of FSO and have revolutionized the way FSO process and analyse financial information for their competitive advantage. Most recently, the global financial crisis has adversely impacted the dynamic and innovative financial service industry in an ongoing manner [Brunnermeier, 2009; Hodge, 2012; Raghunandan, Ramgulam, Raghunandan-Mohammed and Allaham, 2012]. Featherstone [2012] considers that "The global financial crisis (GFC) aftermath, volatile share markets and a slowing property sector are terrible cyclical headwinds for financial services". It has been reported that FSO are still recovering from the significant negative impact of the global financial crisis [Australian Bureau of Statistics, 2013]. Traditionally FSO are one of the earlier adopters of new technology, however, the global financial crisis aftermaths seem to impede FSO to take the full advantage of emerging FST and their obvious benefits. FSO executives should consider and re-examine the cost savings, flexibility, scalability, market readiness, customer loyalty, regulations, security, availability of IT skills, impact on outsourcing ventures, and data confidentiality issues when adopting and investing in new FST [Khalfan, AlRefaei and Al-Hajry, 2006].

This exploratory article presents research on FST innovation, trends, challenges and opportunities from the perspectives of FSO technology executives and CIOs (based on thirty interviews) to identify major emerging research themes around FST adoption in FSO. These research themes will assist FSO and researchers to understand FST adoption needs and extend their research and can help to develop or update theories and frameworks for FST adoption.

This article is organized as follows: Section II discusses the theoretical background and research focus. Section III defines the research method and limitations. Sections IV presents the results of the qualitative analysis of the interview data by using a thematic network approach [Attride-Stirling, 2001; Rene and Taylor-Powell, 2003]. Section V discusses the findings of this analysis. Finally, this article concludes with a short discussion and conclusion in Section VI with further directions on future research.

II. BACKGROUND: THEORETICAL FOUNDATION AND RESEARCH FOCUS

A number of studies have been reported in the past on the patterns of FST adoption for business transformation such as Automated Teller Machines [Saloner and Shepard, 1995], Credit Scoring Technologies [Akhavain, Frame and White, 2005], and Real Time Gross Settlement Systems [Bech and Hobijn, 2006]. Furst, Lang and Nolle, [2002] identified a number of factors motivating the adoption of internet enabled banking services by using a multinomial logistic regression model. Courchane, Nickerson and Sullivan [2002] used a two-stage real options framework for investigating the investment decision about the adoption of internet enabled banking services. The current influx of a number of new FST themes (e.g. cloud, mobile and social networks), after the impact of the recent global financial crisis, and the drive for lower risk, sustainable FSO profitability now demand that IS scholars identify and re-examine FST adoption patterns. This section discusses the FST literature and identifies a set of questions that were used as a lens for data analysis within this study.

FST plays an important role in the growth and improvement of the services offered by FSO e.g. online banking, ATMs, EFTPOS [Wonglimpiyarat, 2006a]. FST can be used in a broad range of financial data analysis such as liquidity, leverage, turnover, profitability, present, and past performance in predicting the future state of financial services business [Moynihan, Jain, McLeod and Fonseca 2006]. Technology is not only used for analyzing and predicting business performance but it can also help "financial organizations build customer and channel loyalty, enhance customer relationships and increase customer, channel and product profitability and market share" [Siomkos and Tsiames, 2006]. Hence, it may be suggested that similar to "money", technology is like a blood stream in the financial services technology operating model and the use of "technology in the mass automation regime is carried through to the smart automation regime, showing that the technological change in the banking sector is not revolutionary but evolutionary" [Wonglimpiyarat, 2006b].

The current influx of a number of emerging FST present both opportunities and challenges to FSO. FSO need to assess their operational readiness and investment strategy about emerging FST adoption [Economist, 2008; Powell, 2009; Zandt, 2010; Shroff, 2010] as they strive to recover from the catastrophic losses incurred in the global financial crisis. Most recently, Wilson, Casu, Giradone and Molyneux [2010] presented their work on emerging themes in banking. While this work, based on the literature review, has been conducted around the core themes of performance, risk and governance of financial institutions, no such recent work (as far as we are aware of) has been conducted in the emerging FST adoption domain from the practitioners' perspective. This article further supplements this research and identifies a number of key emerging practitioner themes in FST adoption by addressing the following main research question.

1. "What are the emerging themes of FST adoption in FSO?"

We have reviewed the related work and literature and have identified related sub-questions in the context of our main research question.

The financial services sector has been adversely impacted in the last few years by the global financial crisis and shifted its focus to raising capital and reducing cost as opposed to investing in technological invention or innovation [Brunnermeier 2009] so as to recover from the terrible losses incurred [Australian Bureau of Statistics 2013]. Invention can be defined as to discover a new idea, process, service or product, where as an innovation is an act of putting the invention into practice [Fagerbeg, Mowery and Nelson, 2005]. Technological inventions, when put into practice, can improve the processing and analysis of financial data, which can then improve the quality and delivery of financial services at reduced costs [Wilson et al., 2010]. Reduced cost may lead to increased lending capacity and positive growth across the sector; however, before making any decision about the adoption and investment in new FST, there is a need to understand:

1.1. "What are the FST adoption trends and top priorities in FSO?"

The adoption of technological inventions presents both challenges and opportunities for achieving business growth and productivity objectives [Shroff, 2010; Gill, Bunker and Seltsikas, 2011]. There are a number of factors that may drive or hinder the adoption of emerging FST. Therefore, FSO need to consider and compare those factors such as cost savings, flexibility, scalability and compare them with their readiness, customer loyalty, regulations, security and data confidentiality challenges when adopting and investing in new technology [Khalfan et al., 2006; Gill and Bunker, 2013].

1.2. What are the key objectives and challenges from FST adoption and improvement perspectives?

1.3. Which FST are the most effective and customer centric in the financial services industry?

The adoption of technology combines a number of additional factors such as the demand of human resources and outsourcing partners in order to put FST into practice [Fagerbeg et al., 2005]. For instance, FSO may require human resources with the required knowledge and skills to put technological invention into practice. FSO internal IT staff or departments may also not be able to provide everything on their own. They may rely on their outsourcing partners [Ono and Stango, 2005] for developing or providing additional technological services and products for the delivery and maintenance of financial services and products to their customers. FSO may also choose to outsource, if other geographically co-located FSO in the region choose to outsource [Borzekowski and Cohen, 2005]. Therefore, we need to re-examine how recent technological inventions impact human resourcing (e.g. demand for IT skills), outsourcing ventures (e.g. FSO outsource call centers or development work) and overall IT strategy and operating models (e.g. FSO and their alignment to local and regional needs)?

1.4. Which IT skills are now more in demand in FSO and how are outsourcing ventures evaluated by them?

1.5. How are FSO maintaining their overall IT strategy to meet the dynamic, global and local regional needs?

III. RESEARCH METHOD AND LIMITATIONS

Section II discussed the main research problem and a set of five key research questions, which have been identified based on the analysis of background literature on FST. These five key questions (as mentioned above: 1.1 – 1.5) and our deployment of a thematic network analysis [Marshall and Rossman, 1999] have been used to analyze thirty interviews of FSO technology executives and CIOs for this study. These interviews were published during February 2011 – November 2011 by the FST media in Australia (please see Appendix A for demographic data).

A thematic network analysis approach is appropriate for deeply understanding and analyzing qualitative interview data. Thematic analysis is a hermeneutic approach that refers to the identification and interpretation of a text (in this case an interview text). It is a way to explore the meaning of a text by identifying common themes or patterns. A text

is analyzed by coding it, by differing concepts, and then by grouping these concepts into categories. Concepts and categories are also well established elements of Grounded Theory [Strauss and Corbin, 1990]. Thematic analysis is anchored around the central notion or meaning of a text at the abstract level. Themes can be further organized in a hierarchy (from basic to global level themes) to develop a thematic network.

We found thematic analysis very helpful in identifying and exploring the implicit meanings or themes embedded in the interview transcripts. Themes can be classified as basic themes, organizing themes and global themes. Basic themes [Attride-Stirling, 2001] are the lowest-level themes, which are derived from the textual data. A basic theme represents a statement of belief anchored around a central notion that is evident within a text. Basic themes, on their own, do not convey the meaningful interpretation of data text and they need to be analyzed and read in the context of other themes. Basic themes can be grouped into organizing themes in order to enhance the meanings of basic themes in the context of other themes. An organizing theme is a middle level theme that clusters and summarizes the principle assumptions or meanings of related basic themes at a more abstract and broader level. Finally, organizing themes can be grouped to uncover the main global themes. Global themes significantly represent the text as a whole. A global theme [Attride-Stirling, 2001] is a super-ordinate theme that “encompasses the principal metaphors in the data as a whole. A global theme is like a claim in that it is a concluding or final tenet”.

In order to analyze the interviews for this article, we applied the thematic network analysis approach [Attride-Stirling, 2001] along with the four-stage qualitative data analysis process outlined by Rene and Taylor-Powell [2003]. The thematic network analysis process includes the following activities [Attride-Stirling, 2001]:

- Identification of the category codes and underlying concepts
- Identification of the themes (e.g. basic, organizing, and global)
- Development of the thematic network
- Description of the thematic network
- Summary of the thematic network
- Interpretation of the thematic network

These activities were then applied to a four-stage qualitative data analysis process [Rene and Taylor-Powell, 2003]. The four-stage process, with embedded thematic network analysis activities, was used in this research (Table 1 and Figure 1):

- Stage 1: Collect and analyze interview data
- Stage 2: Categorize data (e.g. coding of categories and concepts)
- Stage 3: Apply thematic network analysis
- Stage 4: Interpret the thematic network

Table 1 describes the combination of thematic network analysis with the 4 stage qualitative data analysis process. Figure 1 then outlines the main activities of the overall research process.

