

Key Challenges for Establishing CIO Position in the Public Sector of LDCs: A Case of Bangladesh

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Abstract

Unprecedented growth of information and communications technology (ICT), calls for new public management, pressure from donors, citizen demand, and, above all, the government's "Digital Bangladesh" political pledge provide impetus for integrating ICT in the public sector of Bangladesh. Despite efforts, the country cannot make sufficient progress in ICT due to the lack of IT structure led by a chief information officer (CIO) or similar leadership position. Although the literature describes various aspects of CIO including role effectiveness, competencies and structural relationship, it does not offer any prescriptive measure on how the CIO position should be established. Drawing on institutional theory, this research identifies critical challenges to establishing the CIO position in the public sector of Bangladesh. In-depth interviews with various stakeholders at different levels of the public sector reveal two critical challenges: a lack of organisational structure, and a lack of commitment at a policy level.

Keywords Chief information officer, public sector, challenges, institutional theory, Bangladesh

1 INTRODUCTION

Developing countries are facing challenges in integrating Information and Communication Technology (ICT) in their public sectors and hence failing to avail the full potential of ICT. Lack of ICT leadership role, particularly, Chief Information Officer (CIO), is revealed as one of the challenges. (Hussain et al. 2016; Heeks 2005). The existing literature provides limited knowledge on how these countries can establish such role. The CIO is a position that best integrates ICT with organisational objectives through planning and managing the information resources. The CIO does not deliver the advantages of technology but also designs strategies to use ICT for value creation and growth of organisations. (Chen et al. 2010; Chun and Mooney 2009). This positive perception of the CIO has traversed from private sector to public sector and from developed to developing countries. Despite the suggestions, many developing countries, including Bangladesh, could not create structures to establish CIO role in its public sector to oversee and manage information resources towards broader development agenda.

To foster development in every sector, the government of Bangladesh announced the “Digital Bangladesh” political pledge in 2009. Under the banner of this pledge, the Bangladesh government endeavoured in a number of initiatives to transform and modernize the public sector. Despite the vision and attempts, Bangladesh could not advance in e-government (Waheduzzaman and Miah 2015). 2014 UN E-Government Survey reported that the country ranked 148th among the 193 member states. The absence of leadership to guide public sector through proper management of information resources is duly addressed in the literature as a key issue for this underperformance. (Waheduzzaman and Miah 2015; Imran and Gregor 2010;). This leadership could be provided by a CIO or other similar role, but Bangladesh had yet to establish this role in its organisational structure (Hussain et al. 2016). It should be noted that, in connivance with literature United Nations (UN) has also emphasized the role of CIO as critical for sustainable e-government in the E-Government Survey (2014, p. 81) where it states

“The importance of the CIO or its equivalent is to create a unified and centralized agency responsible for designing, implementing and disseminating e-government throughout the entire public administration in a seamless way.”

This research answers the broad question, “What are the challenges for establishing CIO role in the public sector of Bangladesh?” The research offers two contributions. First, it will contribute to current body of knowledge by expounding critical challenges emerging from the context that are not addressed by the existing literature. Second, it will provide guidance to the policy makers in formulating strategies to overcome the challenges.

The research paper is organized into sections. The next section outlines the background. The following sections discuss context, theoretical background, research methodology, and results. The final section provides the conclusion and the future research directions.

2 BACKGROUND

Modern governments are increasingly adopting ICT in their business processes, service delivery modes, and internal and external communications, leading to the development of sustainable e-government. Although developed nations can already derive economic and social benefits from using ICT in government or e-government (Lam 2005; Lee et al. 2005), developing nations continue to fall behind. Majority of e-government projects in developing countries suffer from failures of two types: total and partial (Heeks 2005). These failures are caused by many different factors, among which, the lack of ICT leadership or championship is the most critical (Rose and Grant 2010; Imran and Gregor 2010). ICT leadership with management acumen emerges from CIOs who strategically align technology with business and create value for organisations (Chen et al. 2010; Chun and Mooney 2009).

