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The Impact of Cloud-Based Digital Transformation on IT Service Providers: Evidence From Focus Groups

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ABSTRACT

Cloud-based digital transformation is having a profound impact on new and incumbent information technology service providers. In transitioning from traditional to cloud-based service provision, some IT service providers are experiencing substantial difficulties in realizing effective business models. Taking the perspective of 20 large business model mature and small and medium enterprise born-on-the-cloud multinational IT service providers, this focus group study contributes to the dearth of research examining the broader impact of cloud computing on IT service providers' business model. The study provides two core insights. First, using the STOF business model framework, the paper provides a vivid contextual understanding of the nuanced impact of cloud computing along four core business model domains: service, technological, organisational and financial. Second, the study identifies a number of salient challenges which are impacting IT service providers' efforts to effectively leverage the benefits of cloud-based digital transformation.

KEYWORDS

Business Model, Cloud Computing, Digital Transformation, Focus Groups, IT Service Provider

1. INTRODUCTION

"It is not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change..." (Megginson, 1963, p. 4). This quote rings no truer than in the current information technology landscape. A landscape where new and incumbent IT organizations are attempting to leverage the benefits of digital technologies such as the internet of things, 3D printing, big data, augmented and virtual reality and so on. Cloud computing technologies continue to become mainstream from an adopter and provision perspectives. The Forrester consulting group predict that cloud computing will continue to experience rapid growth with market revenues surpassing \$240 billion by 2020 (Bartels et al., 2014). As a transformative technology and a significant paradigm shift, cloud technologies not only impact "...every aspect of our lives, be it working, shopping, or watching movies...[but they will] continue to revolutionize the ways we store, process, and use information, creating a wealth of possibilities for individuals, teams, organizations, and societies..." (Benlian, Kettinger, Sunyaev, and Winkler, 2016, p.1). However, while there is a health body of research which

has examined the impact of cloud-based digital transformation from an adopter perspective, the manner with which IT service providers are deriving value from cloud-based digital transformation is under researched. This is significant as there is evidence to suggest that these organizations are experiencing substantial difficulties as a result of provisioning cloud technologies (e.g. Clohessy, Acton and Morgan, 2016; Winkler, Benlian, Piper, Hirsch, 2014; Khanagha Volberda, and Oshri, 2014). Whereby, "...the cloud is the latest example of Schumpeterian creative destruction: creating wealth for those who exploit it and leading to the demise of those that don't..." (Weinman, 2012, p. 4). Thus, this research is motivated by the following factors. First, digital transformation is concerned with the changes digital technologies can bring about in a company's business model, which result in "...modifications to organizational structures, processes and skills sets that are necessary to cope and exploit new technologies..." (Hess, Benlian and Wiesböck, 2016, p. 2). Extant research argues that in order to ensure the long-term business viability and sustainability of the computing paradigm further research is merited into how IT supply-side organizations can develop effective business models which align with the nuanced value propositions afforded by cloud computing (Chang et al., 2013; Morgan and Conboy, 2013; Weinhardt et al., 2009). Second, a number of international surveys of IT service providers have identified that a lack of business model innovation pertaining to cloud products, services and business uses in the market (CSA and ISACA, 2012) and an inability to produce compelling business cases for customers (KPMG, 2012) represented salient challenges which were currently stagnating customer uptake of cloud technologies. According to Linthicum (2012), "...the core problem is that most cloud technology providers believe what they do is innovative. To them, that means adopting the strategies of the market leaders, replicating their features and APIs (call for call), and hyping the market..." The author argues that while such a fast follower ethos may have worked effectively in the past, modern technological savvy business customers require concrete assurances pertaining to the business value of adopting a cloud computing solution (Linthicum, 2012). Extant and widely cited research has shown how early information technology service providers can encounter salient business model difficulties when attempting to incorporate a new digital technology within their organization (Christensen, 1997; Lucas and Goh, 2009; Teece, 2009). This business model metamorphosis, if not managed solicitously, is strewn with many abrogating repercussions (Christensen, 2001; Teece, 2009). The emergence of new digital technologies has created winsome opportunities for "...researchers to provide new insights into how digital organizations can develop compatible business models with internal-external factors in order to cope with turbulent business environments..." (Al-Debei and Avison, 2010, p. 375). The cloud computing paradigm has reached a level of maturity which lays the foundation for researchers to investigate how IT service providers have moulded and sustained their cloud computing business arrangements over time (Iyer and Henderson, 2012). Given the dearth of research pertaining to how cloud technology impacts IT service providers' business models and the calls by researchers for further research into this specific area (Achtenhagen Melin, and Naldi, 2013; Boillat and Leger, 2013; Clohessy, Acton and Morgan, 2017). With this in mind and using the STOF business model framework (Bouwman, De Vos, and Haaker, 2008) as a lens, the objective of this study is to expand the dearth of extant knowledge in this domain by providing insights into the following research question:

How does cloud-based digital transformation impact IT service providers?

The remainder of this paper is structured as follows. The next section provides a theoretical background to the study. Next, the focus group research methodology approach is discussed. This is followed by a presentation of the study's main findings. Finally, we conclude with a discussion pertaining to the broader implications of our research which includes an outline of the study's contributions, limitations and directions for future research.