Table 1. Data collection and analysis process		
No.	Stages	Description
1	Collect and analyze interview data	Access the FST media website and select the interview transcripts that match/ answer the key research question Obtain interview transcripts from the FST media Read each interview Segment each interview in a set of statements and then group those statements for the purpose of further analysis against the identified research questions (Section IV)
2	Categorize data (Coding)	Read the segmented interviews (from Step 1) and extract the concepts and knowledge embedded in the interview data to answer the identified research questions Identify key concept categories based on the extracted concepts and

Table 1. Data collection and analysis process		
No.	Stages	Description
		knowledge Label the identified categories
3	Apply thematic network analysis	Analyze meanings of the concepts and categories and extract the basic themes (Table 2) Identify relationships among the related basic themes and group them into organizing themes (Table 3) Identify relationships among the organizing themes and then group them into global themes (Table 3) Identify technology adoption objectives, challenges, customer centricity, human resource, outsourcing and overall IT strategy maintenance elements and link them to related Global Themes (Tables 4-9)
4	Interpret the thematic network	Interpret the interview transcripts with the help of the identified thematic network Identify key points and lessons learnt Outline findings (Section IV)

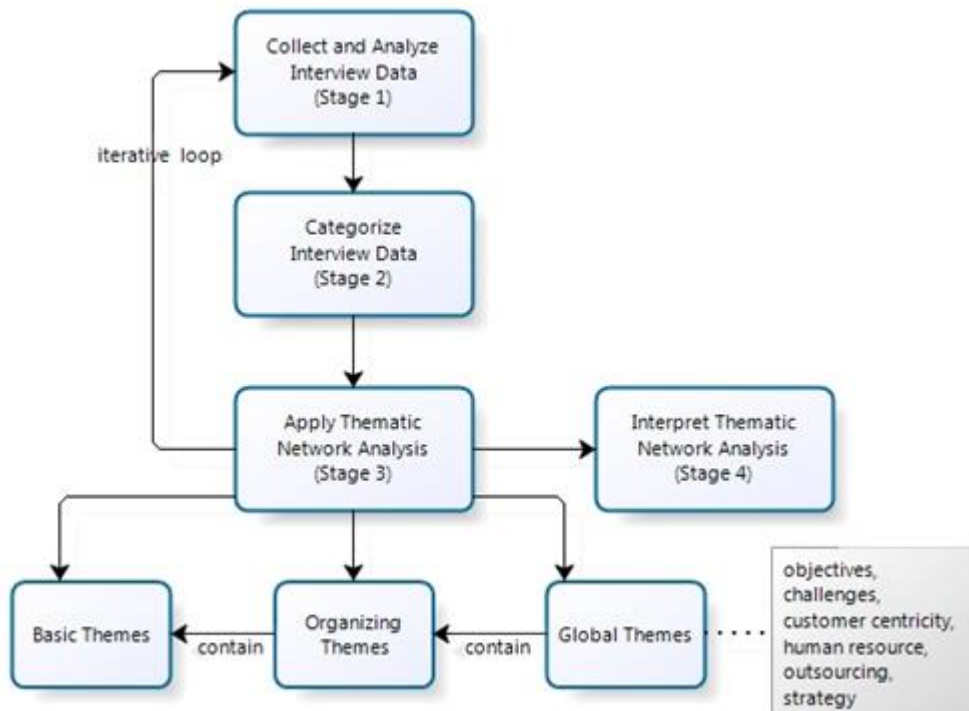


Figure 1. Research Process – Main Activities

Stage 1: Collect and Analyze Interview Data

We accessed the FST media website and downloaded the interview transcripts (published during 2011) in order to analyze them in light of our research questions (Section II). Interview texts are considered appropriate data sources for qualitative research [Myers and Newman, 2007]. The analysis of the interview transcripts indicates that FST media used an open-ended question set to conduct the interviews. Each transcript outlines answers to the open-ended questions. In this case FST media which is similar to Gartner, interviewed FSO senior leadership in order to understand the overall direction of the financial services industry in regards to FST adoption. The interview

transcripts were published by FST media during 2011. Please note that FST media selected and interviewed the senior executives from financial service industry for all of the interviews analyzed in this study. Therefore, our research team had no control over the selection of interviewees, although, we believe them to be a reasonable representation of the key senior FSO executives. In total, thirty interview transcripts were included in our research as they offered substantial commentary on our research questions. After analyzing fifteen interview transcripts, there was a high level of repetition and similarity in the interviewees' responses, which further supported our impression of the representative nature of the interviewees. A list of interviews that have been analyzed for this study can be found in Appendix A.

It is important to mention that there was no relationship-bias between the researcher and the interviewees and between the researcher and the FST media (the interviewer organization). FST media is a well-known and trusted organization for publishing information on the financial services sector in Australia. FST media has access to senior FSO executives; they conduct and publish these interviews for public distribution of high-quality information on the technological trends in the financial services sector. Therefore, we used interviews from FST media as a trusted and appropriate source for this study. The use of secondary data is considered appropriate in qualitative information systems research [Myers, 1997]. Researchers can reliably use primary and/or secondary sources of data suit to their specific research context. What is important is the selection of the data source and the quality of the data. FST media publishes data for the CxOs and IT decision makers of the banking, wealth management, insurance and financial services. It was considered appropriate to use FST media, therefore as a trusted and reliable data source for this research. There are also other reasons for relying on the secondary data such as the non-availability of the interviewees (e.g. CxOs and senior FST executives), their location, time, and resources. FST media published the data, which allowed us to access valuable raw data (e.g. interview transcripts) at no financial cost. The data that was collected from the FST media organization was therefore deemed to be of good quality and appropriate to answering the research questions being studied in this article. Each interview transcript was carefully inspected for its research relevance before being including it in the analysis.

Stage 2: Categorize Interview Data (Coding)

Coding was used to identify and code the concept categories. The purpose of coding is to reduce or group the text (concepts) into manageable chunks or concept categories. A concept category represents the underlying concepts or knowledge embedded in the interview text. Each interview was analyzed to extract concepts (in terms of trends and priorities) related to FSO processes, products, services, channels, people, information and technology. In total, sixty concepts were identified. These sixty concepts were grouped or coded into eight concept categories. For instance, we analyzed the statements from interview transcripts and identified the customer information related concept "Single View of Customer" (Interview #1) and customer process related concept "Customer Centric Processes" (Interview #2). The related concepts were then grouped and coded as the "Customer Information Management" category (Table 2). The Customer Information Management concept category refers to both customer data and processes. Essentially, each concept category represents a set of related concepts or statements.

Stage 3: Apply Thematic Network Analysis

Once the concepts in the interview data are organized into concept categories, then the thematic network analysis is applied to the concepts within each concept category to explore the meaning or basic themes. A basic theme refers to the lowest-order premises evident in the coded text. We reviewed the concepts in each concept category and extracted the themes or patterns as they related to the research questions and concept categories. For instance, nine concepts in the Customer Information Management category were reviewed as they related to research question 1.1 (Section IV) and consequently three basic patterns or themes were extracted. These basic themes answer the research question 1.1 and suggest that Customer Information Consolidation, Customer Context Awareness, and Customer Process Standardization are the key trends and top priorities in FSO (Section IV). This initial application of the thematic network analysis reduced the text (sixty concepts) into a manageable set of nineteen basic themes that summarize the sixty concepts.

These nineteen basic themes were analyzed and grouped into eight organizing themes. An organizing theme is a cluster of basic themes that share the same meaning, issue, argument or assumption. For instance, the basic themes of Customer Information Consolidation, Customer Context Awareness, and Customer Process Standardization were grouped under the Customer Relationship Management System organizing theme (Table 3). This further reduced the nineteen basic themes into a manageable set of eight organizing themes that summarize the nineteen basic themes.

Finally, these eight organizing themes were analyzed and related organizing themes were grouped into two global themes. A global theme is a cluster of organizing themes that share the same meaning, issue, argument or assumption (Table 3). For instance, customer related organizing themes were clustered into a Customer Platform

global theme. Organization-wide themes were clustered into an organization-as-a-whole global theme. The organization-as-a-whole global theme supports or hosts the Customer Platform global theme. It is evident here that thematic network analysis helped us to turn the raw interview transcripts from concept into a meaningful global theme. Each basic theme is linked to the organizing theme and each organizing theme is linked to the global theme. The linking or hierarchy of themes forms the FST thematic network.

The resultant thematic network was not considered in isolation. Further, we reviewed the interview transcripts and identified the FST adoption objectives, challenges, customer centricity, human resource, outsourcing and overall IT strategy maintenance elements and linked them to related Global Themes. The resultant thematic network and associated FST adoption objectives, challenges, customer centricity, human resource, outsourcing and overall IT strategy maintenance elements are explained in Section IV.

Stage 4: Interpret the Thematic Network Analysis

Finally, we interpreted the thematic network in the context of the original research questions and interview transcripts. This was done in order to identify key points and lessons learnt. The interpretation of the thematic network is discussed in Section V.

The coding and labeling of categories, concepts or themes identified in the interviews are subject to human error and mistakes, which may lead to inconsistency [Weber, 1990; Miles and Huberman, 1994]. The concepts, categories, themes and their inter-connections were identified by the first author. They were independently and concurrently checked by other two researchers within the team; and were then adjusted from this process. Checking was completed iteratively to minimize any possible omissions, errors or coding bias.

IV. ANALYSIS AND RESULTS: EMERGING THEMES IN FST

This section presents the research analysis and results that collectively form the conceptual framework of emerging themes in FST (Figure 2).

Innovative Trends and Top Priorities

In relation to our first area of focus:

1.1. “What are the FST adoption trends and top priorities in FSO?”

Interview #1, states that

“One mega trend is customer information management – a single view of the customer and accounts across products and channels.”

We analyzed this statement and extracted the Single View of Customer concept. The Single View of Customer concept from Interview # 1, was grouped under the Customer Information Management category. Similarly, other interview statements were analyzed; and all the identified concepts and categories are summarized in Table 2. Thematic network analysis was then applied to discover the basic themes. For instance, in the Customer Information Management concept category, the review of the Single View of Customer and Customer Information based Service Delivery Model concepts identified the common “Customer Information Consolidation” basic theme. This seems to suggest that the trend is to consolidate dispersed customer information for the single view of customer and customer information based service delivery model. The identified basic themes are the lowest-level abstract characteristics of the data that summarize the identified concepts (Table 2).

