Abstract

Not-for-profit (NFP) universities in the United States (US) are facing challenges with limited IT funds, and resources, while IT needs, and complexities are increasing. NFP universities have to carefully decide how to allocated limited IT funds among competing projects, how to align IT with university’s strategic objectives, and how to reduce operational costs. With this goal in mind, majority of the NFP universities in the US have founded IT governance. IT governance is accountability and decision rights framework which answers what IT decisions to make, how to make them, who provides input, and who makes decisions. IT governance is well-adopted in for-profit organizations. Although NFP universities in the US have acknowledged the importance of IT governance, and adopted it, it is less than ten years old in most of the universities. This paper explores IT governance in NFP universities in the US, its challenges, potential areas of research, and research methodologies.

1. Introduction

IT needs and complexities in the NFP universities in the US are increasing because of the increase in student enrolment, compliance and regulations, use of internet, mobile devices, and advanced technologies in teaching and research. Many old IT systems, and infrastructure require upgrade, or replacement. Universities are facing the pressure to execute more IT projects, and provide more IT services, while the budget and resource availability remain unchanged. As such, it is critical to make right IT project investment decision, prioritize IT projects, and meet the investment objectives. NFP universities have voiced the challenges below.

“IT budgets in university are fixed, while demand for IT services is increasing” (Weir, 2004, Northwestern University)

"Why do college and university leaders continue to express frustration over the cost of the IT investment and not recognize its value?" (Denna, 2014, The University of Maryland, College Park).

“Competing IT requirements need to carefully evaluated and deployed to ensure the optimal investment of limited funds and resources” (University of Arizona, Office of IT, 2014)

2. Investment on IT Projects in NFP University

NFP universities in the US invest on IT projects to support and enhance teaching, research, and administration (Gayle et al., 2003), meet essentials and strategic need (Hilton, 2009, The University of Virginia), align IT with university’s strategic objectives (Albrecht et al., 2004, University of Cincinnati), business continuity and regulatory compliance, security and data
protection (Yanosky & McCredie, 2008, University of California, Berkeley), create customer focused solution, standardization, and reduce effort duplication (Chavira, 2015, Yale University, The University of Utah).

Table 1. IT Project Investments in NFP Universities in the US

<table>
<thead>
<tr>
<th>Year</th>
<th>Investment Amount</th>
<th>Source</th>
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<tbody>
<tr>
<td>1990s</td>
<td>&gt;$5B</td>
<td>Kvavik and Katz, 2002</td>
</tr>
<tr>
<td>2000s</td>
<td>&gt;$320M in 120 universities &gt; $39M yearly maintenance</td>
<td>Trevvett, 2013</td>
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<tr>
<td>2010s</td>
<td>&gt;50M in single university</td>
<td>Dodds, Fleagle, Patterson, 2014</td>
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3. IT Governance Defined

Weill and Ross (2004) of Massachusetts Institute of Technology, Sloan School of Business define IT governance as the accountability and decisions rights framework, which must address the following three questions:

- Who makes the IT decisions, who provides input
- What IT decisions need to be made, how decisions are monitored
- How conflicts are resolved

IT governance decisions are made on five domains, which are IT principles and strategic need, IT architecture, IT infrastructure, business need, and IT project prioritization (Weill, & Ross, 2004). The purpose of IT governance is to align IT with organization’s strategic need, realize value, manage risk, resource, and meet the performance criteria (Weill, & Ross, 2004). Steven De Haes and Wim Van Grembergen of University of Antwerp, Belgium define IT governance as an organizational capacity to control the creation and implementation of IT strategy to ensure the alignment of business and IT (Grembergen, & De Haes, 2004).

Figure 1. IT Governance Frameworks
4. IT Governance in NFP University

The Association for the Study of Higher Education (ASHE) report from EDUCAUSE in 2003 define IT governance in university as the structure and process to make authoritative decision on the IT issues in the university that have significant importance to internal stakeholders in the university, namely the university employees, students, and also on the external stakeholders, who are vendors, consultants and the community (ASHE, 2003). IT governance in NFP universities is formed of various committees, which provide input, and make decisions on university’s IT investments. These committees decide fund allocation among different IT projects, prioritization of IT projects, and selection of IT products, and vendors for procurement projects. Universities depend on IT governance to make strategic IT decisions that align with objectives of the universities, improve competitive position through IT innovation, IT process improvement, and optimization of cost, resource and risk (Bowen, Cheung, & Rohde, 2007).

