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Trevor Clohessy

National University of Ireland, Galway, trevor.clohessy@nuigalway.ie

Thomas Acton

National University of Ireland, Galway, thomas.acton@nuigalway.ie

Lorraine Morgan

Maynooth University, lorraine.morgan@nuim.ie

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The Impact of Cloud-Based Digital Transformation on ICT Service Providers' Strategies

TREVOR CLOHESSY, THOMAS ACTON & LORRAINE MORGAN

Abstract The relationship between digital transformation and strategy formulation in the context of new digital technologies is emerging as a research area which is ripe for investigation. Recently, information system researchers have focused their attention on exploring this relationship in the context of cloud computing-based digital transformation. However, while extant research has explored this relationship from an adopter perspective, there is a dearth of research which has used an information and communications technology (ICT) service provision viewpoint. Taking the perspective of fifteen ICT service providers, this comparative case study elucidates how cloud-based digital transformation has impacted these organisations' strategy formulation processes. This paper provides the following insights. First, cloud-based digital transformation can positively impact the realisation of strategic objectives in terms of deliberate strategies such as agility and competitive positioning. Second, we present a process model which delineates how ICT service providers' strategy formulation was observed to be an emergent process, encompassing recursive cycles of business model experimentation and iteration, organisational learning and organisational adaptation, primarily as a result of the profound disruptive and innovative impact of cloud-based digital transformation.

Keywords: • Digital Transformation • Cloud Computing • Strategy • Case study • ICT service provider •

CORRESPONDENCE ADDRESS: Trevor Clohessy, National University of Ireland Galway, J.E. Cairnes School of Business & Economics, 49 Upper Newcastle, Galway, Ireland, e-mail: trevor.clohessy@nuigalway.ie. Thomas Acton, National University of Ireland Galway, J.E. Cairnes School of Business & Economics, 49 Upper Newcastle, Galway, Ireland, e-mail: thomas.acton@nuigalway.ie. Lorraine Morgan, , National University of Ireland Galway, J.E. Cairnes School of Business & Economics, 49 Upper Newcastle, Galway, Ireland, e-mail: lorraine.morgan@nuim.ie.

1 Introduction

In recent years organisations have realigned their information and communications technology (ICT) strategic objectives to provisioning and/or sourcing lower cost, flexible, resilient supply and delivery options as a means of responding to the impacts of globalisation and the associated cost pressures (Mohdzain and Ward 2007). Cloud computing represents an innovative technological advancement which appears to offer a solution to these aforementioned objectives (Ward, 2012; Iyer and Henderson, 2012). Subsequently, incumbent organisations are undergoing cloud-based digital transformation journeys in order to reap the multitude of anecdotal business and strategic benefits. In order for organisations to perform effectively in a digitized and networked economy, an “understanding of the role and relevance of strategy is necessary for effective competitive behaviour” (Mansfield and Fourie, 2004). The role of ICT in developing effective strategies has been well documented (Porter and Millar, 1985; Henderson and Venkatraman, 1993; Atkins, 1994). Strategic ICT can not only support and shape strategy but can also be pivotal in determining commercial viability and represent a source of competitive advantage when used in innovative ways (Croteau and Bergeron, 2001; Zott et al., 2011). However, the concept of ICT-enabled strategy formulation is relatively ambiguous. For instance, Ward (2012) opines that the “knowledge we have developed [over the past 30 years] about information systems strategies appears to have had little impact in some organisations, even though they invest hundreds of millions of pounds in new information systems and digital technology every year. This is evidenced by a global survey conducted by McKinsey (Khan and Sikes, 2013) of 807 executives which revealed that while they acknowledged the strategic importance of digital technologies to their business goes beyond cutting costs (e.g. business efficiency, product and service innovation, entering new markets and so on), they were also dissatisfied with its effectiveness pertaining to enabling overall strategic objectives (e.g. the realisation of forward looking strategies which support growth and innovation). In the context of cloud computing, strategy can be defined as “a set of decisions required to create and deploy a network-based, information service delivery strategy that results in both cost savings and organisational agility (Iyer and Henderson, 2010). However, the current state of art pertaining to cloud-based digital transformation strategies that might be appropriate for ICT service providers is relatively ambiguous. As ICT service providers begin to formulate their cloud strategies, “they need to understand the inherent capabilities that are afforded by cloud computing...[which] can help them gain a competitive advantage by creating opportunities for cost advantage and organisational agility”(Iyer and Henderson, 2010). Having a comprehensive understanding of cloud-based digital transformation is “critical to forming a cloud strategy that will unlock business value worth orders of magnitude more than the costs” (Linthicum, 2012). ICT are strategic insofar as they successfully implemented and are also used to realise strategic intent (Arvidsson, Holmström, and Lyytinen, 2014). For instance, Khanagha et al. (2014) conducted a longitudinal qualitative case study, from 2009 to 2013, of a telecommunication company (Telco) in order to investigate how an established firm organised their digital transformation and strategic arrangements when

