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Abstract

Cloud computing is a popular buzzword in the IT industry, and promoted as a concept that will afford organizations scalable computing resources from external providers on a pay-per-use basis. With the minimization of in-house IT infrastructures, organizations have been promised sizable cost savings and reduced administrative hurdles, making it an attractive outsourcing proposition for non-IT enterprises, such as universities, whose IT departments have been riddled with budget cuts, and increased workloads. However, cloud computing has its share of risks and can challenge the authority of an organization’s central IT authority. This paper presents a case study of a large Australian university, with a risk-averse IT department, that has begun to engage in cloud computing, and elucidates the perceptions of senior IT managers on their motivations to adopt cloud computing and their concerns over their future role as influential policy-makers in the enterprise.

Keywords: Cloud computing, IT services, IT in organizations, outsourcing, universities, case research
1 Introduction

In his book, The Big Switch: Rewiring the World, from Edison to Google, Nicholas Carr (2009) equates the phenomena of cloud computing to mass public utilities such as electricity. He predicts the demise of the power of the in-house IT department, as more of the organizational IT infrastructure migrates onto the cloud. The market for cloud computing is projected to be worth $42 billion per year by 2012 (Buyya et al., 2009; Gleeson, 2009). Cloud computing has been promoted as an alternative to investments in ICT infrastructure by organizations, especially in times of economic difficulties, as the capital expenditures are replaced by operating expenses using a utility model (Mowbray and Pearson 2009).

There is no standard definition for cloud computing, as stated by Grossman (2009), and Voas and Zhang (2010). However, the term “cloud” was inspired by the depiction of the remote digital environment and the Internet as a cloud in eBusiness textbooks (Sultan, 2010). According to Vaquero et al. (2008), clouds “are a large pool of easily usable and accessible virtualized resources (such as hardware, development platforms, and/or services). These resources can be dynamically reconfigured to adjust to a variable load (scale), allowing also for an optimum resource utilization. This pool of resources is typically exploited by a pay-per-use model in which guarantees are offered by the Infrastructure Provider by means of customized SLA”.

Cloud computing is being promoted in view of the benefits it offers to organizational users. It is claimed to be driven by economics, and the simplification of complex ICT infrastructure in organizations (Erdogmus, 2009). The primary benefits of cloud computing include elasticity and scalability of computing resources and associated cost savings (Armbrust et al., 2009; Babcock, 2010; Zhang et al., 2010). However, there are also concerns with the use of cloud services by organizations, pertaining to matters of security and privacy, vendor lock-ins, (Catteddu and Hogben, 2009; Khajehhosseini et al., 2010), and drop in reliability (Leavitt, 2009; Naughton, 2009).

Cloud computing also brings about changes in organizational policies, processes, and importantly, to the structure and role of the central IT department, and is the subject of interest for academic research in light of the fact that it challenges established notions of how IT resources are allocated and used within organizations (Creeger, 2009; Khajeh-Hosseini et al., 2010; Tyndall, 2010) and that it has become increasingly associated with Green IT (Sultan, 2010). Sparked by this interest in cloud computing and its adoption in large organizations with diverse user communities, we embarked on a longitudinal case study of a large university in the midst of its adoption of cloud computing and present a qualitative examination of motivators and concerns regarding cloud services, with implications for the changing role of the central IT department, expressed by the university’s senior IT managers. This paper presents a case study of the cloud computing adoption in a large Australian university over the period from early 2008 to late 2010.

