Decision Making Surrounding IT Outsourcing within Ontario Hospitals

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Abstract – Decision Making Surrounding IT Outsourcing within Ontario Hospitals, Master of Science in Management (MScM) 2018, Kyle Stewart, Yeates Graduate School of Studies, Ryerson University

With the increases to healthcare expenditures and with technology playing a more critical role in hospitals, IT outsourcing has become an important topic for hospital executives. There has been a lack of research in Canadian healthcare on IT outsourcing within hospitals. This research explores the several factors associated with hospital CIOs and Managers in outsourcing their IT systems. Additionally, this research looks to identify the benefits, risks and alternatives to IT outsourcing within Canada, specifically within the province of Ontario. While transaction, agency and knowledge-based theories are discussed, they are not tested. They provide more of a guide and confirmation of these decision factors. Hospital CIOs and Managers were interviewed and recorded to determine the decision factors. Lacity et al (2010) IT Outsourcing decision model was used as a starting point for the decision factors and a Canadian model was developed from an adaption of Lacity et al work. This research provides a starting point for IT outsourcing research within the Ontario hospital sector.

Glossary

Cerner	Cerner Corporation is an American supplier of health information technology solutions, services, devices and hardware
CIHI	Canadian Institute for Health Information
CIO	Chief Information Officer
Epic	Epic Systems is an American privately held healthcare software company
Five 9s	Commonly known as 99.999%. Refers to the desired level of availability.
FTE	Full Time Equivalent
HIPA	Health Information Privacy Act
HIS	Health Information Systems
HP/HPE	Hewlett Packard/ Hewlett Packard Enterprise
IS	Information Systems
IT	Information Technology
ITIL	Information Technology Infrastructure Library
ITO	Information Technology Outsourcing
LHIN	Local Health Integration Network
MRI	Magnetic Resonance Imaging
MOHTLC	Ministry of Health and Long-Term Care
NHS	National Health Service
QDA	Qualitative Data Analysis
REB	Research Ethics Board
SLA	Service Level Agreements

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1   Introduction

Outsourcing is the handing over of an internal activity, with related assets, intellectual property and employees, to a third-party organization and usually controlling the source through contract and partnership management (Aubert, Patry, & Rivard, 2003; Roberts, 2001). Subcontracting, contracting out, staff augmentation, flexible staffing, employee leasing, professional services, contract programming, consulting, and contract services are all terms which refer to outsourcing (Moschuris & Kondylis, 2006). For many years, healthcare organizations have outsourced non-core departments such as food service and housekeeping (Moschuris & Kondylis, 2006). Now, managers and health professionals are attempting to reduce healthcare costs and they are turning to outsourcing in new ways to obtain ambitious standards of care while keeping costs low (Moschuris & Kondylis, 2006). The findings of Moschuris and Kondylis (2006) stated that there seems to be many studies on outsourcing in healthcare:

> "Given the growing importance of outsourcing in healthcare, the extent of its usage has been widely examined in the USA (Gardner, 1991; Solovy, 1996; Hensley, 1997; Triulzi, 1997; Hensley, 1998; Ngeo, 1998; Smyth, 1998; Sunseri, 1998; Blouin and Brent, 1999; Katzman, 1999; Morrissey, 1999; Wholey et al., 2001; Lorence and Spink, 2004; Nicholson et al., 2004). There are also studies, which investigate the usage of contract service providers in healthcare in UK (Mark, 1994; Smyth, 1998; Heavisides and Price, 2001; Riley, 2001), in New Zealand (Cameron, 1998; Renner and Palmer, 1999)" (p. 5)

While significant research has been published regarding other countries, it seems Canada lacks empirical research and studies on outsourcing within the healthcare sector. There are some studies (e.g. Chow & Heaver, 1994; Marr, Tam, & Bacchus, 2011; Rivard-Royer, Landry, & Beaulieu,

2002) that focus on Canadian healthcare and the outsourcing phenomenon, but few are both recent and extensive. Because the Canadian healthcare system differs significantly from the US, and other countries, research that is Canadian specific can be enlightening to industry participants. There are concerns amongst Canadians that the government will not be able to continue to afford their current health care systems (Ridic, Gleason, & Ridic, 2012). Complaints about reduced performance, overworked technologies, and inefficient management of hospital and healthcare facilities are areas that are getting the most attention (Ridic et al., 2012).

The research question proposed is "What are the decision factors that affect Canadian hospitals (as represented by Ontario) in their decision to outsource their IT services?" This question will lead to three sub-questions: What are the benefits with IT outsourcing within Canadian hospitals? What are the risks for outsourcing IT in Canadian hospitals? What are the alternatives to IT outsourcing within Canadian hospitals?

This research seeks to identify the decision factors or influences in choosing between in-house and outsourcing the IT functions of Canadian hospitals. The research approach will be qualitative, and the research methods will be semi-structured interviews of hospital CIOs and managers. As stated earlier there has been research and empirical studies on outsourcing hospital information systems within the UK, New Zealand, USA and even Greece. Each study identified the outsourcing activity, driver, benefit, risk, and arrived at stated conclusions. While Canada does fall under the Beveridge health care model, the same as the UK, there is a lack of literature on the Canadian market (Guimarâes & Carvalho, 2011). The Beveridge health care model is a tax-based national health system which ensures more equitable access to its patrons. The Beveridge health care model is universal in coverage and reduces the problems of risk selection and cost shifting by healthcare providers and insurers(Or et al., 2010). This system is beneficial in containing health

care costs, however, traditionally they have underperformed in terms of offering choice for users and have longer wait times (Or et al., 2010). The Beveridge health care model differs from the Bismarck health care model, which is popular within the US, Germany and France. The Bismarck health care model is insurance-based, which provides the beneficiaries with an abundance of providers and choices. The major challenge with the Bismarck model is cost containment (Or et al., 2010). Appendix A displays what this study potentially can offer with a perspective on Canada. This investigation of outsourcing in Canadian hospitals may provide a framework or model which can be helpful for more efficient IT procurement processes.

The paper is organized as follows. This paper begins with a review of relevant literature in five sections. First, theoretical frameworks are discussed. Second, literature that discusses healthcare spending is reviewed. Third, literature on outsourcing is examined for relevant trends. Fourth, the risks of outsourcing are reviewed. Next, the shared service model as a potential alternative to outsourcing is discussed. Security of privacy and patient information is discussed in the context of outsourcing. Finally, a theoretical IT Outsourcing Decision model is examined. Following the literature review, the research approach is described. This is followed by a discussion of the research results and then a conclusion.

2   Literature Review

Three theoretical frameworks that guide this research are: transaction cost economics, agency theory and knowledge-based theory.

2.1   Transaction Cost Theory

Transaction cost theory, which was introduced by Coase (1937) then refined and worked on by Williamson (1975, 1979, 1981, 1985) and then succeeded by Pitelis (1991), is focused on

governance structures (Bahli & Rivard, 2003; Cheon, Grover, & Teng, 1995). It is suggested that the most efficient way to manage a transaction depends on the key characteristics of the transaction costs themselves (Bahli & Rivard, 2003). The key characteristics are asset specificity, threat of opportunistic behaviour by the vendor, complexity of the transaction and overall cost savings. The unit of analysis is transaction cost and this can be defined as direct and indirect costs of managing, negotiating and administering contracts between firms (Tiwana & Bush, 2007).

The two behavioural assumptions that apply to the transaction cost theory: limited or bounded rationality and opportunistic behaviour (Bahli & Rivard, 2003; Dibbern, Goles, Hirschheim, & Jayatilaka, 2004; Ngwenyama & Bryson, 1999; Tiwana & Bush, 2007). Bounded rationality refers to how the limitations of the human mind and information available will rule out a complete assessment of the potential consequences of all the possible decisions (Bahli & Rivard, 2003). Opportunistic behaviour refers to the fact that humans do not only act with self-interest, but they also act to cleverly take advantage of others. The central views of transaction cost theory are that activities that incur high transaction costs are more likely to be produced in the firm, whereas transactions for which such costs are lower are more likely to be outsourced (Tiwana & Bush, 2007).

Transaction cost theory deals with make or buy decisions and information systems outsourcing is a special type of this decision (Ngwenyama & Bryson, 1999). Transaction cost theory is relevant to the research question because the key characteristics provided by the theory allow for a specific influence, positive or negative, on the outsourcing decision making. By positive, we mean that they are willing to outsource and by negative, we mean they are going to keep it in-house.

Asset specificity can be defined as the uniqueness of the organization's hardware and software resources (technical capital) and the skill set of their information systems employees (human capital) (Cheon et al., 1995). This relates to the research question by focusing on the strategic importance of these assets. An asset with greater strategic importance is also an asset with higher specificity under the transaction action theory perspective (Cheon et al., 1995; Dibbern et al., 2004). The higher the strategic importance of a process to the client firm's business, the more likely the client firm will develop formal and informal control mechanisms (Tiwana & Bush, 2007). This means that the firm is more likely to keep their process in house because it is easier to control the process when handled by the firm itself. If the process is a general process, such as routine maintenance and network management, then it is more likely to be outsourced due to its low level of strategic importance (Tiwana & Bush, 2007). Dibbern et al. (2004) agreed with this and stated that a higher level of uniqueness can add to the perception of transaction and production costs which will reduce the likelihood of outsourcing.

The threat of opportunistic behaviour by the vendor, also known as vendor opportunism, can be defined as the lack of trust by the firm in its belief that the vendor will fulfill contract obligations (Balakrishnan, Eldenburg, Krishnan, & Soderstrom, 2010). The greater the threat of opportunism, the greater controls the firm must put in place to control the vendor's behaviour which translates to higher costs for them (Balakrishnan et al., 2010). The higher the transaction costs, the less likely they are to outsource. However, as stated earlier, this stems from a lack of trust. If the vendor has created a higher level of trust with the vendor due to reputation or previous experiences, then the perceived threat of opportunism decreases. However, if management decides to place slack control mechanisms on a vendor then the threat of opportunism increases (Tiwana

& Bush, 2007). In health care, trust and privacy of patient data are very important features and this must be seen in the client vendor relationship.

Complexity of the transaction refers to the complexity of the process. The transactional cost perspective found that the greater the complexity of the process, the more technical expertise is required which means the firm is likely to outsource the process. As stated earlier, information systems are usually not a core component for health care professionals which means that they are less likely to be equipped for complex information system processes. Health care professionals who are not experts in information systems are 1) more likely to outsource these systems to avoid certain risks such as the failure of the project 2), rely on specialized vendors, who are more experienced and able to handle this process, and 3) and feel more comfortable in the fact that benefits from the specialized vendors will offset the alleged loss of control (Tiwana & Bush, 2007).

Lacity and Willcocks (1995) found that with information systems evolving so quickly, there is a risk of not being able to adapt to these modern technologies. A risk that Willcocks and Lacity (2009) found was that it is hard to adapt to vendor contracts that deal with these new technologies as well. In terms of overall cost, Tiwana and Bush (2007) found that:

"Specialized IT vendors have the capacity to aggregate the demands of multiple clients, thereby achieving greater software development scale economies relative to a single-client firm. This is likely only if the client does development similar to (e.g., comparable platforms, development languages, and application types) the prospectively outsourced project on a smaller scale than a vendor." (p. 265).

This is appropriate for health care as the hospitals tend to have similar platforms and the more potential market of vendors that can provide these services will also increase (Burmahl,

2001). This means that there will a larger talent pool of vendors for hospitals to tap into. The focus of this is the overall cost advantage that a vendor can provide compared to providing it internally. As the perceived cost savings from the vendor increases the more likely the client is going to outsource.

2.2   Agency Theory

Agency theory, which is based on the work of Jensen and Meckling (1976), focuses on determining the most efficient contracts between principals and agents (Cheon et al., 1995). For this study, we will focus on the firm as a relationship between the principals and agents. The focus of agency theory is on the idea of goal incongruence between the principal (the client) and the agent (the vendor) (Aubert et al., 2003; Bahli & Rivard, 2003; Dibbern et al., 2004; Eisenhardt, 1989; Tiwana & Bush, 2007). The basic argument is that the client transfers decision rights to the agent (Dibbern et al., 2004), the client cannot monitor the actions of the agent perfectly and without costs (Bahli & Rivard, 2003) and that they cannot foresee every contingency and that their interests are bound to clash (Aubert et al., 2003; Eisenhardt, 1989). The unit of analysis is agency cost and this is the cost of developing and administering contractual agreements and the residual loss subsequent from inadequate organization or incentive (Aubert et al., 2003).

The way to combat these issues is to develop control mechanisms to monitor and manage the relationship between the client and the vendor (Cheon et al., 1995). Therefore, the organization will base their outsourcing decision on factors that influence agency costs (Cheon et al., 1995). Cheon et al. (1995) stated that the agency costs are: uncertainty, risk aversion, programmability, measurability and length. For this study, we will focus on measurability and programmability.

Measurability refers to the extent to which the outcome of a process can be precisely assessed using predefined criteria (i.e. project schedules, costs, milestones, etc.) (Cheon et al.,

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1995; Tiwana & Bush, 2007). When a client establishes performance metrics at the beginning of a project, they are then able to tie in incentives and penalties with the vendor performance, this is an example of a control mechanism (Tiwana & Bush, 2007). Measurement difficulty is an important characteristic of client vendor relationships because the ability to empirically and precisely measure project outcomes is essential to connect rewards with performance (Wuyts & Geyskens, 2005). Therefore, if it is difficult to measure the performance of a vendor then it will be even harder to develop contracts that can govern the outsourcing relationship which means it will open clients to a significant risk of agency costs. To combat this, management may decide to keep things in-house to be able to avoid the agency costs.

Programmability, also known as vendor behavior observability, is the degree to which appropriate behaviour by the outsourcing provider can be specified and monitored during the development process once a project has been outsourced (Bahli & Rivard, 2003; Kirsch, 1996; Tiwana & Bush, 2007). Choudhury & Sabherwal (2003) found that there are three mechanisms in which you can monitor vendor behaviour: placing vendor and client employees close together, imposing frequent deliverables and the use of Web-based project tracking software allows for monitoring vendor progress.

2.3   Knowledge-Based Theory of the Firm

Knowledge-based theory of the firm holds the perspective that human capital particularly those embedded in firm-specific routines, skills and languages are as critical to the performance of a firm as the physical assets (Poppo & Zenger, 1998). This theoretical perspective holds that firms are viewed as distributed sources of implicit and explicit knowledge whose diverse knowledge bases are the key factors of sustained competitive advantage (Tiwana & Bush, 2007). Knowledge-based theory suggests that outsourcing arrangements operate as the channel for

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utilizing a vendor's complimentary skills and expertise. The decision making surrounding outsourcing is guided by the knowledge-based theory will then be focused more on obtaining and manipulating unique technical knowledge that is not readily available to the firm (Poppo & Zenger, 1998; Tiwana & Bush, 2007).

Despite the weighted importance of having unique knowledge of the client firm, there needs to be a shared understanding in knowledge between clients and vendor firms during the software development process (Tiwana & Bush, 2007). Tiwana and Bush (2007) found that:

> "The reason is that effective software development requires project level integration of client domain knowledge and vendor technical knowledge during the development process [62, 67]. Without such integration, the unique knowledge of the client firm cannot be successfully leveraged in the outsourced custom-software development process" (p. 270).