transitioning to provisioning cloud services. The authors identified that as a result of the emergence of disruptive cloud-based digital transformation, the strategy formation process encompasses a “collective experimental learning process revolving around a number of alternative strategic intentions ranging from incremental evolution and transformation to complete replacement of the existing business model” (Khanagha et al., 2014). Currently, there is a dearth of research relating to how cloud-based digital transformation impacts ICT service providers’ strategies. Consequently, research relating to how these concepts develop, interact and harmonise is also underdeveloped. This is pertinent now as the cloud computing paradigm has reached a level of maturity which lays the foundation for IS researchers to investigate how ICT service providers have moulded and sustained their cloud-based digital transformation arrangements (Clohessy et al. 2016, Hess et al. 2016). In order to ensure the long-term business viability and sustainability of the cloud computing paradigm, further research is required to elucidate exemplars of successful and unsuccessful ICT service provider digital transformation arrangements (Chang et al., 2013).

Thus, the objective of this research is to:

Explore how cloud-based digital transformation impacts ICT service providers’ strategies?

The remainder of the paper is structured as follows: The next section builds the theoretical foundation for the study. Then we elucidate our research method. Next, the findings are presented and discussed. Finally, we conclude with implications for theory and practice.

2 Theoretical Underpinning

2.1 Cloud-Based Digital Transformation

Digital transformation is concerned with “the changes digital technologies can bring about in a company’s business model, which result in changed products or organisational structures or automation of processes” (Hess et al. 2016). The long journey towards digital transformation is often fraught with complexity and ambiguity for incumbent ICT firms (Clohessy et al. 2017). This is compounded by the fact that the transformation of mature business models to digital-based business models encompasses potential nuanced legacy liabilities and issues. This is prominently evidenced by ICT service provider stalwarts such as Dell, Intel, IBM and Hewlett Packard whose struggles pertaining to how to best leverage the benefits of cloud-based digital transformation have been well documented. Frequently, these organisations are operating in uncharted digital waters and as a consequence lack the strategic clarity pertaining to what steps they need to consider prior to and during their digital transformation journey. The cloud computing concept encompasses a recombination of existing and new technologies and differentiates itself from antecedent ICT paradigms via five essential characteristics: rapid elasticity,

measured service, broad network access, resource pooling, and on-demand-self-service (Mell and Grance 2011). Cloud computing enables ICT service providers (person, organisation or entity responsible for making a service available to cloud consumers) to virtualise their computational resources and concurrently provision them, via a service orchestration process, typically in the form of Software-as-a-Service (SaaS), Platform-as-a-Service (PaaS) or Infrastructure-as-a-Service (IaaS) (Liu et al., 2011). While there is anecdotal evidence which highlights the transformative business and strategic value afforded by cloud computing for ICT service providers (Clohessy et al., 2016, Armbrust et al., 2009), our understanding of how these organisations can develop digital transformation strategies that effectively align with the value propositions inherent to cloud computing technologies is still limited (Iyer and Henderson, 2012; Chang, Walters and Wills, 2013; Khanagha et al., 2014).

2.2 Bounding the Concept of Strategy

In order for IS researchers to have a comprehensive understanding of an organisation's ICT strategy, it is useful to understand the evolution of their intended and realised strategies (Chan, Huff and Copeland, 1998). Mintzberg and Waters (1985) propose a widely cited comprehensive categorization for strategy which identifies intended, realised, deliberate, unrealised and emergent strategy as constituting key components of the strategy formulation process. This categorization of strategy is suitable for investigating the "peculiarities" of modern emerging ICT (Peppard, Galliers, and Thorogood, 2014) and thus provides a backdrop for this study to better explore the strategy formulation process of ICT service providers (Figure 1). Intended strategy represents the organisation's official strategy (which may or not be written down) and realised strategy which reflects the outcomes of decisions undertaken by the organisation stakeholders which may manifest from deliberate, emergent, and unrealised strategies. Deliberate strategy is defined simply as "realised as intended", emergent strategy as "patterns or consistencies realised despite, or in the absence of, intentions" and finally unrealised strategy as "intentions that are unsuccessful in its consequences" (Mintzberg and Waters, 1985).