2 What is Cloud Computing?

There has been considerable dispute as to whether cloud computing presents a “new paradigm” as the concept is largely based on existing technologies, such as utility computing, virtualization, and grid computing, except that it is an integration of these technologies (Weinhardt et al., 2009). There is actually nothing new about the notion of cloud computing as such, taking into account the inclusion of existing technologies such as Centralised and Distributed Computing, Utility Computing, and Virtualization (Zhang et al., 2010). However, the novelty lies in the integration of these technologies onto a network situation (Weiss, 2007). Cloud computing is essentially outsourcing of IT resources (Babcock, 2010). The act of having an outside organization provide various information services appears to be synonymous with the concept of Outsourcing, which is not new a concept to IT research. Organizations have outsourced aspects of their IT since the mid-1960s (McFarlan and Nolan, 1995).
Clouds can be deployed as public, private, or a hybrid models. Computing services are offered on a pay-per-use basis (utility computing) to customers in a public cloud, whilst in a private cloud, the datacentres are owned by the organization or managed exclusively on behalf of the organization by the cloud provider (Armbrust et al., 2010). Hybrid models incorporate both public and private clouds (Babcock, 2010). The three main types of services offered by cloud computing providers include Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS). IaaS includes the remote delivery of computing infrastructure services via virtual computers, servers, and storage, though the applications and data are still owned and controlled by the client company. PaaS includes the provision of infrastructure services and operating (system) environment by the cloud vendor. Clients are able to develop applications using tools offered by the cloud provider and test them in the cloud environment. However, the actual data is still owned and managed by the client. Under the SaaS model, an entire range of services from infrastructure, operating and application development environment, to the actual applications and maintenance of databases by the cloud services provider. In essence, the client delegates and relinquishes all controls on its ICT infrastructure to the cloud provider.

3 Cloud Computing in Universities

The benefits of scalability and elasticity and pay-per-usage model have stimulated the adoption of cloud services by universities. Amazon Web Services (AWS) sponsored the University of California at Berkeley in moving the administration of one of its courses onto a SaaS cloud as it required the allocation of a large number of servers within a relatively short period of time (Fox, 2009). Another instance is the adoption of cloud services by the School of Electrical Engineering & Computer Science (EECS) at Washington State University, which was primarily motivated by the need to contain the ICT budget (DeCoufle, 2009). Cloud computing has also begun to be looked upon favourably by higher educational institutions in the UK (Hicks, 2009; Sultan, 2010), and adopted in the developing world, such as the Beijing University of Technology, one of the 17 universities worldwide to have joined the IBM Cloud Academy initiative (Kshetri, 2010), the Indian Institute of Technology (IIT)-Kanpur (MacMillan, 2009), Vietnam National University (VNU) (Ariff, 2008), and a consortium of East African universities (HEALTH Alliance) (Wanjiku, 2009) use cloud services.

However, Yanosky (2008) warns that the adoption of cloud computing in universities could be perceived by in-house IT departments as a prelude to the erosion of their influence and administrative authority. With the pay-per-use and scalability features of cloud computing, users are able to seek IT services from external providers, and become “choosers” of IT services, thus reducing their
dependency on central IT. This has already been reported in the corporate sector, namely the case of BP in which a group of users bypassed the central IT department and corporate security processes to seek the services of Amazon AWS (Knode, 2009). Yet, cloud computing is not expected to entirely erode the administrative authority of central IT departments over organizational networks. Yanosky (2008) also warns that users would revert to central IT for advice when they encounter problems with the cloud services. This could lead to central IT either placing restrictions on the type and kind of IT services (and providers) that users can access from the cloud, or by taking on the role of “certifiers”, thus morphing its role to that of a “certifier, consultant, and arbitrator”. On a more general sense, in the context of organizational IT use, Khajeh-Hosseini et al. (2010) point to the area of IT procurement as a candidate for changes brought in by the adoption of cloud computing. What is becoming apparent is the fact that the role of the IT department in universities will undergo transformation (Goldstein, 2008; Yanosky, 2008).

4 Seeking IT Resources Externally: Theoretical Underpinnings

There have been many theories used in research to explain different aspects of outsourcing. In one particular framework these theories are classified into the strategic management view, the economic view, and the social view (Lee et al, 2000). Three theories from this framework have been chosen to represent different dimensions of the outsourcing decision. From each category, a theory has been selected, which has been widely used in research, to explain the motivations behind outsourcing. These theories are Transaction Cost Economics (Marcolin and Ross, 2005; Lacity and Willcocks, 1996; Cheon et al., 1995), the Political Power model (Dibbern et al., 2004; Lee et al., 2000; Lacity and Hirschheim, 1993), and the Resource Based-View (Haried and Ramamurthy, 2010; Bharadwaj et al., 2010; Lee et al., 2000).