There are two other influences with the exploiting of technical knowledge of a vendor at the project level and they are: (1) the degree in which knowledge about the client's requirements for a specific project can readily be communicated with the vendor and (2) the degree in which the knowledge can remain steady over the course of the project's life cycle (Tiwana & Bush, 2007). The unit of analysis is human capital.

2.4   Growth in Healthcare Spending

With rising healthcare costs and budget restrictions, hospital managers and CIOs are always searching for ways to reduce their costs and find a way to make their organizations work more efficiently (Roberts, 2001). The Canadian Health-to-Gross Domestic Product (GDP) ratio has declined from 11.6% to an estimated 10.9% between the period of 2011 to 2015 (CIHI, 2015). Hospital growth rate in spending is at 0.9% as of 2015 which is the lowest it has been since the

1990s (CIHI, 2015). Hospitals expenditures per capita in Canada has increased by 3.5% in the period of 2014 to 2015 which is putting a strain on managers and CIOs and forcing them to find new ways to reduce costs (CIHI, 2014, 2015).

Total health expenditure in Canada was expected to reach over $219 billion in 2015. This represents over 10.9% of Canada's gross domestic product (GDP) in 2015 (CIHI, 2015). Despite this share reducing since 2009, there are still rising costs within the healthcare sector. Hospitals account for 29.5% of total health spending which is continuing to grow each year although the pace has slowed down over the past few years (CIHI, 2015). In fact, hospitals account for the highest amount of expenditure within Canadian healthcare with Physicians at 15.5% and Prescription Drugs following behind at 13.3% (CIHI, 2015). Please refer to Appendix B to see the Canadian healthcare expenditure chart for 2015. Hospital spending is expected to grow approximately 0.9% in 2015 which would account for $1,804 per person (CIHI, 2015). This is the lowest growth rate since the late 1990s (CIHI, 2015). The majority of this hospital expenditure is spent on compensation for the hospital workforce, over 60 percent (CIHI, 2015). Within Ontario, healthcare accounts for 41% of the provincial health spending, with an average of $5,920 being spent per capita which is the equivalent of 0.1% increase of per capita (CIHI, 2015). Please refer to Appendix C. It is believed by the Canadian government that "The possibility of technological change could create cost savings due to process efficiency or could generate cost increases due to new or expanded diagnostic services and treatments" (CIHI, 2015, pg. 23).

The information systems support category increased from 1.8% in 1999 to 2.4% in 2008 of hospital expenditures (CIHI, 2012). A higher share for systems support may reflect the increasing complexity and widespread adoption of electronic systems for clinical records, monitoring and management of hospital functions (CIHI, 2012).

Technologic innovation, in combination with weak cost-containment measures, is a major factor in high and rising health care costs (Bodenheimer, 2005). Evidence suggests that improved health care technologies generally increase rather than reduce health care expenditures. Nations with more health system integration have relied on expenditure controls and global budgets to control costs (Bodenheimer, 2005).

The above literature shows that there is a slow increase in healthcare spending and even in hospital spending itself. With information support systems rising to 2.4% in 2008 of hospital expenditures and 60% of the hospital spending being used on compensation for hospital workforce there lies potential savings and to gain skilled labour for hospital IS support services. One suggestion for patient savings and access to skilled information systems support is the phenomenon of outsourcing.

2.5 Outsourcing

Outsourcing was believed to be a response to cost reduction by Sharpe (1997), however, Bryce and Useem (1998) believed that firms were adopting outsourcing for transformation of manufacturing and service. This was done to provide the firms with stability to their production cycles and to benefit from the specialization of the firm. Outsourcing has been regarded as a strategic move to improve processes and acquire greater talent or expertise. For the last three decades, there has been a growing interest in the information systems outsourcing (Iqbal & Dad, 2013; Jae-Nam, Miranda, & Yong-Mi, 2004; Lacity & Hirschheim, 1993; Lee, 2001). It appears that outsourcing with information systems was legitimized by the successful implementation by Kodak (Dibbern et al., 2004; Lacity & Willcocks, 1995; Qu, Pinsoneault, & Oh, 2011). Thus the term "Kodak effect" was developed which meant that because of this successful implementation,

other highly profitable companies went into partnerships with outsourcing vendors (Dibbern et al., 2004; Qu et al., 2011).

The theory of outsourcing is tightly related with transaction cost economics and the early works of this can be related back to Coase's (1937) statement of "First, as a firm gets larger, there may be decreasing returns to the entrepreneur function, that is, the costs of organizing additional transactions within the firm may rise. Naturally, a point must be reached where the costs of organizing an extra transaction within the firm are equal to the costs involved in carrying out the transaction in the open market, or, to the costs of organizing by another entrepreneur" (p 394).

Throughout the last two decades there has been a growing interest in research done on outsourcing and it seems to be highly related to information systems (e.g. Dibbern et al., 2004; Kern & Willcocks, 2000; Marr et al., 2011; Ngwenyama & Bryson, 1999). The outsourcing of information technology or information systems has become a focal point for many hospitals as managers initially look to reduce their costs (Menachemi, Burkhardt, Shewchuk, Burke, & Brooks, 2007). Outsourcing relates to various theories such as Agency theory, Game theory, Innovation theories, Power and Politics theories, Relationship theories, Social Exchange theory, Strategic Management theories, and Transaction Cost theory (Dibbern et. al, 2004).

The workings of Poppo and Lacity (2002) looked at two sets of studies that have examined the governance of IT (Lacity & Willcocks, 1995; Poppo & Zenger, 1998). Despite the different methodologies - Lacity and Willcocks focus on interviews and induction, where as Poppo and Zenger implemented the use of surveys and econometric models - the findings remained consistent and complimentary. There are four lessons to be learnt from these findings: 1. transaction cost economics logic is not intuitive and managers have learnt from experience how to efficiently develop IT contracts; 2. managers can achieve higher performance when they apply the transaction

cost economics to not outsource the most specialized IT activities; 3. managers can achieve higher satisfaction when they apply the transaction cost economics to measure and benchmark outsourcing IT activities; 4. and managers realize higher performance when they match their use of customized IT contracts with supportive relational norms, when they invest in such relational norms (Poppo & Lacity, 2002, 254).

The focus of transaction cost economics, in terms of outsourcing, is on the certain characteristics of the transaction or the object of the transaction which would lead its internal, hybrid or external governance (Dibbern et al., 2004). In other words, the focus would be on total insourcing, selective outsourcing and total outsourcing. Total insourcing is the executive decision to keep the management and provision of approximately 80% or more of the IT budget internally after evaluating the IT services market (Willcocks & Lacity, 2009). Selective outsourcing is the executive decision to source selected IT functions from external vendors while still providing in the range of 20% to 80% of the IT budget internally (Willcocks & Lacity, 2009). Total outsourcing is the executive decision to transfer approximately over 80% of the IT budget for IT assets, leases, staff, and management responsibility to an external IT provider (Willcocks & Lacity, 2009). Information systems are naturally not a core business in any health care organization but it does affect almost every process or activity once implemented (Suomi & Tahkapaa, 2004).

As stated earlier, organizations usually have three options when it comes to sourcing information systems, they can either provide the services themselves, insourcing, or they can hire external organizations to be their IT suppliers, outsourcing or they can provide a mixture (Willcocks & Lacity, 2009). Public health organizations are guided by national politics and political decisions (Suomi and Tahkapaa, 2004). Therefore, for-profit hospitals usually face less institutional constraints than government hospitals and thus their transaction costs associated with

outsourcing are likely to be lower for both their clinical and nonclinical services (Balakrishnan et al., 2010). There are various reasons in which organizations may decide to do insourcing such as managing costs with real transparency, management needing to control their processes and the confidence that their information will remain relativity private (Fishman, 2012).

Within the IS field, there are varying reasons as to why organizations, such as hospitals, outsource their IT services (Roberts, 2001; Wholey, Padman, Hamer, & Schwartz, 2001). Outsourcing can provide hospitals with the ability to focus on the core competencies and customers. If the hospitals create partnerships with leaders of IT, they can achieve greater efficiencies (Roberts, 2001). As outsourcing by healthcare organizations increase, the potential market of vendors that can provide these services will also increase (Burmahl, 2001). This will provide a larger pool of expertise and talent for other healthcare organizations to tap into to meet their needs (Burmahl, 2001). Insourcing may lead to the creation of proprietary systems and limit the technology transfer through vendors (Lorence & Spink, 2004). According to Lorence and Spink (2004), it is believed the less that healthcare organizations use outsourcing, the slower will be the development of industry-wide standards and practices across vendors (p. 132).

Outsourcing can also provide lower costs and risks, while greatly expanding flexibility innovative capabilities, opportunities for creating value-added shareholder returns (Roberts, 2001). Thouin, Hoffman and Ford (2009) found under the transaction cost perspective that IT activities that have become commodities should be outsourced to improve a firm's financial performance. Kern and Willcocks (2000), slightly agreed that outsourcing is driven by economic action but that it is embedded within social relations and organizational strategy this aligns with the strategic management theories. While in Menachemti et. al. (2007) findings, IT outsourcing was not a cost-lowering strategy but instead a cost-neutral way in which hospitals would use to gain an

organizational strategy, this related to social exchange theory and relationship theories. Lorence and Spink (2004) findings support the above viewpoints within the United States as their empirical findings of over 16,000 healthcare information manager's viewpoints on outsourcing found that the top two reasons as to why they purchase information resources was to improve patient care and to save money. Another advantage is the cost efficiency associated with outsourcing due to economies of scale and of experience. Because the third party specializes in IT management, it can provide good service levels at lower cost (Thouin et al., 2009).

The size of the hospital can affect the decision whether a hospital may outsource their IT services or not. Augurzky and Scheuer (2007) found that the smaller the hospitals, the more likely they were to outsource their IT services. This could be since the smaller hospitals are focusing more on their core businesses and find it cheaper and more efficient to outsource, and the larger hospitals have the funding to keep things in-house and maintain control. O'Regan and Kling (2011) found that if your firm is small, outsourcing of Research & Development (R&D) will greatly benefit your organization by facilitating R&D investment, which increases profitability (p 102). However, O'Regan and Kling (2011) findings presented that organizations with less than 40 full time employees should consider outsourcing their research and design activities to increase their profitability and that the larger the size of the firm, the less likely they are to outsource.

2.6   Risks of Outsourcing

There are many benefits as to why organizations should outsource, however there are many risks associated with outsourcing. Some of these risks factors that hospitals could potentially face are incomplete contracting, lack of active management of the supplier on contract and relationship dimensions, poor sourcing and contracting for development and innovative technologies, difficulties in constructing and adapting deals in the face of rapid business or technical change

(Willcocks and Lacity, 2009, p. 129). A body of literature has been developed to address these risks as most of the risks concern either loss of control by management or contractual relationship issues. Agency theory is a potential way to combat some of the contractual issues that may arise from outsourcing. Some of the strategic risks faced by outsourcing within hospitals are the threat of intellectual property abuse and the possibility that there may be a lack of expertise within the hospital's information systems, in case the hospitals wish to go in-house within the future.

Information systems outsourcing is centered on the 'make or buy' decision problems that transaction cost theory can address. As information systems outsourcing continues to expand, firms must decide which types of activities should be outsourced and which should be kept in-house. The cost of outsourcing is not solely focused on that of the service, but it is inclusive of the costs in setting up the relationships, and managing and monitoring the vendor's activities (Ngwenyama and Bryson, 1999). This theory provides aid to information systems areas such as the risks faced by firms (e.g. Ngwenyama and Bryson, 1999) and the factors determining the importance of transaction costs (e.g. Aubert et al., 2003). When an organization enters Information Systems (IS) outsourcing, by contracting out their information processing activities to an external entity, there tends to be a loss in the degree of control in that activity which results in the boundary of the firm changing (Ngwenyama and Bryson, 1999). In terms of a business transaction, Ngwenyama and Bryson (1999) found that IS outsourcing entails five basic risks:

1. Changing the boundary of the firm by moving operations outside of it

2. Uncertainties concerning vendor performance

3. Opportunistic bargaining and decisions by the vendor

4. Loss of competencies to the outsource

5. Loss of immediate control of important value chain activities. (p 352-353)

When the firms lose control due to outsourcing, two basic risks arise: shirking and opportunistic bargaining (Ngwenyama and Bryson, 1999). Shirking can be defined as the vendor not performing to the standards started within the contract, and opportunistic bargaining refers to the vendor attempting to demand higher than market prices. To manage the risk of shirking, the outsourcer can invest monitoring and coordinating mechanisms. One way in which opportunistic bargaining can occur is when an outsourcer is committed to a single vendor and would have to pay a significant cost to switch to another. There is no straightforward way to deal with the issue of opportunistic bargaining because per Porter (1985), the potential threat of losing business to the other competitive vendors will encourage the vendors to perform at an acceptable level and to bargain at market level with the outsourcer.

2.7   Hospital Shared Services: An Outsourcing Alternative

Another approach to reduce IT costs that hospitals might take is the shared services model. Shared services can be defined 'multiple agencies sharing common corporate services through a dedicated shared service provider'(Walsh, McGregor-Lowndes, & Newton, 2008, p. 202). Shared services create more time, energy and focus for service providers so that they can focus on their core business of service (Walsh et al., 2008). There are six key factors were consistently identified with the implementation of a shared services model: 1. the need for top management support and leadership; 2. determining which services to move into a shared services arrangement; 3. people management issues; 4. ensuring there is an effective governance arrangement in place; 5. balancing business process redesign and reshaping of roles and technology; and 6. building a new culture (Walsh et al., 2008).

Plexxus is an example of a health shared services organization, or network, comprised of twelve hospitals in the Greater Toronto Area (GTA). It started in 2002-2003 when two hospital

associations came together to deliberate potential economies by combining forces to procure goods and services (Hanrahan, 2011). This effort was aimed at generating savings by achieving economies of scale and reducing operating costs in the "back office," including supply chain, accounts payable, human resources (payroll), general ledger and financial reporting (Hanrahan, 2011). In 2006, twelve GTA hospitals adopted the Plexxus shared services within their supplies and services, finance, and payroll functions (Hanrahan, 2011). After its implementation, approximately $6.9 million was returned to the members for reinvestment into the healthcare system.

Hanrahan (2011) stated that:

"The intent of these "health shared service" models are to maximize the value of expenditures in health care through more efficient practices in the management of resources. The goal is to generate savings that can be reinvested into respective provincial health care systems." (p. 1).

Shared services are like outsourcing except smaller hospitals are trusting in the client-vendor relationship of the larger hospital they pair up with. The primary focus of shared services has been the concentration of transaction-orientated services that are repetitive and are much the same for each business unit (Walsh et al., 2008). This falls under most of the IS functions within a hospital which tends to be reporting and monitoring of systems. This could potentially be a benefit for smaller hospitals to integrate with larger hospitals but the issue with this would be the management of patient data and the trust and relationship with the third-party suppliers which are similar problems faced by outsourcing. This places an overreliance by smaller hospitals on larger hospitals and if the larger hospitals choose to return to insourcing then the smaller hospitals will be placed in a difficult position.

