Insights into IT Governance Teaching in Tertiary Education

Hasna Bakhuraybah[1*], Walaa Mal[2], Heba Fasihuddin[3***]**

hbakhuraybah.stu@uj.edu.sa   wmal.stu@uj.edu.sa   hafasihuddin@uj.edu.sa

University of Jeddah, College of Computer Science and Engineering, Department of Information Systems and Technology, Jeddah, Saudi Arabia

Summary

Information Technology Governance (IT Governance) becomes a fundamental for any organization, as it supports decision making as well as the strategic alignments between IT resources and business goals. IT governance is an emerging field and yet to be applied by various sectors in Saudi Arabia. IT practitioners in different sectors are witnessing the need to adopt IT Governance; however, it is believed that many lack the efficient knowledge and require some training and self-learning to address their daily tasks in this field. This study focuses on IT governance teaching in Saudi Arabian tertiary education and measures IT governance awareness among IT graduates and IT employees. Research methods involve conducting an online survey that was targeting IT graduates and IT employees with the goal to measure their level of knowledge about IT governance. In addition, in order to find the level of teaching IT governance in Saudi higher education, a review of all Saudi universities websites were conducted checking their offered programs and courses. 231 responses were collected and 45 universities websites have been checked. This study found that there is a shortage in teaching IT governance in Saudi universities, which leads to insufficient knowledge of IT governance among IT graduates. Therefore, the authors recommend considering the concept of IT governance in undergraduate and graduate teaching in such a way that ensures a proper preparation for work field. Based on the authors knowledge there is no previous study that focuses on measuring the level of IT governance awareness among IT graduates and the needs of considering this in tertiary education in Saudi Arabia.

Keywords:
Information Technology Governance; IT Governance Teaching; IT Governance in Saudi Arabia; IT Governance Awareness in Saudi Arabia.

1. Introduction

Information technology (IT) impacts almost every aspect of the organizations, from board members, executives, managers, employees, vendors and customers. With such a wide scope, the impacts of IT decisions should not be undervalued. Information technology governance (IT governance) supports the organizations improve their strategic decisions by counting the stakeholders in the decision-making process [1]. IT Governance is a subset of Corporate Governance and it is concerned about the efficient and effective use of IT assets to achieve the organizations' business goals [2].

Tertiary education refers to the education beyond high school level provided by universities and colleges. It is a necessity for tertiary education to be in track with the industry changes and technology innovations as this contributes in improving the graduates' readiness, knowledge and skills to overcome the work-life challenges as well as increasing job opportunities.

This research paper investigates the level of teaching IT governance in tertiary education in Saudi Arabia. The main motivation in conducting this study is the fact that Saudi organizations are in the direction of adopting IT governance as part of the digital transformation that complies to the country vision [3]. To achieve the goal of this study, first a literature review of IT governance and in particular in Saudi Arabia is conducted. Then, an exploration of the current state of IT governance teaching in Saudi higher education institutes is held, in which all universities' websites in the country were checked [4]. In addition, the awareness of IT graduates and employees of IT governance is measured through an online survey.

The overall structure of the paper takes the form of six sections, including background, methodology, results, discussion of findings and finally the conclusion.

2. Background

In the year 1991, the term IT Governance was used for the first time in IT literature by Venkatraman who defined IT governance as the method that describes how IT mediates business relationships through an IT system [5]. In 1998, the Information Systems Audit and Control Association (ISACA) established the IT Governance Institute to advance the knowledge and standards of IT controlling and directing [6]. ISACA is an education foundation that has a large-scale research effort to expand the IT governance and control field knowledge value [7]. Effective IT governance programs ensure that IT strategies, policies, procedures, and initiatives are aligned with the organization's goals. IT governance includes people and compromise processes, tools and methodologies to guide the decision making about the IT

concerns [8]. IT governance includes several activates such as but not limited to, managing the IT critical resources to control IT initiatives planning, measuring IT performance, managing IT risks and providing risk mitigation strategies, cooperating with IT portfolio management to optimize IT investment and providing a framework to ensure all IT initiatives deliver business value [6], [9].

In simple words, IT governance structures how organizations align both IT strategy and business strategy to achieve their goals and measure IT performance. It makes sure that IT processes provide measurable results through impacts performance factors. The IT governance goal is to assure that the IT investments generate business value, and risks associated with these investments are mitigated by implementing governance and controlling frameworks.

