

EXPLORING THE ROLES AND LEADERSHIP BEHAVIOR OF CHIEF INFORMATION OFFICERS (CIOS): CASE STUDIES OF TWO PUBLIC UNIVERSITIES IN MALAYSIA.

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ABSTRACT: Chief Information Officer (CIO) plays a very important role in an organization as CIO is the IT leader who ensures effective IT employment in organizations. The aim of this study was to explore the roles and leadership behaviors of the CIO in HEIs in Malaysia. This study, which employed semi-structured one-on-one interviews, was conducted with former and current CIOs of two public universities of Malaysia. The interviews were transcribed, and the interview data were analyzed thematically. The results indicated that the main roles of CIOs are managing IT infrastructure, handling HEI's IT requirements, governance of IT in HEIs and strategic planning. It was also found that CIOs should have interpersonal skills, IT knowledge, managerial knowledge and skills and knowledge about HEIs' requirements. Furthermore, CIOs should exhibit Transformational and Transactional leadership behaviors to be effective IT leaders.

KEY WORDS: Role, Leadership, Behaviour, CIO.

1. INTRODUCTION

The use of Information Technology (IT) for the enhancement of learning, teaching, research and management of Higher Education is necessary to improve the quality of Higher Education Institutions (HEIs) (Khouja, Rodriguez, Halima, & Moalla, 2018). As IT has become one of the integral part of the HEIs, over the years many institutions have created an executive position to manage IT whose title is used in various ways to designate the IT leader including the names head of IT, IT director and IT manager (Cook & Sutherland, 2014). Over the past 20 years, the term used to refer to this position (the head of IT or IT leader) is the Chief Information Officer or CIO (Dlamini, 2015).

Research shows that CIOs are uniquely positioned, and their work was poorly understood (Hickman & Akdere, 2017). Tripathi and Khazanchi (2018) pointed out that there is limited researches in the domain of IT leadership and decreasing publication rate since 2014. Some of the researchers have adopted various approaches to understand how the organizational role of CIO evolved. Although these researches focusing on role of CIO in different fields enrich the literature, there is still ambiguity in the current description of the role of CIO in both research and in practice (Hütter & Riedl, 2017).

Hence the objective of this paper is to find the strategic and leadership role of CIOs, what skills and aspects are important for CIOs to be successful and what leadership behaviors are exhibited by successful CIOs. The focus of this research is in the context of higher education in Malaysia as suggested by Ghawe and Brohman (2016) that studying CIO's role in specific sector of the industry has the potential to enrich our understanding of the demands and challenges faced by both CIOs and the organization.

2. LITERATURE REVIEW

The studies conducted on the role of CIO in organizations point out several and diversified roles. A study conducted by Araújo and Pedron (2015) highlighted the key roles of CIO including the management of three key information technology service areas, the management of production, customers of IT and technological aspect of the function. According to Hütter and Riedl (2017), the CIO is considered one of the most important personnel in the sourcing and deployment of IT to cater to the demand of organization. The efficient and effective technology supply is considered as the main responsibility of the CIO (Hütter & Riedl, 2017). Top 10 IT issues of 2020 by Educause highlighted the importance of CIO role in the higher education institutions as an integrative CIO. The issue of CIO is listed as number 10 in their list for repositioning or reinforcing the role of IT leadership as an integral strategic partner of institutional leadership in supporting institutional missions.

Several studies point out the changing role of the CIO due to institutional demands. The role of the CIO is undergoing transformative changes as higher education institutions advance through the use of technology as per institutional priorities (Top 10 IT Issues, 2020). The position of IT executive has evolved from just being the head of IT to that of a strategic leader who makes vital decisions that are responsible for the development and implementation of projects that are closely associated with the mission and vision of the institutions (Dlamini, 2015). Furthermore, the role is being changed from technical, operational to that of enabler, innovator and strategist. CIOs' personal competencies along with capabilities and skills can transform IT resources into a competitive advantage within the organization. (La Paz, 2017). According to Pinho and Franco (2017), CIO needs to have vast experience in leadership and management to (a) manage IT resources, (b) make sure the information system is always up and running, (c) manage data, (d) IT governance, (e) IT value conversation, (f) get the finances right, (g) build strong IT teams, (h) establish authority in IT governance and (i) maintain the equilibrium between IT investments and the core missions of HEIs.