Table 2: Innovative Trends and Priorities – from category codes to basic themes			
Ref.	Category Code	Underlying Concepts or Knowledge	Basic Themes
1	Customer Information Management	<ul style="list-style-type: none"> • Single View of Customer • Customer Information based Service Delivery Model • Customer-Business Interaction based Services • Empower Customer via Technology Access • Location-Aware Customer Experience • Customer-Centric Processes 	<ul style="list-style-type: none"> • Customer Information Consolidation • Customer Context Awareness • Customer Process Standardization

Table 2: Innovative Trends and Priorities – from category codes to basic themes

Ref.	Category Code	Underlying Concepts or Knowledge	Basic Themes
		<ul style="list-style-type: none"> • Customer Process Re-engineering • Standardizing Processes 	
2	Business Intelligence	<ul style="list-style-type: none"> • Capture Customers' Web and Mobile Behavior • Recognize Customer Buying Behavior • Organization-wide Analytics • Decision Making Automation 	<ul style="list-style-type: none"> • Customer Behavior Awareness • Analytical Capability Enhancement
3	Mobile Banking	<ul style="list-style-type: none"> • NFC • Mobile Communication • Mobile Payments • Real-time Cross-border Payment Systems • P2P Payment • 3G Technology • Android • iPad • iPhone • Remote Cleaning and Removal of Data from Mobile Devices 	<ul style="list-style-type: none"> • Mobile Transaction Management • Transactional Convenience
4	Green IT	<ul style="list-style-type: none"> • Independent Carbon Impact Assessment • Reminding People to Switch off • Monitors • Technology to Highlight Benefits • Technology to Highlight Cost 	<ul style="list-style-type: none"> • Carbon Management • Behavioral Changes
5	Core Capability	<ul style="list-style-type: none"> • Remote Access • BYO Device • Virtual Desktop Interface • Internalize Cloud • Storage as a Service • Infrastructure as a Service • Refurbishment and Rationalization of Datacenters • System Usage Reporting Metrics • Underutilized System Areas • Scalable Technology Platform • Reliable Technology Platform • Disciplined Execution • Better Incident Resolution • Higher Straight Through Processing 	<ul style="list-style-type: none"> • Virtualization • Data Centers Consolidation • Private Cloud Deployment • Infrastructure Remediation
6	Security	<ul style="list-style-type: none"> • Market Events Review • Dynamic 2nd Factor Authentication • Biometric Security • Voice Authentication 	<ul style="list-style-type: none"> • Risk Awareness • Customer Access Management
7	Integration	<ul style="list-style-type: none"> • Enterprise Single Sign-on • Architecture Reform • Integrating Digital and Physical Channels 	<ul style="list-style-type: none"> • Single View of Bank • Partner Services



Table 2: Innovative Trends and Priorities – from category codes to basic themes

Ref.	Category Code	Underlying Concepts or Knowledge	Basic Themes
		<ul style="list-style-type: none"> Integrating Partner-Powered Services 	
8	Social Media	<ul style="list-style-type: none"> Peer to Peer Interactions Social Network Integration with Systems Social Media to Reach out to Customers Brand Awareness Customer Acquisition Brand Loyalty Need-based Conversation Web 2.0 Tools Internal Collaboration External Collaboration Social Media integrated Marketing 	<ul style="list-style-type: none"> Customer Collaboration Staff Collaboration

We analyzed the relationships between basic themes and grouped related basic themes into organizing themes (Table 3) in order to further enhance the meanings of these basic themes. For instance, the basic themes of Customer Information Consolidation, Customer Context Awareness, and Customer Process Standardization refer to the overall customer relationship management generic theme. Therefore, these basic themes were grouped under the generic Customer Relationship Management System organizing theme.

Finally, we grouped related organizing themes under main themes or global themes: Customer Platform and Organization-as-a-Whole. For instance organizing themes related to customer (e.g. Customer Relationship Management System, Decision Support etc.) refer to the overall customer platform. Therefore, customer related organizing themes were grouped under the Customer Platform global theme. Similarly, organizing themes related to the overall organization (e.g. Green System, Infrastructure etc.) refer to the whole organization. Therefore, organization related organizing themes were grouped under the Organization-as-a-Whole global theme. Global themes summarize the organizing themes. The hierarchy of themes (Basic → Organizing → Global) represents the thematic network (Figure 2). Further, the link between the global themes has also been shown in the thematic network.

Table 3: Innovative Trends and Priorities – From basic to organizing to global themes

Ref.	Basic Themes	Organizing Themes	Global Themes
1	<ul style="list-style-type: none"> Customer Information Consolidation Customer Context Awareness Customer Process Standardization 	Customer Relationship Management System	Customer Platform
2	<ul style="list-style-type: none"> Customer Behavior Awareness Analytical Capability Enhancement 	Decision Support System	Customer Platform
3	<ul style="list-style-type: none"> Mobile Transaction Management Transactional Convenience 	Mobile Payment System	Customer Platform
4	<ul style="list-style-type: none"> Carbon Management Behavioral Changes 	Green Systems	Organization-as-a-Whole (OaaW)
5	<ul style="list-style-type: none"> Virtualization Data Centers Consolidation Private Cloud Deployment 	Infrastructure	Organization-as-a-Whole (OaaW)

Table 3: Innovative Trends and Priorities – From basic to organizing to global themes			
Ref.	Basic Themes	Organizing Themes	Global Themes
	<ul style="list-style-type: none"> Infrastructure Remediation 		
6	<ul style="list-style-type: none"> Risk Awareness Customer Access Management 	Multi-level Security System	Customer Platform
7	<ul style="list-style-type: none"> Single View of Bank Partner Services 	Shared Services System	Organization-as-a-Whole (OaaW)
8	<ul style="list-style-type: none"> Customer Collaboration Staff Collaboration 	Collaboration Tools	Customer Platform

The thematic network is referred to here as the conceptual research framework of emerging themes in FST adoption (Figure 2).

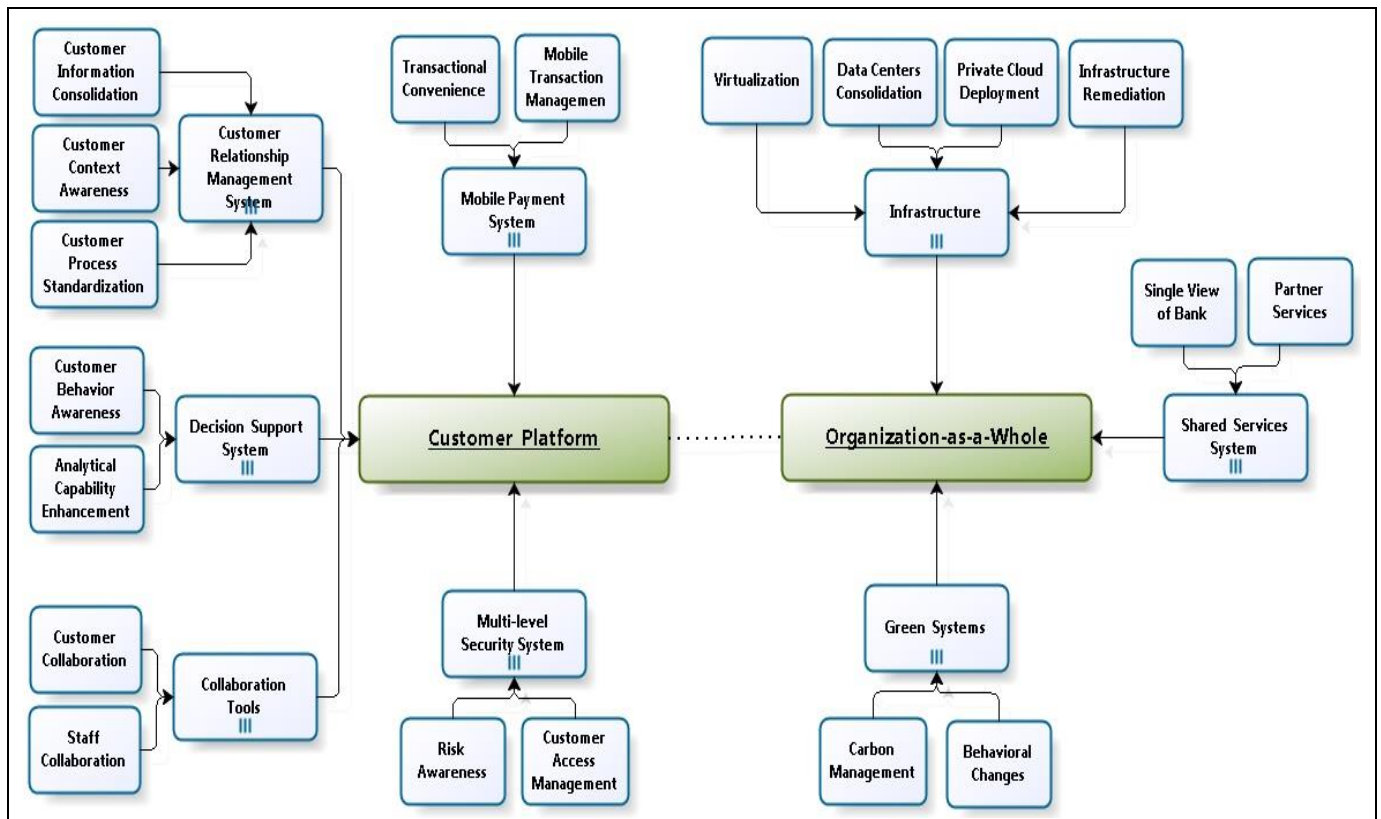


Figure 2. Conceptual Framework of Emerging Themes in FST Adoption

Boxes with the symbol III (Figure 2) represent the organizing themes (e.g. a cluster of basic themes). Green boxes represent the global themes (e.g. a cluster of organizing themes). Arrows in Figure 2 represent the bottom-up relationship from the basic themes to organizing themes and organizing themes to global themes (as we discovered them during our analysis). Dotted line between global themes in Figure 2 indicates the organizational environment Organization-as-a-Whole theme that is required to support the Customer Platform theme. From the Customer Platform global theme perspective, it can be observed from Figure 2 that the current trends and priorities are front office customer relationship management, decision support systems, collaboration tools, multi-level security and mobile payment systems. Whereas, from the Organization-as-a-Whole global theme perspective, the current trends and priorities are green systems, infrastructure and shared services. Based on the identified global themes and underlying organizing and basic themes, we can conclude that that the current focus of FSO, after the financial crisis, is investing resources only in front office customer platforms and infrastructure consolidation research and adoption. This is to present the Organization-as-a-Whole view to a customer for improved customer experience. At this stage, it seems (based on the analysis presented in Tables 2-3) that investment of resources is not a priority in back office systems (e.g. HR, Payroll) refurbishments. Interview #1, states that

“Banks need to clearly define core competencies to ensure they are investing in areas that deliver competitive advantage.”