The 2016 Ontario HIS Renewal Report defined an "HIS Cluster" as a group of hospitals that have partnered in some capacity to support patients using a shared HIS instance, which is typically under a lead hospital (Ministry of Health and Long-Term Care, 2016). The Ministry of Health and Long-Term Care (2016) stated that "The Hospitals within a cluster usually share an affinity that is conducive to sharing an HIS instance. Such affinities include:

- shared patient population and referral patterns,

- part of an integrated regional health network, and

- common areas of clinical specialization" (pg. 9)

Ministry of Health and Long-Term Care (2016) stated that "A February 2015 survey conducted by the Ontario Hospital Association (OHA) indicated that:

- 35% of Ontario hospitals are currently implementing or have recently completed an upgrade or replacement,

- 37% of Ontario hospitals plan to replace their HIS solution within the next two years (n=97),

- 70% of the hospitals that are completing or already have completed an upgrade or replacement chose to do so in partnership with their peers,

- 89% of the hospitals planning to replace their existing solution within the next 2 years are very likely or certain to partner with peers when making these HIS investments (n=34)" (pg. 19)

With the hubs and cluster model being encouraged by the Ontario government, many hospitals will be a part of the cluster for utilizing a common HIS service. The smaller hospitals will become more reliant on the larger hospitals as they combine with them to join the hubs and

clusters. In fact, it is expected that these hubs and clusters will morph or spawn into more advanced delivery hubs. Therefore, the number of distinct HIS vendor solutions will be expected to be reduced significantly (Ministry of Health and Long-Term Care, 2016).

2.8   Privacy and Security of Patient Information

Companies of all sizes, industries, and geographic locations are increasingly subject to a host of complex requirements regarding personal data privacy and security (Klosek, 2005).This is especially true within healthcare as consumers and employees are becoming increasingly more concerned about the privacy and security of their personal data (Klosek, 2005). Privacy is a key governing principle of the patient-physician relationship, the protection of their client data is of the upmost importance (Appari & Johnson, 2010). According to Appari and Johnson (2010):

> "Over time, a patient's medical record accumulates significant personal information including identification, history of medical diagnosis, digital renderings of medical images, treatments, medication history, dietary habits, sexual preference, genetic information, psychological profiles, employment history, income and physicians' subjective assessments of personality and mental state (Mercuri, 2004)" (p. 281)

The ability to keep patient information private is vital to the survival of a hospital as patients strongly believe that their information should only be shared with people involved in their care (Appari and Johnson, 2010). Privacy of healthcare information is open to certain organizational threats: Accidental disclosure, data breach by insider, data breach by outsider with physical intrusion, insider curiosity and unauthorized intrusion of network system. For this paper, we will briefly discuss accidental disclosure and unauthorized intrusion of network system. Accidental disclosure is when a healthcare personnel unintentionally discloses patient information to others, this could be prevented by outsourcing as the risk of this breach could be placed into the

vendor contract, shifting the risk over to the vendor (Appari and Johnson, 2010). This relates back to the agency theory. Like accidental disclosure, unauthorized intrusion of network systems is when an outsider intrudes into an organization's network from the outside to gain information or render the system inoperable (Appari and Johnson, 2010). To deal with issue, agency theory could help lower the risk of this when setting up the contract.

Faix, Cagnolatti and Flynn (2011) found that the most sophisticated and well-funded security programs of any corporation or government entity can only reduce the likelihood and impact of a security-related event, but cannot provide a 100-percent protection guarantee.

> "With the addition of mobility, portability, and microsizing management, control and security grow increasingly difficult. Every day, minor security infractions such as accidental faxing of a patient record to an incorrect fax number occur in today's healthcare industry" (Faix et al., 2011, p. 162)

To deal with these infractions and potential threats organizations hospitals have typically developed privacy and use policies (Faix et al., 2011). However, in this digital age, one of the best ways to protect an organization's information assets is for security professionals to remain current on evolving threats and mitigating technologies (Faix et al., 2011). Not every hospital has the budget or ability to keep up with these threats and new technologies and a solution to this process might be outsourcing. Hospitals can hire vendors to deal with the information security aspect and using the agency theory concepts to guide their contract construction to shift the risk towards the vendors to ensure that they behave in the appropriate manner.

The Conference Board of Canada Summit on Sustainable Health and Health Care had a general agreement that the healthcare sector is one of the last areas of slips of paper and fax

machines (Muzyka, Hodgson, & Prada, 2012) . Progress on applying information technology more widely within the health care system has been stifled by suboptimal strategies to engage health providers in the acceptance of these technologies (Muzyka et al., 2012). Progress has also been stagnant because of the endless debate focusing solely on privacy needs that could be accommodated through appropriate security such as outsourcing to vendors with high expertise in information systems privacy and security. These obstacles are blocking the adoption of even rudimentary tools that would improve outcomes, speed process, ease work burdens, and improve the sharing of useful information and protocols (Muzyka et al., 2012).

Hospitals and doctors are responsible for ensuring the security and privacy of patient health information. Taking the necessary security measures will help ensure hospitals derive the benefits technology offers, while protecting patient information and minimizing risk (Canadian Medical Protective Association, 2013). Cloud computing is being considered by doctors as a way of storing health records electronically (Canadian Medical Protective Association, 2013). While there are different service models, clouds allow data to be stored on an off-site server run by a third party. Cloud computing, which is a form of outsourcing, has also raised significant security and confidentiality concerns among doctors and hospitals (Canadian Medical Protective Association, 2013). These privacy and security issues are manageable when there is proper planning, design, and selection of cloud models (including careful consideration of cloud infrastructure, service, and deployment)(Canadian Medical Protective Association, 2013). This presents an opportunity for hospitals to pass on this responsibility to third party vendors, by outsourcing this process they are gaining expertise in the field.

2.9   Theoretical Model: ITO Decisions

Lacity, Khan, Yan, & Willcocks (2010) completed a review of published research on the IT outsourcing phenomenon over the last 25 years. The focus of the research article was to answer two questions: What has the empirical academic literature found about information technology outsourcing (ITO) decisions and outcomes? What are the gaps in knowledge to consider in future ITO research? After conducting their research, they developed two models of outsourcing: one model addressed ITO decisions and one model addressed ITO outcomes. The model of ITO decision included independent variables associated with Motivations to Outsource, Transaction Attributes, Client Firm Characteristics and Influence Sources (Lacity et al., 2010).

The research confirmed that there is a broad and deep understanding of ITO however it highlighted that there is still much to do and identified gaps in the current literature. Diagram 1 below is retrieved from (Lacity et al., 2010, pg. 408)

- Cost Reduction (++)
- Focus on Core Capabilities (++)
- Access to Skills/Expertise (++)
- Business/Process Improvements (++)
- Technical Reasons (++)
- Political Reasons (+)
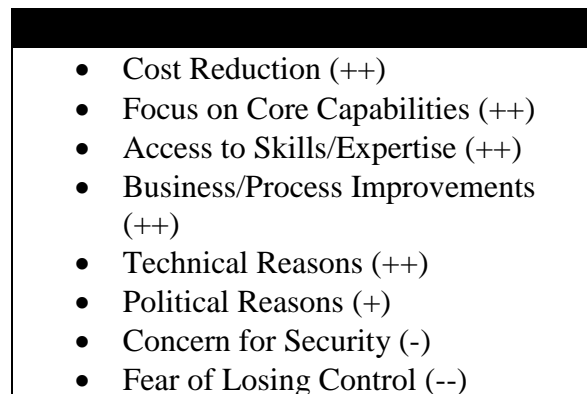- Concern for Security (-)
- Fear of Losing Control (--)

Diagram 1: Descriptive model of findings on ITO Decisions.

For the findings of this data, independent variables that were selected had to have at least 60% consistent evidence. This was done to ensure that at least more than half the evidence produced the same findings. To improve the robustness of their findings, a tiered system was

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created. Evidence of 60% to 80% was ('+') and higher than 80% was ('++') when positively significant. Evidence of 60% to 80% was ('- ') and higher than 80% was ('- - ') when negatively significant(Lacity et al., 2010).

Motivations to outsource has been extensively studied throughout the IT outsource literature (Lacity et al., 2010). Eight motivations were examined and provided consistent results: Cost Reduction, Focus on Core Capabilities, Access to Skills/Expertise, Business/Process Improvements, Technical Reasons, Political Reasons, Concern for Security, Fear of Losing Control (Lacity et al., 2010). Of these eight, Cost Reduction was the most frequented reason for ITO decision (Lacity et al., 2010). Focus on Core Capabilities was the second most frequently examined relationship. Access to Skills/Expertise, Business/Process Improvements and Technical reasons also had motivations in outsourcing IT with more than 80% of the evidence positive and significant (Lacity et al., 2010). Political reasons showed evidence between 60% to 80% that was positively and significantly related. Concern for security and fear of losing control were negatively related to ITO decisions (Lacity et al., 2010).

Client Firm Characteristics found mixed reviews in terms of its relationship with ITO decisions. Prior IS Department Performance was the only characteristic that provided consistent results and this was negatively significant (Lacity et al., 2010). Four other client firm characteristics were studied: Client Size, Industry, Prior Firm Performance, and IS Department Size however the findings were inconsistent and occasionally found no relationship (Lacity et al., 2010).

Transaction attributes produced four independent variables that were studied and had consistent results. IT researchers found that Uncertainty, Critical Role of IS – Transaction and business risk led to less outsourcing with evidence of 60% to 80% being negative and significant

(Lacity et al., 2010). Transaction Costs led to less outsourcing with more than 80% of the evidence being negative and significant. Although transaction cost economics is a dominant theory within ITO decisions there were mixed results in asset specificity as a motivator for outsourcing. The results were either positive, negative or no relationship found (Lacity et al., 2010).

Influence sources, like client firm characteristics, only produced one independent variable that produced consistent results: Mimetic Influence. Influences arose when the perception that peer organizations were more successful. The studies found that mimetic influence positively and significantly affected ITO decisions (Lacity et al., 2010).

2.10 Conclusion of Literature Review

The literature review above has described that outsourcing has become an option for hospitals to improve their efficiency with an organizational strategy that should reduce their costs. There are many influences as to why hospitals choose to outsource their IT services however there seems to be a gap in research on the Canadian hospitals decision making in outsourcing their IT services. Therefore, the question "What influences Canadian hospitals in their decision to outsource their IT services?" is relevant in today's research as it will help to shed light on the topic of IT outsourcing and managerial influences.

3 Research Approach

The research project relies on a qualitative research approach as this has been the staple of fields such as social science (Miles & Huberman, 1994). Over the past few decades, researchers in applied fields and basic disciplines (business studies, health, care, organizational studies etc.) have shifted to a more qualitative paradigm (Guest, MacQueen, & Namey, 2011; Miles & Huberman, 1994; Teegavarapu, Summers, & Mocko, 2008). According to Miles & Huberman

(1994), qualitative data is 'a source of well-grounded, rich descriptions and explanations of processes in identifiable local contexts' (pg.1). While qualitative data's interest increases, there are still issues that must not be overlooked by this method: frequent data overload, distinct possibility of researcher bias, adequacy of sampling when only a few individuals can be selected, etc. (Miles & Huberman, 1994).

Quantitative perspective focuses more on expressing an phenomenon's reality numerically (Joyner, Rouse, & Glatthorn, 2012). It is focused more on a positivist epistemology perspective(Joyner et al., 2012). However, this research is focused on meaning and understanding of a phenomenon in their natural settings, which means that is through a qualitative perspective (Joyner et al., 2012). According to Blaikie (2009), interpretivism views social reality as the product of its inhabitants; it is a world that is interpreted by the meanings participants create as a necessary part of their everyday activities together. Therefore, the research described in this paper is focused through an interpretivist epistemology. This research is focused on decision factors which means that the data will be focused on certain categories, this type of data analysis is aligned with qualitative data analysis methods (Blaikie, 2009). Within qualitative data research, the researcher's role is to gain a systemic overview of the context under study (Miles & Huberman, 1994). Through this process, certain themes and expressions to be reviewed and analyzed to further assist the research. According to Miles and Huberman (1994), the main task of the qualitative research is to explain the ways in which people in a setting act, account for and manage their day-to-day operations. The main instrument of qualitative data is usually the researcher as most of the analysis is done with words and these words can be manipulated to create sub-clusters or codes to allow the researcher to contrast, compare, analyze and create patterns (Leech & Onwuegbuzie, 2011; Miles & Huberman, 1994).

The use of expert interviews is still relatively new compared to other methodologies such as case studies, ethnography, etc. According to Bogner, Littig, & Menz (2009), it was the work of Meuser and Nagel (1991) which created an opening systematic debate on expert interviews. However, it would take another ten years before the debate developed any significant momentum, in an rising trend that is also replicated in recent methodology handbooks (Bogner et al., 2009). The use of expert interviews has long been an important topic within social research (Bellamy, Bledsoe, & Traube, 2006; Bogner et al., 2009; Dorussen, Lenz, & Blavoukos, 2005; Meuser & Nagel, 1991; Van Audenhove, 2011). In some research articles, in-depth interviews with senior managers are regarded as expert interviews (Tseng, 2008). Expert interviews have been used in both IT and healthcare research for some time (Betancourt, Green, & Carrillo, 2002; Österle et al., 2011; Tseng, 2008; Walker, Pan, Johnston, Adler-Milstein, & al, 2005). Although the actual role of the expert interview in individual research design, their method and the approaches used to analyze the results may differ from case to case, there are still a number of common, applied reasons for their growing interest in research (Bogner et al., 2009).

Who is an expert? According to Meuser & Nagel (1991), an expert is a person who is responsible for the development, implementation or control of solutions/strategies/policies. This person usually has privileged access to information about groups of persons or decision processes. This falls right into this research project as the CIOs and hospital managers fit this mold. They would be considered experts in their field of work and they are responsible for many of these implementation, control or decision processes.

Expert interviews provide the researcher with more control over the dimensions that are central to the comparative research (Dorussen et al., 2005). This is due to the experts providing richer or a unique source of 'inside' information to the specified area (Dorussen et al., 2005).

Bogner et al. (2009) stated "The fact that interviewer and interviewee share a common scientific background or relevance system can increase the level of motivation on the part of the expert to participate in an interview" (pg. 2). The experts are willing to participate to help "make a difference" in the field or for their own profession curiosity about the topic and field of research (Bogner et al., 2009).

There are three dimensions of expert knowledge: technical knowledge, process knowledge and explanatory knowledge. For this research, process knowledge dimension is being used. Process knowledge is used to provide information on the experts routines, specific interactions and the processes that they are directly involved in (Bogner et al., 2009; Van Audenhove, 2011). This relates to the different decision processes they make. There are three different interview types: explorative, systematizing and theory generating. Process knowledge falls under systematizing expert interview type (Bogner et al., 2009; Van Audenhove, 2011). Systematizing expert interviews are used to focus on the exclusivity of the expert's knowledge which is based on their expertise or exclusive position (Van Audenhove, 2011).

There are six different interaction types for expert interviews: interviewer as co-expert, interview as expert outside of field, interview as lay person, interviewer as authority, interviewer as confederate, interviewer as possible critic. Dr. Ron Babin was the main interviewer throughout the research and through his previous projects with Hospital institutions and IT outsourcing publications, he can be considered a co-expert within the field. A co-expert can provide a symmetric, high level of interaction and ask many in-depth questions towards the interviewee. The advantage of this is that it provides a high level of discussion and a rich information generation (Van Audenhove, 2011). Expert interviews will provide rich and in-depth information in regard to

the decision factors by hospital CIOs and managers on whether they would outsource or build their IS systems. Therefore, the expert interview methodology is appropriate for this research.