2. THEORETICAL BACKGROUND

2.1. The Concept of Cloud Computing

In the past 20 years, the concept of information technology service outsourcing (ITSO) has been an intensively studied field (See Schneider and Sunyaev, 2014; Hirschheim, Heinzl and Dibbern, 2013; Lacity and Wilcocks, 2012). ITSO can be defined as "...the significant contribution by external vendors in the physical and/or human resources associated with the entire or specific components of the IT infrastructure in the user organization..." (Loh and Venkatraman, 1992). The outsourcing of IT services has become one of the most important organizational concepts in recent decades (Mvelase, Dlodlo, Williams, and Adigun, 2011; Böhm, Leimeister, Riedl, and Krcmar, 2011). Salient benefits of information technology service provisioning can include increased efficiency, cost savings, enhanced global software development practices, competitive advantages, flexibility and so on (Chang and Johnston, 2012; Schneider and Sunyaev, 2014; Al-Rousan, 2015). The latest turbulent global economic downturn in conjunction with the rapid evolution of IT and the availability of cheap computational resources is necessitating that the IT departments of many organizations consider adopting cost and resource efficient technology platforms. Rather than adopting a defensive strategy and a battenning down the hatches ethos, there is potential for organizations, to capitalise on the innovative capabilities of emerging technology platforms in order to achieve a competitive advantage. An example of a nascent digital technology is cloud computing. Cloud computing represents a fundamental change in how information technology is provisioned (Creeger, 2009), in that it enables "...computing facilities such as storage compute power, network infrastructure and applications to be delivered as a metred service over the internet, just like a utility..." (Khajeh-Hosseini, Sommerville, and Sriram, 2010, p.2). Numerous surveys and reports have highlighted the growing trend and popularity of cloud computing technology. For example, a report conducted by Forrester research highlighted how the global cloud computing market will grow from \$58 billion in 2013 to \$191 billion in 2020 (Bartels et al., 2014). At its most primitive, cloud computing is a propitious form of provisioning (Durkee, 2010; Venters and Whitley, 2012) where hardware and software computing resources are provided by cloud providers 'as-a-service' over a network from large scale data centres. While it has been argued that cloud computing may represent the next evolution of computational provisioning (Böhm et al., 2011; Etro, 2009), there is evidence to suggest (see Schneider and Sunyaev, 2014) that the cloud represents a fundamental technological paradigm shift which differentiates itself from traditional IT provisioning via a number of core characteristics (e.g. pay-per-use billing models, virtualisation, innovative business models, nuanced security and privacy challenges). Cloud computing "...induces a shift in task responsibilities during decision processes and self-service procurement, provides standardised services with a narrower scope, enables new scenarios of outsourcing and governance arrangements, and uses short-term usage-based contracts..." (Schneider and Sunyaev, 2014, p. 3).

In order to bound the meaning of the cloud computing concept for this study we use the well cited definition presented by Mell and Grance (2011), as that proposed by the American National Institute of Standards and Technology (NIST), which describes cloud computing as "...a model for enabling ubiquitous, convenient, on-demand network access to a shared pool of configurable computing resources (for example, networks, servers, storage, applications and services) that can be rapidly provisioned and released with minimal management effort or service provider interaction..." (p. 2). Further, this description is specific in detailing cloud computing as comprising five essential characteristics (broad network access, rapid elasticity, on demand self-service, measured service, resource pooling), four deployment models (public, private, hybrid, community), and three service offerings (software as a service, platform as a service and infrastructure as a service). This description for the continually evolving cloud computing paradigm is "...intended to serve as a means for broad comparisons of cloud services and deployment strategies, and to provide a baseline for discussion from what is cloud computing to how to best use cloud computing..." (Mell and Grance, 2011, p.

2). It is this definition of the cloud computing paradigm that is employed in this study which serves to provide a conceptual bounding for the concept.

2.2. Digital Transformation: Bounding the Business Model Concept

The emergence of the new digital marketplace has resulted in IT organizations having to transform their extant business models in order to exploit new customer value opportunities. While this shift has created opportunities to create new and innovative business models, these companies are often having to operate in uncharted digital waters. It has been argued that organizations must become adept at reshaping and remodelling their business models rapidly in order to counteract the impact of a fluid IT market landscape (Hess et al., 2016; Berman, 2012). According to Osterwalder and Pigneur (2010), the starting point for any concrete discussion on business models should commence with a shared understanding of what a business model is. All businesses implicitly or explicitly deploy business models. In its most rudimentary form a business model represents the blueprint of how an organization conducts business. A number of recurring thematic descriptors emerge from a content analysis conducted by Clohessy et al. (2016) which are used to frame a business model definition for the purposes of the following study:

- First, a business model describes the internal business modus operandi (operational and managerial infrastructure) required to operationalise the business model;
- Second, a business model encompasses the ability of an organization to create and capture value, via internal and external activities, and generate revenue;
- Third, a common business model descriptor is that it must be capable of delineating the organization's position within a value creating network and the relationships with partnering stakeholders (actors) (e.g. customers, suppliers and so on);
- Fourth, a business model encompasses value propositions and offerings;
- Fifth, resources (assets and capabilities) are required to develop and implement a business model;
- Finally, in order to transform a business model into viable sustainable business, it must be operationalized concurrently with an effective competitive strategy with both elements necessitating review on a periodic basis.