This statement seems to suggest that:

Despite the global financial crisis FSO continually need to invest in their Organization-as-a-Whole and Customer Platform related FST to stay alive and competitive in the market.

The analysis presented in this section has identified the current situation of FSO in terms of emerging FST adoption themes. However, the resultant emerging FST themes are not helpful in isolation. Therefore, in order to complement the thematic analysis presented in this section, we further analyze and discuss the Global Themes in the context of FST adoption objectives, challenges, customer centricity, human resources, outsourcing and IT strategy maintenance.

Technology Adoption Objectives and Challenge

This research not only provides emerging themes in FST but also provides deeper insight into the related FST adoption objectives, challenges, customer centricity, human resources, outsourcing and IT strategy maintenance. The previous section presented the emerging themes in FST; however, adoption of new emerging FST presents both opportunities and challenges for FSO. In order to further understand and extend the analysis on emerging themes in FST (as noted in Tables 2 and 3 and Figure 2), we further analyzed the interview transcripts in order to report the key FST adoption objectives and challenges and then linked these to the relevant global themes, which are summarized in Tables 4 and 5.

1.2. What are the key objectives and challenges from FST adoption and improvement perspectives?

Table 4: Technology Adoption Objectives

Ref.	Objectives	Linked Global Themes
1	<ul style="list-style-type: none"> • Superior Customer Service • Customer Service Improvement • Greater Client Satisfaction • Customer Experience Transformation • Easier and Simpler Transaction Methods • Minimum Adverse Impact to Customer • Mobilization • Cross-sell Products and Service to Customer via Social Media • Predictability 	Customer Platform
2	<ul style="list-style-type: none"> • Operating Efficiency • Continued Growth • Reduce Significant Risk of the Legacy Platform • Superior Performance Reporting • Higher Availability • Few Production Issues • Common Platform and Asset Re-usability • Integrated International Payment Systems • Application Coverage and Multi-Platform Integration • Repeatability • Cost Effective 	Organization-as-a-Whole

Table 5: Technology Adoption Challenges

Ref.	Challenges	Linked Global Themes
1	<ul style="list-style-type: none"> • Changing Customers/Prospects Lifestyle • Ensuring Consistent Customer Experience • Silo CRM • Silo Business Intelligence 	Customer Platform

2	<ul style="list-style-type: none"> • Lack of Resources (Difficult to Get Right Resources) • Lack of Resource Alignment • Staff Turnover and Loss of IP • Obsolete Technology Adoption • Inconsistent Technology Adoption • Inappropriate Technology Adoption • Brining Systems Together to Recognize Multi-channel Transactions • Cross-border Synergies • Regulatory Clearance on Technology • Local Country Specific Laws • Storm of Changing Regulations • Budget Overrun 	Organization-as-a-Whole
---	--	-------------------------

Key technology adoption objectives were identified and linked to the respective identified global themes: Customer Platform and Organization-as-a-Whole (Table 4). For instance, Interview #3, states that

“We want customers to see us as their preferred bank. Our focus on transforming customer experience”.

This objective refers to the Customer Experience Transformation objective in Table 4. Interview #5, states that

“We recently implemented pControl and pQuant for our investments business in Australia. The first objective was to address a fairly significant risk associated with the legacy platform and the many manual processes and workarounds. We wanted to reduce the probability of errors related to this”.

This objective refers to the Reduce Significant Risk of the Legacy Platform objective in Table 4. Objectives related to customers e.g. superior customer service, customer service improvement etc. were linked to the Customer Platform global theme. Whereas, objectives related to organizations e.g. operating efficiency, continued growth etc. were linked to the Organization-as-a-Whole global theme. It seems from this analysis (Table 4) that due to the recent financial crisis that objectives of FSO are to only invest and adopt technology that would help them to reduce their operating cost and enhance the customer experience.

A decision to adopt a technology is not an easy task and here the challenge for FSO is how to adopt appropriate technology aligned to their business needs. From our analysis key technology adoption challenges were identified and linked to the respective identified global themes: Customer Platform and Organization-as-a-Whole (Table 5). We can clearly observe (Table 5) that there are a number of challenges currently faced by FSO. There is currently a shortage or limited supply of technology resources in the market and consequently FSO are competing with each other and facing difficulty in getting the right resources for their technology divisions or departments. FSO are also challenged by constantly changing lifestyles and the adoption of latest devices (e.g. Smartphone, iPads, and tablets) by their customers, especially young customers. For instance, Interview #4, states that

“The important challenge for retail banks is getting tuned to lifestyle changes of their customers and prospects”.

This challenge refers to the Changing Customers/Prospects Lifestyle challenge in Table 5 (customer platform related challenge). Interview #1, states that

“A further challenge is ensuring maximum advantage from investments in technology and avoiding wasteful expenditure from uncoordinated and piecemeal adoption of technology, adoption of inappropriate/inconsistent technology or adoption of obsolete technology”.

This statement refers to the Obsolete Technology Adoption, Inconsistent Technology Adoption, and Inappropriate Technology Adoption challenge in Table 5 (organization-wide challenges). It seems that FSO should closely observe the changing lifestyle of their customers and adjust their technology for interacting with those customers. FSO, who are offering services in different countries, are faced with the challenge of required local regional regulatory compliance or technology clearance prior to proceeding with the adoption of new technology, which sometimes can be a problematic and a lengthy process. Lack of integration between customer relationship management systems and business intelligence systems is another challenge, which is important when integrating, reporting and analyzing customer behavior information for improving business services. The analysis presented in this section suggests that FSO need to consider the identified objectives and challenges when making decisions about what and how to adopt appropriate technology aligned to their business needs and customer life styles.

Effective and Customer Centric FST

It can be observed from our analysis that many of the FST trends, priorities, objectives and challenges are around the customer and related FST adoption. Our analysis also highlights the perceived effective customer centric FST from the perspective of FSO leadership, which has also been linked to the identified respective global themes: Customer Platform and Organization-as-a-Whole (our third area of focus).

1.3. Which FSTs are the most effective and customer centric in the financial services industry?

Table 6: Effective Customer Centric FST		
Ref.	Effective Customer Centric FST	Linked Global Themes
1	<ul style="list-style-type: none"> • Mobile – SMS to contact customers • Consistent Superior Customer Experience • Customer Channel Preference Analysis • Enhancing Channel Experience 	Customer Platform
2	<ul style="list-style-type: none"> • Internet • Effective Technology Enactment (More important is the way the technology is used) • Excellence in Architecture • Loosely Coupled Systems • Virtualization • Green IT 	Organization-as-a-Whole

We have also identified a number of effective customer centric FST aspects. For instance, effective customer centric FST aspects, related to customers (e.g. mobile, channel etc.) are linked to the Customer Platform global theme. Whereas, effective customer centric FST related to organizations (e.g. effective technology enactment, excellence in architecture etc.) are linked to the Organization-as-a-Whole global theme. Current internet and mobile technologies i.e. online banking systems, self-service information kiosks etc. are considered to be effective customer centric as opposed to traditional technologies (Table 6). Interview #7, states that

“The rapid adoption rate of smartphones will give the canvas of banking experiences a new look, thereby lending new meaning to mobile and online banking”.

This statement refers to the importance of mobility in financial services. Similarly, it has also been noticed in the analysis of Interview # 25 that the most effective technology for acquiring and retaining Gen-Y customers is mobile technology [e.g. interviewee states: “80 percent of customers are under 35 and 40 percent are under 25 – so it is incredibly important”]. Interview #12, states that we are

“a high quality, customer centric, service oriented financial institution. We are committed to providing a 'consistent superior customer experience' by leveraging technology and hence, a holistic and comprehensive view of the customer requirements become integral for the realisation of this objective”.

It has also be observed that these days the effective and customer centric FST should be cost effective, which can be assisted by virtualization and the appellation of Green technologies. For instance, Interview #22, states that

“Green initiatives include investing in new energy-efficient equipment; power saving modules for lighting, air-conditioning and office equipment; recycling of paper, obsolete mobile phones, computers and cartridges and including environmental considerations”.

This statement seems to suggest the Green technology is not only symbolic and FSO Green initiatives are actually linked to clear material advantages. On another occasion, Interview #6, states that

“Virtualisation itself is now a mature technology, however its deployment in financial services has room to grow. Improved hardware offerings and better management tools are helping drive adoption as are internal efforts at mitigating migration risk to a virtual estate. This is especially relevant for applications that have specific performance criteria”.

These two statements seem to suggest that there is a close relationship between customer centric and cost effective virtualization and green IT. FST is important for FSO, however, the most important thing is the way FST are adopted by FSO. For instance, Interview #9, suggested that

“The best technology platforms in the world all have one thing in common. They make the complex seem simple. Simple to use, reliable, easy to upgrade and exceptionally well integrated.”

This statement indicates that effective and customer centric technology should be based on flexible and loosely coupled components or elements that have the ability to adapt to changing business needs. Another interviewee, Interview #4, states that

“A communication hub that is located at the crossroads of different product processors and delivery channels is a key architectural component for achieving customer-centricity”.

In summary, the key message is that effective and customer centric technology should be able to provide multiple channel support and seamlessly integrated product processes for superior customer experience i.e. easy to use and easy to interact with. It should also be able to log customer channel preferences’ information and produce reports for determining and enhancing customer experience.

Human Resources and Outsourcing

Strategic human resource management [Krssadaki, Matsatsinis and Hanzis, 2010] and outsourcing are the important factors in the context of IT skills, which are required to develop, adopt and manage emerging FST. Our analysis highlights that IT skills are now more in demand and how outsourcing ventures are evaluated in FSO. The responses for this area of focus have been analyzed and have been linked to the identified global themes: Customer Platform and Organization-as-a-Whole.