A study highlighted that IT governance is a fundamental for any organization because it represents the key of realizing the business value of IT, as it describes the IT decision making responsibilities among the organization different stakeholders, and defines the procedures and methods for making and monitoring IT processes [10].

Moreover, Pereira and Silva revealed in another study that IT governance has been in the Chief Information Officer top issue list because of the complex IT governance frameworks and they highlighted the importance of having guidelines and initial roadmaps to achieve the IT and business alignment [11]. This shows the significance of teaching the concept of IT governance and having the main principles in this field, which consequently inspire the authors to conduct this study.

Organizations implementing IT governance programs are making more strategic IT investment decisions [8]. A study by Pereira and his team found that implementing IT governance frameworks in an organization supports the IT investment decision making process by contributing to the development and maintenance of the IT investment lifecycle [12]. IT governance enhances the lifecycle by the following activities: prioritizing the organization's demands, realizing business benefits out of that IT investment, reducing the investment-related risks, involving all the stakeholders and improving communication, and finally ensuring the IT investment value and quality [12].

Adopting IT governance is now becoming vital to many organizations globally due to its benefits. Many prior studies noted the necessity of implementing IT governance. A recent study [3] aimed to determine the level of IT governance in Saudi Arabia and the relationship between IT governance and the organizations' performance in 131 organizations. The study showed that IT governance positively impacts the operational performance of the organizations; However, the researchers noted that only 15% of the organizations have IT members with sufficient IT governance knowledge and they reported the need to take an urgent actions to activate IT governance in Saudi organizations [3].

Another study discussed the IT governance role in enhancing IT portfolio management, the researcher investigated the implementation of the four IT governance pillars, which are accountability, transparency, participation, and predictability in Saudi private sector organizations. The quantitative analysis showed that there is a significant relationship between IT governance and its pillars, as well as the IT portfolio management [13].

In term of IT governance education, Carrway and group of researchers noted that, establishing a higher education IT governance program has to be a priority and its importance should not be underestimated. This due to the importance of IT governance in organizations and how it contributes in achieving a successful IT strategy [1]. The same study provided a high-level agenda of the concepts that need to be considered when creating an IT governance program, which includes [1]:

- Identifying the goals of IT governance.
- Reviewing literature and organizations' IT governance processes.
- Reviewing the IT governance activities.
- Reviewing the type of decisions that IT governance makes and the stakeholders.
- Comparing organizations before and after IT governance.
- Defining the initial structure of IT governance and what processes does the IT governance improve.

The previous literature review, draw the attention to the importance of considering teaching the concept of IT governance in higher education, and how this could contribute in rising the opportunities of fresh graduates to find jobs in this field. Next section presents the research methodology of this study.

3. Research Methodology

To gain a better insight into the current state of IT governance teaching in Saudi tertiary education, data was collected by a research in the Academic courses and programs available in all the tertiary institutions' websites in Saudi Arabia and it covered all computing and IT-related programs. This helped in identifying the universities and colleges that teach IT governance. According to the Saudi Ministry of Education, the tertiary

education in Saudi Arabia consists of 64 tertiary institutes and includes 14 private universities [14], 29 government universities [15] and 21 private colleges [16]. Despite the number of institutes, our study reveals that not all of them provides IT-related programs, as only 12 private universities, 27 government universities and 6 private colleges offer such programs.

To measure the awareness of IT graduates and employees about IT governance, quantitative data was collected by a survey that distributed online targeting IT graduates and IT employees. The objective of the survey was to explore the level of education of the IT graduates and employees, their familiarity about IT governance and the source of their knowledge, and whether the organization they work at has IT governance section. The survey consisted of 7 multiple-choice questions and 2 open questions. The first question in the survey asked about the educational institute to collect data about the institutes' names weather it teaches IT governance courses or no and to exclude answers from non-Saudi universities. The second question asked about the graduation year to collect data about when the IT students graduated with a background in IT governance. The third question asked about the level of education to assist finding at which level the participants learned IT governance and what is the education level of the IT employees who are familiar or not familiar with IT governance. The fourth question asked about the occupation to have insights about the IT students and whether the employees have IT governance section in their organization or no to collect data about the organizations' adoption of IT governance. The fifth question was the most important question, asked the respondents about whether they are familiar with IT governance concept or no. To collect data about the IT governance knowledge source, the sixth question asked about the source of IT governance knowledge. For those who learned IT governance in their tertiary education, the survey asked at which educational level they learned it to collect data about the program's level which teaches IT governance. The survey was distributed through emails, social media and LinkedIn targeting all the IT graduates and IT employees in Saudi Arabia. The survey received 231 responses. The results and findings are reported in the following section.