![Typical IT Governance Structure in NFP University](image)

**Figure 2. Typical IT Governance Structure in NFP University**

5. Importance of IT Governance in NFP University

Majority of the NFP universities in the US have formed IT governance to aid with IT decisions. A survey of thirty five US universities reveal that these universities use IT governance to make IT project investment decisions (Golden et al., 2007). A survey of over five hundred IT leaders from US universities disclose that the IT leaders in these universities spend most of their time on IT project investment decisions using governance (Allison, & DeBlois, 2008). Chief Information Officer (CIO) of NFP universities play a key role in decisions making using IT governance, and are now a part of the executive cabinet in many universities (Jordan, 2004).

"IT Governance in university is not just about making the right decision every time; rather, it's about the process for decision-making. Good process ensures consistency and accountability; so when something goes wrong (or right!), it's easier to trace what happened and what we can do about it” (Chavira, 2014, Yale University).

“IT governance is important to engage its diverse stakeholders in university, establish priorities for technology investment that are aligned with institutional goals and priorities. IT governance structures and processes influence the development and design of technology services, policies
and solutions. IT governance coordinates services and decision-making between technology organizations in schools and departments and the central technology organization. IT governance groups and processes promote transparency, accountability and dialogue about technology that facilitates effective technology adoption” Goldstein, 2015, Case Western Reserve University.

“A new IT governance structure that defines the decision-making roles and responsibilities and an accountability framework for IT on campus.” is the solution to improve IT investment decision. Office of CIO, 2014, The University of Utah.

"IT governance is a means to ensure effective and efficient use of resources and capabilities across U-M in order to meet the goals of the university.” Office of CIO, 2014, University of Michigan.

6. IT Governance Challenges in NFP University

IT governance in NFP universities is complex, and different from the IT governance structure in for-profit universities. Part of it has to do with presence of both centralized and decentralized structure, operations in silo, and conflicting priorities.

Table 2. IT Governance Challenges

<table>
<thead>
<tr>
<th>IT Governance Challenges in NFP Universities</th>
<th>Source</th>
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<tbody>
<tr>
<td>• Multiple committees add complexity (Teaching, Research, Administration and Student Outreach, Core IT committees) • Volunteer committee members, limited commitment • Centralized and decentralized</td>
<td>IT Governance Structure in University of Illinois, Chicago, Western Carolina University, University of Maryland, College Park, North Carolina State University</td>
</tr>
<tr>
<td>• Difficult to build a consensus on campus wide IT strategy because of politics</td>
<td>Kvavik, 2004, The University of Minnesota</td>
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<tr>
<td>• IT project needs are disparate, and have varying challenges, which cannot be easily compared • Return on Investment (ROI) is impossible to calculate, as many are indirect measures of customer satisfaction and performance • Not profit centers, but seat of learning</td>
<td>Weir, 2004, Northwestern University</td>
</tr>
<tr>
<td>• Leadership lacks interest in IT • Decision making is slow</td>
<td>Golden et al., 2007, Indiana University</td>
</tr>
<tr>
<td>• Dynamic because of change of IT priorities, and leadership</td>
<td>Grembergen and De Haes, 2009, University of Antwerp, Belgium</td>
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7. Knowledge Gap on IT Governance in NFP University

IT governance research is more prevalent in for-profit organizations. A research of over two hundred for-profit organizations in twenty three countries reveal that IT governance has benefited those companies to improve operational efficiency, and competitive position (Weill, & Ross, 2004). A survey of the senior leaders of the for-profit corporations reveal that the senior leaders believe that greater the use of IT governance processes, the more is the value delivery from IT (Benson, Bugnitz, 2009). Similar information is not known on NFP universities.