1.4. Which IT skills are now more in demand in FSO and how are outsourcing ventures evaluated by them?

Table 7: Human Resources		
Ref.	Human Resources	Linked Global Themes
1	<ul style="list-style-type: none"> Customer-Centric – ability to relate their work to customers 	Customer Platform
2	<ul style="list-style-type: none"> Production Management Project Management Relationship Management Social Media Management Leadership Application Development Application Support Outsource Infrastructure Support Combination of Business and Technical Enthusiasm Common Sense Hard Working Innovation Diversity Business-Centric – ability to partner with business Commercial acumen 	Organization-as-a-Whole

Table 8: Outsourcing		
Ref.	Outsourcing Ventures’ Assessment	Linked Global Themes
1	<ul style="list-style-type: none"> Competition Intellectual Property Domain Knowledge Risk Regulatory Compliance Confidence Trust 	Organization-as-a-Whole

We also identified a number of human resource and outsourcing issues. For instance, staff skills related to customers (e.g. customer-centric: ability to relate their work to customers) are linked to the Customer Platform global

theme. Whereas, skills related to organizations e.g. production management, project management etc. are linked to the Organization-as-a-Whole global theme. It is clear from the analysis (Table 7) that despite technical skills related to emerging FST, FSO staff should have the ability to relate their work to business, customer experience and satisfaction. Interview #17, states that

“I’m really looking for talented people who can partner with the business to deliver for our customers – so business-savvy, commercial acumen and leadership capability is as essential as strong technology skills”.

Despite traditional leadership and management skills, there is also an emerging demand for social media managers and a need for people with both the business and technology skills, which is referred to here as a hybrid skill. For instance, Interview #22, states the need for social media skills for

“monitoring the chatter on the numerous (and increasing) social media channels”.

This seems to suggest that FSO has interest in social medial channels and there is need for people who have the right skills to effectively monitor and work with these new emerging social channels. Finally, along with business and technology skills, there is a great demand for people possessing behavioral skills such as enthusiasm, common sense, hard work, innovation and diversity.

We also identified (Table 8) that outsourcing ventures should be assessed mainly from an overall organization’s strategic importance perspective. Therefore, outsourcing has been linked to the overall Organization-as-Whole global theme. Interview # 3, states that

“We don’t outsource anything strategic. To assess if an initiative or process is strategic, we ask ourselves - is this how we differentiate ourselves from the competition? Is there a proprietary or intellectual property component key to our strategy? Are our existing skills and domain knowledge essential to managing risk? Is there regulatory compliance to adhere to?”

It is evident from the analysis of this statement that competition, intellectual property, domain knowledge, risk and regulatory compliance related projects or items should not be outsourced.

Strategy Maintenance

Technology adoption is often linked to the IT strategy component of the overall enterprise strategy [Gill, 2013]. This section discusses the FSO leadership perspectives on the maintenance of an overall IT strategy in the context of FST adoption. The following question was the basis of our analysis of FSO perspectives on IT strategy maintenance. IT strategy maintenance aspects have been linked to the overall identified global theme: Organization-as-a-Whole, which are summarized in Table 9.

1.5. How are FSO maintaining their overall IT strategy to meet the dynamic, global and local regional needs?

Table 9: Strategy Maintenance

Ref.	Strategy Maintenance	Linked Global Themes
1	<ul style="list-style-type: none"> • 80%Standardisation Across the Board “must-haves” • Maximizes the use of Global Solutions • Customization “preferred but not mandatory” • Location base services • Reconcile Short-Long Investment Streams • Harvest Immediate Opportunities • Parallel WIP Long Term Opportunities • Response to Variation in Regulations • Retains the Agility to Provide Local Solutions • Agile Guided Strategy • Leadership and Local Expertise Collaboration on the Ground • Community-focused Social Media Policy • People Driven strategy. What people are saying about our services in social media • Multi-channel strategy – start transaction online complete on your mobile or iPad 	Organization-as-a-Whole

IT strategy maintenance, from a globalization perspective, involves the standardization of processes and maximization of the deployment of global solutions to support global or standardized processes. IT strategy maintenance, from a localization perspective, focuses on the customization of preferred but not mandatory and customizable special business processes and technology. For instance, Interview # 3, suggested that

“We realised about 80 per cent of processes could be standardized while the rest had to be country specific. We combined process standardisation with optimisation to yield faster, more effective operations”.

IT strategy maintenance can be segmented between short and long term investment streams for capitalizing on immediate and long term opportunities. This would allow the management of short and long term streams in parallel. However, despite short and long term streams, IT strategy should be able to quickly respond to unplanned events such as variations in the regulations i.e. ability to provide solutions compliance to changing global and local regional regulations. For instance, Interview # 9, states that

“we combine strong leadership and expertise on the ground in each location, supported by a global IT organization and strategy that maximises the use of global solutions but stills retains the agility to provide local solutions when needed”.

In summary, the analysis of the statements from interview transcripts suggests that in order to align the global and local aspects of IT strategy, FSO leadership needs to collaborate and involve local experts on the ground throughout the lifecycle of IT strategy design, implementation and maintenance

V. DISCUSSION

This section discusses the concept categories, global customer platform and organization-as-a-whole themes and their relationship from practice and research perspective.

Concept Categories

This article reviewed thirty interview transcripts and identified a set of eight concept categories, which includes sixty concepts. As the scope of this article is to identify the emerging themes of FST adoption during textual thematic analysis of the FSO interview transcripts, it may not be important to show the number of times each concept category was mentioned in the interview transcripts. This is because, a concept category important in one FSO context may not be important in another FSO context at all. Nevertheless, in order to provide more clarity and transparency, this section highlights the number of times (frequency) each concept category was mentioned in the interview transcripts. Table 10 provides a list of concept categories with their frequency, percentage and source interview number. For instance, Customer Information Management was mentioned by 28 out of 30 interviews (93% of the interviews). It can be observed from this analysis that Customer Information Management (93%), Mobile Banking (90%) and Core Capability (100%) are within the high frequency range (76% – 100 %). Security (73%) and Social Media (67%) are in the medium frequency range (51% - 75%). Business Intelligence (33%) and Integration (37%) are in the low frequency range (26% - 50%). Finally, Green IT (10%) is in the very low frequency range (1% - 25%).

The work presented in this article is a qualitative analysis of interview data, and therefore, it is not appropriate to suggest that one concept category is more important than the other concept category merely based on the number of times (frequency) that concept category is mentioned. The research presented provides concept categories and themes to facilitate practice or research directions by shedding light on the areas of greatest value and potential return in FST adoption. FSO should make their own judgment about the importance of each concept category or theme for their own individual requirements according to their own specific context.

The concept category frequency from this research can be used more broadly by practitioners or researchers as an indicator of how relevant a given category is across all of the FSO interviewed. In other words, if a category is mentioned for all FSO, then this category would seem to be relevant for all FSO. For instance, Core Banking Capability seems to be more relevant (as it is mentioned with high frequency) than Green IT (mentioned with very low frequency). Consequently, practitioners and researchers may choose to focus more on concept categories with high frequencies than on the concept categories with low frequencies. Practitioners or strategists can use these concept categories (and their frequency ranges) as a guide for planning and prioritizing their strategic FST adoption initiatives and investments for the next 3-5 years. Enterprise architects could be interested in one or more concept categories and their impact assessment on the overall existing FSO enterprise architecture. Researchers, may choose one or more concept categories for planning their research initiatives.



Table 10: Concept Category

Ref.	Concept Category	Frequency	Percentage	Source Interview Number
1	Customer Information Management	28	93%	1,2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30
2	Business Intelligence	10	33%	1,3, 5, 7, 11, 12, 18, 23, 24, 25
3	Mobile Banking	27	90%	1, 2, 3, 4, 5, 6, 7, 9, 10, 11, 12, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30
4	Green IT	3	10%	3, 10, 22
5	Core Capability	30	100%	1,2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30
6	Security	22	73%	2,3, 4, 6, 7, 8, 9, 10, 11, 12, 14, 15, 16, 17, 18, 20, 22, 23, 24, 27, 29, 30
7	Integration	11	37%	1,3, 4, 5, 11, 12, 15, 16, 22, 25, 28
8	Social Media	20	67%	2,4, 6, 7, 11, 12, 15, 16, 18, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30

Customer Platform Theme

The global customer platform theme includes five organizing themes (Figure 2): customer relationship management system, decision support system, collaboration tools, mobile payment systems and multi-level security systems.

Customer Relationship Management System

The customer relationship management (CRM) system is a broad area; however, the analysis of the interview transcripts suggests three emerging trends of customer information consolidation, customer context awareness and customer process standardization (based on the analysis presented in Section IV). It can also be observed from Table 10 that Customer Information Management (93%) is considered a highly relevant area and option for FSO. Customer information consolidation is important for providing a 360 degree or single view of the customer record or information in a CRM system. Interview #20, mentioned that

“Traditionally in financial services, organizations have systems and processes that span across channels, but the channels themselves can still often operate on a siloed basis. This can result in duplication, inefficiency and an inconsistent customer experience.”

This seems to suggest that duplicated and dispersed customer information from different channels can be consolidated in order to provide a single view of customer information throughout the organization via a holistic single interface. It would enable FSO to enhance customer relationships, improve customer service and facilitate the overall business planning process for retaining customers in the current financial situation. The single view of customer information would help FSO to better understand the customer context and process standardization (Table 2). For instance, Interview #12, suggested

“to develop a holistic single interface to view all the customer details and relations the customer has such as: customer demography; physiographic details; products and relationships with the bank; and channels and service usage.”

The single view of customer information is not an option, rather it is becoming a new regulatory requirement (e.g. the UK Financial Service Authority) for supporting the “Treating Customer Fairly” principles [OpenSpan, 2013]. However, the establishment of the effective CRM system that enables single view of customer information is not a straight forward task. It would require changes and support from people, processes and underlying infrastructure and shared services systems of the Organization-as-a-Whole theme. FSO strategists and enterprise architects may assess the impact of the adoption of modern CRM systems on the existing FSO strategy and enterprise architectures. Based on the assessment, they may need to develop a strategic roadmap for modern CRM system adoption. Researchers,

may be interested in finding new ways of handling and integrating duplicate and dispersed customer information via a holistic single interface, which is important for providing a single view of the customer.

Decision Support System

The decision support system theme suggest two emerging trends: customer behavior awareness and analytical capability enhancement (Figure 2). The analysis of the interview transcripts suggests that existing analytical capability can be enhanced to improve decision making. For instance, Interview #1, suggested

“restructuring data warehouses/marts, greater adoption of content management and business process management technologies to automate information management and decision-making processes.”

The enhancement of the analytical capability may help recognizing customer buying behavior or patterns. For instance, Interview #5, suggested that

“We’ve recently brought out a new product in Japan specifically targeted at Gen-Ys which recognises that their buying behaviour is different.”