4. Results

This section presents the results of this study. In regards to the IT governance courses provided in Saudi higher education institutes, the search in websites of universities and colleges around Saudi Arabia revealed that only 4 government universities teach IT governance as a course

in Master program, and these universities are King Abdulaziz University, King Saud University, University of Jeddah and King Faisal University. Moreover, it was found that two of these universities- University of Jeddah and King Saud University- teach the concept of IT governance as a course in Bachelor program. It should be noticed that this result is based on the websites search and the data provided at the time this paper was written in March 2020.

In regard to the survey, the main focus of the survey is measuring the awareness of IT governance among IT graduates and practitioners and finding the level of adopting IT governance in their workplace. It also focused on measuring the respondents' level of knowledge in IT governance and the source of this knowledge. The overall number of responses were 231 and the respondents were from 22 different tertiary institutes graduated between the year 2007 and 2020. Their level of education ranges from diploma to doctorate, as 73% are Bachelor degree holders, 18% are with Master degree, 9% with Diploma and 0% Doctorate as shown in Fig.1.
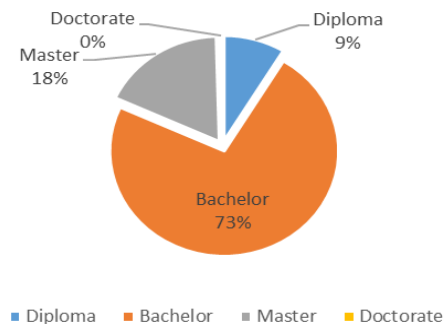

Fig.1 The respondent's educational level.

Regarding the occupation, 57% of the respondents are employed, 21% are senior students, 15% are unemployed and 7% are unemployed but with experience as shown in Fig.2.
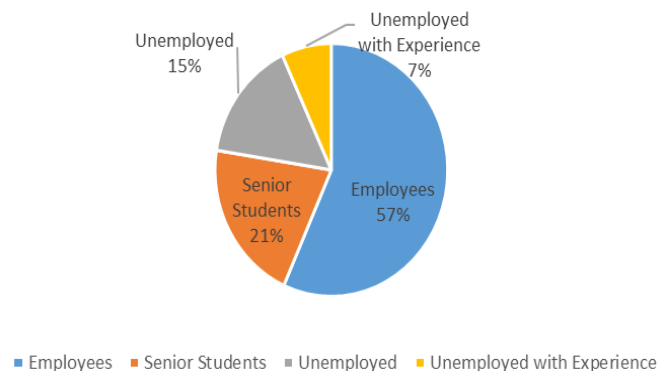

Fig. 2 The respondent's occupation.

For the respondents' familiarity with IT governance concepts 55% of the respondents where not familiar while 45% were familiar. Although 23% of the employees respondents answered that there is an IT Governance department in their organizations, the results showed that only 45% of the employees classified themselves familiar with the concept of IT governance. For the senior students, only 19% of them learned IT governance at their tertiary institute.

In terms of the resources of their knowledge, 33% of respondents learned about IT governance in tertiary education and their graduation year ranged from 2016 to 2020, 30% from self-reading, 24% from work while 6% learned IT governance from training course and 7% of them develop their knowledge from LinkedIn, as shown in Fig.3.
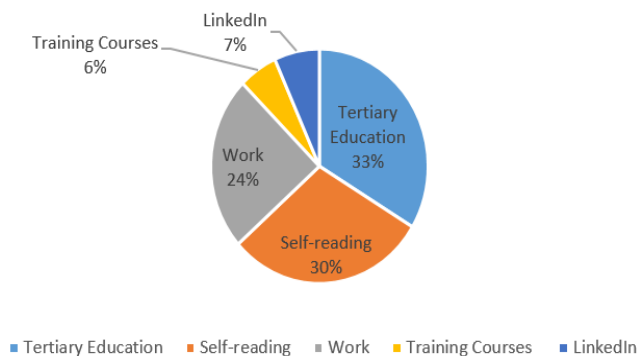

Fig. 3 The respondents' IT governance knowledge source.