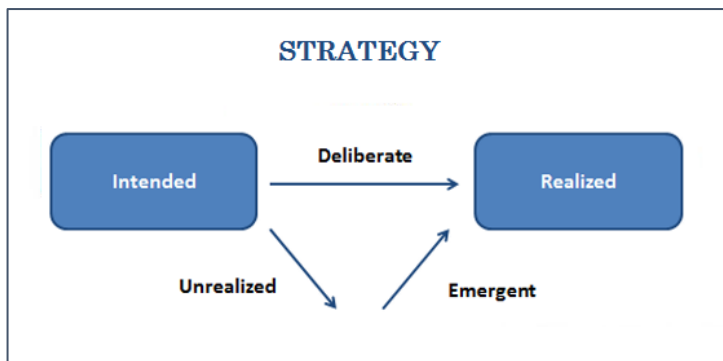


Figure 1: Strategy Research Lens (Mintzberg and Waters, 1985)

We selected the aforementioned seminal categorisation as a basis for conceptualising the concept of strategy for the following reasons. First, no single strategy can be a panacea for an organisation and that the most optimal strategic variables alter due to certain conditions and factors (Zott and Amit, 2008). Given the rapidly evolving nature of the cloud computing paradigm (Ojala and Tyrvaïnen, 2011), and the subsequent dynamic nature of cloud-based digital transformation (Clohessy et al., 2016), the categorization is well suited for delineating the strategy formulation process and chronicling how ICT service providers have arrived at their current realised strategy. Second, in the context of cloud-based digital transformation, the categorisation enables the identification of problematic issues and emerging patterns of events and behaviours which may have resulted in ICT service providers deviating from their intended strategy (Mintzberg and Waters, 1985; Chan et al., 1998). Third, the categorisation enables business strategy to be “viewed in a non-descriptive manner, being conceived in terms of how companies actually decide and act, not how they should decide and act” (Jansson, 2008). In the next section, we delineate the research method operationalised in order to elucidate our research objective.

3 Methodology

This paper’s research objective is to explore how cloud-based digital transformation impacts ICT service providers’ strategies? Due to the dearth of empirical research pertaining to examining the relationships of the focal phenomena under scrutiny, our study is exploratory. Thus, a multi-method, comparative case study research design was selected for the study (Stebbins, 2001, Yin, 2014). The research sampling approach was directed by evolving theoretical concepts, whereby we identified organisations and people from which we expected to elicit the majority of insights into the phenomena of interest (Strauss and Corbin, 1998). For instance, this study encompasses an analysis of both large and small and medium enterprise (SME) ICT service provider firms. The large business model mature (BMM) ICT ventures represent organisations that have significantly longer tenure as ICT service providers that are currently transitioning from ‘pre-cloud’ to ‘cloud-based’ business models. The SME born-on-the-cloud (BOC) ICT ventures represent organisations who do not possess the requisite existing maturity or tenure of pre-cloud business models. These firm’s business models originated on the cloud. Data collection took place between January 2015 and August 2015 using semi-structured interviewing based on a common protocol across 15 ICT service provider organisations. Following the standard practice of using senior management as data sources, (Iyer and Henderson, 2012, Clohessy et al., 2016) we chose a senior manager from each targeted organisation. Interviews lasted between 70 and 120 minutes. The interviews (including follow-up interviews) were conducted until theme exhaustiveness was reached, which manifested when similar themes were being identified and no new themes emerged. All interviews were transcribed, proof read and annotated and then coded using NVivo 10. In order to improve the credibility of the data and provide cross and complementary perspectives on emerging elements, secondary evidence in the form of archival documents and published materials sourced from the ICT service providers’

websites (e.g. white papers, specific ICT service providers case studies, brochures, reports) were collated and analysed. While the study did not undertake a grounded theory approach, in analysing the data, the researcher used an analytical hierarchical data analysis process adopted from Ritchie, Spencer and O'Connor (2003) incorporating open and axial coding techniques based on the recommendations of Strauss and Corbin (1998).

Table 1: Data sources for the study.