In order to elucidate our research objective, we used a business model framework (Table 1) which encapsulates all of the core business model thematic descriptors described above along four core business model domains. This framework is based on the STOF business model framework (Bouwman et al. 2008) which delineates how a business model represents the "...blueprint for a service to be delivered, describing the service definition and the intended value for the target group, the sources of revenue, and providing an architecture for the service delivery, including a description of the resources

Table 1. STOF business model research framework (Bouwman et al., 2008)

Business Model Domain	Description
Service Domain	Delineates an organisation's service offering and the inherent value propositions and the specific end-users in particular target customer segments.
Technological Domain	Delineates the technical functions and core competencies needed to realise the service offering.
Organisational Domain	Delineates how the organisation creates value from a service offering via the configuration of actors (value network) comprising resources which together perform value activities.
Financial Domain	Delineates the revenue and cost structure arrangements operationalised in order to capture value from a service offering.

required, and the organizational and financial arrangements between the involved business actors, including a description of their roles and the division of the costs and revenues over the business actors...” (p. 33). We selected the aforementioned categorization as a basis for bounding the business model concept as this framework is well suited for analysing new and innovative digital services (Juntunen, Luukkainen, and Tuunainen, 2010). Moreover, this categorisation is comprehensive, holistic, coherent and comprises business model components which are similar to other widely cited categorisations such as the business model canvas (Osterwalder and Pigneur, 2010), the balance score card (Kaplan and Norton, 1992) and the business model elements framework (Teece, 2009). Additionally, the categorisation has been previously utilised to assess the impact of cloud technology on business models (Ghezzi, 2009; Nedyalkov 2013; Jongtae, Myeong-Cheol, and Junghoon, 2014). However, it has not been previously used to assess the impact of cloud computing on IT supply-side business models. The next section delineates the research approach deployed in this study.

3. METHODOLOGY

3.1. Focus Group Protocol

Due to the dearth of empirical research pertaining to examining the relationships of the focal phenomena under scrutiny, a focus group research design was selected for the study (Myers, 2013; Kleiber, 2004). The purpose of a focus group is to elicit “...collective views on a certain defined topic of interest from a group of people who are known to have had certain experiences...” (Myers, 2013, p. 123). It has been argued that focus groups represent established methods which enable researchers to conduct cogent qualitative research (Kleiber, 2004; Tracy, 2012). Focus groups are a cogent IS research method which “...possess the potential to provide great insight into the phenomena of interest, [enabling IS researchers to gain] a deeper understanding of the topic of interest by providing more background information about the circumstances of the participant’s answers or opinions...” (Belanger, 2012, p. 1). The two focus groups, comprising twenty participants, took place in the latter half of 2015 based on a common protocol which will now be discussed in greater detail. Largely informed by the results of a precursory case study which encompassed fifteen expert interviews, the unit of analysis for this study was large business model mature (BMM) and SME born-on-the-cloud (BOC) IT service provider organizations (ITSP) (Table 2). The objective of the focus groups was to provide a platform for elucidating the collective views of ITSPs pertaining to a number of themes which had been identified the precursory case study. The focus groups were designed and run in accordance with the widely established and cited protocols as recommended by Kitzinger (1995); Morgan, Kruger and King, (1998) and Tracy (2012). In terms of access to participants, the organization of the focus groups was aided by the fact that they were held in conjunction with a national industry workshop for ITSPs. Thus, the focus group design was based on a convenience purposeful sampling strategy. Focus group one comprised twelve participants and focus group two comprised eight participants. The size of both focus groups are in accordance with the recommended numbers for discussions of complex topics (Casey and Kruger, 1994). In order to limit bias, both focus groups contained a mix of large and SME ITSPs. The separate focus groups sessions were run in parallel and lasted for approximately 80 minutes. Prior to the commencement of the focus group sessions, we presented (1) background information pertaining to the research (2) an overview of the preliminary study findings from phase one and (3) delineated the objectives of the focus group sessions to all of the participants. Next, all participants were debriefed on the study’s privacy policy and informed that they would be assured confidentially and anonymity. The focus group sessions were held in a comfortable, relaxed setting and took place at two reasonably sized roundtables. Refreshments were also provided during the focus group sessions.

In accordance with recommended focus group methodology (Morgan et al., 1998), a semi-structured interview guide was used to direct the focus group discussion. Both focus group sessions were facilitated by a moderator and assistant moderator. The role of the moderators,

Table 2. Focus group research participants

Interviewee Code*	Role	Industry/Size**/Business Model ***
Focus Group 1 (N = 12)		
1, 2, 3, 4	Cloud Product Manager, Cloud Strategy Leader, Senior Software Engineer, Project Manager	Software – Large Cloud Provider – (BMM)
5,6,7	Cloud Principal, Senior Manager, Senior Software Engineer	Software – Large Cloud Provider - (BMM)
8, 9	Cloud Principal, Senior Software Engineer	Software – Large Cloud Provider – (BMM)
10	Cloud Engineer	Software – Large Cloud Provider – (BMM)
11	Senior Software Engineer	Software – SME Cloud Provider – (BOC)
12	CEO	Software – SME Cloud Provider – (BOC)
Focus Group 2 (N = 8)		
13	CEO	Software – SME Cloud Provider – (BOC)
14, 15	Senior Software Engineer, Senior Manager	Software – Large Cloud Provider – (BMM)
16	Cloud Engineer	Software – SME Cloud Provider –(BOC)
17	CEO	Software – SME Cloud Provider – (BOC)
18	CEO	Software – SME Cloud Provider – (BOC)
19	Senior Software Engineer	Software – SME Cloud Provider – (BOC)
20	CEO	Software – SME Cloud Provider – (BOC)

*Interviewee pseudonyms have been applied to protect anonymity. ** Firm size categorised using limits as set by the European Union along the dimensions “number of employees” (e.g. Small 10 -49, Medium 50-249, Large 250+) and “annual turnover”. ***Large firms categorised as ‘business model mature’ (BMM) ventures (e.g. extant pre-cloud business models) while SME firms categorised as “born-on-the cloud” (BOC) business model ventures (e.g. current business model originated on cloud).