In addition to the previous figures, it was found that 78% of respondents with IT related Bachelor degree lack the knowledge of IT Governance. Furthermore, only 9% of them learned the concept from their study at the university while 13% learned it from other resources. The next section will discuss all findings, results, and reviews of this study.

5. Discussion of Findings

The introduction of this paper illustrated the importance of IT governance to organizations and how it affects the organization's performance and IT decision-making. The study focused on measuring the level of awareness among IT graduates and the level of providing the topic of IT Governance in Saudi higher education. As shown in the previous section, the number of educational institutions who offer the IT governance courses is very limited which leads to a very modest level of awareness among graduates. Therefore, the authors believe that offering IT

governance courses or at least topics are needed at the universities and colleges in order to enrich the graduates awareness and knowledge level. Consequently, the awareness and utilization of IT governance can be improved since a low percentage of IT practitioners were found aware about IT governance.

IT graduates need to know the IT governance pillars in order to enhance their thinking about cost monitoring and expenses reduction, as the pillars are the improvement indicators for the organization's IT portfolio management. Also, both private and government sectors in Saudi Arabia are realizing the importance of IT governance, and in some cases there is a specialized department which is concerned about the IT governance for the organizations. Most organization in Saudi Arabia are working hardly toward the digital transformation in an optimal approach, and this embodies great chance for IT graduates to find work opportunities. Therefore, having adequate knowledge of IT governance is a real gain as the results showed high percentage of graduates are not familiar with IT governance concepts.

Tertiary education can contribute to deliver the IT governance knowledge and its framework implementation by providing the general guidelines of IT governance beside the implementation main processes. This will help in minimizing the difficulty that graduates face in work field. It will be very beneficial if universities and colleges teach the IT governance frameworks through case studies as this allow students to realize the real benefits of considering IT Governance and the difference that it makes.

The majority of the respondents who are aware of IT governance, know it from other resources not tertiary education as the number of universities who teach IT governance is low compared to the total number of universities. Besides, high percentage of respondents hold Bachelor degree and do not know about IT governance which is disappointing considering the fact that it becomes a must in most organizations. It is believed that offering the concept of IT Governance in tertiary education may develop students skills in decision making and critical thinking, which support them in work fields as making the right decisions and developing the right IT policies and procedures is the success factor for any IT worker and future CIO.

To sum up, it is found that the number of organizations that adopt IT governance in Saudi Arabia is high, while a knowledge gap within IT practitioners is noticed. Most of the employees learned IT governance by practice in work, which sounds good but causes real difficulties and challenges that can be easily addressed through educational institutions.

6. Conclusion

The purpose of this study is to measure the awareness level of IT Governance among IT graduates and employees, and the level of teaching it in tertiary education in Saudi Arabia. The results lead the authors to recommend more consideration of IT governance courses and topics in tertiary education, as it builds skills and improves the graduates' readiness to work in any organization.

There are some limitations to this study. First, the sample size is small in comparison to the number of Saudi Arabia IT graduates and employees. Second, the web search of IT governance courses was not expanded to check the courses' details and topics as information provided online are limited. Moreover, it was not possible to achieve representatives of each educational institution to assure the courses content and topics or even to assure the training that student receive. Thus, the results represent the collected data and some variance is possible. Despite the mentioned limitations, the study revealed the real need of teaching IT governance whether in higher education institutes or through other institutions. Although the result was conducted in Saudi Arabia, it can be assumed that similar issue is exist in other countries. Future research may involve larger samples from different regions, so that more insights can be found.

References

[1] D. Carraway, K. Arrud, J. Hagins, Br. Martinez, H. Molina, J. Perry, R. Stingel, and C. Will, "Higher Education IT Governance Checklist," no. March, pp.1–15, 2017.

[2] "IT Governance (ITG)," https://www.gartner.com/en/information-technology/glossary/it-governance, accessed Mar. 1. 2020.