As explained earlier, there are three theoretical approaches that have been used to explain outsourcing; transaction cost economics, agency theory and knowledge-based theory. Both inductive and deductive approaches can be used within qualitative data research. However, this study takes a deductive approach to the data. Deductive approach focuses on validating or disconfirming existing theory (Cavaye, 1996). Unlike the inductive approach that focuses on theory-building analysis and grounded theory, the theoretical frameworks have been established and are guiding this research.

3.1   Data Collection

Prior to initiating the data collection, an application for human subject's research was submitted to and approved by the Ryerson University Research Ethics Board (REB). Appendix D provides the REB approval letter.

The first stage of the data collection and analysis process is reviewing literature that describes outsourcing, outsourcing in information systems and outsourcing in the healthcare sector to provide the researcher with a basis for understanding and to further develop an idea for coding the data.

Based on the themes identified in the literature review, the researcher conducted qualitative interviews with experts in the field of IT outsourcing in healthcare in Canada. Qualitative sampling was conducted Compared to quantitative sampling which tends to focus on larger numbers and seek statistical significance, qualitative sampling focuses on smaller numbers to get rich and purposeful data (Miles & Huberman, 1994). A frame or scope is developed to confirm or uncover

the basic processes of the study. Qualitative sampling is usually theory-driven as it provides the flesh on the bones of the general constructs of the proposed theories (Miles & Huberman, 1994). As such, the candidates to be interviewed during the research are executives at Canadian (Ontario) hospitals who are responsible for IT decisions, including outsourcing, and outsourcing vendors. Typically, the title of the person would be CIO, VP or Manager of Information Systems. These potential participants have a broad perspective of the risks and opportunities of IT outsourcing within a hospital, as well as an understanding of the feasibility of technology and the associated costs, and usually considered experts within the field.

The next stage of data collection was through semi-structured expert interviews. This research was conducted using in-person interviews, conducted at the office of the CIO or hospital manager. Semi-structured interviews are used to get close to the social actor's meanings and interpretations based on their accounts of the social world that they are involved in. Despite semi-structured interviews allowing individuals to freely comment, they also maintain a response procedure that allows comparisons across the respondents. The semi-structured interview provides the interviewees an opportunity to discuss or elaborate on topics that were not properly identified within the discussion outline (Blaikie, 2009). Each interview lasted approximately 60 minutes to provide enough time for the individual to properly answer the questions. Prior to the interview each person was asked, and agreed, to participate freely in the interview; see Appendix E for the consent form signed by the participants. Each interview was recorded and transcribed for replication and analytical purposes. A set of 11 open ended questions was used to guide the interview. Please refer to Appendix F. The research team identified 15 participants, to be interviewed in person, through skype or phone interviews. According to Miles and Huberman (1994), a study with more than 15 samples can become cumbersome as there is too much data to

scan and too many permutations to account for. Guest, Bunce, & Johnson, (2006) stated "that samples as small as four individuals can render extremely accurate information with a high confidence level (.999) if they possess a high degree of competence for the domain of inquiry in question". Dworkin (2012) stated that a large amount of literature recommended, guided and suggested anywhere from 5 to 50 participants as adequate. Mason, (2010), highlighted numerous areas of research on sample sizes in qualitative sampling

"The subsequent analysis tool has also been used by some to estimate a minimum sample size—recently for example by Atran, Medin, Ross (2005, p.753) who suggested that in some of their studies "as few as 10 informants were needed to reliably establish a consensus"" (pg. 4.)

"Their findings suggested that data saturation had occurred at a very early stage. Of the thirty-six codes developed for their study, thirty-four were developed from their first six interviews, and thirty-five were developed after twelve. Their conclusion was that for studies with a high level of homogeneity among the population "a sample of six interviews may [be] sufficient to enable development of meaningful themes and useful interpretations" (pg. 5).

"On closer examination however, perhaps this should not be surprising. When the guidelines for saturation by various researchers are examined the integers zero and five are equally prevalent, even in those presented in more detail by Green and Thorgood. Nearly all of the examples of sample guidelines presented here by previous researcher are in multiples of five. This is all the more curious when empirical examples presenting guidelines for saturation (e.g. Romney et al., Griffin & Hauser; and Guest et al.) shy away from such simplistic estimates." (pg. 15).

Grant (2012) agrees with Guest, Mason and Dworkin, suggesting that qualitative research techniques, such as interviews, is purposive sampling where the researcher judgement determines

the sample selection. Based on the findings of Guest et al., (2006), Mason (2010), and Dworkin (2012), 10 interviews were deemed sufficient to conduct in this research, nine in-person and one via phone.

Recruitment was initially conducted through personal contacts and then moved onto opportunistic sample selection. Opportunistic sampling focuses on the researcher making sampling decisions during the process of data collection (Cohen & Crabtree, 2006; Miles & Huberman, 1994). As more interviews were conducted, the sampling decisions were improved as opportunities to select other candidates increased (Cohen & Crabtree, 2006). The research supervisor, Dr. Babin, has conducted numerous research and consulting projects in the IT and health care field over the last 15 years. From his experience, he has collected a list of personal contacts that were invited to participate in this research. The sample represented both large and small hospitals, all hospitals were teaching based. The sample that was selected represents a large number of hospitals. There are 14 LHINs in Ontario, and in this sample, there are 3 LHINs represented in this research. Within Ontario, there are 145 public hospital corporations with 224 sites, there are 24 sites represented in this research (Government of Ontario, 2014). For every 1000 people there are 2.3 hospital beds in Ontario (OHC, 2016). There are currently 14.1 million people in Ontario, therefore this translate into there being approximately 32,645 beds in Ontario (Government of Ontario, 2017). This research has included hospitals that account for 3,431 beds.

3.2   Research Analysis

With the expansion and interest in qualitative analysis, there have been additions of qualitative analysis tools. Tools such as Qualitative Data Analysis (QDA) Miner, Ethnography and NVivo have been developed to increase the rigor of a qualitative research (Leech & Onwuegbuzie,

2011). By using these tools for data analysis, a researcher can improve their analysis much further when compared to doing it manually (Bazeley, 2007; Leech & Onwuegbuzie, 2011).

For this research, all transcripts have been placed in NVivo and they are coded to help develop themes. There are a few words that are unique to NVivo such as a node, tree node and free node (Leech & Onwuegbuzie, 2011). A node can be defined as a group of text that a researcher has put meaning on. Tree nodes are organized nodes and a free node are nodes that are not associated with any tree node.

NVivo has been widely used for various different analysis methods (Bazeley, 2007; Leech & Onwuegbuzie, 2011). For this research, NVivo was used for thematic analysis. Thematic analysis is a type of qualitative analysis that is used to analyze classification, develop codes and present themes or patterns that relate to the data (Alhojailan, 2012; Guest et al., 2011). Thematic analysis is used to identify any factors or variables that influence any decision surrounding a participant (Alhojailan, 2012). The thematic approach is appropriate when the samples are determined and defined before the study. According to Alhojailan (2012), there are four situations where thematic analysis is appropriate: Data interpretation, deductive and inductive approaches, understanding current practices of an individual, and coding and categorizing of data. This research study connects with all four of the situations; the research participants are giving their most appropriate explanations for their decisions, this research is taking a deductive approach, trying to understand the current decision making of the participants, and the decision makings are being coded and categorized. For this research, the CIOs and hospital managers that have been interviewed are labeled as a CIO interviewee.

The codes or nodes that are developed are based on the outsourcing success factors model of Lacity, Khan, Yan, and Willcocks, (2010). This was done to see if similar themes arise in

Canada as the general outsourcing literature that Lacity et al. (2010) found. Once this data has been analyzed, a descriptive model will be developed to provide a guide for other CIOs and hospital managers working within a similar setting and to add to the literature on outsourcing of healthcare IS within Canada.

4   Results

4.1   NVivo Results

Selecting the themes from transcripts was an iterative process. Initially, after going through the transcripts ten common themes were identified, in alignment with themes found in the IS outsourcing literature. The themes were 1) performance, 2) cost shifting/reduction, 3) core competency 4) contract, 5) control, 6) risk, 7) privacy, 8) security, 9) Canadian policies, and 10) staff. After further inspection, it was seen that these themes could be shrunk down to six themes. The six new themes which make up the structure of this research are 1) performance, 2) cost allocation, 3) core competency, 4) contract, 5) policies and 6) staff.

The findings of Lacity, Khan, Yan, and Willcocks (2010) found 20 themes in total from the review of the literature but in their descriptive model they used eight themes: 1) cost reduction, 2) focus on core capabilities, 3) access to skills/expertise, 4) business/process improvements, 5) technical reasons, 6) political reasons, 7) concern for security, and 8) fear of losing control. Refer to Diagram 1 above to see a review of the eight themes.

While there are some similarities in this research's themes compared to Lacity et al (2010), the findings of Lacity et al. is more of an outsourcing industry overview and this research is more specific to healthcare in Canada. Thus, this was the motivation to keep these themes in this format.

Nodes		
Name	Sources	References
Cost Allocation	10	93
Contract	10	81
Performance	10	65
Core competency	10	61
Policies	10	49
Staff	10	43

Legend:
Most referenced
Moderately referenced
Least referenced

Diagram 2: NVivo Coding References Results

The coding of the NVivo data is of separate instances of mentioning. This does not reflect the amount of times these words were mentioned individually. Costs Allocation was associated with words like pay, payment and value when used in the same context. The NVivo results display that contract and costs were mentioned the most, costs were mentioned 93 times, contracts were mentioned 81 times. Performance and Core competency were mentioned within proximity of each other, 65 and 61 respectively. While Policies and Staff were mentioned the least at 49 and 43.

Various vendors were mentioned throughout the interviews, Cerner was the most mentioned vendor, followed by HP/HPE, CompuCom, Epic, IBM, Oracle, Microsoft, Bell, Google, Rogers, Hydro One Telecom (HOT), and TELUS. Various outsourced items were mentioned, the most mentioned item was data centre, followed by help desk (desktops, PC support), application support, switch, network, telecommunications, mail, voice, video, power.

Within the coding the most referenced words were costs, vendor, management, security and cloud. While costs and vendor match well with the data of the coding references, security was

referenced several times. Security was referenced many times within the same context which may skew the data. Cloud was referenced in the top five of the coding references. Cloud was usually referenced by CIO Interviewees as a look to the future. CIO Interviewee 3 stated "Its giving us the impetus to shut down our environment down to one data centre, it's also given us the impetus to push more things into the cloud environment". Refer to Appendices G, H, I, J for diagram and numerical representation of the NVivo word cloud and frequency. The following section describes the six themes in detail, which are summarized in Table 1 below.

Key Themes	Description of Theme	Why this is important in Hospital IT Outsourcing?
Performance	Technical performance. i.e. throughput, speed, accuracy	Ensure that processes are running smoothly due to high stakes.
Cost Allocation	Budget restrictions, cost reduction, shifting or investing	Apply costs to other areas and invest in more technologies.
Core competencies	Provide care to patients, vendors expertise	Allows hospitals to focus on hospital care while still receiving high quality work
Contract	Contract itself, control of the vendor and the risk associated with outsourcing.	Ensuring that vendors act accordingly to support the hospitals and provide them with accountability.

Policies	Privacy, Security, Political issues	Protection of patient data is critical to hospitals success. Political policies may prevent certain vendors from working with Canada. I.e. Patriot Act
Staff	Staff members of hospitals	Skilled labor, unique skills and protection of loyal staff as they add value.

Table 1 – summary of key themes in hospital IT outsourcing

4.2 Performance

Within this research, performance refers to the technical performance of the IS systems. It could be associated with improved business processes and technical reasons that Lacity et al (2010) examined. CIOs were looking to improve the performance of their IS systems to better serve their clients and to ensure operations run smoothly. The focus of performance was on ensuring that the system works because in the hospital environment patient's lives can be at stake. When users are working with outdated information then they fall behind on tasks and slow down the hospital processes. Performance extends to areas such as data accuracy and currency, system availability, speed and throughput.

> Interviewee 2: "We do understand what 7/24 means, I do understand what it means for an ICU to go down. We also live that. A lot of our service level agreements (SLAs) that we provide to our smaller hospitals are 1. probably way better servicing than they've ever experienced and 2. The standard that is expected of an academic teaching centre because that's what I have to provide my biggest client."

Interviewee 8: "I think that the clear answer is that there is an obvious benefit to us as a healthcare organization going down this route and that has to do with us by and large with the fact that, it's a lot faster and easier for us to be able to stand up the kind of capabilities necessary under this model vs if we were to go the traditional path of building it from the inside"

Interview 8: "So, the training and governance is fundamentally the same, but you get the added benefit of saying well not only is their data centre and security controls better than ours, but their disaster recovery capabilities are better than ours too."

Interviewee 4: "The response time itself was huge to our end users. If you can spend more than half of the time in use for an averaged system response that means that the end users have so much more time to do what they are here for which is caring for the patients. I can't highlight how valuable that was. Another benefit to outsourcing was the improvement of our uptime. We have built in very stringent limits on how much downtime can occur within any month etc. We rarely have a downtime. When you can depend on the system being up and operational, it is just such an absolute value to the organization that we didn't necessarily have prior to outsourcing that."

Interviewee 10: "Performance - Outsourcing IT may cost more, but the service will be better than in-house."

4.3 Cost Allocation

Due to the budget restrictions for many of the hospitals, the IT budget tends to suffer the most due to it being viewed as a supportive role within the hospital. Previously stated in the literature review, hospital IS systems account for around 2.8% of the global budget which means

that there is not a lot of space to work with. IS systems in the banking industry in the UK accounted

for over 16% in 2003 (Minz, Mollenkamp, Dreischmeier, & Felden, 2004). In the US, IS systems

in the banking industry can be as high as 26% (Mai, 2012) . Outsourcing should reduce the

operating expenses or at least make the process more efficient by saving time within the hospital

operations. While cost reduction is the typical name for one of the motivations for IS outsourcing,

this research has also named it cost shift. It is cost allocation because most CIOs while they were

looking to reduce their costs, they were doing this, so they can reinvest in other IS areas such as

advanced analytics as mentioned by Interview 3. As per the literature review, cost was the

underlying factor that motivates outsourcing (Bodenheimer, 2005; Lacity et al., 2010). Without a

cost reduction or cost shifting, CIOs and hospital managers were not entertained by it because that

was their driving factor, even if they were offered additional services.

> Interviewee 1: "The weird thing about costs from a hospital perspective though is the IT
>
> budget, the CIO's allocation comes out of the hospital global budget and when there is a
>
> hospital foundation on the board and fundraising all involved in a hospital allocation of
>
> funding when you're out in the community and you need a MRI machine or another shift
>
> of nurses at your palliative care unit is always going to get more attention and more money
>
> and investment than IT."