ICT provider*	Size**	Cloud Services/Business Model***	Interviewee
<i>Inno Ltd.</i>	Large	<ul style="list-style-type: none"> ▪ Hybrid, public and private managed and self-service hosting cloud offerings. ▪ Outsourcing and consultancy services. (BMM) 	Cloud CTO
<i>MobCon</i>	Large	<ul style="list-style-type: none"> ▪ Provision connectivity into cloud IT solutions via their existing next generation Telco network and bespoke software solutions. ▪ Manage the design, build and implementation of their customers cloud solution ensuring seamless network integration. (BMM) 	Cloud CTO
<i>Sigmaten Systems</i>	Large	<ul style="list-style-type: none"> ▪ Hybrid, public and private managed and self-service hosting cloud offerings. ▪ Outsourcing and consultancy services. ▪ Microsoft and SAP value added resellers. (BMM) 	Cloud CTO
<i>Gaviour Ltd.</i>	Large	<ul style="list-style-type: none"> ▪ Hybrid, public and private managed and self-service hosting cloud offerings. ▪ Outsourcing and consultancy services. (BMM) 	Cloud Manager
<i>ZystemTech</i>	Large	<ul style="list-style-type: none"> ▪ Hybrid, public and private managed and self-service hosting cloud offerings. ▪ Outsourcing and consultancy services. (BMM) 	Cloud Manager
<i>SandstemTech</i>	SME	Bespoke software solutions enable travel companies to derive maximum benefit for their customers. (BOC)	CTO
<i>Levatte</i>	SME	▪ Bespoke procurement software solution.	Cloud Manager

		<ul style="list-style-type: none"> ▪ Enables customers to source and evaluate new suppliers. 	
<i>Yet3</i>	SME	Bespoke CRM sales management and membership body software solutions. (BOC)	CEO
<i>FieldZuite</i>	SME	<ul style="list-style-type: none"> ▪ Supply IT infrastructure in the form of public, private and hybrid cloud infrastructure hosting. ▪ Disaster recovery and virtual desktop services. (BOC) 	CEO
<i>VClazz</i>	SME	<ul style="list-style-type: none"> ▪ Supply IT infrastructure in the form of public, private and hybrid cloud infrastructure hosting. ▪ Microsoft value added resellers. (BOC) 	CTO
<i>Zeta2k</i>	SME	Bespoke software solution enables customers to visualize their raw log data in order to unlock real time critical insights. (BOC)	CTO
<i>Med3Care</i>	SME	Bespoke software solutions aimed at the travel clinic service market segment. (BOC)	CEO
<i>Braavos PLC</i>	SME	Bespoke software solution enables customers to integrate and connect their existing core IT infrastructure into an ICT service providers’ offering. (BOC)	CEO
<i>LYS</i>	SME	<ul style="list-style-type: none"> ▪ Supply IT infrastructure in the form of private and hybrid cloud infrastructure managed hosting. ▪ Outsourcing and consultancy services. ▪ Microsoft and Citrix value added resellers. (BOC) 	CIO
<i>WebReve</i>	SME	Bespoke software solution enables customers to design and build cloud-based website solutions. (BOC)	CEO

Company 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).*

4 Findings

In this section, we report the empirical results obtained during the analysis of the semi-structured interviews (denoted as sanitised quotes), archival documentation and published materials. It was evident from the study that cloud-based digital transformation not only have a dynamic and turbulent impact on ICT service providers' strategies (emergent and unrealised) but also have a cogent collective impact in terms of agility and competitive positioning (that is, their deliberate strategy) (see Table 2).

Table 2: The impact of cloud computing based digital transformation on realised strategy

Realised Strategy	Digital Transformation Impact	Sources
Deliberate Strategy	1. Increased agility - organisational and operational	All ICT service providers - Examples from INNO, Zeta2k, FieldZuite, MobCon, LYS, Braavos, SandstemTech
	2. Increased strategic acquisitions	All large ICT service providers - Examples from Sigmathen Systems, INNO
Emergent and Unrealised Strategy	3. Increased strategic partnerships	All ICT service providers - Examples from MobCon, Zeta2k, LYS, VClazz, INNO, Med3Care
	4. The dynamic nature of cloud-based digital transformation, in conjunction with the fluid of the cloud computing market, facilitates increased incidences of emergent and unrealised strategy.	All ICT service providers- Examples from VClazz, Yet3, FieldZuite, MobCon, INNO

The strategies for ICT service providers (large and SME) encompassed short and long-term objectives such as cogent market impact, increasing return on investment (ROI), enhanced agility, reinvestment of capital, and reducing capex and opex. For example, study participants in Levatte and Sigmathen Systems described how their strategy is focused on broadening their cloud geographic footprint and growing their customer base in order to increase revenues while the CEO at FieldZuite explained that their primary strategy is about increasing revenues through repeat customers.