[3] A. Hamdan, R. Khamis, M. Anasweh, M. Al-Hashimi, and A. Razzaque, "IT Governance and Firm Performance: Empirical Study From Saudi Arabia," SAGE Open, vol.9, no. 2, p.2158244019843721, Apr. 2019.

[4] "Kingdom of Saudi Arabia - Ministry of Education," Ministry of Education Electronic Gate, accessed Feb. 23. 2020.

[5] H. C. C. da Silva, D. S. da Silveira, J. S. Dornelas, and H. S. Ferreira, "Information Technology Governance in Small and Medium Enterprises - a Systematic Mapping," JISTEM - J. Inf. Syst. Technol. Manag., vol.17, 2020.

[6] M. Rouse, "What is IT Governance Institute (ITGI)?" .

[7] "About Us," https://www.isaca.org/why-isaca/about-us/history, accessed Feb. 29. 2020.

[8] J. Grama, "Understanding IT GRC in Higher Education: IT Governance," https://er.educause.edu/articles/2015/2/understanding-it-grc-in-higher-education-it-governance, accessed Feb. 28. 2020.

[9] L. Gunawardena and L. Ramesh, "IT Governance: Why Its Important | Architecture & Governance Magazine," https://www.architectureandgovernance.com/it-governance/understanding-governance-often-fails/, accessed Mar. 4. 2020.

[10] R. Peterson, "Crafting Information Technology Governance," Inf. Syst. Manag., vol.21, no. 4, pp.7–22, Sep. 2004.

[11] R. Pereira and M. Mira da Silva, "A Literature Review IT Governance Guidelines and Main Areas," ACM Int. Conf. Proceeding Ser., Oct. 2012.

[12] C. Pereira, C. Ferreira, and L. Amaral, "Shape a business case process: An IT governance and IT value management practices viewpoint with COBIT 5.0," Atas da Conf. da Assoc. Port. Sist. Inf., vol.17, pp.60–75, 2017.

[13] W. Afandi, "Information Technology Governance Role In Enhancing It Portfolio Management: A Case Study On Saudi Arabia Private Sector," Paideuma (Wiesb)., vol.12, no. 090–5674, pp.78, 96, 2019.

[14] "High Education Private Universities," https://departments.moe.gov.sa/PHE/UnivAndCollageList/Pages/جامعات-التعليم-الجامعي-الأهلية.aspx, accessed Feb. 27. 2020.

[15] "Government Universities List," https://www.moe.gov.sa/AR/HIGHEDUCATION/GOVERNMENT-UNIVERSITIES/LISTOFUNIVERSITIES/Pages/default.aspx , accessed Feb. 27. 2020.

[16] "High Education Private Colleges," https://departments.moe.gov.sa/PHE/UnivAndCollageList/Pages/كليات-التعليم-الجامعي-الأهلية.aspx, accessed Feb. 27. 2020.

Hasna Bakhuraybah is an IT Risk and Governance Senior Specialist at Nahdi Medical Company, Saudi Arabia. She received her BSc degree with first class honors in Computing Information System from King Abdulaziz University, Saudi Arabia, in 2016. She earned an MSc in Enterprise Information Technology from The University of Jeddah, Saudi Arabia, in 2020. Her research interests include IT governance, risk management, e-government, and open-source enterprise resource planning. She has published several publications in peer-reviewed journals.

Walaa Mal is an IT Technical Support Engineer at Gulf Medical Company, Saudi Arabia. She received her BSc degree in Information Technology from King Abdulaziz University, Saudi Arabia in 2016. She earned an MSc in Enterprise Information Technology from The University of Jeddah, Saudi Arabia, in 2020. Her research interests include enterprise resource planning, strategic information systems, IT governance,

and e-government. She has published several publications in peer-reviewed journals.

Heba Fasihuddin is an Assistant Professor at the department of Information Systems and Technology in the College of Computer Science and Engineering at The University of Jeddah, Saudi Arabia. She received her BSc degree in Computer Science from King Abdulaziz University, Saudi Arabia, in 2004. She also earned an MSc degree with first class honors in Information Technology from the University of Newcastle, Australia, in 2011. She awarded her PhD degree in Information Technology from the same university in 2015. Her research interests include adaptive and intelligent systems for collaborative open learning, IoT, applied information systems, and healthcare knowledge management. She has published several publications in peer-reviewed journals and conference proceedings.