> Interviewee 3: "I don't have great strength in my IT team for Lean six sigma process
>
> redesigns. I've still got lots of guys that run around that patch servers and deploy hardware.
>
> If I could find someone to go around and do that cheaper, if the other hospital institution's
>
> solution of supporting my switches was cheaper, I would 100% do that and I'd take every
>
> single dollar I save and put it into an Full Time Equivalent (FTE) advanced analytics
>
> redesign."

Interviewee 3: "Because right now, I don't have any, right now its I pay you a software licensing fee and its best effort on your part. I said to them, come back to me with a business case that shows me that I can save anything more than a dollar and I'll entertain it. I still haven't heard back from them. I said to them it doesn't have to be just saving a dollar of the money I spend with you today, it could be spending money off of anything

Interviewee 2: "I probably over the years, I think I've had at least three reviews done around my helpdesk whether we could outsource those services and the biggest challenge we kept finding was that, yeah people would come in and offer us all this great stuff, but no one could meet the cost structure that I had in place."

Interviewee 7: "How can IT partner help you with frequently dealing with those budgetary constraints where a hospital would prefer to buy a new a bed or new clinical device as opposed to doing a server refresh"

Interviewee 8: "Hospitals and healthcare in general are in a great deal of pressure from the government in terms of our spend, every year we are being asked to look at how we can reduce costs in a variety of different ways and strangely enough the idea of having an operating expense versus having a capital expense is very different."

Interviewee 8: "Yeah, they've got multiple data centres that they've invested millions and millions of dollars in making sure that this is a redundant infrastructure should something fail in one data centre, we still have access and full control of our information which is not something we could necessarily say we would be at the level of the reliability with an internal set of systems."

Interviewee 5: "It's all about driving efficiencies and staying relevant and in order to stay relevant you're always looking at driving your unit costs down and increasing your value."

Interviewee 8: "The biggest concern for a hospital to go into a cloud world or cloud offering is that you move from a capital investment into an increase in your operational budget and that itself is the biggest obstacle, biggest challenge for us, for all hospitals in Canada to have more and more software as a service. It will increase your operational costs which will impact your funding. So that's discussions we need to have with ministry of health."

4.4   Core Competency

In this research study, core competency falls under the core competency of both the hospitals and the vendors. According to Prahalad & Hamel (1990), core competencies can be defined as the collective learning in the organization, they are enhanced as they are applied and shared within the organization, they are used to co-ordinate diverse production skills and integrate multiple streams of technologies. Two of the three tests stated by Prahalad & Hamel (1990), focus on a core competency making a significant contribution to perceived benefits of the product and it is something that is difficult for competitors to imitate because of its complexity. Within this study, core competency is looked at from both sides, the focus of the core competency by the hospitals which is to provide care for their patients and the core competency of the vendors which is to provide IS outsourcing services whether application or hardware support. The issues that many of the hospital CIOs faced was that for the most part, they could not compete with global companies on hiring top talent, or there was no talent available in their area or workers had left. The core competency of the hospital is to provide care and aid to the patients and for that IT is seen as a supportive role.

Interviewee 2: "Compucom is probably my biggest true outsource and they manage… so we've had… since 99' I've had a network utility model. So, they run my network and I only pay when I plug a device into an endpoint or when we light up a wireless access point. So, the benefit to me has been I don't worry about any of that technology, sort of like your home phone."

Interviewee 6: "I just think it's really hard to do your core business and in fact what I'm saying is philosophically that is where we shouldn't outsource. Your core business, that is what you have your staff for, you educate your staff on it, so you can provide the best business that you can, and we can train our people to know the way our business works better than any outsource company could."

Interviewee 2: "Exactly. So, I looked at that and said if I'm moving into the advanced clinical space, I need this software vendor that's running this 1.6 billion corporation between the two, I need it to work and I need to have a good relationship between the two. I need to get expertise to manage the software."

Interviewee 1: "We can't compete with the Microsofts and Deloittes of the world, they get the best and the brightest."

Interviewee 3: "So, when we decided to outsource with Cerner, it was around two things. It was around the ability of my team to have the knowledge to keep the software current. There used to be upgrades every 18 months Cerner has some small upgrades every month. For my team to keep up with the knowledge to be able to support the software and manage it, impossible."

Interviewee 7: "Things like a service desk, or desktop, some niche app support things but frequently my understanding and limited experience is that they are relatively insourced, a lot because there is a niche amount of skills because there are challenges sometimes to come up with the business case based on how you would leverage that on a broader scale."

Interviewee 8: "Security is a very high demand skillset these days. Hospitals and other public-sector organizations broadly, aren't in the best possible situation to get the best talent, because quite frankly we don't have the best budget and resources."

Interviewee 8: "There are some nuisances there that make it a little bit more challenging but our learning management system, we just signed a deal to outsource that. We are outsourcing emergency mass notifications to a cloud provider for a variety of reasons, mostly because that's the right way to do EMNS"

Interviewee 10: "This institution is committed to having its IT staff knowledgeable re clinical applications and will manage the in-house relationships with medical staff at Hospital institutions. This will not be outsourced. Specific IT skills will be developed and retained for HIS configuration management, analytics (including business intelligence/ big data) and project management."

4.5   Contract

Contract has three areas that it focuses on; the contract itself, control of the vendor and the risk associated with outsourcing. Numerous studies and research have examined outsourcing and contracts (Aubert, Rivard, & Patry, 2004; Bahli & Rivard, 2003; Dibbern et al., 2004; Eisenhardt, 1989; Tiwana & Bush, 2007) . The participants' focus on the contract was about ensuring that they received proper SLAs. Control of the vendor has been an important aspect because the vendors

themselves are a business and they need to ensure that they are making a profit. So, while the hospitals are looking to reduce costs, the vendors are looking to profit, this can create issues within the relationship. Issues such as the inability to perfectly monitor the vendor's actions to ensure that their interests do not clash. Hospitals are looking for more of a business partner than just a vendor. This leads into risk as there is a risk that the vendor may not act accordingly which will put the hospital at risk, if the contract does not have proper controls then the hospital is at risk which puts their operations and costs at risks.

> Interviewee 2: "I'm sure they had someone on their corporate side saying I need another 5% out of our revenue from one of our smaller hospital institutions this year, they won't notice it in the contract. So, like most outsourcers are in it because they are trying to make money and if you don't manage how they're operating then they will make more."

> Interviewee 4: "We negotiated in good faith, as did Cerner, we didn't know the SLAs or the SLOs that other clients were receiving in the states because they were confidential. We weren't able to really evaluate whether we were getting good SLAs or SLOs and we thought were getting good ones, and for the most part we are...As we were contacted by further Canadian clients we would have the opportunity to share with them, when you're doing your contract be sure to include this type of verbage or be sure to not overlook etc. So those are the things we did learn as we moved along."

> Interviewee 2: "We have on a lot of occasions here, not just in IT but in our hospital institutions, insourced back what they thought was a great idea to outsource, one of the biggest challenges that organizations fall prey to is that they believe once they outsource they can put all the risk and work on the vendor."

Interviewee 5: "You are given a budget, you are given priorities and sometimes in order to deliver on those priorities it is easier to do it in the vertical environment that you have control of."

Interviewee 7: "Obviously from a HIS perspective, shutting down a hospital because they can't admit patient whether it's any aspect of our system, the network the servers, the HIS is running on, in this case Cerner, those are dramatic risks that we work with our clients to remove points of failure in terms of how the infrastructure is designed, so then you can improve around that. It really boils down to are we in this together and is there a level of trust through sense of urgency around what the ultimate end is. This is not about a server being down, this is about somebody's kid unable to be admitted because we don't have a system for them to be admitted."

Interviewee 8: "We've taken a very different approach in that really what I am looking for is not the best price but the best vendor that's going to give the greatest degree of partnership. Are they going to be interested in our success in the same way that they are invested in our success, are they going to be at the table to figure out why something isn't working as optimally as it could, are they going to be pushing themselves to be making sure the service delivery is exceptional in every way?"

Interviewee 8: "It will be important for vendors to align with the "strategic values" and priorities of hospitals, and to put "skin in the game", to develop a long-term relationship."

However, if the contract is managed properly then the hospital will have proper control and mitigate their risk

Interviewee 3: "Second is response and resolution, so there are four levels of response, four levels of issues, from patient risk to financial risk to maybe later and there is a response and resolution list for those and the hospital gets to declare which category and we get to declare the downtime. So, Cerner can't say that's not a down time. If I don't like it, then I pull the cord. I get to pick the level and I can say its level 1 and they can't mess with me, I get to declare it."

Interviewee 3: "Cerner owns it and 16% of Cerner's monthly bill is at risk if they can't deliver."

Interviewee 6: "It's kind of nice to have that HP assumes a lot of risk so then we can then focus on the clinical side."

Interviewee 9: "I have my SLA with the vendor, I've been asking five 9s. If there is an incident in my firewall, within the hour it must be resolved, whatever you do, within the hour it is resolved. Yes, you have those strict service level targets, there is a cost, but you also need to look at what are the services where you have that strict SLA and then you can start looking at where software as a service offering where you feel like okay it is a good vendor, it's not state of the art top notch, but it is good enough for us. You don't always need in the top of the offerings."

4.6   Policies

Patient data has become one of the most critical areas of in terms of protection. The need to keep data private and secure has created a number of policies that govern the way businesses can operate and interact and some of these can deter or even prevent certain agreements in terms of outsourcing decisions. Canada faces political issues such as the US Patriot Act. The Patriot Act

allows the United States law enforcement officials to seize electronic communication and business records that cross their borders (Banks, 2012). This power allowed them to demand that electronic communication service providers hand over information without alerting the affected parties. This affects Canadian healthcare because if a vendor is running a data centre in the US, then their patient data is open to the U.S. government. Due to the US Patriot Act, Canadian organizations are not allowed to U.S. based cloud services (assuming they are only operating in the private sector) (Banks, 2012). In British Columbia, public bodies that are subject to the Freedom of Information and Protection of Privacy Act are required to ensure that personal information under their control is only stored in and accessible from Canada, subject to certain exceptions (Banks, 2012). Federal and provincial private sector privacy legislation does not permit the transfer of personal data and information to an organization in another jurisdiction for processing and storing, provided that "The transfer does not entitle the organization receiving the personal information to use that information for purposes other than those for which individuals expressly or impliedly consented.

- The transferring organization remains accountable for the protection of the personal information that has been transferred.

- The organization receiving the personal information provides a comparable level of data security, as would be required under Canadian law, and the terms on which the collecting organization collected the information.

- Disclosure is made to individuals. As a general rule, this disclosure to individuals should include notice that (1) their personal information will be transferred outside of Canada for processing and storage; (2) their personal information will be subject to the laws of the foreign jurisdiction; and (3) the laws of the foreign jurisdiction may be different (and less protective) than those of Canada." (Banks, 2012)

To protect patient data, all hospital data centres need to reside in Canada and some vendors cannot provide this. Government policies on healthcare that push hospitals into working as clusters and hubs prevent hospitals from making IT investments which means less space for innovation.

Interviewee 4: "And certainly, if the data is being held outside of the jurisdictions and again that's why we needed a Canadian data centre, we weren't able to share the data centre that resides in Kansas City. We needed a Canadian data centre so that the US Patriot Act would not apply to us, that was one of the concerns."

Interviewee 2: "It's a model that seems to work to the point that the provincial government as a few months ago has mandated that we have to operate in a cluster and then ultimately move in towards a hub because they do not want to see individual hospitals making investments in IT."

Interviewee 3: "What's interesting for me is that the Kamloops's data centre is a Bell Q9 facility. I've said to Cerner if you move to British Columbia, I don't have any issues with you moving the hardware there, I don't need to come in and see the flashing lights."

Interviewee 10: "If Epic were to establish a Canadian data centre, Hospital institutions may contemplate outsourcing the HIS infrastructure; now, the HIS will operate Epic on the hospital institutions computers in the hospital institutions' data centre."

4.7   Staff

Human relationships are always a significant factor in decision making. Loyalty to staff members who have been a part of the business for some time can present issues when deciding to outsource as it may change or remove the staff member from the process and in some cases from

work. The CIOs have either shifted their staff's focus to keep them on board or improved their staff's capability to ensure that they can compete with their outsourcing competitors. Some hospital CIOs believe that the relationships that their staff members have developed with the doctors and nurses provide important value and that the outsourcers cannot necessarily provide this type of value.

> Interviewee 2: "I went to the rest of the execs, I've built a team here that is knowledgeable, skilled, loyal, long-termed, focused on what we are doing and at some point in time we are going to move forward, we are going to have to invest, I said 'it makes no sense for me to start lopping off these people if I have to hire them back again when I won't be able to in 5 years"

> Interviewee 3: "So, I would be still more in a place to outsourcing more and part of that is because I want to create room on my team to be able to help people to use the data and spend my FTE on the advanced analytics."

> Interviewee 6: "So, we should decide how a certain project should be built and once we decide how it should be built then Cerner, the outsourcing company, they will build it, but the team said that's where we get joy, getting the thing to work, we get joy from that."

> Interviewee 6: "That's right then we can focus on other things on the clinical side. The decision to do...to outsource Cerner was made maybe 3 years ago, maybe not even 3. I wasn't here, so decisions are always made in context. I think though what prompted it was that some of the staff left so there was concern on how can we support this thing."

> Interviewee 9: "I think we have 25 people that go to an Information Technology Infrastructure Library (ITIL) version 3 training with certification, we do another 30-next

month, so we have our ambassadors in guys we need to be more process driven rather than

be ad hoc reactive etc. That will help, and it will also start in building our knowledge based

so that we have the knowledge. So that we know that if we have a certain incident and it

was resolved by second or third level that knowledge can then be transferred to the service

desk agents so that then we can increase our first call resolution."