who were both experienced senior researchers, was to (1) disseminate and ensure adherence to the focus group ground rules (2) facilitate and lead the discussion pertaining to the themes contained in the interview guide and (3) manage the group dynamic. For example, in instances where contributions were complex or unclear, the moderator probed deeper (e.g. “Can you provide an example?”). The assistant moderators, who were both researchers, took notes during the focus group discussions and also ensured that none of the participants were overlooked when attempting to make a contribution. Participants were instructed, that prior to making their initial contribution, that they should briefly introduce themselves to the other focus group participants in terms of outlining their name, the company who they are employed with and their role within the organization. In accordance with Kitzinger (1995), for the first part of the focus group sessions, we assumed a backseat role and engaged a process of ‘structured eavesdropping’. Later on, we adopted a more “...interventionist style, urging debate to continue beyond the stage it might otherwise have ended and encouraging the group to discuss the inconsistencies both between participants and within their own thinking...” (Kitzinger, 1995, p. 301). When the focus group sessions concluded, the researchers, moderators and assistant moderators debriefed each other on how they thought the focus groups went. Significant insights and observations elucidated during this debriefing session were recorded as field notes.

3.2. Data Analysis

Both focus group sessions were audio recorded with the express consent of all participants. The two audio recordings were transcribed, proof read and annotated by several researchers. Extensive notes and observations (e.g. the impact of group dynamic) recorded by the researchers and assistant moderators were also included as part of the data analysis. A copy of the transcript, containing only the individual's particular contribution, was sent to each focus group participant for validation purposes. Follow up contact was conducted in situations where clarification was sought pertaining to themes which emerged within groups and across groups. In order to improve the credibility of the data and provide cross and complementary perspectives on emerging elements, supplementary evidence in the form of archival documents and published materials sourced from the ITSPs' websites (e.g. white papers, specific IT vendor case studies, brochures, reports) were collated and analysed. The researchers used NVivo 10 software in order to analyse and structure all of the qualitative data collated and to ensure the traceability of the coding evolution. The use of NVivo software in qualitative research is a well-established and a recommended tool for researchers (Myers, 2013). While we did not undertake a grounded theory approach, following Ritchie, Spencer and O'Connor (2003), the researchers used a multistage hierarchical data analysis approach comprising four analytical cycles which incorporated open and axial coding techniques based on the recommendations of Strauss and Corbin (1998). The hierarchical data analysis procedure used was an iterative process whereby as "...categories are refined, dimensions clarified, and explanations are developed, there is a constant need to revisit the original or synthesized data to search for new clues, to check assumptions or to identify underlying factors..." (Ritchie et al., 2003, p. 222). The primary analytical cycle comprised a process of open coding which was used to identify codes (concepts and higher-level categories) from each interview transcript. The main headings (free nodes) for this stage were informed by the core focus of the research. In the secondary analytical cycle, axial coding was used to reassemble the data that were fractured during the open coding phase by identifying causal conditions and relationships between the concepts and categories (Strauss and Corbin 1998). The coding process continued until the categories were deemed to be theoretically saturated (Strauss and Corbin, 1998). The tertiary analytical cycle encompassed a process of triangulation and integrative diagramming to illustrate the interaction of the various levels of conditions. The final analytical cycle encompassed the development of the study's findings. This process was substantially facilitated by analytical memos which is a powerful sense-making tool for qualitative researchers (Myers, 2013).

4. FINDINGS

In this section, we present the empirical results obtained during the analysis of the focus groups (denoted as sanitised quotes), archival documentation and published materials. Tables 3, 4, 5, and 6 summarise the key findings which emerged from the study. It is evident that while cloud-based digital transformation has positively impacted their organizations, the study also revealed the disruptive impact associated with provisioning cloud technology. Using the STOF business model framework we now delineate in detail how cloud computing is impacting on ITSPs' business models.

4.1. Service Domain

From a service business model domain perspective, the analysis reveals that cloud computing has afforded ITSPs with service benefits pertaining to extended market reach and new services. However, cloud computing has also resulted in salient challenges relating to customer confidence and product differentiation which are acting as inhibitors to these benefits (Table 3). With regards to the benefits, the analysis identified that the value propositions for both SME and large organizations were identical (e.g. virtualization, multi-tenancy, low capital expenditure (capex) and operating expenditure (opex), agility, scalability, dynamic allocation, elasticity, resource pooling). From an SME ITSP perspective,

Table 3. Supporting evidence relating to the impact of cloud computing on ITSPs' service domain (+ denotes benefits, - denotes inhibitors)

Source	(+) New Services	(+) Extended Market Reach	(-) Product Differentiation	(-) Customer Confidence
Focus Group 1	"In comparison to the stale, vanilla traditional computational offerings, cloud computing has enabled us to provide a customisable portfolio of game changing offerings" (Expert 10).	"Cloud computing has enabled our company to modularise existing products as cloud offerings and provide them to new markets" (Expert, 8).	"The barriers to entry in a cloud provisioning context are extremely low, it can be quite difficult to make our value propositions stand out from the rest" (Expert 5).	"Our company is now selling consumable services and the learning curve encompassing attracting and retaining customers is still maturing" (Expert 2).
Focus Group 2	"For SMEs, access to main vendor competencies and expertise, especially in the areas of security and disaster recovery, can enable them to compete with companies higher up the value chain. Many start-ups would not have the capital to build equivalent platforms" (Expert 18).	"The ability for an SME to acquire main vendor cloud solutions has really given our company a springboard to target and compete for a global customer base" (Expert 17).	"In order to differentiate ourselves from the competition, we are making our value propositions as customisable as possible in order to provide that degree of flexibility" (Expert 14).	"The provision of cloud offerings encompasses certain nuances which makes customer acquisition extremely challenging" (Expert 15).

the ability to lease incumbent ITSP infrastructure, solutions, services and certifications, in addition to the provision of their bespoke cloud services, resulted in the manifestation of new value propositions. It was apparent from the focus groups that the traditional extant barriers to entry for SME ITSPs were dramatically minimised when provisioning cloud offerings. The value propositions for large ITSP were also quite evident whereby the analysis revealed that they all provision a rich portfolio of standardised and customizable cloud solutions and APIs which incorporate varying trial utilisation periods, enterprise grade security, elasticity and availability, disaster recovery, self-service and fully managed functionality, SLA's with 99.9% uptime guarantees and open source standards and platforms. Large ITSPs can also combine extant legacy product and service offerings with new cloud enabled ones to create unique and attractive value propositions.