Some of the studies highlighted the important skills and qualifications of the CIO which make them successful. A study conducted by Dlamini (2015) found that CIOs need to have people skills, good communication skills, and interpersonal skills. The CIO holds the responsibility for running and managing the information systems and IT infrastructure of the organization while displaying effective leadership skills (Hickman & Akdere, 2017). Apart from the technical knowledge about IT, CIO should also have business knowledge which is the knowledge about the industry they are working in (Araújo & Pedron, 2015). As IT usually does not stand alone as a single organization, most of the organizations integrate IT to

achieve their business objectives and to gain competitive advantage. Hence, they should understand the organizational goals and adapt the IT systems as per the requirement of the organization (Eom, Kahai & Yayla, 2015).

According to Catalano (2019), responsibilities, skill sets, and mindset of CIOs in higher education have expanded around industry needs. The CIOs in higher education is thinking and acting strategically, delegating and outsourcing, and balancing mobility, agility and cost-efficiency with holistic view of technology to cater the fast pace transformation in today's higher education institutions.

3. METHODOLOGY

This study employed a qualitative approach to explore the strategic and leadership role of CIO in HEIs of Malaysia. The data on CIOs roles were collected via semi-structured one-on-one interviews with the former and current CIOs whose answers were recorded and transcribed to answer the desired research questions. The Interviews were recorded and transcribed and then themes were generated to find the answers to the research questions.

The participants of the study were selected from two public universities in Malaysia. All participants had the experience as a CIO of a public university and their knowledge and experience in the field could provide rich data to address the research objectives. All the participants are male CIOs who have 5 or more years of experience in the field.

The central questions asked in the interviews were (i) What is the nature and role of the CIO in HEIs of Malaysia? (ii) What are the leadership behaviors exhibited by the CIOs of HEIs in Malaysia?

4. RESULT AND DISCUSSION

This section of the article presents the discussion of the themes from the interviews. When the interview data were analyzed, three main themes emerged, each of which was constructed from emergent themes. All the themes were created from the participants' description about their views as the strategic and leadership role of CIOs and their leadership behaviors in HEIs of Malaysia. The results in this section would be presented by analyzing each interview question. Table 1 given below describes the themes and subthemes that were generated from the interview data.

Table 1: Themes and subthemes generated from interview data

Main Theme	Sub Themes
The Strategic Role of CIO in Malaysian HEIs	Managing IT infrastructure Handling HEI's IT requirements IT Governance Strategic Planning
Important Aspects of CIO	Interpersonal Skills IT knowledge Managerial Knowledge and Skills Knowledge about HEIs' requirements
Leadership Behaviors of CIO	Transformational Leadership Behaviors Transactional Leadership Behaviors

4.1 The Strategic Role of CIO in Malaysian HEIs

The analysis of interview questions revealed that the role of CIO in HEIs of Malaysia are multifold. The interviewees highlighted several roles of CIO in HEIs of Malaysia which includes managing IT infrastructure, handling IT requirements of the institutions, IT governance and strategic planning.

4.1.1 Managing IT infrastructure

The CIOs' response revealed that one of the main roles of CIO in HEIs of Malaysia is to handle IT infrastructure of the HEIs. One of the CIOs highlighted this by saying that *"CIO supposed to look over the computing infrastructure, make sure it meets the university requirements, fulfils university requirement and it is updated securely, and the users are happy"*. This was supported by two more CIOs who claimed that *"CIO roles comprise handling IT infrastructure"* and *"responsible for ICT development including basic ICT facilities of IT infrastructure"*. These claims point that CIOs of HEIs of Malaysia feel the importance of looking after the IT infrastructure in the institutions, enhancing it to deliver the mission and vision of the institutions. Furthermore, IT infrastructure has to be maintained well to cater for the rapidly changing environment of HEIs. According to Pinho and Franco (2017), with the modern university requirements, CIOs are being challenged to replace old and inflexible IT infrastructure with more robust and integrated systems. Hence one of the main roles of CIO is to ensure that IT infrastructure and services are in sync to meet the institutional needs (Dlamini, 2015).