4.1 Transaction Cost Economics (TCE)

Much of the past and current literature on outsourcing has been concerned about the “make or buy” or “in source vs. out source” decisions concerning the behaviour of business organizations (Bharadwaj et al., 2010; Haried and Ramamurthy, 2010; Whitten et al., 2010, Clemons et al., 1993). Therefore, one of the common theories used to explain the motivation of outsourcing is Transaction Cost Economics (TCE) (Coase, 1937; Williamson, 1985). When deciding between outsourcing and producing internally, organizations base their decisions around an economic cost decision. TCE is used to comment on outsourcing in three ways, which are economies of scale, switching costs, and coordination of transaction costs. The argument for outsourcing is that the use of IT can reduce costs of explicit coordination and therefore, organizations are encouraged to outsource to other suppliers who have economies of scale, particularly owing to their expertise in the development of software information and expertise (Lacity and Hirschheim, 1993).

It is also argued that IT has the ability to lower coordination costs without increasing the associated transaction risk, leading to more outsourcing and less vertically integrated firms (Clemons, 1993). On a final note, switching costs such as sunken investment costs, lost performance, management upgrade, uncertainty of future IT operations, induction re-training performance costs, candidate search costs, information transfer and setup costs, and in-learning costs are seen as a form of transaction costs that can be reduced through outsourcing. Organizations prefer to continue outsourcing when switching costs are high (Whitten et al., 2010).

4.2 The Political Power Model

The concept of political power is useful when considering four different aspects of power. The first aspect is treating power as a function of position within a structure. It is argued that structure is a key source of power because it legitimises the exercise of power and authority of an institutional code
Concerning outsourcing, departments or employees who are in a position of influence can use their power to determine whether to outsource or not. The second aspect is based on the evidence that resource acquisition is also a critical source of power (Salancik and Pfeffer, 1977). In the case of outsourcing, the more resources a member brings into the organization, the more power she/he accumulates (Lacity and Hirschheim, 1993) and thus, is able to influence the decision making between in the context of purchasing IT services. The third aspect of power refers to the idea that power comes from offering value that is unique and not substitutable. This value is more strategic and thus, the party that holds this valuable resource can influence the make or buy decision. Finally, the fourth aspect of power that is relevant to outsourcing is the ability to absorb uncertainty. The argument is that reduction in task uncertainty is viewed as a major element in decision making. Lacity (1993) argues that the ability to provide information concerning new technology or services absorbs uncertainty and therefore, puts the service provider or department in an influential position when it comes to decision making (Lacity and Hirschheim, 1993).

4.3 Resource-Based View (RBV)

The Resource-Based View (RBV) proposes that an organization has specific resources that can assist in its competitive positioning in the marketplace. The key measure of whether a resource is strategic is based on four characteristics: heterogeneity, value, inimitable and non-substitutable (Barney, 1991). In the context of outsourcing, organizations can consider strategic resources in one of two ways. Organizations can explore the strategy of outsourcing activities that are seen as non-essential or not considered as core competencies or core capabilities. Competence refers to “a firms capacity to deploy resources, usually in combination using organizational processes, to affect a desired end and thus represents bundle of skills and technologies rather than a single, discrete skill or technology” and competence is defined as the ability to deploy combinations for firm-specific resources to accomplish a given task (Bharadwaj et al., 2010), whereas capability is defined as the strategic application of competencies, their use and deployment to accomplish given organizational goals. A core IS capability is a capability needed to facilitate the exploitation of IT, measurable in terms of IT activities supported, and resulting business performance (Willcocks and Feeney, 2006). Alternatively, the outsourcing relationship itself and knowledge created from this relationship could be seen as the strategic resource for an organization to continue to improve over a lengthy period of time and a key indicator for outsourcing success is partnership quality (Goo et al., 2007; Lee and Kim, 1999). However, this was contradicted by one study concerning client and vendor IT outsourcing relationships (Haried, 2010), which argued that a partnership can not be seen as strategic resource primarily because the vendor and the client both have conflicting goals and this may impact on their partnership engagement.

Therefore, we can apply these theories, traditionally used to comment on outsourcing, to explore the decision making process and motivational drivers behind policy changes through cloud computing. The findings of our research will explore whether these three theories are sufficient alone to explain the behaviour of the research case, or whether there are other factors of importance outside this framework that need to be incorporated in future guidelines for policy making associated with organizational use of cloud services.