Target customer segments for ITSPs include private (business-to-business and business-to-customer) and public sector organizations. Large ITSP study participants specifically target global SME and large multinationals with enterprise grade cloud technologies. Cloud computing has enabled these aforementioned ITSPs to leverage their existing infrastructure and customer base in order to successfully commercialise their cloud technologies. As one focus group participant revealed, "... cloud technology has enabled our organization to dramatically extend its market reach. Traditionally we sold our products at a very high cost (e.g. multi-million, multi-year deals to the customer). This project also encompassed very long implementation phases. Because of these limitations our traditional customer and market base as relatively small. We have transitioned from the primary targeting of global governmental agencies and large enterprises to now being able to target a multitude of new and niche markets such as SMEs, non-profit organizations and individual customers..." (Expert 15). For SME ITSPs, cloud computing has enabled them to target global markets which would not have been accessible via traditional software provision methods. For instance, some of the SMEs ITSP are now providing their bespoke cloud offerings in diverse international market segments such as Vietnam, Israel and Iran. As one focus group expert remarked, "...customer acquisition in a cloud computing

context has changed dramatically from the traditional method of having sales representatives beat the door down in order to gain a sale...” (Expert 18).

With regards to challenges, ITSPs are currently experiencing substantial challenges in facilitating effective differentiable customer value propositions around their cloud offerings. This challenge is manifesting as a result of the fact that ITSPs’ cloud offerings encompassed near identical cloud service user (CSU) value propositions, (e.g. business innovation, self-service/managed/hosted solutions, scalability, minimal capex and opex, automatic provisioning, measured service, security and so on). This has led some of the ITSP to revise how they promote their cloud solutions to CSUs. As one focus group participant revealed, “...we have become a leader in the cloud computing market due to our ability to create all of our new cloud offerings based on real life business cases. This enables our organization to achieve cogent differentiation from our competitors...” (Expert 1). Customers’ knowledge (e.g. comprehension of cloud offerings) and customer resistance were also identified by the study participants as salient challenges for ITSPs. The focus group participants explained that for many customers, the transition to the cloud is not as straightforward as they would like it to be whereby challenges related to training and learning need to be addressed on an ongoing basis. An analysis of the supplementary evidence revealed that whilst ITSPs provide a wealth of information (via their websites, brochures, blogs and so on) pertaining to their cloud offerings, comprehensive transparency relating to charges, SLA terms and conditions, penalties, and even benefits was lacking. The information provided to market specific cloud offerings was also often very technical and also universally similar across ITSPs. Alleviating customer security concerns also represented a significant obstacle for all ITSPs. For instance, one focus group interviewee explained, “...there are two main customer concerns which we are regularly encountering which make cloud technology a hard sell. The first concern relates to convincing customers to migrate their data to the cloud. The other challenge relates to enterprise IT managers having concerns pertaining to losing their jobs if they adopt cloud technology. This concern is often justified as an ITSP can manage a large proportion of the functions currently being tasked to a customer’s IT manager...” (Expert 2). Another focus group interviewee immediately weighed in to support expert’s 2 comment whereby he stated, “...just to add to what expert 2 has expressed, we often find that our organization has been brought in against the IT manager’s wishes. For example, last week, we were dealing with a customer who no longer wanted to operate their own in-house IT infrastructure in order to focus solely on their marketing function. Their primary objective was to outsource this function to us via one of our cloud solutions. However, this will inevitably will lead to the loss of a number of jobs within the IT function of that particular company. Cloud computing has evolved the role of the chief information officer within a company where they must adapt or perish...” (Expert 12).

4.2. Technological Domain

The technological domain business model component describes the technical functions and architecture needed to realize the service offerings. As evidenced by Table 4, cloud computing has had both positive impacts, in terms of service delivery and software development and deployment and negative impacts largely as a result of the complexities inherent to the underlying cloud architecture. With respect to the benefits, cloud computing’s innovative delivery system has enabled large ITSP organizations to successfully leverage their existing infrastructure, expertise and software application portfolios. For instance, the interviewees explained that unlike traditional methods, the cloud is an extremely innovative delivery system that enables them to deliver a broad range of services with more efficiency. The speed with which an indigenous data centres can now be rolled up within a country is rapidly increasing. The cloud deployment models encompassing the essential characteristics made accessible via the ITSPs’ indigenous websites has enabled the both large and SME ITSPs to target new and niche customer segments which would not have been previously possible. As one focus groups surmised, “...customer acquisition has changed dramatically with cloud computing, whereby ITSPs must now place an increased emphasis on acquiring customers organically via their websites...” (Expert 17).