4.1.2 Handling HEI's IT requirements

Another main role of CIO highlighted by the participants of this study is the responsibility of overseeing that IT services are effectively and efficiently employed in all the departments of the HEIs. One of the CIOs highlighted this by saying that *"we offer our services to the faculties and the rest of university, to finance, to HR, so across the university"*. While another CIO pointed that *"Streamlining and consolidating functional processes between departments to produce more efficient services"* as one of the main roles of CIO in the HEIs.

The CIOs also pointed the importance of matching or aligning the IT strategic plans and infrastructure with the need of the university. One of the CIOs highlighted

that “We have our strategic plan which will match or align the university requirements, for example when we do something it has to be like cascade balance score card idea, it has to cascade from the university level planning or strategic plan to the respective Kulliyah, Center and Department, and Division”. Hence with different cultures dominating in HEIs, the CIOs should focus on real purpose of higher education and cater to enhancing the purpose (Dlamini, 2015).

4.1.3 IT Governance

The CIOs who participated in this study highlighted their role in IT governance in the university. One CIO highlighted the value delivery and IT strategic alignment as “to look at the big picture, and make sure we deliver value and is aligned to the university requirement, university vision”. When it comes to IT resources “both technical and staffing, in terms of ICT resources it was distributed.” So the CIO decided to “we centralize the resources.” CIO also focuses on performance management through monitoring staff members as he mentioned “whether certain things are being done properly or not, what is their performance, whether we are meeting target or not? So, in meetings I would basically tell them what need to be done.” CIOs participation in IT governance is one of the themes found from research (Dlamini, 2015). Pinho and Franco (2017) highlighted that CIOs must manage IT resources, ensure the uptime of the systems, data management, IT governance, and IT value delivery.

4.1.4 Strategic Planning

One of the main roles of CIO as highlighted by the participants of the interview is CIO as a strategist who plans and employs IT related tasks in the HEIs. They noted that CIO has “become a key driver in the planning of strategic ICTs and ensure the implementation of the planned plans which will facilitate the university’s mission and vision”. One of the participants explained the development of IT strategic plan as “CIO is involved with the team to develop the university strategic plan. The university strategic plan being higher institution must focus, they must focus on the main domains; its about teaching and learning, research consultancy, and about student development... that strategic plan at the university level it will cascade down the ICT strategic plan for the university”. Furthermore, CIO should “Promote effective and efficient use of IT to achieve the agency’s strategic goals and act as a pioneering change agent. Lead and engage agencies in government efforts to develop and implement public sector IT projects that bring change in the management and administration of Public Services”. This is in agreement with the finding of Dlamini (2015) which suggested that CIOs has to be good institutional strategists as the HEIs are depending on them to integrate dynamic uses of IT to achieve the organizational goals.

4.2 Important Aspects of CIO

The CIOs who participated in this study highlighted several important aspects and features that CIOs should have in order to be successful and effective CIOs. This comprises knowledge and skills that CIOs should possess. Though traditionally CIOs are seen as people who handle only IT related issues of the institutions, these CIOs emphasized the non-IT requirement of the CIOs. CIOs stressed that “... But now we are saying that the trend they are giving more

responsibility to the CIO to look into the corporate, talk about enterprise wide requirement.” Hence the aspects underlined in this theme includes CIOs having interpersonal skills, IT knowledge, managerial knowledge, and skills and knowledge about HEIs itself.