Table 3. IT Governance Knowledge Gap in NFP University

<table>
<thead>
<tr>
<th>Knowledge Gap</th>
<th>Source</th>
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<tbody>
<tr>
<td>University’s IT governance can draw different responses from different</td>
<td>Gayle et al., 2003, New York University</td>
</tr>
<tr>
<td>stakeholders, as if five blind men are explaining an elephant</td>
<td></td>
</tr>
<tr>
<td>Committee members have varied understanding of IT governance</td>
<td>Kvavik, 2004, The University of Minnesota</td>
</tr>
<tr>
<td>University's strategic goals were not well understood by committee members</td>
<td>Golden et al., 2007, Indiana University</td>
</tr>
<tr>
<td>IT governance is not well defined in NFP universities</td>
<td>Study on Australian Universities, Bhattacharya and Chang, 2007</td>
</tr>
<tr>
<td>Survey of over three hundred participants from different US universities</td>
<td>EDUCAUSE Center for Applied Research, 2008</td>
</tr>
<tr>
<td>report that success of IT investments using IT governance is not always</td>
<td></td>
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<tr>
<td>evaluated</td>
<td></td>
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<tr>
<td>IT decision makers in universities have limited understanding of IT</td>
<td>Study of universities in Thailand, Jairak and Praneetpolgrang, 2011</td>
</tr>
<tr>
<td>governance principles and performance</td>
<td></td>
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8. Problem Statement


It is also known that NFP universities have acknowledged the importance of IT governance framework, and the majority of the NFP universities in the US have founded IT governance framework. But IT governance in NFP universities in the US is less than ten years old, and is an emerging area of research. Following areas are not well known in the context of NFP university.

• How IT governance framework is utilized to make IT decisions?
• How IT governance framework influences the speed, cost, and quality of IT decision making?
• How IT governance influences the success of IT project, post decision?
• Do IT governance, and project management practices cross cut to ensure project success?
9. Potential Research Questions

Decisions made to select an IT project, and to procure an IT product is made using IT governance framework in NFP universities. Potential area to research are how decisions are made to select an IT project, and procure an IT product using IT governance framework in NFP universities.

After the IT project and product are chosen using IT governance, IT procurement projects are initiated and executed. Potential area to research are how IT procurement projects are executed, whether project is complete within time, and budget, and whether success criteria is met. Finally, association could be drawn between IT governance success and project success, if any.

Potential areas of research are:

- How IT governance influences the speed, cost and quality of IT decision in NFP universities?
- How IT governance influences the project management practices to ensure project success?

10. Importance of the Research Study

NFP universities in the US invest on IT projects to meet essential, and strategic IT needs. As IT funds are limited, it is critical to make right investment decision, and meet the investment objectives. It is important to study the conditions that influence decision making process, and how to improve the decision making process. This study is timely, as IT decisions have paramount importance on the sustenance and growth of NFP universities.

“One of the most difficult questions in universities is where to invest limited IT resources for maximum benefit, which is made more difficult with constrained and shrinking IT budget with increase in demand for IT projects” (Weir, 2004, Northwestern University).

“It is important to study whether the IT investment decisions improve teaching, learning, research, university operations, decisions making, communication, collaboration and risk management” (Denna, 2014, The University of Maryland).

It is hoped that the studies in this area will contribute to the knowledge on how IT governance in NFP universities influence speed, cost and quality of IT decision making. IT decision makers in NFP universities can use this knowledge to improve IT decision making under IT governance.

11. Research Methods

Research will involve literature review, approval from Institutional Review Board (IRB), as it may include human subject research and interviews.
Research Mental Model

- Literature Review
- IRB Approval

Conduct Study on Multiple Cases:
- Single IT project in a NFP university is one case
- One, or more cases from a single NFP university
- Cases from multiple NFP universities

Gather Data from Multiple NFP Universities:
- Interview IT Governance committee members
- Project documents and archives

Answer Research Questions:
- How decisions are made to investment on IT projects using IT Governance framework in NFP universities?
- How project management practices contribute to project success, post decision in NFP universities?