Table 4. Supporting evidence relating to the impact of cloud computing on ITSPs' technological domain (+ denotes benefits, - denotes inhibitors)

Source	(+) Service Delivery System	(+) Software Development and Deployment	(-) Complexity
Focus Group 1	"We can now rapidly acquire and deploy servers for our customers from our main vendor partner ... in the past it used to take a couple of days to do this, now we can do this in a matter of minutes via their website supplier portal" (Expert 12)	"Our innovative cloud platform enables our customers to customise our standardised cloud offerings in order to match their specific enterprise requirements" (Expert 8).	"The complexities pertaining to developing, maintaining and deploying cloud architecture can be quite arduous even for a large global company like us" (Expert 2).
Focus Group 2	"Our main vendor partner has a number of globally based data centres. This enables our company to provide the flexibility to our customers pertaining to where they would like to store their data" (Expert 16)	"Cloud computing has enhanced our responsiveness. We have to pitch to a large enterprise customer next week and cloud technology has enabled our company to create a demo environment for them in a matter of hours" (Expert 13).	"Cloud complexity and maturity is definitely a big concern. We have had to turn down business as certain customer legacy applications (e.g. 3D rendering products), are not cloud friendly" (Expert 15).

All ITSPs agreed that cloud technology had greatly enhanced their ability to develop and deploy software which enabled the organizations to respond rapidly to market demand. With regards to software development, one of the salient technological benefits of cloud computing revolved around the ability for large ITSPs to modularise their existing product offerings. In the words of one focus group interviewee, "...in the past, my division was focused on selling a single off the shelf unit, but now we are currently in the process of modularizing and virtualising that product into a SaaS solution. This will enable the company to sell the product to multiple customers in multi or single-tenant environments on a consumption pay-as-you-go model..." (Expert 8). Software deployment methods have also dramatically changed as evidenced by one focus group participant who opined, "...prior to cloud computing, it would have roughly taken several weeks or more for our organization to create the infrastructure required to throw up demonstration environments for our customers..." (Expert 13). The complexity of cloud computing technology was also identified as a salient challenge amongst ITSPs. For instance, IaaS was identified by the majority of the focus group participants as a particularly vexatious service model requiring massive resources in order to compete with incumbent IaaS providers such as Rackspace, Amazon and Google. Additionally, the time taken to virtualize specific extant off the shelf products varied from months to years. Moreover, there was a sense of frustration amongst the participants pertaining to cloud inability to integrate with customer's legacy applications. One senior manager described how they had to turn down a lucrative governmental contract for providing cloud services for a nuclear power plant as the antiquated existing IT infrastructure were incompatible with their cloud computing services. There was general consensus amongst the participants that there is still a good number of years to go before they possess the knowledge and competencies required in order to reduce the complexities inherent to cloud technologies.

4.3. Organizational Domain

The organizational domain business model component describes how organizations create value from service offerings via the configuration of actors in a value network comprising core competencies and resources which together perform value activities. Table 5 provides a summary of how cloud computing has positively impacted this domain in terms of collaboration and strategic realisation.

Table 5. Supporting evidence relating to the impact of cloud computing on ITSPs' organizational domain (+ denotes benefits, - denotes inhibitors)

Source	(+) Collaboration	(+) Strategic Realisation	(-) Workforce Development	(-) Technological Dynamism
Focus Group 1	"For the first time in decades, our company has partnered with a rival competitor. This partnership has paved the way for unprecedented innovation across R&D departments. Without cloud this would not have been possible" (Expert 5).	"Cloud technology has facilitated the operationalisation of agile business models which have enabled us to become global leaders in delivering best of breed hybrid cloud solutions" (Expert 7).	"A big part of our innovation strategy involves acquisitions and partnerships in order to source competencies we are deficient in and are unable to source" (Expert 8).	"As a company we are continuously learning with cloud technology. For example, my division is learning and evolving based on the experiences with our current cloud product" (Expert 1).
Focus Group 2	"Our partnership with Microsoft has enabled our SME to have access to a global IT department ... led to cost, expertise and velocity competitive advantages" (Expert 16)	"Cloud computing has had a profound positive impact on our SME clients in terms of converting capex to opex and innovation ... these business cases have enabled to increase meet our customer targets" (Expert 14)	"The cloud landscape is changing so rapidly that our company cannot keep up with the degree of employee upskilling required" (Expert 15).	"We are still continuing to learn with cloud technology. We envisage that once the technology stabilises we will be able to fully realize the innovation potential of cloud business models" (Expert 14).

However, workforce development and technological dynamism were identified as salient challenges which are stagnating ITSPs' efforts to fully leverage the provisioning of cloud technologies. In terms of the benefits, all ITSPs confirmed that their cloud-based business models have significantly impacted the realization of their company's strategic objectives (e.g. accelerated growth, cost and agility). For instance, all ITSPs indicated that their cloud strategies had considerably enhanced the agility of their organizations enabling them to develop new or improved services faster than they have done did in the past and at a lower cost. This benefit was most notably evident in SME ITSPs whereby cloud-based business models enabled these organizations to compete with larger ITSPs and also deliver their cloud services with greater efficiency to multiple global locations around the world. The large ITSPs indicated that they were in the process of retiring traditional functions of their business in order to focus solely on provisioning cloud technologies such has been the success of their strategy realization in a cloud computing context. With regards to collaboration, all ITSPs identified that acquisitions of other ITSPs and strategic partnerships had played pivotal roles in their ability to competitively position themselves in the cloud market. The participants confirmed that these acquisitions and partnerships had enabled their organizations to achieve a shorter time to market with a broad portfolio of global cloud services. Moreover, they enable the ITSPs to catalyse their global cloud footprint. For example, rather than lose a foothold in a particular cloud market (e.g. public, private, hybrid), the large ITSP participants confirmed that cloud computing has led them to collaborate with some of their fiercest rivals. These collaborations have resulted in the development of state of the art cloud integration products which have become pivotal to accelerating the adoption of cloud services. From an SME perspective, partnerships enable the organizations to offer nuanced customer value propositions. For instance, all of the SME ITSPs' bespoke cloud offerings have been deployed on large ITSPs' platforms which are safe harbour, HIPPA, SAS, NHS etc. compliant. The SME participants confirmed that they would not have been able to ensure a similar level of security and quality standards due to their limited resources. This was of particular relevance to two ITSPs