5 Research Methodology

An in-depth single case study of an Australian tertiary institute provided this research project with a revelatory case (Yin, 1994), with the opportunity to analyse one particular organization’s motivation and decision behind moving a portion of its IT services to a “cloud”. In accordance with Eisenhardt (1989), a qualitative and single case study approach for this research project is chosen primarily to provide the researchers with an opportunity to obtain rich data concerning management decision processes and the corporate governance of deciding how, what, and when to outsource to a cloud.
provider. The revelatory and unique aspect of the case is based around the IT implementation history of this organization, which has not always been successful. Thus, in order to understand this organization’s cautious approach and how it may have had an impact on its overall adoption initiatives surrounding external IT services, it was deemed essential to pursue an in-depth look into why and how an organization approaches cloud computing (Eisenhardt and Graebner, 2007). It should be noted that this paper offers an analysis of IT managers’ perceptions of cloud computing and their changing roles, gathered over a period of two years, as part of a longitudinal study. To explore a phenomenon an in-depth manner calls for a qualitative methodology with the data collection technique being made of semi-structured interviews and follow-up interviews. These interviews were carried out with various levels of management through the organization that play a part in contributing and formulating IT policy. In this paper, we report in-depth interviews with two key figures, intimately involved with matters related to the adoption of cloud services, in the university’s central IT department. Under the conditions stipulated in our university research ethics committee agreement, we will refer to the case university as UniOZ and the senior IT managers as A and B.

We were also inspired by Avison and Myers (1995) in their adoption of participant observations as the research methodology in Information Systems research. Participant observation enables researchers to gain an understanding of the informal awareness of a selected community of individuals and their behavioural customs through an extended period of rigorous association with them in their natural habitat (DeWalt et al., 1998; Douglas, 1976). Our participant observations were actively conducted from 2008 to late 2010 and were focussed on academic staff using various cloud-based IT applications extensively in their teaching and research, with aim of enriching our findings.

6 The Case Study: UniOZ

UniOZ is a large university in Australia, offering programs in the fields of technology (computer science, engineering), management, architecture, social sciences, and the arts. It has an enrolment of 70,000 students and employs over 3,900 academics and administrative support staff (which include IT support staff). It is a geographically dispersed organization with campuses spread across Melbourne, inter-state, and overseas. Its two main legacy systems are the Student Administrative Management Systems (SAMS) and the Human Resource (HR) system, both ERP applications. The other applications include the eLearning system (Blackboard), library system, and the Novell email system. This section presents a longitudinal account of the status of cloud usage in UniOZ from early 2008 to late 2010.

6.1 The Pre-Cloud period (2008 to mid-2009)

Our preliminary investigations began in early-2008 with participant observations of academic users, which revealed their use of cloud computing for running simulations, inter-university research collaborations, and file storage. It was estimated by the central IT department that at least 50% of the academic staff were using some sort of cloud services in their respective projects. The reason most academics offered regarding their decision to use external cloud services was that they were not able to avail such services via the central IT department. Even though users were allowed to request new applications or additional IT resources, the approval process was considered uncertain and time-consuming. It was much easier to approach the cloud provider and pay for services using research grants. At the same time, the IT department had been experiencing a relentless increase in demand for IT resources and has had to negotiate more physical spaces to house additional servers.

6.2 The official move to an external provider (mid-2009 to early 2010)

The need for further IT resources forced the generally risk-averse IT department to co-locate its datacentre in a private cloud, both provided by an external vendor. However, it expressed concern at
the subtle pressure towards the migration to IaaS services, applied by the vendor, and reluctance at having lost control over the management of in-house applications upon their migration onto the cloud.

6.3 Current situation (mid-2010 to current)

The IT department had moved onto to adopt a more favourable stance towards externally provided IT resources as the benefits of the movement of servers to the external datacentre began to yield benefits. It was in the process of migrating eLearning systems back to the vendor and negotiating with both Google and Microsoft for the student email accounts. Yet, the IT department still held concerns over the future administration of IT resources within the university.

7 Discussion of Findings

In this section, we discuss the findings from the in-depth interviews with senior IT managers A and B, and corroborate these with our participant observations of academic users. The issues that emerged from the analysis of the data can be categorised into motivators for cloud services adoption and the concerns about the future role of the IT department with the continued migration of applications onto the cloud.