FSO may consider using the emerging BigData (e.g. Hadoop, Cloudera, BigData Appliance) and predictive analytics technologies (e.g. SAS, SPSS predictive analytics) to enhance their analytical capability. They may adopt BigData technologies to process real-time large sets of data for detecting frauds in a financial transactions (insurance claims, credit card transactions etc.) and using predictive analytics technologies to process historical data for identifying customer buying behaviours or patterns, and forecasting customer future needs and behaviours [Lattice, 2012]. The use of the predictive analytics could be beneficial for developing personalized financial products, performing actuarial analysis, target marketing, optimizing price, selling, managing risks and frauds. The modern decision support system with BigData and predictive analytics capabilities may help FSO in improving profitability while quickly identifying and responding to the always changing competitive demands, trends and regulatory requirements. For instance, a credit card issuer used predictive analytics technology for developing a personalized credit line for individual customers and reported a \$6 million increase in their profit [FICO, 2012]. The adoption of emerging decisions support technologies seems beneficial, however, it would require changes and support from people, processes and underlying infrastructure and shared services systems mentioned in the Organization-as-a-Whole theme. FSO strategists and enterprise architects may choose to assess the impact of the adoption of emerging decision support systems on the existing FSO strategy and enterprise architecture. Based on the assessment, they may decide to develop a strategic roadmap for contemporary decision support systems adoption. Researchers, could be interested in researching how to best assess handling large amount of customer information for recognizing customer buying behavior or patterns.

Collaboration Tools

The collaboration tools theme focuses on both external customer collaboration and internal staff collaboration through the adoption of emerging social media such as Twitter and Facebook. For instance, Interview #7, pointed out social media as one of

“the top three technology trends in Asia Pacific and globally: advanced business intelligence; mobile banking and mobile payments; and social media.”

The analysis of this interview transcript suggested that social computing is not just about sharing personal information, photos and videos online but it also enables organizations to reach out to their customers, resolve issues, as well as to distribute and advertise business information. FSO are showing interest in social media adoption for not only customer collaboration but also for staff collaboration. Interview #12, suggested that

“Within banks, social computing can be leveraged for managing both outward facing (customers) and inward facing (employees) relationships. Externally, banks are creating a new kind of customer intimacy with Web 2.0 and social networking technologies and tools like blogs, micro blogging, pod casts, rating, RSS (Really Simple Syndication), tagging, video sharing, wikis and social networking sites like Facebook and MySpace to reach out to customers and partners. Internally organizations are relying on technologies like mash-ups (a web application that combines multiple sources of data into a single tool) and blogs to keep the lines of communication open with their employees.”

Our analysis indicates that there is considerable interest in the adoption of social media among FSO. It can be observed from Table 10 that Social Media (67%) is considered a possible area of focus for FSO. FSO strategists and enterprise architects may choose to assess the impact of the adoption of emerging social collaboration tools and their integration with existing systems. Based on the assessment, they may decide to further develop a

strategic roadmap for contemporary social collaboration tools' adoption. Researchers, could be interested in researching how to best assess and adopt emerging social collaboration tools in FSO.

Mobile Payment System

The mobile payment system theme, in the context of overall mobile banking, includes mobile transaction management and transactional convenience. It can be observed from Table 10 that mobile banking (90%) is another highly relevant area or option that FSO may consider. One of the interviewees, Interview #1, states that

"We are piloting initiatives around the mobile wallet, phone based credit and using mobile to service the banking requirements of India's poor. Leveraging emerging technologies like NFC (Near Field Communications) could make traditional credit cards redundant and reduce fraud while enhancing customer convenience."

This seems to suggest that FSO are showing interest in contactless NFC mobile payment services to improve the customer experience. Interview #2, suggested that

"we place the customer at the center of everything we do. This is a significant change in strategy, so we now have a significant programme of work to deliver transactional convenience to our customers"

Transactional convenience seems to be a very important non-functional requirement in the context of mobile payment systems and FSO may choose to pay close attention to it. It has been noticed in literature that there is growing trend toward mobile banking. For instance, Bank of America, Bank of the West, ING Direct and PNC Financial are embracing P2P technology by allowing their customers to make payments via mobile phones or standard web pages i.e. transfer money from one account to any other account [Sherter, 2010]. Google Wallet also provides pre-paid Google cards and also allows Citi MasterCard. The emergence of new Mobile Payment System providers (non FSO) could be seen as a competitive threat by the FSO. However, FSO should not necessarily consider this as a threat. This is because these new players are not trying to enter in the business of banking or financial services. For instance, Google does not seem to considering becoming a FSO. Google provides mobile payment solution architecture and messaging system that can be configured for a specific context. It is also not practical or possible to restrict or stop these new Mobile Payment System providers. FSO strategists and enterprise architects may carefully assess their mobility readiness and develop mobile strategy and enterprise architecture to support emerging contactless NFC point of sales and the overall emerging Mobile Payment ecosystems. Researchers, could be interested in researching ways to best assess and adopt Mobile Payment System in FSO. In summary, FSO may consider collaborating and partnering with Mobile Payment System providers in reaching out to their customers; and providing them with seamless, integrated, simple, easy to use, connectivity from anywhere and secure channels for interactions and making payments. FSO may choose to focus on their core business (e.g. providing financial services and products) and facilitate the new players outside of the traditional financial services industry to provide specialized payment solution systems.

Multi-level Security System

The Multi-level security system theme, in the overall context of security, draws our attention to two important areas: risk awareness and customer access management. It can be observed from Table 10 that security, based on its appearance in interview transcripts or frequency (73%), is considered an important area or option that FSO may consider. Interview # 24, mentioned that

"We approach online security from different angles. First, we are in the process of moving to dynamic 2nd factor authentication for all web and mobile-based transactions. Second, we will introduce more stringent forms of authentication (out-of-the-band, transaction-signing, etc.) for sensitive transactions. Authentication can be viewed as reactive and defensive so we need to supplement it with the ability to detect malicious intentions before they become full-fledged attacks. Finally, much can be done in customer communication and education to raise awareness of online security. All these are part of our on-going digital security strategy".

Our analysis suggests that a secured and trusted multi-channel customer platform, with multi-level security, is critical for improving interaction with customers, but also accepting and settling new business without unnecessary involvement of FSO staff. Interview #2, mentioned that

"Security is always of paramount importance to us and we regularly review relevant market events and independent research that will assist in maintaining our high standards – the idea is that we not only monitor but proactively manage the security envelope."

We observed from the analysis that tightening security and reducing risks can be realized by adopting dynamic 2nd factor authentication security system. Importance is also given to market event reviews for better risk awareness and



management. Risk awareness and managing access to sensitive or confidential customer data is paramount where the customers are allowed to interact with FSO through different channels. The leakage of sensitive information may lead to legal and financial losses but may also result in customer distrust. FSO strategists and security architects may consider developing multi-level security capability for avoiding any security compromises. Researchers, could be interested in researching and developing new multi-level security algorithms, applications and processes.

Organization-as-a-Whole Theme

The global organization-as-a-whole theme presents shared elements that support the whole enterprise or organization, therefore, it is called an “organization-as-a-whole” theme. The dotted line (Figure 2) shows the relationship between the global customer platform and the organization-as-a-whole theme. This will be discussed in the last section of this article before our conclusion. This section focuses on the global organization-as-a-whole theme that includes three organizing themes (Figure 2): infrastructure, shared services systems and green systems.

Infrastructure

Infrastructure is one of the organizing themes under the global organization-as-a-whole theme. Our analysis highlighted four basic themes under the infrastructure organizing theme (Figure 2): virtualization, data center consolidation, private cloud deployment and infrastructure remediation. The virtualization theme indicates FSO interest in providing virtual desk interface (VDI) access to their employees. Data center consolidation indicates FSO interest in consolidating their systems, storage and infrastructure. Private cloud deployment indicates that FSO is interested in private cloud solutions instead of a public cloud. This may well be due to the sensitive nature of FSO business and customer information. Interview #20, suggested that the

“security of our customers’ data is of paramount importance to us. We are looking to build some internal cloud capability and also leveraging some external offerings in areas that we do not have sensitive information”.

Data center consolidation is a pre-requisite to setup an internal private cloud deployment. In addition to consolidation, the infrastructure remediation theme indicates the option of up scaling and strengthening infrastructure to keep up with the growth of business. Interview #2, stated that

“We will also continue to upscale and strengthen our infrastructure and core capabilities.”

Private cloud and virtualization seem to offer cost effective infrastructure options [Mulholland, 2010; Gill and Bunker, 2011; Smith, Gill, Hasan and Ghobadi, 2013], and it is reasonable to state that FSO may leverage these options for capital efficiency against the backdrop of financial crisis. Interview #16, suggested that

“public cloud offerings can be problematic for financial services organizations given regulatory and risk-related concerns regarding data security and compliance.”

FSO may want to adopt the cloud, however, at the same-time they would like to retain control over sensitive customer and financial information. The adoption of cloud technology presents many challenges and can also provide many benefits. Interview #22, mentioned that

“we are continuing our journey with improvements to our architecture that will prepare our business for cloud services should we wish to use them”.

FSO strategists and enterprise architects may choose to assess their readiness and prepare their strategy and enterprise architecture [e.g. Gill, Smith, Beydoun and Sugumaran, 2014] for the possible adoption of cloud and virtualization. Researchers, could be interested in researching cloud and visualization assessment and adoption models for FSO.

Shared Services System

The shared services system is one of the organizing themes under the global organization-as-a-whole theme. Our analysis highlighted two basic themes under the shared services system organizing theme (Figure 2): single view of bank and partner services. The single view of a bank theme indicates FSO interest in a simple and integrated view of organizational processes (e.g. single view of a bank), products, services and systems to both the customers and employees as opposed to having a fragmented view of the organization. The key is: take the best solution and then use it across the organization., Interview #3, suggested that

“The focus is to provide a single view of the bank to customers across all financial products and services, across all channels.”

The analysis of the interview transcripts suggested that there is an emerging trend for providing a single view of the integrated distributed cross-channel and cross bank partner services to a customer. Interview #26, mentioned that

“Most online banking facilities are currently based on a model where you come to the bank to do your banking, albeit in an online context. Moving forward I see this being less and less the case. Online banking in the Retail space will evolve from being dominated by monolithic, proprietary channels to a set of bank or partner-powered services, distributed and accessible wherever the customer might be in the online or digital world.”