who supplied cloud medical services. There was general consensus amongst all ITSPs that it is imperative to assemble a cogent supply chain in order to reap the top and bottom line benefits of provisioning cloud technologies. In terms of the challenges, workforce development represented a salient obstacle for the focus group participants. The participants confirmed that there is currently a dearth of employees who possess the requisite cloud computing software development skills and expertise. For instance, engineers who possess the competencies for developing and maintaining IaaS infrastructure which can scale for a global customer base are in short supply. Moreover, cloud data centres are engineered to different specifications to traditional ones and thus require cloud-specific competencies to maintain and operate them. The participants noted that academic institutions must provide more cloud computing related courses which can address this skills shortage. In the meantime, the large ITSP participants confirmed that they are in the process of developing in-house cloud certification training courses which will be made available to their employees and partners. Moreover, as a market leaders in cloud technology, they possess the requisite resources to acquire the knowledge we may be deficient in via partnerships and/or acquisitions.

With respect to technological dynamism, all ITSPs confirmed that the rapidly evolving cloud technological landscape was preventing their organizations from reaching their full growth potential. For instance, one focus group participant stated, "...we have recently sold our traditional hardware business segments. Our primary objective in the next 5 - 10 years is to become primarily known as a provider of only cloud technology. However, progress is currently really slow as the majority of our time is spent identifying how our portfolio of on premise solutions can be migrated to SaaS-based solutions..." (Expert 1). Another focus group expert added, "...the current cloud market is in a rapid state of acceleration. The process of migrating our existing extensive portfolio of services into cloud-based solutions is very laborious. Customers want our traditional offerings in cloud form immediately. If we cannot provision it to them, they will go elsewhere..." (Expert 8).

4.4. Financial Domain

The financial domain business model component delineates the financial arrangements (e.g. revenues and costs) and growth investment decisions operationalised in order to capture value from a service offering (Bouwman et al., 2008). As evidenced by Table 6, cloud computing has impacted the financial domain positively in terms of multiple revenue streams and cost advantages. However, once again salient inhibitors to these benefits were identified in terms of revenue capture and return on investment forecasting. The revenue structures of all ITSPs' cloud services comprise licensing, pay-per-use, monthly and annual billing models. The participants confirmed that cloud computing has enabled their organizations to operationalize a basket of revenue streams which are made possible by the elastic and consumption based metrics inherent to cloud technology. Certain ITSPs have applied unique features to their revenue models. For example, the large ITSPs provide both financing and 'ramp model' credit service facilities for adopter organizations that are in the embryonic stages of increasing their sales pipe line. These firms initially incur relative low monthly charges which 'ramps up' accordingly as their organization becomes more established. This ramp model ensures the alignment of service with the likely revenues that they are going to acquire. All ITSPs (large and SME) indicated that the formation and operationalisation of effective revenue models for cloud computing technologies represented a salient challenge for their organizations. In terms of the larger ITSPs, they are still acclimatizing to the new cloud computing revenue structures. In the traditional model, these organizations would receive upfront large monetary compensations for their services. With cloud computing the revenue capture cycles are increasingly fluid and uncertain. The participants revealed that their shareholders have not yet got used to receiving dribbles of cash with cloud solutions. Hence, there is somewhat of a reluctance to fully move the organizations to the cloud. One focus group participant stated, "... we are currently juggling the benefit of a new extended market reach with lower returns on sales when compared to the traditional means of service provision..." (Expert 1). Another focus group expert opined, "...we now have the prospect of more deals but for less returns, but we are hoping

Table 6. Evidence relating to the impact of cloud computing on ITSPs' financial domain (+ denotes benefits, - denotes inhibitors)

Source	(+) Multiple Revenue Streams	(+) Cost Advantages	(-) Revenue Capture	(-) Return on Investment Forecasting
Focus Group 1	"We possess a large portfolio of existing on premise products that we are currently converting to SaaS which we intend to monetise via multiple new and novel business models" (Expert 8).	"The cloud has enabled the company to avoid the traditional barriers for growth i.e. initial capital investment" (Expert 12).	"A big issue with our public cloud offerings are that customers are not committing after their cloud trial period ends ... we are experiencing that cloud technology is not enabling us to be as profitable as we were in the traditional model of IT provision" (Expert 5).	"75% of our revenue is still procured from traditional on premise hardware and software solutions ... we have made long term investments in cloud technology costing in the billions envisaging that we are going to make a big return on investment in the future" (Expert 1).
Focus Group 2	"Our company has migrated from a traditional single business model incorporating licencing fees to operationalising a basket of business models ... we have experienced unprecedented growth levels as a result" (Expert 13).	"Since we outsourced our development platform to a PaaS offering we have witnessed a substantial reduction in costs ... savings reinvested back into the company" (Expert 17).	"A major concern for us is that the cloud is very easy to adopt, consequently it can be very easy for customers to leave ... converting those trial periods to permanent contracts is proving challenging" (Expert 20).	"We have committed substantial investments with regard to providing infrastructure, specifically in the form of global data centres and fail-over data centres ... the decision to do this was mostly driven by market pressure rather than sound ROI metrics ... only time will tell" (Expert 14).

that we once we get a foothold in the market these extended deals will be converted to appropriation of significant revenues..." (Expert 18).