7.1 Motivators for adopting external IT solutions

Manager A narrated the IT department’s decision to move part of its IT infrastructure into the external datacentre, owing to the acute shortage of physical facilities, including power and cooling resources, to accommodate additional servers. Building a new data-center or renovating current facilities for the purpose was going to cost the university up to Aus $35 million and taken a minimum of two years. In the words of the manager A:

"...we've run out of space for putting in additional equipment. But, we need the expansion of our computing capability now! So, we went for the external datacentre as the vendor was providing the facility to house our additional servers. Plus, going with them reduces our responsibilities as part of our infrastructure is now being maintained by the vendor’s technical support... it’s a great relief!"

The external datacentre also provided a development and testing environment for legacy ERP applications. The external datacentre was a “smart” facility in terms of energy consumption, design, and layout, and could easily host more servers as per demand. It also drastically reduced the need for in-house physical spaces allocated for the IT infrastructure, which could now be re-allocated to revenue generating areas of teaching and learning.

The IT department was also being persuaded by the central research unit to approve SaaS applications that can enhance research collaborations. The unit, responsible for coordinating the administration of research activities across the institution, had been inspired by the use of Google Apps as collaborative tools by university research teams worldwide. This was partly influenced by the wide usage of Google apps and IaaS services, such as Dropbox, by academic users. The IT managers A and B were both favourable of a move to cloud services for online collaborative research, and cited the reduction in the IT department’s workload as a result of moving such applications to external vendors, as reiterated by IT manager A:

"The research guys need 5 Petra bytes of storage in the next 5 years –how do you maintain such a large volume of data. We have got around 3000 tapes holding 300 terabytes of university data now. If we had to manage 5 Petra bytes, that would amount to 20,000 tapes. Imagine all the resources we would need to devote to managing that – enormous challenge! That's when cloud services come into the picture"
Thus, the IT department held no qualms over the institutional use of collaborative research tools offered by cloud providers. IT manager B stressed:

“Collaborative research tools can be better delivered and managed by external providers... and their services are robust.”

The same logic was offered with regards to the migration of eLearning systems back to the respective vendors. According to IT manager B:

“Deciding on whether to purchase applications and run them internally, or get the vendor to provide us the services of the applications, is a question of capability and resources. Sometimes, it is easier to find the money than find the people with the required skills and expertise within the organization. Thus, it’s just a better decision to pay the vendor to host the applications”

Despite the optimism over using eLearning systems as externally provided services, the IT department held detailed discussions with other policy-makers on whether it was going to move such systems back to the vendor. Eventually, external hosting was decided upon and Blackboard was one of those core eLearning applications that were moved back to the vendor. As stated by the manager B:

“Blackboard wouldn’t have figured as a candidate for external hosting as it is one of our frontline applications. However, it is desperately in need of an upgrade (and has been for a while) but we haven’t had the funds to do that – the prime diver behind moving this application externally.”

Manager B emphasized that the “speed of delivery”, not the cost differential, was the prime driver behind the university’s consideration of cloud services. Cost-differential was not a primary driver as the IT department would still need to be involved with content management, customization, and integration with internal applications. Rather, the IT department expected to be relieved of the burden of the administration of the application and the infrastructure around it. The IT department was also working out the migration of student email accounts onto the cloud and considering the options of opting for either Google or Microsoft. According to the IT manager A:

“We are expanding the storage on the 100,000 or so student mailboxes...about 150 terra bytes of data, 9% of which is probably rubbish. So, it's a great benefit if we move these email accounts onto the cloud.”

7.2 Concerns over Externally-hosted IT Resources

UniOZ’s IT policy has been considered to be “conservative” and risk-averse, and has long maintained applications internally at the expense of efficient administration of IT resources. This explains their initial cynicism with cloud computing, some of which still prevail among the higher echelons of the organization. Security and privacy were still primary concerns, which meant legacy systems such as the ESS and SAMS applications were to remain housed internally. With regards to eLearning systems, considered “core” applications, there were concerns about the loss of in-house skills and expertise and vendor lock-ins once these applications were entirely migrated to the clouds, as stated by manager A:

“...there’s the lock-in thing...once the vendor’s got you, they can gradually start charging you to a point where it can offset cost-savings, but you are unable to revert back to your own in-house ICT infrastructure as it’s no longer there”

To address their concerns, the IT managers saw their future role as increasingly being involved with the drafting of Service Level Agreements (SLAs) with cloud vendors. In line with the university’s security and privacy policies, the department was reviewing various departmental contracts with cloud providers, established over a period of time. Cloud services involving data considered sensitive, in view of relevant policies, were candidates for review. Hence, the formalization of applications was another area the IT department perceived as its future role. The criteria for formalizing these applications are being negotiated in what is considered a “political” process, and could have implications for users, in view of what cloud services they would be allowed to use. Manager B:
“...we have not had any formal criteria till recently in what we are going to do about these externally hosted applications. However, we will be using more of these applications in the future and are establishing ways of managing their use in a more formalized way.”