4.2.1 Interpersonal Skills

All the CIOs participated in the study highlighted several interpersonal skills that are crucial for an effective CIO. One of the CIOs pointed out that *“As CIO post is a high-level post, we have to be able to navigate through the politics of the university, that is like handling user complaints, user dissatisfaction and the other problems that you face. So, everything depends on how you handle the situation, so people skill is very important to me”*. These CIOs outlined several important skills that are necessary to decrease the bridge between the employees and other users of IT in the institution. These skills include the ability to negotiate, communication skills, ability to listen to others, be a good team player, handling problematic situations and political savviness.

These are in line with the study by Chatterjee et al. (2018) which found out that interpersonal skills like communicative ability and political savviness are interpersonal skills that improve the effectiveness of CIO.

4.2.2 IT Knowledge

One of the crucial qualities of a CIO is to have the necessary IT knowledge to become a CIO in the first place. The CIOs stressed that any CIO should be *“very competent in technical requirement”* and *“should have technical knowledge, that is the IT knowledge has to be very strong”*. These CIOs believe that IT knowledge is important to make strategic decisions and in providing consultations in important matters of HEIs. According to Dlamini (2015), it is crucial for CIO to have technical knowledge as it helps the institution to reach its goal. It is important that CIOs be aware of the important technologies and have knowledge about emerging technologies (Dlamini, 2015). However, this finding is in contrast to the study conducted by De Arujo and Pedron (2015) which found that technical knowledge is less relevant to IT project success.

4.2.3 Managerial Knowledge and Skills

The participants of this study have highlighted the importance of managerial knowledge and skills necessary for a CIO. One of the CIOs pointed that *“That’s part of management, you must have management skills so you must treat your staff members well, you have to listen to them. I have a meeting with them every week just to understand the operation, just to understand what is going on because IT is very disruptive. You can have a failure now and then almost every day you always have problems. So actually, it is very operation-oriented thing, very operation-oriented day-to-day kind of thing”*.

The participants have highlighted that as the role of CIO is no longer just tackling IT related aspects of the institution, their role is much wider and involves the business aspect of the institution. These skills include planning skills, being visionary, thinking of big picture, change management, operations management,

project management etc. The CIOs should have knowledge about business strategies and concepts to handle real-life business situations (Dlamini, 2015).

4.2.4 Knowledge about HEIs' Requirements

The CIOs who participated in the interviews stressed the importance of domain specific knowledge of the CIOs. One of the CIOs noted that CIOs need to be equipped with the latest and trending information about the requirements of the administrative staff, academic staff and students of the HEIs. One of the CIOs highlighted the reason for this by saying that *"So lets say in the case of one of the target of the university is to be world class university in terms of the facilities so if you talk about possessing the world class facility for the student and staff, so ITD has to think of something of what is the world class technology for WiFi, what is the world class technology for in the case of may be desktop or software and so on.. so that the students are always getting the best from the technology"*.

Hence a CIO working in a HEI, should have the knowledge about education system, and IT technical knowledge and interpersonal skills to manage the employees. With the business knowledge and IT technical knowledge, the CIO should focus on aligning the IT with the organizational objectives. Hence, they should understand the organizational goals and adapt the IT systems as per requirement of the organization (Eom, Kahai & Yayla, 2015). A good CIO should have enough technical knowledge to lead projects and monitor the employees. Recent studies highlight the importance of the skills such as team management, business domain knowledge, communication, project management and people skills (Araújo & Pedron, 2015). Though most low-level employees working in IT might require more technical knowledge and team working skills, the CIO would require leadership and people management skills as well (Hickman & Akdere, 2017).

4.3 Leadership Behaviors of CIO

The CIOs who participated in this study pointed out several leadership behaviors that a CIO should possess to become a successful CIO. Looking at the literature, these behaviors can be categorized under the two themes, transformational leadership behaviors and transactional leadership behaviors.

4.3.1 Transformational Leadership Behaviors

CIOs have shed light on transformational leadership behaviors of CIOs that should play a vital role in HEIs. They highlighted how they provide vision to employees, how trust and confidence are built between CIOs and their team, how CIOs can encourage creativity and problem solving and how CIOs should give individual attention to employees. Empirical results from Shao and Huang (2018) showed that transformational behaviors are beneficial to increase followers' perception of job autonomy, which in turn promote their extended use of information systems.