IT Governance Cross Case Analysis using QCA
- IT Governance conditions:
  ØNumber of IT committees
  ØNumber of procurement bids
  ØStructure (Centralized, or Decentralized)
  ØLevel of communication
  ØNumber of conflicts
- IT Governance Outcomes:
  ØSpeed of decision making
  ØTransparency in decision making

Project Management Cross Case Analysis using QCA
- Project management conditions:
  ØProject budget
  ØProject duration
  ØProject resource
  ØProject management practices
- Project management outcomes:
  ØOn time
  ØWithin budget
  ØMeet performance criteria

Knowledge Contribution:
- Investment decisions on IT projects in NFP universities using IT Governance
- Factors influencing speed and transparency of IT decision making
- Project management practices overlapping with IT governance decision making
- Use of QCA for IT governance research

Figure 3. Research model

11.1. Case Study

Case study asks why a decision was made, how to carry out the decision, and what results were obtained because of those decisions (Schramm 1971). Theory could be generated from a case study, or a hypothesis could be tested in a case study (Eisenhardt, 1989). Multiple cases are used to replicate the theory, triangulate evidence, match patterns, find additional details, analyze variations (Yin 2013). However, it is neither necessary, nor even preferred to have random selection of cases because, it is more important to choose cases based on theoretical sampling, where the additional cases may either replicate or augment the theory to be built in the case study (Eisenhardt, 1989). Due to the complex and contemporary nature of IT governance and paucity of cumulative research, case study is a good fit for IT governance research on IT projects (Ribbers et al. 2002). Multiple IT projects from multiple NFP universities could be selected for the research.

11.2. Interview and Content Analysis

Case study may include qualitative documents, quantitative data, observation, questionnaire, survey, interview, which could be gathered from a single source, or multiple sources of evidence (Yin, 2013). Eisenhardt (1989) is her seminal case study research on studying how IT decisions are made in microcomputer industry, uses interviews and quantitative data. She studied eight
different microcomputer firms, and collected data by interviewing employees with different roles in the firm. For each firm, she interviewed top IT manager, functional manager, and non-management employees. She gathered quantitative data from questionnaires, which asked questions on conflict and power. Industry reports and internal documents were used as secondary source of data. From the interview responses obtained, she did pattern matching and content analysis. Finally, she formulated propositions, and supported them based on the data collected. Similar approach with interviews can be used on IT governance research.

11.3. QCA
Qualitative Comparative Analysis (QCA) was introduced by Charles Ragin in the 1980s. QCA is capable of pinpointing cross-case patterns, complex causal relationships between cases, and can be useful in research designs involving small and intermediate-size, e.g., five to fifty cases (Ragin, 1989). The underlying logic of QCA is, causes combine, which in turn, provides a better bridge to case-level investigation and analysis than an assessment of their net effects (Rihoux, & Ragin, 2009). QCA is well suited for the analysis of causally complex claims framed in terms of necessity and sufficiency and is considered a “third way” between “qualitative” and “quantitative” methods, and it is based on the assumption that “many roads lead to Rome” (Wagemann, & Schneider, 2010). Internal validity is tested by ensuring that the selected cases and values show both positive and negative outcomes, and variables vary between cases (Rihoux, & Ragin, 2009).

Because of complex causal conditions of IT governance, and ability of QCA to find causal conditions from small number of cases, QCA is a good fit to study IT governance conditions and its outcome. A single IT project selected under IT governance in NFP university can be considered as a case. Conditions and outcome of IT governance can be selected from literature review, and interviews with IT governance committees from NFP universities. Based on the data collected on conditions and outcome, and the threshold assigned, the values of the conditions can be coded as boolean (0 being absent, 1 is present), multi-value attribute (0 being low, 1 being medium, and 2 being high), or fuzzy value (scale of 1 to 10), if additional granularity needs to be preserved. QCA analysis will use truth table, minimization of conditions to analyze how IT governance conditions contribute to outcome.

12. Conclusion

Given the importance and high adoption of IT governance in NFP universities in the US to make key IT decisions, it is important to study how IT decisions are made under IT governance framework, and how IT governance contributes to speed, cost and quality of IT decision. Given the emergent nature of IT governance in NFP university, many research questions can be formulated to explore IT governance framework in NFP university, and how IT governance practices contribute to project management practices, post IT governance decision. Because of limited availability of data, complexity of causal conditions, case study, and QCA are good fit as research methodologies.

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