4.8   Hospital Outsourcing Decision Model (HODM)

Diagram 3 below depicts the Hospital Outsourcing Decision Model (HODM) developed

from the research findings described above. The HODM relies on the Lacity et al. (2010)

model and adapts that model to reflect the prominent issues to consider when outsourcing

hospital IT.   Within this model, each factor plays a role in both creating an outcome from

IT outsourcing or being a driving factor towards outsourcing.
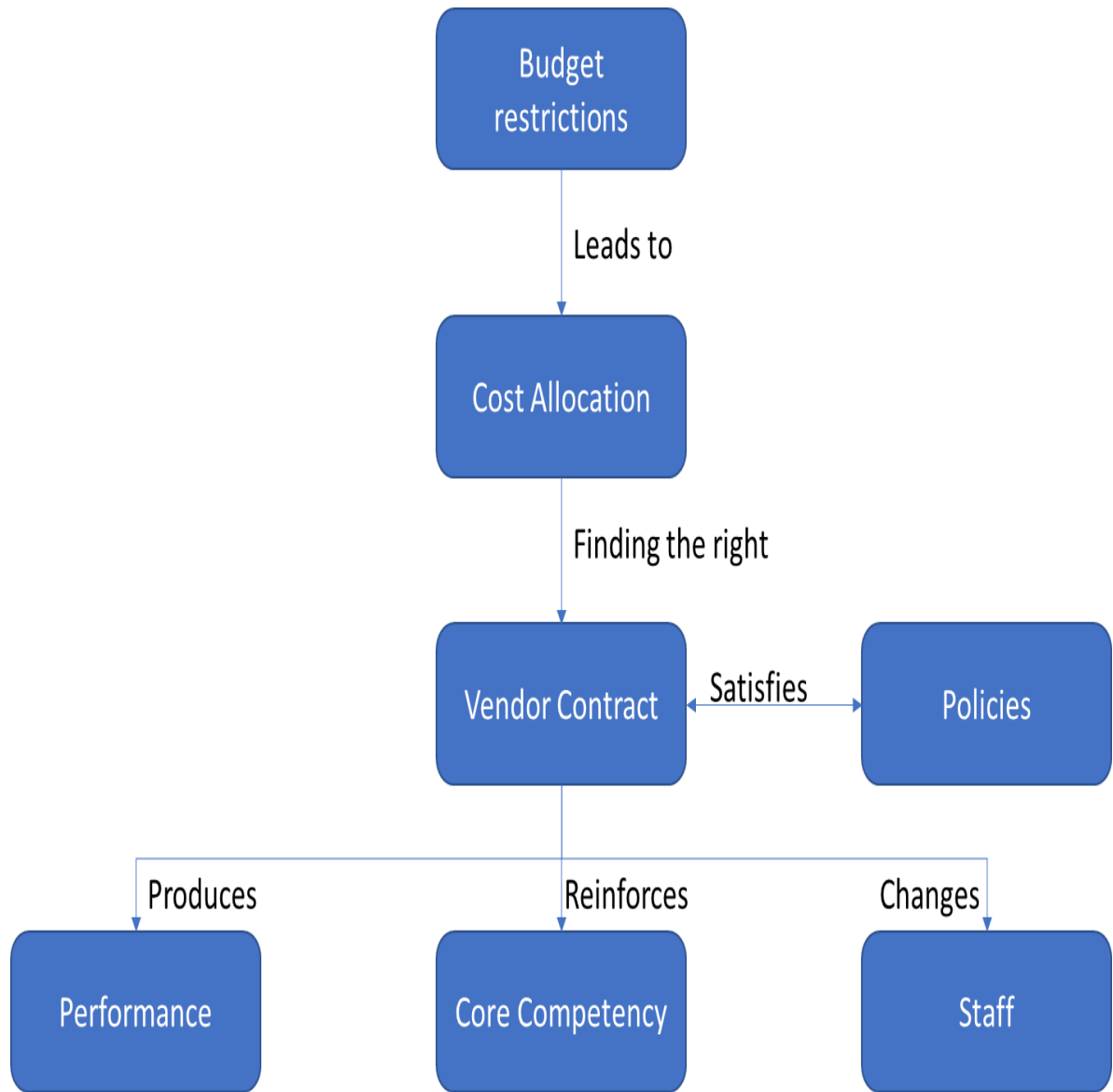
Diagram 3: Hospital Outsourcing Decision Model

4.8.1   Budget Restrictions/Cost Allocation

Technology's increasing role in healthcare causes a growth in demand for IT services. At the same time, information technology is more readily available and affordable, as demonstrated by individuals' use of smart phones, laptops and software. Hospital health care professionals have a growing expectation of IT availability in their professional lives, as they experience in their personal lives. Increased demand for IT increases the expenditure of healthcare technology in the

hospitals. Restricted hospitals budgets are under pressure to find cheaper or better ways to perform both information technology processes and healthcare processes.

As components of IT are outsourced, expenditures move from a capital budget (e.g. purchase and depreciation of servers and software) to an operational budget (usage-based payment for software as a service and cloud services) will impact the funding hospitals receive for IT. Currently, for larger hospital they receive funding from three models: Health Based Allocation Model (~40%), Quality-Based Procedures (~30%), and Global (~30%). Global funding is based on the previous year, Health Based Allocation Model allocates expenses based on demographics and clinical data of the people they serve, Quality-Based Procedures funding is based on types and quantities of patients treated using rates based on efficiency and best practices per procedure (South West LHIN, 2012). Hospital funding is more focused on the clinical side, driven by patient-based funding in comparison to the administration side. Hospitals are more likely to spend money on an MRI machine than invest in upgrading their desktops or software.

This turns hospitals towards outsourcing where the external vendors can offer different infrastructure and software, usually for a subscription, for a cheaper price than building it. The benefit of this for the hospital is that they can reallocate IT budgets to various areas such as data analytics, advanced analytics redesign, robotics etc. For example, Hospital institutions Hospital has invested in 'big' data analytics and uses vast quantities of data (1256 data points per second per patient) to diagnose patients in its neo-natal intensive care unit (Proffitt, 2012).

Within the Hospital Outsourcing Decision Model, budget restrictions and reallocation of budget to high impact areas such as data analytics, is a factor that drives CIOs to consider IT outsourcing.

4.8.2   Policies

Before hospitals begin their search for vendors and contracts that can offer lower cost services and skilled talents they must ensure that the external vendors satisfy certain policies. Policies are split into two categories: Government policies and Hospital unit policies. Under the government policies, hospitals must follow the regulations and restrictions set by the government in which they fall under, in terms of finding a vendor and operating through their external IT services. The Ontario government encourages hospitals to work in clusters for different areas such as HIS, payroll, HR and information technology software. The Ontario government has defined the HIS renewal strategy (2016) that calls for more partnering between hospitals for common HIS systems (Ministry of Health and Long-Term Care, 2016). The 2016 HIS renewal strategy will restrict the number of approved vendors. Currently, Meditech, Cerner, McKesson (to be discontinued in 2018) and Quadramed leverage more than 80% of Ontario hospital beds. All hospitals currently using McKesson will have to find a replacement as McKesson will be no longer servicing Canada.

The government's policies extend to the hospital's policies in the need to protect patient data. Due to the Patriot Act, only vendors that have a Canadian presence with a data centre within Canada, can partner with Canadian hospitals. Once a vendor can satisfy these areas, they can begin talks with the hospital in terms of a contract. These polices ensure that patient data is safer and that hospitals have a model or guideline to follow. During our interviews we learned that the recent decisions of Microsoft and Amazon to provide Canadian based cloud services has allowed hospitals to consider these external suppliers as viable outsource providers.   As well, the Ontario government has revised and strengthened the Health Information Privacy Act (HIPA) with higher standards and penalties regarding patient health information.

4.8.3   Vendor Contract

Hospitals in Ontario are dependent on the regulations and restrictions of the government for choosing potential partnerships due to the restriction in the number of HIS vendors. Within the restrictions described above and with the budget drivers discussed earlier, the next step is developing the contract to ensure that they get the right benefits from the outsourcing arrangement. Benefits are not only what the vendor can offer in terms of services but also benefits in terms of the vendor acting as a partner. Generally, vendors are in providing these services to make a profit and if not controlled or governed then they may take advantage of the situation they are in. To ensure that vendors do not act in their own interest, and ensure that they work in terms of building with the hospital, hospitals need to place different measures of control and governance. An example of this is ensuring that hospitals are asking for proper SLAs that match the needs of the processes that they require. The critical nature of the hospital environment requires some very strict SLAs and not all vendors can match up to them. The vendors must match the level of reliability, uptime, throughput, etc. required to ensure patient care is not affected. As one hospital executive told us, they expect the vendors to provide quality of service mindful that it could be their own family member relying on IT in the hospital operating room.

With every outsourcing arrangement there must be an end to the contract. This may pose problems if the contract with the vendor must end prematurely or even when it ends because the contract term has run out. Hospitals should be reviewing their contract constantly to ensure that they are getting what they need and have a contingency plan if they need to move forward without their vendor. Hospitals should ensure that their commitment to the vendor and the processes that they chose will be something they truly believe in. In our interviews we heard that a hospital commitment to cloud services would be a lot easier to change, unlike a payroll system, HIS etc.

4.8.4 Performance

Performance is split into two areas: IT related performance and patient related performance. IT performance falls under the areas of technical deliverables in terms of throughput, availability, security. An established company like Microsoft has a larger budget and reputation to attract skilled talent which allows them to provide better performances within the hospital IT processes. Hospitals, at times, are willing to pay more for increased performance because people's lives are on the line. Paying for improved performances will help to reduce errors that previously would've occurred which in turn saves money to fix these errors. Improved performances within the services means there are more ways to improve the patient process such as a reduction in waiting times, admitting patients, providing patient care such as medicine retrieval etc. It will create a more stable, faster or reliable area for the patient care.

4.8.5 Core Competency

With the access to skilled talent and services from the vendor, hospitals are now able to take full advantage of these resources in which they couldn't afford on their own. Their partnership allows them to get specialized resources in areas that they could not afford. It provides the hospital with an assurance that they will be able to get the processes done because of the level of expertise that they were able to attain. With this sense of assurance, the hospital can now focus more of its resources on their core competency which is patient care. We heard from one CIO that by relying on external IT vendors the focus for internal IT staff shifts from technology to better understanding needs and requirements of the health care professionals in the hospital. In addition, while external providers deliver reliable IT services, internal staff can focus on new and hospital specific services such as health data analytics, health services and more clinical services.

4.8.6 Staff

With the lack of skilled staff or the loss of staff members, hospitals turn to outsourcing to ensure that they can get the level of expertise that they need. Hospitals find it difficult to compete with other big recruiters, such as banks, Microsoft, IBM, etc., in hiring and retaining qualified IT staff. The other companies will offer higher pay and benefits for the same set of skills. The outsourcing contract gives the hospital access to these staff members through their vendor contracts. The outsourcing contract can reduce the number of IT staff that was needed which will lower the internal IT costs. Hospitals will be replacing staff because of their access to specific skills which in turn they can now either redeploy, retrain or reskill staff to high priority areas or areas that provide a higher value to the hospital. An example of these areas are data analytics. With the shifting of their staff members, hospitals can focus on the clinical requirements, which increases their understanding of the requirements for the end users of the IT services.

4.8.7 HODM compared to business outsourcing decisions

How is the HODM different from a typical outsourcing decision for any business? We examined outsourcing at Ontario hospitals which have a specific set of policies, such as HIPA and HIS restrictions. As well, hospitals have been increasing their use of technology and are now catching up to other sectors such as banking or retail. However, hospitals are unlike other organizations in that patient care involves highly defined medical processes and in many cases the life of a patient depends on appropriate medical procedure. When IT systems support the medical processes, there will be instances where a patient's life depends equally on medical process as well as information from the IT systems. Other industries may have similar profiles where life may depend on support from IT systems, such as air traffic control, automation of nuclear power stations, or support for military operations. However, the clear majority of IT outsourcing is in

commercial or government operations, without a life-or-death implication. So, the HODM must differ in the Performance category (4.8.4) above, in that outsource vendor service levels, reliability and security must be appropriate for a hospital environment. Not all vendors will be able to meet that requirement, so the field, and competition, will be limited to a small set of very focused and qualified outsource vendors. As we see with the HIS, there may be only a handful of outsource vendors capable of meeting Ontario hospital requirements. This makes the HODM framework different from a typical outsourcing decision model. Cost reduction may provide the motivation for CIOs to consider outsourcing IT. However, due to the limited number of qualified vendors and the importance of highly reliable IT services to support medical procedures, cost reduction may not be the most significant reason for outsourcing IT in a hospital.

4.8.8   Theoretical support for HODM

The theoretical frameworks that were identified within the literature review have helped to guide this research and assist in the formulating of the model. Three theories that were identified within the literature, transaction cost theory, agency theory and knowledge-based theory. While there were no hypotheses to test these theories, they provided the basis of knowledge for this research, aligned with the results, and assisted in developing the HODM. Cost allocation found that hospitals would not necessarily go forward with outsourcing unless the vendor could do it cheaper or reduce the transaction cost. Interviewee 2 stated that they would not go forward unless they could provide it cheaper which meant that this was a negative effect because it remained in-house and this is aligned with the transaction cost theory literature (Ngwenyama & Bryson, 1999). Transaction cost found that the greater the complexity of the process, the more technical expertise is required which means the firm is likely to outsource the process. Within the core competency and staff, to obtain greater IT technical expertise, the hospital must outsource. The higher the

strategic importance of the process the higher the chance the process remains in-house. Under core competency, patient care is a highly strategic important capability in the hospital which means that this will remain within the hospital while general IT processes will be outsourced. Vendor opportunism which results in lack of trust of the vendor fulfilling its contract obligations will reduce the chance that a hospital will outsource. If the vendor is unable to provide the right security, privacy and government policies then a hospital will be less likely to outsource, i.e. If the vendors are unable to provide a data centre within Canada, then they will not be considered in an outsourcing contract. While Burmahl (2001) believed that hospitals will have similar platforms for technology thus increasing the potential market for vendors, with the government policies pushing more restrictions on HIS, there will be only a few trusted vendors available. Within Policies of HODM, only those that satisfy the policies will be allowed which means it will reduce the threat of opportunism thus reducing the controls the firm must place on the vendor which translates into lower costs. This means that the transaction cost will be lower which will make it more likely to be outsourced.

Agency theory focused on vendor behaviour and ways to control them. The vendor contract spoke about SLAs being ways to monitor and control the vendor to ensure that it aligns with the hospital goals and are accountable. Agency theory suggests performance metrics (throughput, speed, accuracy, etc.) be included in contracts and this is done to ensure that the performances are kept at the required level for the hospital. To monitor and ensure improved performance is maintained penalties and incentives are suggested control mechanisms. These will result in less costly errors for the hospital. This falls under the performance of the HODM where the performance must be at the critical level of what is required of the hospital. The SLAs are the control mechanisms that Cheon et al. (1995) suggested to monitor vendor behaviour. Interviewee 7 is a representative of a

vendor that resides within the hospital, this is another mechanism in which Choudhury & Sabherwal (2003) suggested to monitor vendor behaviour. Knowledge-based theory focuses on the value of human capital and how it is just as important as physical assets.

Knowledge-based theory suggested that outsourcing arrangements operate as the channel for utilizing a vendor's complimentary skills and expertise. One of the reasons why hospitals would outsource is because they felt they could not compete with other companies in hiring skilled talent and expertise because these companies had either a better reputation or higher budget to attract those resources. Core competencies and staff are aligned with Knowledge-based theory because it shows that the hospitals are hiring these vendors based on the high level of complimentary skillsets and expertise that they offer. Interviewee 1 talked about how they can't compete with Microsoft and Deloitte because they can hire the best and the brightest and Interviewee 3 stated that they their vendor's staff would be able to keep up more with the outsourcing maintenance and processes better than the hospital staff. This meant that their hospital staff could be redirected to another high value area.

5   Conclusion and further research

5.1   Conclusions

The purpose of this research was to identify the factors that affect Canadian hospital in their decision to outsource their information systems. This research adds to the outsourcing, IS outsourcing and Canadian healthcare literature. As there are few studies on IT healthcare within Canada, this research has shed light onto an area that is not well known. This research identified six decision factors for outsourcing IT within the Canadian hospital industry. The six factors are: 1) performance, 2) cost allocation, 3) core competency, 4) contract, 5) policies and 6) staff. These six factors are derived from the eight factors identified by Lacity et al. (2010).

This research found that within the sample of participants all hospitals were outsourcing at least one component of their IT systems. The IT components that were outsourced were: human resources, infrastructure and software. Despite each hospital outsourcing at least one component of their IT systems, there are a wide breadth of IT outsourcing within this sample. One hospital was close to almost being considered completely in-house as they had only outsourced a small component of their hardware. In fact, this hospital had actually brought back certain processes that they had outsourced because of their strong belief in the expertise and talent pool of their staff. On the other hand, there was a hospital that wanted to outsource as much as they could so that they could focus their fulltime staff on more important tasks such as advanced analytics and robotics.