All ICT service providers confirmed that their cloud-based business model(s) have significantly impacted the realisation of their company's strategic objectives (see Table 2) which has been largely the cumulative result of a combination of deliberate, emergent and unrealised strategy. In terms of deliberate strategy, all ICT service providers identified that their main objective for operationalising cloud influenced business models was mainly for agility reasons. For instance, the CTO at INNO described how their cloud strategy was focused on enhancing the agility of the organisation, stating that "the new religion is cloud and we are all about agility and DevOps principals. Our objective is to develop new or improved services faster than we did in the past. All new offerings must be agile and be able to be provisioned at low cost". This CTO further elucidated that "our new strategy is that we are going to become a SaaS organisation and get out of the hardware business". The CEO at Braavos pointed out that their cloud-based business models "foster agile and cost effective operations which are currently enabling our strategic objectives of becoming a market leader as a cloud integration service provider". While the CTO at Zeta2k described how their "cloud enabled business model has allowed us to be very agile and nimble in order to provide a service to a large number of users very quickly, thus facilitating strategic objectives". Similarly, the CTO in FieldZuite explained that their business model has had a significant collective impact on the company's strategic objectives by not only enabling them to compete with larger ICT service providers but also to deliver their cloud services with greater efficiency to multiple global locations around the world. Moreover, the CTO in MobCon elucidated on two examples of the cloud business model impact on their strategic objectives.

First, he described how cloud computing facilitates enhanced efficiency (e.g. operational, cost and resource) and faster innovation in terms of supporting accelerated cycles of development. For example, cloud computing enables the early deployment of demonstration environments that would otherwise require substantial capital expenditure as a precursor to a full business case. Second, MobCon's strategic partnering with Amazon Web Services (AWS) facilitated stability in their business model components, thus minimising strategy-business model misalignment issues which may have manifested because of the disruptive nature of cloud computing technology. The CTO in SandstemTech added, "the cloud has enabled us to be more responsive. We have sales pitch for a large airline next week and cloud computing has enabled us to create an enterprise demo environment for them in a matter of hours. The traditional method we would have utilised three years ago would have taken weeks in order to create the same infrastructure for the demo environment". Strategic acquisitions were also identified as deliberate strategy by all large ICT service providers. For example, the CTO in Sigmathen Systems explained, "it was a deliberate strategic decision to acquire an established managed hosting in ACD (company synonym)". Prior to this acquisition, the company were losing customers to public cloud offerings. In order to streamline the on-boarding process for cloud customers, the company also acquired an independent software vendor (ISV) start-up company who specialised in subscription billing.

The CTO in INNO also pointed out that their decision to acquire an established cloud provider such as CEES was pivotal to their cloud success, stating that “INNO’s acquisition of CEES in 2013 accelerated its cloud computing strategy overnight. We can now use the CEES infrastructure and platform to rapidly deploy existing software services as SaaS”. Partnerships were also identified as an example of deliberate strategy by ICT service providers (e.g. Zeta2k, LYS, VClazz, INNO, Med3Care). Both the interviewees in LYS and VClazz confirmed that it was a deliberate decision for their organisations to operate as value added resellers (VARs) in order to avail of the economies of scale provided by their large ICT service provider partner. All ICT service providers confirmed that their emergent strategy manifested from cloud enabled accelerated rate of business growth and incidences of unrealised strategy. For instance, the CTO in VClazz opined, “as a result of the exponential rate of growth we have experienced provisioning cloud services, we have successfully transitioned from the end-user market to the channel markets”. Similarly, the CEO in Yet3 pointed out that the company’s current realised strategy has manifested as a result of emergent strategy based on their accelerated growth in niche global target markets. In relation to unrealised strategy, IaaS was provided as an example by ICT service providers (e.g. MobCon, FieldZuite, INNO). For example, the CTO in INNO explained how prior to acquiring CEES, their efforts to build their own IaaS proved vexatious, further describing how “it really was a painful process trying to develop our own bespoke IaaS. It didn’t have the scale of AWS, Rackspace, and Azure. It failed simply as there wasn’t a big enough pool of resources for all the customer requirements we had. We did not invest in it aggressively enough and were far too conservative about investing in it”. The CTO in MobCon described how the company were initially going to build their own cloud infrastructure. However, MobCon decided to partner with AWS, a partnership that enabled the company to accelerate its move to provide cloud services to its existing customers.