It was beyond the least shadow of doubt that the IT department was undergoing a gradual transformation in its role and responsibilities within the university, as claimed by the IT manager B:

“...it’s the sort of work you have to do when you gradually change your capability away from being a software development and infrastructure maintenance shop to being a facilitator in the management of relationships (between cloud providers and university users), while constantly taking into account organizational policies on privacy and security. So, we are looking at a challenging area.”

8 Conclusion and Implications

Having discussed the findings of the case study, we examine their relevance using the three theories of outsourcing, namely TCE, the Political Power Model, and RBV, with the aim of providing an analysis of the theoretical underpinnings behind the motivations and concerns of moving in-house applications onto a cloud environment, and expanding on issues that extend beyond the theories. Finally, we discuss the implications of our findings in light of the changing role of IT departments in universities and their relationship to users.

As shown below in Table 1, the three theories are able to comment on the main drivers and concerns of UniOZ moving services to a cloud provider. The main benefits that are perceived in shifting their datacentre servers to a cloud provider are to 1) provide the needed space for their servers, 2) free up their space for other uses, 3) free up some of the IT services provided currently by UniOZ internally, and 4) reduce the time and cost required if UniOZ were to build or add more physical space to store their increasing numbers of servers. The primary benefits for the possibility of moving eLearning systems back to the vendor is to free up some university tasks, and the primary benefit for tapping into cloud facilities such as Google Apps is to enhance research collaboration.

However, the overall concerns for UniOZ, whether associated with Infrastructure for a Service (IaaS), or Software for a Service (SaaS), is being locked-in with high switching costs by one particular vendor. The fear of losing internal expertise, especially if there is a case of back-sourcing (reverting to in-house services), is a possible concern for UniOZ associated with applications like the eLearning being migrated back to providers. Security and Privacy remain issues when deciding to restrict the movement of email accounts towards a “Cloud”.

Although TCE comments on the perceived reduced cost through outsourcing to a provider that has economies of scale and expertise in the service sought, it does not totally explain the rationale of an organization wanting something immediately to quickly fulfill a need. As quoted in the case study “we needed the expansion of our computing capability now!” In addition, the hidden costs that have not been included in transaction costs, which are not really associated with risk but to future expansion of an organization and thus, the need to return in-house services are not covered. The feeling of fear of being locked into a relationship is covered through theories of dependency and political models. However, the human behaviour of being cautious through recent history of failures is not necessarily covered in these three theories. Literature concerning outsourcing has pointed to social views but these mainly focus on the continuing and building of relationships between client and cloud provider (Bharadwaj et. al., 2010; Lee et al., 2000). Overall, the findings show that not all perceived benefits were primarily associated with cost.

The potential lessons from the specific case of UniOZ highlight that forming policies of change, especially those concerning decisions to move or not to move to cloud services is to not consider only the economic and financial factors, but also political, strategic and social views. The political model theory has already commented on positions of influence and absorbing uncertainty associated with the research case, and the resource based view has commented on the freeing up of resources to enable an
organization to focus on their core capabilities. However, none of these theories approach the idea that IT departments are no longer in a traditional position of power where outsourcing was once centralised. Now, IT policy has to incorporate possible individuals and smaller groups taking it upon themselves to move to cloud services without consultation and thus, an IT department’s power of position according to Political Theory Models (Salancik and Pfeffer, 1977) has been shifted. The social aspects of this case concern understanding an organization’s history and its internal activities as either drivers or barriers to change.