This research helps to better understand factors that contribute to hospital outsourcing decisions by providing a description of how each one is a motivating factor to outsource and an outcome from outsourcing. The most discussed motivator within IT outsourcing is cost but as identified, IT outsourcing is mostly focused on commercial or government operations, without a life or death implication (Lacity et al., 2010). This means that other factors play an integral role in the hospital environment. The critical nature of the hospital environment increases the importance of performance in keeping the processes running smooth to ensure the preservation of life. The core competency of the hospital is on patient care and hospitals will be willing to spend more to ensure that they can provide the best care possible. Despite cost being a focal factor in IT outsourcing, within hospital IT outsourcing it is not the only or even the most important factor. In some instances, it is just an underlying factor.

Healthcare is a laggard when it comes to implementation of technology and this is partly due to budget as well as IT being looked at as a supportive role. Canada is no different in this area. Therefore, healthcare is playing catch up with other industries to implement many of these

technologies. Patient information has become a prominent piece of data. Hackers and malicious intent are causing hospitals to invest more into their IT systems to protect their patients' data and their own systems from failing. An example of an attack was the May 2017 National Health Service (NHS) Malware, WannaCry, which crippled UK hospital IT services. WannaCry ransomware was an attack that targeted computers running the Microsoft Windows XP by exploiting a security flaw (Coughlin, 2017). This forces hospitals to make decisions on whether they can operate IT on their own or find another party to take over this responsibility. This leads to the decision of outsourcing. This research looked to answer three other questions.

Firstly, what are the benefits with IT outsourcing within Canadian hospitals? The benefits that have been associated within IT outsourcing for Canadian hospitals are that it can be cheaper for the hospitals to take this route, not only in terms of managing the infrastructure but also in terms of the processes. It becomes a cost shifting, not necessarily a cost reduction, as the money that they would use on hiring their own staff and purchasing new equipment would go into the contract that already provides the hospital with access to higher skills and expertise. Many outsourcing vendors have hospital technology as their core competency which means they have the budget to hire for higher skills and expertise. Another benefit is that hospitals can focus on their core purpose which is providing patient care.

Secondly, what are the risks for outsourcing IT in Canadian hospitals? The risks that lay within outsourcing IT in Canadian hospitals are that their reputation is on the line if they do not hold their vendors accountable. Leakage of patient data, not being able to meet the critical nature of a hospital and costly mistakes are some risks that they may face. These can be avoided by hospitals ensuring that their vendor operates as a partner and not as a third-party entity, and has aligned their goals. Another method identified is through proper contract terms such as SLAs. If

the hospitals do not hold their vendors accountable, then they may face certain risks that would force them to come back in-house which would cause another set of issues such as re-hiring talent, reinvesting in new infrastructure, performance and processes downtime.

Lastly, what are the alternatives to IT outsourcing within Canadian hospitals? The direct alternative to IT outsourcing would be to develop, support and operate IT systems in-house. Within the Canadian healthcare, hospitals do not outsource everything, they mostly do selective outsourcing or 'right sourcing'. They ensure the processes and infrastructure that they can get for cheaper or provided with better quality or both are outsourced. Within the Canadian healthcare there are constant calls for budget cuts and ways for hospitals to do things cheaper. This is changing the model for many hospitals in terms of how they spread their global budget. The IT department is constantly affected by these cuts as their budget either remains the same or is reduced which causes the CIOs and hospital managers to find different ways to offset costs while keeping performances at a certain level. Canadian healthcare seems to be moving to a more shared services model in some areas. This is not necessarily an alternative to outsourcing because outsourcing may still occur internally. This is called clustering or hub service. Many of the participants in this research oversee these clusters and their decisions affect all the hospitals within their group.

5.2   Weaknesses and Limitations

Within all research reports and studies there lies weaknesses and limitations. This report is no different. One weakness with this report is that it may not be an accurate representation of the entire Canadian set of hospitals. The research focused mostly on larger hospitals in Ontario which provides a snapshot of Canadian healthcare. Although many of these larger hospitals oversee smaller hospitals through clusters and hubs, this might not be an accurate representation for what smaller hospitals may experience especially in smaller or remote locations. This research is

through the lens of an interpretivist perspective which means that it is based on the interpretation of the author and how they see fit to present it. It is not the author's intentions to be biased towards any research but there remains the possibility of bias. Another potential weakness is the group of the factors. Depending on the interpretation of others, the grouping of the initial 10 themes into six could've been done differently and affected the results of this thesis.

This is a graduate student research report which means that funding, timing and networks to improve the accuracy of the research may be limited. Although six factors were identified for the decision making surrounding outsourcing IS, this does not mean that the other factors that affect other hospitals within the Canadian healthcare system are not in important. For example, different factors may affect IT outsourcing decisions at remote location, or small community hospitals such as those in northern Ontario.

5.3   Opportunities for further research

There are multiple directions to go forward in this area as research as there has been limited research done on IT outsourcing within Canadian healthcare. Within the Canadian health care sector more and more hospitals are becoming a part of a cluster to help reduce costs and manage budget issues. Future research could be on the decision to outsource by the larger unit in the cluster and how its decision affects smaller hospitals within the clusters. All hospitals seem to be outsourcing some part of their IS, so it's not if these things are going to happen its more about when and how much IT will be outsourced. Another area of research to look towards is within the term right-sourcing, determining what part of the IT is best to outsource within Canadian healthcare. Areas to explore are contractual vendor management by hospitals in Canada, inclusive of this is risks, governance and trust. Charging mechanisms for shared services model in IT healthcare in Canada would be another path to follow. This is based on the quote by Interviewee

10, "Ontario Ministry of Health has established an HIS renewal program with the following characteristics: 1) Encourage hospitals to partner, in clusters or hubs; 2) Limit the number of acceptable HIS products – Epic, Cerner, Meditech." Another recommendation was by Interviewee 7, "To me, there is a study, it's an obvious case study that can be done in terms of IT expenditure across hospitals and how it could be made more efficient."

Another opportunity for research could be a quantitative or mixed method research that focuses on all the provinces across Canada and the factors surrounding their decision to outsource their IT. Opportunities for research could be present in testing outsourcing theories within the Canadian healthcare system. An interesting topic that came up within the interviews which will could propose a direction for further research is how cloud computing will affect IT systems within the Canadian healthcare system, will it pose more risks than benefits? Interview 8 stated "I think the reality is that if we could pick everything up and put it into the cloud, we would probably make a lot of decisions to put stuff into the cloud. It's not to say that 100% of everything would but some things would." This shows that cloud computing is on the rise within Canadian healthcare.

With the increasing costs and resources needed in healthcare, it will continue to be an important topic for discussion for Canadian provincial governments. Technology has been a supportive tool for business processes for years and has the potential to both improve the performances and reduces the costs within health care. The six factors that influence IT outsourcing will continue to grow, as IT services become more complex and interconnected. The preliminary outsourcing decision trends and models described in this research will become more valuable to Canadian hospitals in the future.

Appendices

Appendix A: Outsourcing in healthcare across countries. (Guimarâes & Carvalho, 2011)

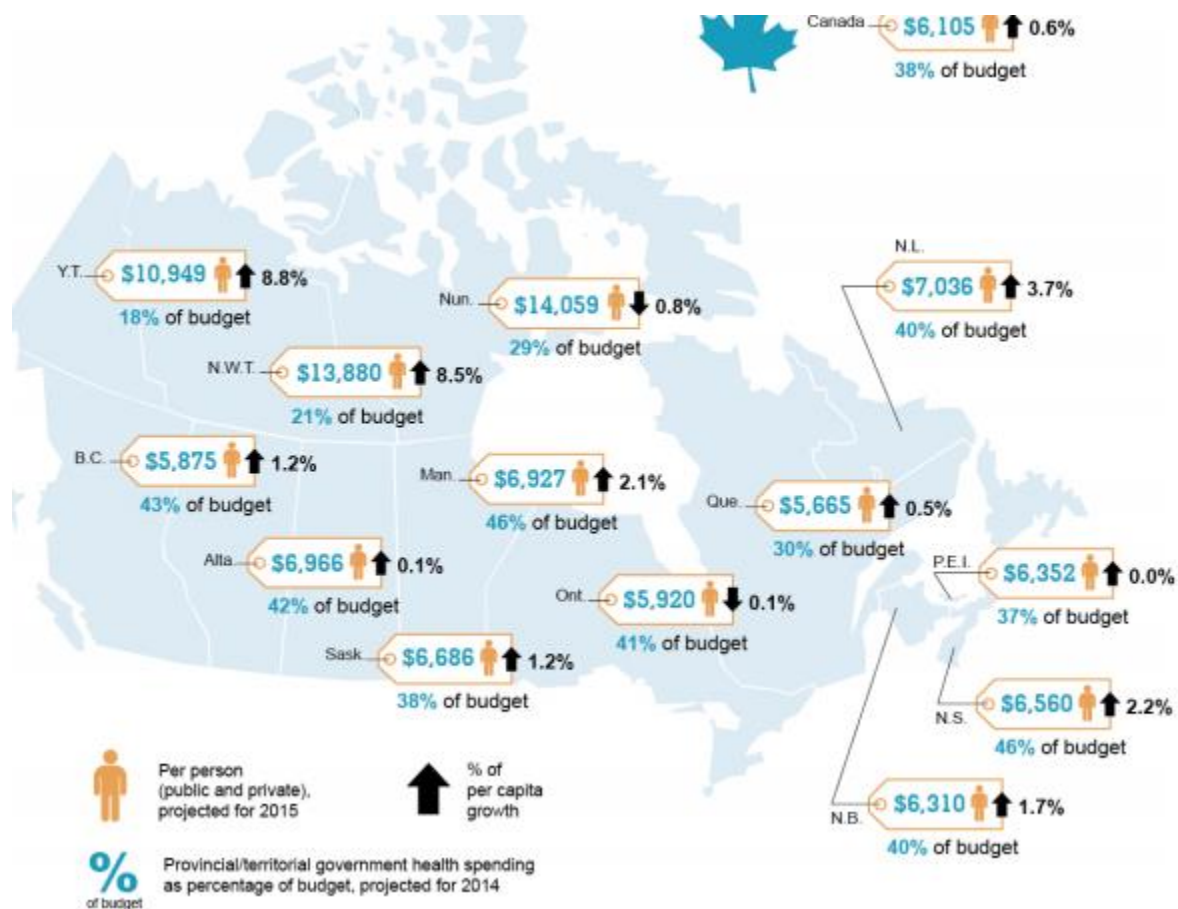| Constructs	Countries				
	Germany	U.K.	Australia and New Zealand	E.U.A	Greece
Outsourcing Activities	**a) Nonclinical services** - Information technology services - Procurement, purchasing and delivery -Payment collection - Facility management (cleaning, laundry) - Patient transport - Snack-bar **b) Clinical services:** (medical and technical): - Laboratory (pathology, microbiology) - Pharmacy - Radiology - Nuclear medicine	**a) Nonclinical services** -Facility management (cleaning, meals and maintenance) -Sterilization - Nonemergency patient transport **b) Clinical services:** - Physiotherapy, occupational therapy, speech and language therapy -Home delivered high-tech healthcare (total parenteral nutrition, intravenous chemotherapy, continuous ambulatory peritoneal dialysis) -"Medical tourism"	**a) Nonclinical services** - Car parking - Laundry - Cleaning - Meals - Information system - Security - Distribution to wards - Maintenance and gardening **b) Clinical services:** - Mental health services - Radiology - Pathology - Pharmacy - Dentistry	**a) Nonclinical services** - Meals - Cleaning - Laundry - Legal advising - Pest control - Waste management -Car parking - Information systems - Patient transport - Sterilization **b) Clinical services:** - Emergency medicine -Magnetic resonance - Imaging - Physiotherapy and rehabilitation - Pharmacy - Dialysis - Pathology - Anaesthesiology - Inpatient care management -"Medicaltourism"	**a) Nonclinical services** - Snack-bar - Meals - Legal advising - Equipment maintenance - Laundry - Laboratory NB: -No published research was found regarding clinical services (apart from Laboratory) outsourcing in Greek healthcare sector
Drivers	- Reduce investment in devices and stocks - Human resources cost reduction - Investments expenses (easier to support by bigger hospitals)	- Cost and health service quality standardization - Partnership policy - Cos reduction in ancillary activities -Business process redesign and IT updating - Access to expertise - Flexibility - Focus on critical activities and lean thinking deployment to achieve strategic advantages	-Cost Reduction - End Public- Private interests conflict - Flexibility to deal with low and vulnerable demand services (e.g. Dental care) -Focus on core competences - Staff reduction (22% reduction in some cases) -Government privatization program - Efficiency -Riskmitigation	-In clinical activities: access to expertise - In nonclinical activities: cost reduction - Process agility (outsource IT to front-end activities as patient admission) -Liability in data transferring and warehousing -Health financing systems changes	- Cost reduction - Patient satisfaction - Flexibility - Scarcity of human resources - Focus on core business
Benefits	- Outsourcing service quality higher than internal (namely in IT) - Cost reduction	- Service standardization (to follow National Standards of Cleanliness for the NHS Report)	-Equipment improvement - Increase in number of patients - Staff reduction (160 to 35 in a 1,200 bed unit) - Cost reduction (from $Aus 200,000 to 3,000)	-Access to best practices and top class technology	- Service quality improvement
Risks	- Adapting problems - High hidden costs of IT outsourcing - Patient claims regarding service quality	- Results monitoring difficulty and consequent need for process monitoring	- Supplier noncompliance and quality decreasing -Contract clauses non compliance - Monitoring costs not previously considered - Cultural discrepancies leading to internalization (e.g. meals, cleaning)	- Dissatisfaction with outsourcing outcomes (service quality, cost reduction and processes agility)	- Very low impact on costs - Integration and coordination difficulties - Vendor difficulty to understand internal processes. - Difficulty in negotiating changes in quality levels
Conclusions and Future Perspective	- Outsourcing level (clinical and nonclinical) decreases as hospital size grows. - Regional differences in outsourcing (IT) willingness - Dominant pattern is: patient direct care delivery services are internalized - Outsourcing "second wave" in cleaning, meal, laundry and laboratory services; - Outsourcing growth in sterilization, building maintenance, accounting and HR management services	- NHS Trusts outsourcing contracts evolution : - from cost savings in ancillary services to filling expertise gaps through "knowledge intensive business service (KIBS)" - Growing trend of clinical services off shoring	- "Mix-outsourcing" solutions - Cleaning and meals outsourcing for downsizing purposes (staff transfer) - Cost reductions and quality gains only by reviewing contracts -Clinical services remain internal for having difficult monitoring and outcome measuring comparing with nonclinical	-Contract management fails due to: lack of negotiation skills, bids bad evaluation, bad choice of payment form and absence of measuring culture - The possibility to revert outsourcing process and internalize activities refers only to clinical services - Clinical services outsourcing in agenda -Communication services offshore outsourcing trend	- 95.3%, of respondents outsource one or more activities -Outsourcing didn't lead to full-time personnel reduction (only in 16.3% of respondents occurred a staff replacement of 11% to 20%) - 81.4%, of respondents predict a moderate to substantial outsourcing growth in near future while less than 20% predict a reduction