The study identified that the dynamic and recursive nature of ICT service providers’ strategy formulation, business model experimentation, organisational learning and subsequent adaptation when attempting to explore disruptive and/or innovative cloud business models. Figure 2 below depicts the process model we have developed to reflect this recursive process. All ICT service providers confirmed that their cloud strategy formulation and review decisions were largely management-led (e.g. board of management, investors and so on) with changes being dictated by business model(s) component performance (e.g. market analysis, revenue, cost). For example, the CTO at Zeta2k surmised, “our organisation’s strategy is management-led and informed by business model performance, strategic roadmaps, whitepapers, analyst research reports and customer communities’ feedback”, while the CTO at INNO explained how they have a committee of fourteen people responsible for developing corporate strategy for the company’s four divisions (that is, hardware, software, business consulting and technology consulting). However, on the contrary, the CEO at Yet3 described how their strategy is more leadership-led, which is facilitated by the flat structure of the organisation. The CEO elucidated, “while the advisory board help the company to see the forest from the trees, we have employees in Israel, Vietnam and Japan who can influence

strategic decisions without ever having met the CEO or the advisory board as they know more about the lay of the land than we do”. The CEO asserted that the ability of their globally distributed employees to provide strategic insight on their national landscapes has been a cornerstone of the company’s continued success.

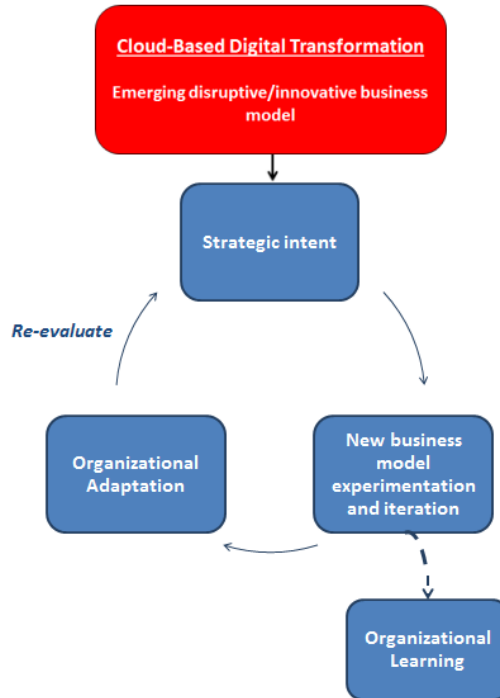


Figure 2: The relationships among strategy formulation, business model experimentation and organisational adaptation when exploring an emerging disruptive and/or innovative business model

In an effort to maximise the realisation of their strategic intent, all ICT service providers are engaging in business model experimentation and iteration. For example, the cloud manager at Levatte described how they are experimenting and iterating their business model constructs at varying levels within the organisation. The CTO in INNO also explained how their organisation was utilizing a bespoke component business modelling (CBM) technique for formalising and reviewing their product business models. The CBM technique breaks an enterprise down into its constituent segments and enables INNO to take the aforementioned areas and break them down and identify elements which bring business value to the company. The CTO at INNO further elaborated, “the CBM breaks our IT function down into segments which we do that is strategic and operational and tactical. Elements and segments which are important for our operations are maintained whilst other which are not strategically important are outsourced”. The CEO at FieldZuite

also explained how the business model impact of the cloud computing paradigm was different to antecedent technologies, pointing out that “customer needs are constantly changing. An inability to review and change individual business model components can result in detrimental effects to the longevity of a ICT service providers’ business”. While the CTO at Sigmathen Systems explained that transition for traditional hardware and software providers to more cloud focused provision methods has had a combined revolutionary and chaotic impact on their business model. The study found that the learning accumulated from this iterative business model process serves as a foundation for organisational adaptation based on the potential, requirements and impacts of the new cloud business model. Strategic organisational adaptation encompassed re-structuring, re-organisation, change of personnel and new ways of managing.

The outcomes of this organisational adaptation served as an input for re-evaluating the strategic intent of the organisations. Our analysis complements and extends existing research - in particular Khanagha et al., (2014). On the one hand, it confirms the dynamic nature of ICT service providers’ strategic intent in response to disruptive cloud-based digital transformation and also identifies the salient roles of adaptation, business model experimentation and the resulting accrument of new knowledge. However, on the other hand, contrary to their findings that presented structural adaptation as a precursor to business model experimentation, our findings indicate that business model experimentation and iteration and the subsequent derived organisational learning serve as salient inputs to ICT service providers evaluating whether the level of organisational adaptation required to pursue their strategic intent is feasible. This would suggest that ICT service providers are operationalizing a cautionary and evolutionary approach prior to committing substantial finances and resources to restructuring their organisation in order to realise their strategic intent. In the next section, we conclude with implications for research and practice.