CIOs motivate others with motivational talk and being positive about the university. One of the CIOs mentioned that *"at the start of every meeting I start with motivational talk. I tell them what we need to do, what is this university's vision, what we want to achieve."* Another CIO stressed the importance of vision and mission by

“every employee must know university’s mission and vision”. Another CIO motivated staff members with the vision and mission by explaining the university’s strategic objectives as he mentioned that *“it is for the university to achieve higher objective. Why we need to have world class facilities is because, in a way, that will help to increase our world ranking”*.

The CIOs also agreed that having a charisma will help the CIOs to perform their tasks better. CIOs stressed that charisma of CIO depends on the context. In this case the academic or university context, as one CIO mentioned that *“CIO charisma, when we talk about charisma it is the ability to motivate, to communicate with the team members, explain their goals and how important their roles are in terms of affecting the objective of the university”*. One of the CIOs noted that *“it’s good to have charisma. Just like political leadership, there is some politicians who have charisma that make them somehow more attractive, but they are not necessarily good. Charisma is a good factor to have but it is not essential”*.

CIOs in this study highlighted the importance of giving individual attention to each employee. However, they stressed that CIOs should not micromanage employees but to have a mechanism to cater for them all. One of the CIOs mentioned that *“we have our like monthly meeting where we invite heads of the sections to report on the progress of the sections.”* Another CIO highlighted that *“No, every section has a leader, every leader should give attention to each of their subordinate.”*. However one CIO insisted that *“we have to give individual attention because every employee at this level requires attention from the top management to feel appreciated and to be recognized...”*.

One of the CIOs described how he encourage creativity and new ways of problem solving among employees. He said *“we have to keep talking to them. We have to keep advising, especially the young ones. So, I spent time with them, and I encouraged them to build new systems, you know, it is like special projects. We have to keep these people interested, otherwise they will move away. In fact, you know some people, we lose people to the industry because they feel bored, they feel they are not interested anymore, and they do not feel the challenge. So, we have to keep on giving challenges to them”*.

Hence it is evident from the discussions of CIOs, that transformational leadership behavior plays an important role in the success of CIO. Studies showed that effective CIOs who utilize transformational leadership enhance organizational transformation and improve the return on IT investments (Hickman & Akdere, 2017). Empirical results from the study of Shao & Huang, (2018) highlighted the benefits of transformational leadership behaviors in IT leaders to promote the extended use of information systems by the user.

4.3.2 Transactional Leadership Behaviors

All CIOs agreed to give awards like best staff award for the year, university quality award, and outstanding service award for completing given task to them. One CIO described his way of rewarding staff as *“I mention them in the meetings, I praise them, we give special certificates for recognitions”*. Another CIO expressed that rewarding is challenging in public university when compared to private sector.

He described it as "*In the case of public university, this is something that perhaps is quite challenging, not like in the private sector where we can give bonus.*"

One of the CIOs described the way he avoided deviation in the workplace and made corrective measures by giving deadlines to projects and activities. He mentioned it as "*we control by giving them deadlines*". The research by Dlamini, (2015) highlighted the importance of both transformational and transactional leadership style in CIOs to govern in the higher education.

5. CONCLUSION

The role of CIO in a HEI is very crucial as it promotes the effective and efficient use of IT in the institutions. Over the years, the role of CIO has evolved, and CIOs are given a unique role, especially in HEIs. This study aimed to find the key roles, aspects and leadership behaviors of CIOs in HEIs of Malaysia. The key themes emerged from each of these main themes. Participants had identified the roles of CIO as managing IT infrastructure, handling HEI's IT requirements, governance of IT in HEIs and strategic planning. Additionally, the important aspects that make an effective and successful CIO include interpersonal skills, IT knowledge, managerial knowledge and skills and knowledge about HEIs' requirements. Furthermore, the CIO's leadership behaviors reported by the participants of the study reflect transformation and transactional leadership traits. For future direction, a detailed focus of research on ITG stakeholders' views on Malaysian HEI is important to get a better understanding of the CIO's role in the context of Malaysian HEI. The results may not be generalized due to the nature of this case study, however, the results may still be of great assistance in exploring the role of CIO and their leadership behavior in the Malaysian HEI context.