Appendix B: Canadian healthcare expenditure 2015 (CIHI, 2015a)

Capital, $243, 4.0%

Public health, $336, 5.5%

Administration, $177, 2.9%

OHS: Health research, $109, 1.8%

Hospitals, $1,804, 29.5%

OHS: Other health spending, $270, 4.4%

Other prof: Other health professionals, $112, 1.8%

Other prof: Vision care services, $120, 2.0%

Other prof: Dental services, $379, 6.2%

Drugs: Prescribed, $814, 13.3%

Other institutions, $651, 10.7%

Physicians, $946, 15.5%

Drugs: Non-prescribed, $145, 2.4%
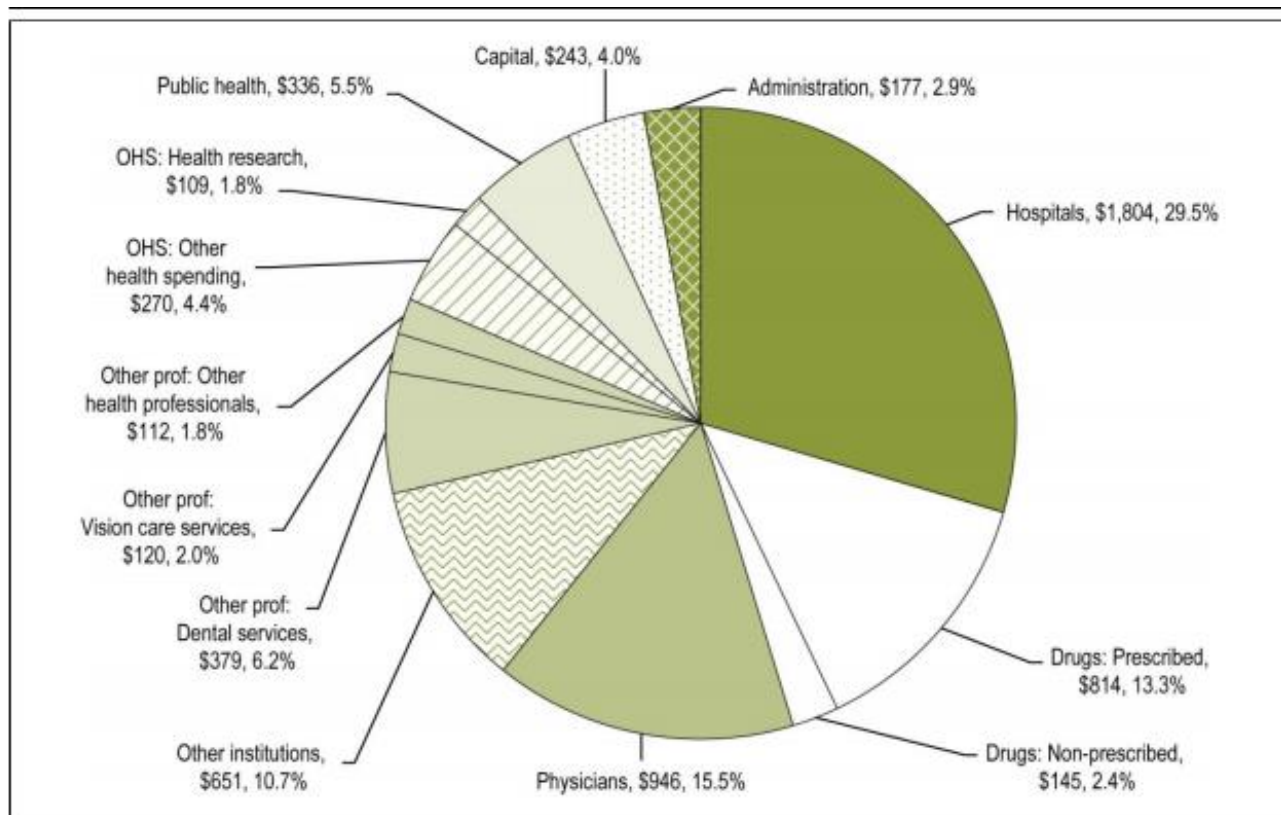
Appendix C: Provincial breakdown of healthcare spending per capita in Canada. (CIHI, 2015b)

Canada —⊙ $6,105 ⬆ 0.6%
38% of budget

Y.T. —⊙ $10,949 ⬆ 8.8%
18% of budget

Nun. —⊙ $14,059 ⬇ 0.8%
29% of budget

N.L.
⊙ $7,036 ⬆ 3.7%
40% of budget

N.W.T. —⊙ $13,880 ⬆ 8.5%
21% of budget

B.C. —⊙ $5,875 ⬆ 1.2%
43% of budget

Man. —⊙ $6,927 ⬆ 2.1%
46% of budget

Que. —⊙ $5,665 ⬆ 0.5%
30% of budget

P.E.I. —⊙ $6,352 ⬆ 0.0%
37% of budget

Alta. —⊙ $6,966 ⬆ 0.1%
42% of budget

Ont. —⊙ $5,920 ⬇ 0.1%
41% of budget

⊙ $6,560 ⬆ 2.2%
N.S.
46% of budget

Sask. —⊙ $6,686 ⬆ 1.2%
38% of budget

⊙ $6,310 ⬆ 1.7%
N.B.
40% of budget

Per person (public and private), projected for 2015

% of per capita growth

%
of budget
Provincial/territorial government health spending as percentage of budget, projected for 2014

Appendix D: REB authorization letter

Ryerson University | **Research Ethics Board**

To: Ron Babin
     Business Technology Management
Re: REB 2017-110: Healthcare IT Outsourcing in Canada
Date: May 3, 2017

Dear Ron Babin,

The review of your protocol REB File REB 2017-110 is now complete. The project has been approved for a one year period. Please note that before proceeding with your project, compliance with other required University approvals/certifications, institutional requirements, or governmental authorizations may be required.

This approval may be extended after one year upon request. Please be advised that if the project is not renewed, approval will expire and no more research involving humans may take place. If this is a funded project, access to research funds may also be affected.

Please note that REB approval policies require that you adhere strictly to the protocol as last reviewed by the REB and that any modifications must be approved by the Board before they can be implemented. Adverse or unexpected events must be reported to the REB as soon as possible with an indication from the Principal Investigator as to how, in the view of the Principal Investigator, these events affect the continuation of the protocol.

Finally, if research subjects are in the care of a health facility, at a school, or other institution or community organization, it is the responsibility of the Principal Investigator to ensure that the ethical guidelines and approvals of those facilities or institutions are obtained and filed with the REB prior to the initiation of any research.

Please quote your REB file number (REB 2017-110) on future correspondence.

Congratulations and best of luck in conducting your research.

Lynn Lavallée, Ph.D.
Chair, Research Ethics Board

The Following protocol attachments have been reviewed and approved.

- Literature Review - Kyle Stewart - Directed Readings Submission (2).docx (submitted on: 27 Mar 2017)
- Written Interview Consent Form - Hospital IT outsourcing v2.docx (submitted on: 02 May 2017)
- recruitment script - hospital IT outsourcing.docx (submitted on: 02 May 2017)
- IT Managers and CIO Interview guides v2.docx (submitted on: 02 May 2017)
- response to REB requirements of April 21, 2017.docx (submitted on: 02 May 2017)
- Research Milestone - Kyle Stewart.docx (submitted on: 23 Apr 2017)

If any changes are made to the attached document throughout the course of the research, an amendment MUST be submitted to, and subsequently approved by the REB.

Appendix E: Research Consent Agreement Form

RESEARCH CONSENT AGREEMENT

GENERAL DETAILS

Title of Research Project: Decision Factors for Canadian Hospitals on IT Outsourcing

Principal Investigator: Dr. Ron Babin, Associate Professor, ITM Department
rbabin@ryerson.ca

Co-Investigator: Kyle Stewart, MScM Candidate, kyle.stewart@ryerson.ca

PURPOSE OF STUDY

You are being asked to consider participating in a research study. Please read this consent form carefully so that you understand the steps and activities involved with your participation. Before you consent to participate, please ask any questions you may have to be sure you understand what your participation will involve. You may take as much time as you wish to decide whether or not to participate in this study.

The motivation of the study is that outsourcing has become an important and growing aspect of healthcare and there is a lack of literature within Canada. Learning about the decision factors may potentially create a model for hospital IT managers and CIO's to decide whether to outsource, build in-house or a mixed model. This will result in potential cost savings, operation efficiencies for hospitals and a chance for hospitals to spend more focus on providing care.

There are a few theories on decision factors surrounding outsourcing within IT healthcare and this study will help to add to the overall literature.

This research is in fulfillment of the thesis requirement for graduate student Kyle Stewart.

DESCRIPTION OF THE STUDY

The focus of this interview is around the decision factors. We hope to gain a better understanding of the major factors affecting hospital IT managers and CIO's in their decision to build and operate in-house, outsource or a mixed model of both for their IT systems. We plan to interview up to 30 persons for this study, with a minimum of 15. Each interview will be approximately 30 minutes to 1 hour long.

Areas of investigation include but are not limited to:

- Reasons for outsourcing decisions
- Reasons for building in-house
- Knowledge on options with outsourcing
- Disadvantages and advantages of each decision

RISKS AND DISCOMFORTS

To minimize any inconvenience, the interview will be conducted at a time that is most convenient for you, in person.

The participant may be sensitive to discussions regarding current or planned outsourcing, as well as the strategy of the hospital. For example, dis-satisfaction with current suppliers, or an intention to renegotiate a contract would be sensitive information, or plans to outsource a process and re-deploy hospital employees would be sensitive strategic information that could damage the reputation of the person and the institution.

In cases where this risk is identified by the participant or the researcher, that information will be excluded from the report or sufficiently anonymized so that it cannot be attributed to a particular executive or hospital. Permission will be received from the participant prior to publication of anonymized information.

There may be economic risk if outsourcing contract data are divulged. See below regarding voluntary participation and withdrawal at any time and our commitment to destroy data collected if a participant decides to withdraw.

BENEFITS OF THE STUDY

The research will potentially provide opportunities to improve decision making on IT systems management based on their situation. The research will aid in adding to Canadian IT healthcare literature as there is a lack of information.

There is no guarantee that there are direct benefits to you as an individual participant.

CONFIDENTIALITY

We will respect your privacy. No information about who you are will be given to anyone or be published without your permission. Similarly we will not identify specific hospitals or departments in any published reports or presentations. Any data provided will be unidentifiable and aggregated to make inferences about the general population. Before our report is published we will ask for you to review the report and to provide any corrections or withdrawals of information.

All data collected will be encrypted and stored on secure, password-protected computers. Once collected, the data will be unidentified and the aggregated product will be stored for up to two years post-completion of the study. Computers and reports will be in a locked facility at Ryerson University.

The final research product will be presented at public forums, Administrative Sciences Association of Canada (ASAC) and should be published in peer-reviewed academic journals, thus advancing knowledge in the field.

VOLUNTARY NATURE OF PARTICIPATION

Participation in this study is voluntary. You can stop at any time. Any relationships you have with staff at Ryerson University will not be affected in any way by whether you take part in this study.

If you decide to participate, you are free to withdraw your consent and to stop your participation at any time without penalty or loss of benefits to which you are allowed. If you choose to withdraw from this study, any data collected up to and including your withdrawal from the study will be NOT used for analyses. If you withdraw, data collected up to that point will be destroyed.

At any particular point in the study, you may refuse to answer any particular question or stop participation altogether.

QUESTIONS ABOUT THE STUDY

If you have any questions about the research now, please ask. If you have questions later about the research, you may contact Kyle Stewart at kyle.stewart@ryerson.ca or Dr. Ron Babin, Associate Director at rbabin@ryerson.ca.

If you have questions regarding your rights as a human subject and participant in this study, you may contact the Ryerson University Research Ethics Board for information.

Research Ethics Board
Office of the Vice President, Research and Innovation
Ryerson University
350 Victoria Street
Toronto, ON M5B 2K3
416-979-5042

AGREEMENT

Your signature below indicates that you have read the information in this agreement and have had a chance to ask any questions you have about the study. Your signature also indicates that you agree to be in the study and have been told that you can change your mind and withdraw your consent to participate at any time. You have been given a copy of this agreement.

You have been told that by signing this consent agreement you are not giving up any of your legal rights.

_____

Name of Participant (please print)

_____   _____

Signature of Participant   Date

_____   _____

Signature of Investigator   Date

Your signature below indicates that you give the researches permission to audio record the interview.

_____

Name of Participant (please print)

_____   _____

Signature of Participant   Date

_____   _____

Signature of Investigator   Date

Appendix F: Questions asked during Semi-structured interviews

1. Please briefly describe the role or responsibility (title, not name) for managing and operating the following IT components:

2. How many service vendors do you currently have?

3. What affects your decision in deciding to outsource? For example, costs, sizing, laying off staff, communication, vendor issues?

4. Please describe how your organization decides to outsource some or all of the IT services.

5. If you have built in-house, why did you decide to do this?

6. What are the benefits that you could expect to achieve from outsourcing?

7. What are your perceived risks surrounding IT outsourcing?

8. At your hospital, what aspects of IT do you consider to be a core competency?

9. What are the key trends in outsourcing that will affect your organization?

10. Has your organization considered a potential shared services model for IT systems?

11. Is there anything we haven't asked, or you would like to add regarding IT outsourcing and the decision factors?

Appendix G: NVivo Word Cloud for selected words within Nodes

Appendix H: NVivo Word Cloud for words across the interviews

Appendix I: Word frequency results across the nodes

Word	Length	Count	Weighted Percentage (%)	Similar Words
costs	5	86	1.13	cost, costly, costs
vendor	6	67	0.88	vendor, vendors
management	10	66	0.86	manage, managed, management, managent, manager, managing
security	8	49	0.64	security
cloud	5	44	0.58	cloud
contract	8	41	0.54	contract, contracts
terms	5	38	0.50	term, termed, terms
risk	4	37	0.48	risk, risks
staff	5	35	0.46	staff, staffs
software	8	33	0.43	software
network	7	32	0.42	network, networking, networks
move	4	30	0.39	move, moves, moving
operators	9	30	0.39	operate, operates, operating, operation, operational, operations, operative, operators
process	7	30	0.39	process, processes, processing

Appendix J: Word frequency results across the interviews

Word	Length	Count	Weighted Percentage (%)	Similar Words
cerner	6	168	0.96	cerner, cerners
managing	8	124	0.71	manage, managed, management, managent, manager, managers, manages, managing
costs	5	106	0.61	cost, costly, costs
application	11	95	0.54	application, applications
cloud	5	95	0.54	cloud, clouds
contract	8	92	0.53	contract, contracted, contracting, contracts
government	10	89	0.51	govern, governance, governed, governing, government, governments, governs
security	8	80	0.46	secure, secured, securities, security, securitys
vendor	6	79	0.45	vendor, vendors
operations	10	68	0.39	operate, operated, operates, operating, operation, operational, operations, operative, operators
network	7	66	0.38	network, networking, networks
infrastructure	14	64	0.37	infrastructure
risk	4	59	0.34	risk, risks
patient	7	55	0.31	patient, patients

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