5 Implications for Theory and Practice

The objective of this study was to conduct an exploratory investigation into how cloud-based digital transformation impacts ICT service providers’ strategies? Both theoretical and practice contributions stem from this research. From a theory perspective, extant empirical research in the area of cloud-based digital transformation has largely focused on adopter perspectives. This study provides a contribution towards a vivid contextual understanding the broader impact of cloud-based digital transformation on both large multinational and SME ICT service providers’ strategies using Mintzberg and Waters’ (1985) seminal research lens. Moreover, our study can further be considered revelatory in that we have incorporated our findings into a new process model (see Figure 2) which demonstrates that business model experimentation and organisational learning serve as salient moderating antecedents to determining the level of organisational adaptation that may be required to realise strategic intent of a cloud-based digital transformation. From a practice perspective, our findings suggest that ICT service providers should continue to focus on using business model experimentation as a means for harmonizing their

organisation's strategies with the disruptive and/or innovative idiosyncrasies of cloud-based digital transformation. While the comparative case study proved to be rich in detail, the findings are based on a small purposeful sample of fifteen 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.

Given the exploratory nature of this research and the high-level nature of the new process model, others will need to build theory and subsequently test it. From an organisational learning perspective, future research is warranted from a resource-based view of the firm and dynamic capabilities perspectives in order to explore how successful ICT service providers are exploiting their core resources and competencies in order to take advantage of the opportunities afforded by cloud technology. Additionally, a systems thinking approach could elucidate the implications of altering existing complex relationships, processes, and feedback mechanisms. For example, different change processes may conflict with one another (e.g. there may be potential interference between re-structuring and individual learning). Finally, while the primary objective of this study was to examine the broader impact of cloud-based digital transformation on the strategy formulation process, we believe that studying the strategy archetypes which emerge as a consequence of explicit cloud-based service models (e.g. SaaS, PaaS, IaaS) seems an area ripe for research.

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References

- Arvidsson, V., Holmström, J., and Lyytinen, K. (2014). Information systems use as strategy practice: A multi-dimensional view of strategic information system implementation and use. *The Journal of Strategic Information Systems*, 23(1), 45-61.
- Atkins, M. (1994). Information technology and information systems perspectives on business strategies. *The Journal of Strategic Information Systems*, 3(2), 123-135.
- Chan, Y. E., Huff, S. L., and Copeland, D. G. (1998). Assessing realized information systems strategy. *The Journal of Strategic Information Systems*, 6(4), 273-298.
- Chang, V., Walters, R. J., & Wills, G. (2013). The development that leads to the Cloud Computing Business Framework. *International Journal of Information Management*.
- Clohessy et al. (2016). The Times they are A-Changin for ICT Service Provision: A Cloud Computing Business Model Perspective 24th European Conference in Information Systems (ECIS) Istanbul, Turkey.
- Clohessy, T., Acton, T., & Morgan, L. (2016). Running While Standing Still: Rethinking ICT Business Model Decisions for the New Cloud Economy. 29th Bled eConference, Slovenia.
- Clohessy, Trevor; Acton, Thomas; Morgan, Lorraine (2017). Lessons Learned: How to Leverage Cloud-Based Business Models. *Cutter Consortium Executive Update*, 20 (7) :1-11.