This seems to suggest the possibility of adopting communication and collaboration technology on a distributed shared infrastructure or platform (shared among different divisions or departments or banks or channels) for enabling shared service systems for dealing with customer requirements. FSO may consider the establishment of a collaborative and cost effective shared service system work environment as opposed to an environment where people and technology are deployed in isolation. Researchers, could be interested in researching risks assessment and adoption of distributed shares services system in FSO.

Green Systems

The green system is one of the organizing themes under the global organization-as-a-whole theme. The analysis of the interview transcripts highlighted two basic themes under the green systems organizing theme (Figure 2): carbon management and behavioral changes. Interview #3, suggested that

“we are focusing heavily on cost management technologies. With thin client, virtualisation and green computing, we want to reduce our cost base while being an ecologically responsible company”.

The overall analysis of interview transcripts indicates that there is not a considerable interest in the adoption of green systems among FSO. It can be observed from Table 10 that only 10% of the interviewees showed interest in Green IT. Nevertheless, green systems draw our attention to organization-wide carbon emission management and behavioral changes such as front and back printing by default, reminding people to switch off monitors, video conferencing instead of face-to-face meetings. The analysis of interview transcripts suggested that green systems are not only simply a symbolic gesture but they do offer real material advantages for establishing a resource efficient and sustainable environment mainly through the lowering of energy costs. This draws our attention to a possible area of research related to the tracking and measuring of real costs and benefits of green systems.

Relationship between Global Customer and Organization-as-a-Whole Platforms

The global customer platform theme refers customer related information systems such as customer relationship management, decisions support, collaboration, mobile payment and multi-level security systems organizing themes (Figure 2). The global customer platform and underlying themes or systems require the support of the global organization-as-a-whole theme. The global organization-as-a-whole theme falls within the core capability category. It is the backbone of an enterprise. It can be observed from Table 10 that the core capability concept category, based on its appearance in thirty interview transcripts or frequency (100%), is considered a highly relevant area of focus for FSO. The customer platform technology elements capability depends on the underlying core capability of the organization-as-a-whole theme elements. Global organization-as-a-whole provides an integrated shared environment to host customer platform systems. The global organization-as-a-whole technology theme includes Infrastructure, Shared Services and Green Systems organizing themes. These themes or systems support different platforms (customer platform, supplier platform etc.). The scope of the global organization-as-a-whole theme is not confined to a single application or platform. For instance, the customer relationship management system of the customer platform, needs an integrated shared hosting environment. The hosting environment refers to infrastructure theme of the organization-as-a-whole. The global organization-as-a-whole technology theme provides such shared infrastructure (e.g. web servers, applications servers, database servers, hardware etc.) for hosting customer platform related systems or applications. Infrastructure theme of the organization-as-a-whole would not only support the global customer platform but it would also support the other systems or applications deployed in the entire organization. FSO may use the information presented in the thematic network of themes as a starting point to develop or update their enterprise strategy, architecture and a roadmap for emerging technology adoption.

This section discussed and analyzed the thematic network themes (Figure 2) identified in Section IV. These themes indicate the emerging FST trends for FSO. It is important for FSO to have scalable, reliable and disciplined technology operating platforms for their competitive advantage. Our analysis indicated that FSO do not seem too keen on investing in back office systems refurbishments. FSO seem to be moving away from organization-led strategy to customer-led strategy (customer empowerment) as well as focusing on the standardization of customer-centric processes for improved customer information management, improved customer experience and to boost

organizational competitive advantage in the market. Based on our analysis, we suggest that in the next 3-5 years, there could be a large shift in FST adoption, and FSO could move away from a traditional isolated banking to more interactive and integrated agile and mobile banking i.e. digital and physical channel integration, mobilization and social media. The potential adoption of new technology signals strategic change. FSO may consider adopting a holistic strategic approach to take on new emerging customer-centric FST while at the same time providing full transparency on investment costs, benefits and risks through business informal and formal market research and partner engagements. Researchers may help FSO to identify and develop such holistic approaches to deal with the assessment and adoption of emerging FST in FSO.

In summary, our research has provided an analysis of texts that represent emerging FST adoption themes (Figure 2). This article can be used by FSO and scholars to set their own strategic research priorities and directions. Emerging FST themes and the related discussion presented in this article may help FSO technology leaders to make more informed decisions about the strategic assessment and adoption of emerging FST. This article may also assist scholars in extending their research in the important area of FST adoption and the development of new methods and approaches to effective FST adoption in FSO. Many, if not all, of the themes could be considered as potential streams of research. A key question for Information Systems (IS) scholars is ‘How could we use the research themes identified in this article to make a valuable contribution to the IS body of knowledge?’. Potentially, IS scholars may select an individual theme from the proposed research framework (Figure 2) and use it as a baseline to further define and test research directions or to, modify or develop an extant framework or theory. Hence, an important objective of this article is to present emerging FST adoption themes to facilitate technology adoption initiatives by shedding light on the areas of greatest value and potential return to both academia and the financial services industry

VI. CONCLUSION

Emerging FST provide opportunities for FSO. FSO may choose to assess and adopt emerging FST for financial and competitive advantage. In this context we set out to determine the important emerging themes of FST in FSO. Our study addressed this question, by analyzing thirty interviews of FSO technology executives and CIOs to identify a number of important emerging FST adoption themes. These included the assessment of FSO objectives, challenges, customer centricity, human resources, outsourcing and overall IT strategy maintenance elements. The identified FST adoption themes were categorized into two global theme categories: customer platform and organization-as-a-whole themes.

The broad global customer platform theme includes five key areas of focus, which are called organizing themes (Figure 2). These include: customer relationship management systems, decision support systems, collaboration tools, mobile payment systems and multi-level security systems. The global organization-as-a-whole theme includes three organizing themes (Figure 2): infrastructure, shared services systems and green systems. This theme provides an integrated hosting environment to support customer platform systems. From our analysis of identified themes, it has become clear that despite recent financial hardships, customer-centric FST enabled transformations cannot be ignored by FSO. FSO may consider investing resources and efforts in customer-centric platforms and organization-as-a-whole areas (e.g. infrastructure consolidation, shared services systems). Customer-centric FST adoption is important in facilitating the achievement of customer-centric objectives (e.g. to improve the customer experience). However, the current influx of a number of emerging FST also presents challenges to FSO (e.g. lack of resources, continually changing local and global regulations etc.). FSO may carefully assess their operational readiness to adopt FST to achieve customer-centric objectives.

We reemphasize that this article is forward looking rather than providing a commentary on the state of the art in FST adoption. The research allowed us to identify key themes that highlight a need for collaborative work between industry and academics on the overarching influence, assessment and adoption of FST. The emerging FST adoption themes and related objectives, challenges, customer centricity, human resource, outsourcing and overall IT strategy maintenance elements can be helpful to further identifying emerging research trends and directions. The financial services domain is dynamic and future research could be conducted to re-examine the scale, scope, governance, performance, safety and readiness of the financial services industry to adopt the emerging customer-centric technologies.

ACKNOWLEDGMENTS

We wish to thank participants in the financial services industry who helped with their valuable feedback and directions for the development of the work presented in this article. We also sincerely thank the journal editor, associate editor and anonymous reviewers of this article for their patience and extremely valuable suggestions for improvements on previous versions of this article.

REFERENCES

Editor's Note: The following reference list contains hyperlinks to World Wide Web pages. Readers who have the ability to access the Web directly from their word processor or are reading the article on the Web can gain direct access to these linked references. Readers are warned, however, that:

1. These links existed as of the date of publication but are not guaranteed to be working thereafter.
2. The contents of Web pages may change over time. Where version information is provided in the References, different versions may not contain the information or the conclusions referenced.
3. The author(s) of the Web pages, not AIS, is (are) responsible for the accuracy of their content.
4. The author(s) of this article, not AIS, is (are) responsible for the accuracy of the URL and version information.

Australian Bureau of Statistics (2013) "Research Paper: A Review of Regional Development Australia Committee Regional Plans", <http://www.abs.gov.au/ausstats/abs@.nsf/mf/1381.0>.

Akhavein, J., W.S. Frame and L.J. White (2005) "The Diffusion of Financial Innovation: An Examination of the Adoption of Small Business Credit Scoring by Large Banking Organizations", *Journal of Business*, (78)2, pp. 577–596.

Attride-Strling, J. (2001) *Thematic Networks: An Analytic Tool for Qualitative Research*, Qualitative Research, UK: SAGE Publications.

Brunnermeier, M. K. (2009) "Deciphering the Liquidity and Credit Crunch 2007–08", *Journal of Economic Perspectives*, (23)1, pp. 77–100.

Borzekowski, R. and A. Cohen (2005) "Estimating Strategic Complementarities in Credit Unions' Outsourcing Decisions", *Fed Working Paper*, <http://people.virginia.edu/~jvp3m/abstracts/cohen.pdf>.

Bech, M. L. and B. Hobijn (2006) "Technology Diffusion in Central Banking", Federal Reserve Bank of New York, *Staff Reports*, No. 260.

Courchane, M., D. Nickerson, and R. Sullivan (2002) "Investment in Internet Banking as a Real Option: Theory and Tests", *Journal of Multinational Financial Management*, (12)4-5, pp. 347–363.

Cooper, J. (2006) "The Integration of Financial Regulatory Authorities – The Australian Experience", speech presented at the 30th Anniversary conference "Assessing the present, conceiving the future", Rio de Janeiro, Brazil

Economist (2008) "Corporate IT Special Report: Let It Rise", *The Economist*, http://www.economist.com/specialreports/displayStory.cfm?story_id=12411882

Fagerberg, J., D.C. Mowery and R.R Nelson (2005) *The Oxford Handbook of Innovation*, UK: Oxford University Press.

Featherstone, T. (2012) "Finance Industry Job Losses to Worsen", <http://www.investordaily.com.au/31251-finance-industry-job-losses-to-worsen>.

FICO (2012) "Understanding Predictive Analytics", <http://www.fico.com/en/Communities/PredictiveAnalytics/Pages/default.aspx>.

Furst, K., W.W. Lang, and D.E. Nolle (2002) "Internet Banking", *Journal of Financial Services Research*, (22)1-2, pp. 95–117.

Gill, A.Q., S. Smith, G. Beydoun and V. Sugumaran (2014) "Agile Enterprise Architecture: A Case of a Cloud Technology-Enabled Government Enterprise Transformation", *PACIS 2014*, Chengdu, China.