In terms of cost structure, the cost benefits associated with provisioning cloud technology was more evident in SME ITSPs who identified that employees, who are involved in the development, maintenance, sales and marketing of cloud offerings, represented the largest cost to their businesses. For instance, one focus group expert acknowledged, "...our company has been able to utilise our main vendor ITSP partner PaaS offering to develop and deploy our SaaS offerings which would have otherwise not have been possible due to cost limitations..." (Expert 16). However, other SME research participants identified that provisioning cloud technology was not all plain sailing from a cost perspective. For example, one focus group expert stated, "...the cost of customer acquisition is a major consideration for SME ITSPs. Can it be done organically via the website or does a large sales team have to be deployed?" (Expert 18). All ITSPs (large and SME) confirmed that they were investing intensively into cloud technology. One focus group expert stated that, "...an SME's success and long term aspirations will be dictated by the degree with which they are willing to continually invest in their business. Our company is living proof that if an SME invests regularly and wisely, they can gain a dominant position in the cloud market..." (Expert 20).

5. CONCLUSION AND FUTURE RESEARCH DIRECTIONS

Using the STOF business model framework (Bouwman et al., 2008) as a lens, the objective of this study was to expand the dearth of extant knowledge in this domain by providing insights into how cloud-based digital transformation impacts IT service providers? As evidenced by Table 7, the study findings confirmed that cloud computing is impacting ITSPs in a beneficial and inhibiting

manner across the four business model domains. The benefits and inhibitors depicted in Table 7 are manifesting from both an organizational context and cloud technology context. With regards to benefits, cloud technology provides ITSPs both business operational value and economic value benefits previously not afforded to them in the traditional mode of IT service provision. This is a salient distinction as the provision of cloud technology goes beyond straightforward financial benefits (e.g. cost reduction) and enables ITSPs to achieve operational efficiencies resulting from the rapid provisioning of computational services, enhanced organizational agility, rapid development and maintenance of services and enhanced collaboration as a result of virtual and physical co-opetition.

The findings also identified the existence of inhibitors across these business model domains. These inhibitors play salient roles in hindering ITSPs' abilities to successfully leverage the benefits of provisioning cloud technology. The organizational and cloud technological inhibitors currently being faced by ITSPs were resulting in significant ramifications for the organizations irrespective of their size. For example, complexity pertaining to developing and maintaining cloud technology has resulted in consequences for both SME and large ITSPs. For illustrative purposes, IaaS is the foundational layer of the cloud computing stack model and provides a cogent backbone infrastructure for enabling ITSPs to automate the configuration and dynamic provision of storage, virtual machines, multi-tenant environment and networks. IaaS presents ITSPs with new opportunities for extended market reach and revenue capture in comparison to the traditional method of provisioning computational infrastructure (e.g. in-house data centres) which was available to a limited customer base due to cost and implementation duration limitations. However, the data suggests that IaaS was proving problematic for ITSPs from organizational and technological perspectives.

Drawing from our discussion above, we now enumerate the contributions of the following research. First, hitherto extant empirical research in the area of cloud-based digital transformation has largely focused on adopter perspectives. This paper provides a contribution towards a vivid contextual understanding of the broader impact of the supply-side of cloud computing services. Specifically, this study focuses on both large business model mature and SME born-on-the-cloud IT vendor's business models using the STOF research lens (Bouwman et al., 2008). Second, this study has served to demystify both the business model benefits and inhibitors which ITSPs are currently experiencing as a result of their cloud-based digital transformation, which to date, has been largely anecdotal. It should be noted that this digital transformation is having a more pronounced impact on large incumbent IT service providers due to nuanced constraints such as their size and the legacy issues encompassed within their extant business models.

While the focus groups proved to be rich in detail, the findings are based on a small purposeful sample of firms. Thus, this study is naturally limited in terms of its generalisability. However, we took care in relating our research findings in order to relate the idiographic details of the cases to theoretical concepts. Additionally, additionally, qualitative research can be prone to multiple sources

Table 7. ITSP business model domain benefits and inhibitors

Business Model Domain	Benefits (+)	Inhibitors (-)
Service	• New Services • Extended Market Reach	• Customer Confidence • Product Differentiation
Technological	• Service Delivery System • Software Development and Deployment	• Complexity
Organizational	• Collaboration • Strategic Realisation	• Workforce Development • Technological Dynamism
Financial	• Multiple Revenue Streams • Cost Advantages	• Revenue Capture • ROI Forecasting

of analytic bias which can weaken or even invalidate (Miles and Hubermann, 1994) research findings. For example, focus groups can "...elicit insightful disclosure as a result of the group effect, whereby group participants show less inhibition, especially when they interact with similar others..." (Tracy, 2012, p. 167). However, it is important for researchers to be aware of the different dynamic which exist between group interviews and individual interviews whereby the data elicited in the former setting can be subject to bias. This impact can be even more pronounced in focus groups comprising competing organizations. In order to minimise the impact of analytic bias, we deployed a number of prescribed tactics (e.g. data source triangulation, focus group protocol etc.) in order to ensure the validity and reliability of the research design.

To validate our findings, we encourage more empirical research on digital transformation from a supply-side perspective. For example, the findings suggest that specific coping mechanisms are required to enable ITSPs to fully leverage the benefits of cloud-based business models. The concept of digital transformation coping mechanisms (see Lederer and Mendelow, 1990) in the context of emergent digital technologies, such as cloud computing, big data, 3D printing and so on, represents a research area which is ripe for further exploration. For instance, future research could identify the specific coping mechanisms that firms need to operationalise in order to minimise inhibitors to cloud-based business models to realize benefits. Additionally, future research should focus on the roles organisational culture, business processes, governance structure (e.g. centralised, decentralised) and leadership style assume in the cloud-based digital transformation process.

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