- Croteau, A. M., and Bergeron, F. (2001). An information technology trilogy: business strategy, technological deployment and organizational performance. *The journal of strategic information systems*, 10(2), 77-99.
- CSA and ISACA (2012). *Cloud Computing Market Maturity*. Available from <https://cloudsecurityalliance.org/media/news/cloud-maturity-study-reveals-top-issues/> (accessed 05th August 2016).
- DaSilva, C. M., Trkman, P., Desouza, K., and Lindič, J. (2013). Disruptive technologies: a business model perspective on cloud computing. *Technology Analysis & Strategic Management*, 25(10), 1161-1173.
- Ehrenhofer, C., and Kreuzer, E. (2012). *The Role of Business Model Design in the Service Engineering Process: A Comparative Case Study in the Field of Cloud Computing to Join Service Engineering with Business Model Design*. Paper presented at the SRII Global Conference.
- Hess T, et al. (2016) Options for Formulating a Digital Transformation Strategy. *MIS Quarterly Executive*. Jun 1;15(2).
- Henderson, J. C., and Venkatraman, N. (1993). Strategic alignment: Leveraging information technology for transforming organizations. *INNO systems journal*, 32(1), 4-16.
- Iyer, B., and Henderson, J. (2010). Preparing For The Future: Understanding The Seven Capabilities Of Cloud Computing. *MIS Quarterly Executive*, 9(2), 117-131.
- Iyer, B., & Henderson, J. C. (2012). Business value from clouds: Learning from users. *MIS Quarterly Executive*, 11(1), 51-60.
- Jansson, H. (2008). *International business strategy in emerging country markets: the institutional network approach*. Edward Elgar Publishing.
- Khan, N. and Sikes, J. (2013). *IT under pressure - McKinsey global survey*. Available from http://www.mckinsey.com/insights/business_technology/it_under_pressure_mckinsey_global_survey_results (accessed 11th May 2016)
- Khanagha, S., Volberda, H., & Oshri, I. (2014). Business model renewal and ambidexterity: structural alteration and strategy formation process during transition to a Cloud business model. *R&D Management*, 44(3), 322-340.
- Khajeh-Hosseini, A., Somerville, I., & Sriram, I. (2010). *Research Challenges for Enterprise Cloud Computing*. Paper presented at the Submitted to 1st ACM Symposium on Cloud Computing, Indianapolis, Indiana, USA.
- KPMG International (2012). *Global Cloud Provider Survey*. Available from <https://www.kpmg.com/SG/en/IssuesAndInsights/ArticlesPublications/Documents/Advisory-ICE-Breaking-through-the-Cloud-Adoption-Barriers-Glob.pdf> (accessed 09th May 2016).
- Linthicum, D (2012). *Buyers Say The Cloud Is Already Tired Out*. Available from <http://www.infoworld.com/d/cloud-computing/buyers-say-the-cloud-already-tired-out-203760> (accessed 15th May 2014).
- Mansfield, G. M., & Fourie, L. C. H. (2004). Strategy and business models-strange bedfellows? A case for convergence and its evolution into strategic architecture. *South African Journal of Business Management*, 1.
- Marston, S., Li, Z., Bandyopadhyay, S., Zhang, J., & Ghalsasi, A. (2011). Cloud computing—The business perspective. *Decision support systems*, 51(1), 176-189.
- Mohdzain, M. B., and Ward, J. M. (2007). A study of subsidiaries' views of information systems strategic planning in multinational organizations. *The Journal of Strategic Information Systems*, 16(4), 324-352.
- Mell, P., & Grance, T. (2011). *The NIST Definition of Cloud Computing—Recommendations of the National Institute of Standards and Technology*. National Institute of Standards and Technology, Special Publication 800-145, Gaithersburg.

- Mintzberg, H., and Waters, J. A. (1985). Of strategies, deliberate and emergent. *Strategic management journal*, 6(3), 257-272.
- Mintzberg, H., Ahlstrand, B., and Lampel, J. (2005). *Strategy Safari: A Guided Tour Through The Wilds of Strategic Management*. Simon and Schuster.
- Ojala, A., and Tyrvaïnen, P. (2011). Developing Cloud Business Models: A Case Study on Cloud Gaming. *IEEE software*, 28(4).
- Peppard, J., Galliers, R. D., and Thorogood, A. (2014). Information systems strategy as practice: Micro strategy and strategizing for IS. *J. Strategic Inf. Sys.*, 23(1), 1-10.
- Porter, M. E., and Millar, V. E. (1985). How information gives you competitive advantage. *Harvard Business Review*, 63 (4), 149 – 160.
- Ritchie, J., Spencer, L., & O'Connor, W. (2003). Carrying out qualitative analysis. *Qualitative research practice: A guide for social science students and researchers*, 219-262.
- Stebbins, R. A. (2001). *Exploratory research in the social sciences*. Sage Publications, London, UK.
- Strauss, A. L., and Corbin, J. (1998). *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory* (2nd ed.), Thousand Oaks, CA: Sage Publications.
- Ward, J. M. (2012). Information systems strategy: Quo vadis? *The Journal of Strategic Information Systems*, 21(2), 165-171.
- Yin, R. K. (2014). *Case study research: Design and methods*. Sage publications. London, UK.
- Zott, C., and Amit, R. (2008). The fit between product market strategy and business model: Implications for firm performance. *Strategic Management Journal*, 29(1), 1-26.
- Zott, C., Amit, R., and Massa, L. (2011). The business model: recent developments and future research. *Journal of Management*, 37(4), 1019-1042.