<table>
<thead>
<tr>
<th>Category of Findings</th>
<th>Benefits/Motivators</th>
<th>Initial/Current Concerns</th>
<th>Lessons from Theory</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motivation for moving to the “Cloud”</td>
<td>Lack of own resources</td>
<td>Lack of Space or reduce need of physical space.</td>
<td>Political power models can help explain the influence from IS providers who can provide the resources like physical space that UniOZ requires. The IS provider can also provide the expertise of providing service as an infrastructure and thus, absorbs uncertainty from UniOZ’s viewpoint.</td>
</tr>
<tr>
<td>Wanting to release resources</td>
<td>The need to free up of services and administration tasks</td>
<td></td>
<td>RBV can comment in this area where UniOZ is able to focus on its core competencies having freed up some of its resources from areas that may have not been considered as a core capability.</td>
</tr>
<tr>
<td>The external data centre was a “smart facility” in terms of energy consumption</td>
<td>Reduce cost and time. Reducing need for more space.</td>
<td></td>
<td>TCE can comment on how service providers have the infrastructure and the economies of scale of providing certain services such as providing the infrastructure for Data Centres.</td>
</tr>
<tr>
<td>Some “Cloud” resources were being used already for research and teaching</td>
<td>The need for collaborative research tools</td>
<td></td>
<td>Political power models can also comment the power IS providers have for providing valuable resources. In addition, specific parts of the university, e.g. the research body may be in the position of power to persuade the move towards the “Cloud”</td>
</tr>
<tr>
<td>Motivations for not wanting to move to the “Cloud”</td>
<td>Not needing to spend time and cost on own resources</td>
<td>Concern with keeping privacy and security</td>
<td>Indirectly this could be tied to economics and part of the transaction costs of moving to the cloud and assessing whether transactions costs are too high.</td>
</tr>
<tr>
<td>Switching costs are low</td>
<td>The fear of vendor lock-in</td>
<td></td>
<td>TCE can comment on how organizations may tend to select the outsourcing option where the switching costs are low (that is the lock-in is low) so that organizations had the option of backsourcing.</td>
</tr>
<tr>
<td>Resources gained by outsourcing</td>
<td>The loss of internal expertise</td>
<td></td>
<td>This can be commented by TCE indirectly because by losing internal expertise the switching costs of going back to an in-house provider</td>
</tr>
</tbody>
</table>

Table 1. Theoretical Bases for Case Study Findings

The implications of this paper leads us to contemplate the future role of the IT department, organizational policies pertaining to information management and IT governance, and relationships of the IT department with the user community. Concerns have been raised about the “end of the middle” (Katz, 2008) or the demise of the corporate IT unit owing to the advent of commercial IT services, such as cloud computing (Carr, 2005; Tyndall, 2010). However, Goldstein (2008) and the case study of UniOZ suggest a gradual transformation, rather than decline, in the role and influence of the IT department. As the roles of university IT departments shift from the development and maintenance of
in-house IT infrastructure to that of a relationship manager and caretaker of the institutional IT needs, it will increasingly play a role in ensuring that the use of commercial cloud offerings do not violate institutional policies regarding security and privacy, intellectual property, and information integrity.

Thus, it will be involved in stipulating policy that will require all cloud offerings to go through formal reviews (Tyndall, 2010), as it is being proposed in UniOZ, which may be perceived negatively by users, whose historical relations with central IT departments can best be described as an uneasy one. Indeed, utmost care needs be taken to prevent IT policies from imposing constraints on the creative use of technology by individual academic units (Ciborra, 1992; Katz, 2008). While it is advisable not to impose “draconian” restrictions on the use of cloud services by individual academic units, the ability of IT managers to identify risks in the use of those services and negotiate comprehensive SLAs with cloud providers will become a paramount element of their role and responsibility. Owing to the importance of universities to ensure the authenticity and safeguarding of official information, it becomes imperative for policy-makers in universities to articulately establish appropriate policies and practices, and checks and balances (Katz, 2008). All through this process of its transformation, the IT department needs to ensure that its involvement in policy-making is not perceived by the user community as yet another attempt at wresting control over IT resources. Thus, future research will be directed at investigating the future role of IT managers as certifiers, consultants, and arbitrators (Yanosky, 2008). Our longitudinal study will be continued on examining this transformation of the IT department with potential contributions to the progression of research on outsourcing and IT governance. Alas, Carr’s predictions of the fading influence of the central IT department (2005) and the transformation of IT as a utility may not materialize as it is simply not a matter of connecting machines to a power source (2003; 2009).

References