REFERENCES

- Araújo, C. C. S. De, & Pedron, C. D. (2015). The IT project manager competencies that impact project success – A qualitative research. *Organizational Project Management*, 2(1), 53. doi:10.5130/opm.v2i1.4142
- Catalano, D. (2019). *3 Major Changes to the Role of the Higher Ed CIO*. <https://er.educause.edu/blogs/sponsored/2019/4/3-major-changes-to-the-role-of-the-higher-ed-cio>
- Chatterjee, S., Sarker, S., Moody, G. D., & Lowry, P. B. (2018). *The Effect of CIO Virtues on CIO Role Effectiveness* (SSRN Scholarly Paper ID 3262272). Social Science Research Network. <https://papers.ssrn.com/abstract=3262272>
- Cook, M. E., & Sutherland, M. (2014). The emerging role of IT leadership in local government. Proceedings of the 8th International Conference on Theory and Practice of Electronic Governance - ICEGOV '14. doi:10.1145/2691195.2691304
- Dlamini, R. S. (2015). The role of the strategic and adaptive Chief Information Officer in higher education. *Education and Information Technologies*, 20(1), 113–140. <https://doi.org/10.1007/s10639-013-9269-5>
- Eom, M., Kahai, S., & Yayla, A. (2015). Investigation of How IT Leadership Impacts IT-Business Alignment through Shared Domain Knowledge and Knowledge Integration. Americas Conference on Information Systems Proceedings, Human Capital in Information Systems (SIGLead), 1–11.

- Ghawe, A., & Brohman, K. (2016) CIO Leadership Characteristics and Styles. *AMCIS 2016 Proceedings*.
- Hickman, L., & Akdere, M. (2017). Effective leadership development in information technology: building transformational and emergent leaders. *Industrial and Commercial Training*, 50(1), 1–9. doi:10.1108/ict-06-2017-0039
- Hütter, A., & Riedl, R. (2017). *Chief Information Officer Role Effectiveness: Literature Review and Implications for Research and Practice*. *SpringerBriefs in Information Systems*, 1–30. doi:10.1007/978-3-319-54753-4_1
- Khouja, M., Rodriguez, I. B., Halima, Y. B., & Moalla, S. (2018). IT Governance in Higher Education Institutions: A Systematic Literature Review. *International Journal of Human Capital and Information Technology Professionals (IJHCITP)*, 9(2), 52–67. <https://doi.org/10.4018/IJHCITP.2018040104>
- La Paz, A. (2017). How to Become a Strategist CIO. *IT Professional*, 19(1), 48–55. <https://doi.org/10.1109/MITP.2017.2>
- Pinho, C., & Franco, M. (2017). The Role of the CIO in Strategy for Innovative Information Technology in Higher Education Institutions. *Higher Education Policy*, 30(3), 361–380. <https://doi.org/10.1057/s41307-016-0028-2>
- Shao, Z., & Huang, Q. (2018). Transformational Leadership and IS Extended Use-The Mediating Role of Job Autonomy and Moderating Role of IT Innovativeness. *PACIS 2018 Proceedings*. <https://aisel.aisnet.org/pacis2018/9>
- Top 10 IT Issues, 2020: The Drive to Digital Transformation Begins*. (2020). Retrieved January 29, 2020, from <https://er.educause.edu/articles/2020/1/top-10-it-issues-2020-the-drive-to-digital-transformation-begins>
- Tripathi, A., & Khazanchi, D. (2018). IS/T leadership: A comprehensive review of published research. In *Americas Conference on Information Systems 2018: Digital Disruption, AMCIS 2018* (Americas Conference on Information Systems 2018: Digital Disruption, AMCIS 2018). Association for Information Systems