Gill, A.Q. (2013) "Towards the Development of an Adaptive Enterprise Service System Model", *AMCIS 2013*, Chicago, USA.

Gill A.Q. and D. Bunker (2013) "Towards the Development of a Cloud-based Communication Technologies Assessment Tool: An Analysis of Practitioners' Perspectives", *VINE - Journal of Information and Knowledge Management Systems*, (43) 1, pp. 57-77.

Gill A.Q. and D. Bunker (2011) "Conceptualization of a Context Aware Cloud Adaptation (CACA) Framework", *Proceedings of the IEEE International Conference on Cloud and Green Computing CGC 2011*, Sydney, Australia.



- Gill, A.Q., D. Bunker, and P. Seltsikas (2011) "An Empirical Analysis of Cloud, Mobile, Social and Green Computing: Financial Services IT Strategy and Enterprise Architecture", *IEEE International Conference on DASC*, Sydney, Australia.
- Hodge, S. (2012) "Australian Financial Services Jobs Down but not Out", <http://www.investordaily.com.au/22566-australian-financial-services-jobs-down-but-not-out>.
- Krassadaki, E., N.F. Matsatsinis and A.K. Hanzis (2010) "Towards Analyzing Training Needs: A Case Study in a Greek Bank", *International Journal of Financial Services Management*, (4)3, pp. 199-219.
- Khalfan, A.M.S., Y.S.Y., AlRefaei and M. Al-Hajry (2006) "Factors Influencing the Adoption of Internet Banking in Oman: A Descriptive Case Study Analysis", *International Journal of Financial Services Management*, (1)2/3, pp. 155-172.
- Lattice (2012) "BigData for Financial Services", http://www.fstsummit.com/media/whitepapers/2012/BigData_for_Financial_Services_.pdf
- Marshall, C. and G. Rossman (1999) *Designing Qualitative Research, 3rd edition*, UK: Sage Publication.
- Myers, M.D. (1997) "Qualitative Research in Information Systems", *MIS Quarterly*, (21)2, pp. 241-242.
- Myers, M. D. and M. Newman (2007) "The Qualitative Interview in IS Research: Examining the Craft", *Information and Organization* (17)1, pp. 2-26.
- Miles, M., and A.M. Huberman (1994) *Qualitative Data Analysis*, Thousand Oaks, CA: Sage Publication.
- Mulholland, A. (2010) *Enterprise Cloud Computing. A Strategy Guide for Business and Technology Leaders*, USA: Meghan-Kiffer Press.
- Mylonakis, J. (2007) "A Review of Banking Institutions' Transformation in Balkan Transition Economies: 1990-2000", *International Journal of Financial Services Management*, (2)1/2, pp. 100-117.
- Moynihan, G.P., V. Jain, R.W. McLeod, and D.J. Fonseca (2006) "An Expert System for Financial Ratio Analysis", *International Journal of Financial Services Management*, (1)2/3, pp. 141-154.
- Ono, Y., and V. Stango (2005) "Outsourcing, Firm Size, and Product Complexity: Evidence from Credit Unions", Federal Reserve Bank of Chicago, *Economic Perspectives*, 1st Quarter, pp. 1-11.
- OpenSpan (2013) "FSA Single Customer View", http://www.openspan.com/solutions/technology_solutions/fsa/
- Powell, J. (2009) "Cloud Computing – What is it and What does it mean for education?" erevolution.jiscinvolve.org/wp/files/2009/07/clouds-johnpowell.pdf
- Raghunandan, M., N. Ramgulam, K. Raghunandan-Mohammed and I. Allaham (2012) "Emerging Issues on the Horizon: Financial Services Industry in Trinidad and Tobago", *International Journal of Humanities and Social Science*, (2) 17, pp. 55-69.
- Rene, M. and E. Taylor-Powell (2003) "Analyzing Qualitative Data", University of Wisconsin-Extension., *Cooperative Extension*, Madison Wisconsin, USA.
- Smith, S.J., A.Q. Gill, H., Hasan and S. Ghobadi (2013) "An Enterprise Architecture Driven Approach to Virtualisation", *PACIS 2013*, Jeju Island, Korea.
- Siomkos, G.J., and L.S. Tsiames (2006) "Analytical CRM Technologies in Financial Services Institutions", *International Journal of Financial Services Management*, (1)2/3, pp. 215-231.
- Schneider, R. and J. Sledge (2011) "The Future of Financial Services: Recommendations for Asset Building", Centre for Financial Services Innovation, <http://www.cfsinnovation.com/content/future-financial-services-0>.
- Shroff, G. (2010). *Enterprise Cloud Computing: Technology, Application and Architecture*. UK: Cambridge Press.
- Sherter, A. (2010). *P2P Payments Are Coming, and the Credit Card Companies Won't Like It*. http://www.cbsnews.com/8301-505123_162-43543966/p2p-payments-are-coming-and-the-credit-card-companies-wont-like-it/
- Sharma, S., J. Lavery and K. Polyanskiy (2010) "Challenges in Maintaining the Regulatory Capital Requirements", *International Journal of Financial Services Management*, (4)4, pp. 243-259.
- Saloner, G., and A. Shepard (1995) "Adoption of Technologies with Network Effects: An Empirical Examination of the Adoption of Automated Teller Machines", *Rand Journal of Economics*, (26)3, pp. 479-501.
- Strauss, A. and J. Corbin (1990) *Basics of Qualitative Research: Grounded Theory, Procedures and Techniques*, CA: Sage Publications.

Wonglimpiyarat, J. (2006a) "The Systemness Characteristics of Financial Innovation: Networks of Electronic Payments", *International Journal of Financial Services Management*, (1)2/3, pp. 255-266.

Wonglimpiyarat, J. (2006b) "Technological Change and Capabilities in Thai Banking", *International Journal of Financial Services Management*, (1) 2/3, pp. 289-307.

Wilson, J.O.S., B. Casu, C. Giradone, and P. Molyneux (2010) "Emerging Themes in Banking. Recent Literature and Directions for Future Research", *The British Accounting Review*, (42)3, pp.153-169.

Weber, R.P. (1990) *Basic Content Analysis*, CA: Sage Publications.

Zandt, D. (2010) *Share This! "How you will Change the Work with Social Networking"*, USA: BK Publishers.

APPENDIX A: DEMOGRPAHICS

This is a list of interviews that have been analyzed for this empirical study.

Interview #	Role	Organization	Interview Date
01	Group Chief Technology Officer	ICICI Bank	16 May 2011
02	Chief Information Officer	Consumer, Standard Chartered Bank	10 May 2011
03	Head, Group Information & Operations	CIMB Group	03 May 2011
04	Chief Information Officer	Bank Danamon Indonesia	27 Apr 2011
05	Chief Operating Officer	Asia Pacific – General Insurance, Zurich Financial Services	19 Apr 2011
06	Managing Director, Head of IT Infrastructure	Asia Pacific, UBS AG, Hong Kong	12 Apr 2011
07	Head of Information Technology	RHB Banking Group	05 Apr 2011
08	Chief Information Officer	Singapore Exchange (SGX)	31 Mar 2011
09	Chief Information Officer, Global Technology Capital Markets	Asia Pacific, Deutsche Bank	22 Mar 2011
10	Managing Director, Head of Global Information Technology Division	Bank of China International (BOCI)	15 Mar 2011
11	Vice President, IT Change Delivery	ING Vysya Bank	07 Mar 2011
12	Chief Information Officer	YES BANK	01 Mar 2011
13	Head of Equities IT	Asia Pacific, Technology, Barclays Capital	24 Feb 2011
14	Director – Regional Data Centre	Asia Pacific, Barclays Capital	01 Feb 2011



Interview #	Role	Organization	Interview Date
15	Chief Information Officer	AMP	16 May 2011
16	Group Executive, Technology	Westpac Banking Group	17 June 2011
17	Chief Information Officer, Retail, Business and Private Banking	Commonwealth Bank of Australia	28 June 2011
18	Chief Information Officer	Wesfarmers Insurance	06 Jul 2011
19	Chief Information Officer	St. George Bank	13 Jul 2011
20	Chief Information Officer	Bankwest	26 Jul 2011
21	Head of Digital Banking	Citi	03 August 2011
22	Group Executive Technology & Operations	Bank of Queensland	10 August 2011
23	Head of IT	Youi	17 August 2011
24	Regional Head, eBusiness	Citi Asia Pacific	24 August 2011
25	Head of e-Channels	St. George Banking Group	31 August 2011
26	Head of Online	BNZ (NAB Group)	07 Sep 2011
27	Chief Information Officer	Suncorp Life	14 Sep 2011
28	Chief Information Officer	APAC General Insurance	21 Sep 2011
29	GM Digital Services	National Australia Bank	07 Nov 2011
30	Chief Information Officer	ING Direct	28 Nov 2011

ABOUT THE AUTHORS

Asif Qumer Gill is a TOGAF 9 Certified Enterprise Architect and a Lecturer in the Faculty of Engineering and Information Technology, School of Software at the University of Technology, Sydney. He specializes in agile enterprise architecture, modelling, engineering and transformation. He is also an independent ICT industry research analyst and consultant. The primary objective of his research is to understand and help organizations to improve their business and IT capabilities by leveraging emerging agile, cloud, and social media technologies. Asif can be reached at asif.gill@uts.edu.au.

Deborah Bunker is a Professor in Business Information Systems at the University of Sydney having previously held senior academic and administrative positions at UNSW and UOW. Her research interests are in IS philosophy, IS management and IS adoption and diffusion in the domains of Sourcing Risk Management and Disaster Management. She has published extensively in international journals and conferences on these topics. Deborah is also President, Australian Council of Professors and heads of IS and Chair, International Federation of Information Processing Working Group 8.6 on Innovation, Diffusion, Transfer and Implementation of IS. Deborah can be reached at deborah.bunker@sydney.edu.au.

Philip Seltsikas is an Associate Professor and Head of Business Information Systems at the University of Sydney. His research focuses on the application of information and communication technologies in business and government. His current research is in the area of electronic government with a specialization on digital identity management. He has previously acted as Scientific Director and Coordinator for several European Commission

funded research and technological development programmes in high technology areas including Identity Management for Electronic Government, Application Service Provision, Electronic Markets, RFID applications and other UK nationally funded research projects in business technology and e-government related domains. Philip can be reached at philip.seltsikas@sydney.edu.au.