As the adoption of CIO in developing countries is a relatively recent phenomenon, study on CIO in this respect is lacking in the academic literature. Synnott and Gruber (1981 p. 66) coined the CIO term, describing him/her as a “senior executive responsible for establishing corporate information policy, standard, and management control over all information resources.” Since the inception of CIO, individual dimensions of CIO positions (e.g., effectiveness of CIO role and the competencies required to make the role fruitful as well as the structural relationship between the CIO and the top management team) have been investigated (Bassellier and Benbasat 2004; Chatterjee et al. 2001; Smaltz et al. 2006). Much of the information systems literature emphasized the CIO’s structural position and its effect on organisations. The strategic position of CIO in organisations has a positive effect on firms’ performance (Banker et al. 2011). A similar view has been shared by a number of scholars who have suggested that CIOs must be included in the top tier of organisations, where they would be given strategic decision making authority to align IT with business needs and make great contributions to organisational

performance (Johnson and Lederer 2010). CIOs positioned in the executive rank and armed with decision making authority can attract organisational support in terms of strong partnership between CIO and top management team, and thus they can directly influence the contribution of ICT toward performance (Preston et al. 2008). Moreover, CIOs' structural position intensifies their relationship with the top management team (TMT), which in turn not only increases its business knowledge but also creates a shared vision in the organisation to assimilate ICT successfully (Armstrong and Sambamurthy 1999; Karahanna 2009).

Although they provided the individual traits of CIOs, which contribute to success, most of these studies deal with CIOs in the private sector, leaving minimal or no implications for those in the public sector. Despite the advantages of studying individual traits, holistic findings are lacking. Moreover, the current body of literature on the CIO does not provide a comprehensive path or model to guide the developing countries to establish CIO positions in their public sector organisations.

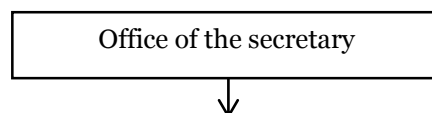
3 CONTEXT

Many ICT innovations in developing countries failed for discounting the impact of contexts in which they were embedded (Heeks 2005). Although selecting one innovation from a developed country and adopting it to a developing country is conventional, this practice fails routinely because the innovation is deemed as "unfit" in the settings of the latter "Unfit" indicates the design-reality gap (Heeks 2005) caused by the interplay of technology, people and society as a whole (Walsham and Sahay 2006; Avgerou 2001). To establish CIO role in the public sector of Bangladesh, the effects of contextual issues, including socio-cultural conditions, should be considered. As Bangladesh does not know how to create a CIO position in its public organisations, obtaining knowledge from countries that have successfully established and sustained a CIO position is a good starting point. Cognisant of the potential for a misfit, a brief description of an administrative structure pertaining to the ICT leadership of Bangladesh and Australia is provided in the following section.

Bangladesh is a least developed country (LDC) with a population of around 160.64 million (Bangladesh Bureau of Statistics). The Committee for Development Policy, a subsidiary body of the UN Economic and Social Council, identifies LDC on the basis of three criteria: (1) low income, that is, a gross national income per capita of less than \$1035 (USD); (2) weak human asset in terms of nutrition, health, education, and adult literacy rate; and (3) high economic vulnerability as indicated by instability in agricultural production and exports as well as victims of natural disasters. As of February 16, 2016, the current number of LDCs is 48 (unohrlls.org). Bangladesh is a parliamentary democratic country, where the President is the chief of state and the Prime Minister is the head of government. Councils of the ministers and secretaries of the civil service machinery assist the Prime Minister in running the government (Bangladesh National Portal).

The current status of ICT in the public sector of Bangladesh is depicted through the organogram of the Ministry of Public Administration (MOPA). A critical look at the organogram of public sector of Bangladesh reveals that it is tightly bounded by the organisational hierarchies where there is little room for establishing CIO position. For example, Figure 1 provides a brief part of the organogram of the MOPA that deals with the ICT wing. The ICT wing is headed by a senior systems analyst which is a mid-level position who does not have any authority to take part in organisational decision making. The organogram is defined on the basis of hierarchy and authoritative position and not on functions in the organisation. In this structure power is concentrated at the top, and authority is defined by position where strict formalized routines, rules, and procedures govern the behaviours of managers and members. A hierarchical organisational structure is inflexible and mechanized (Zafarullah and Huque 2001), characterized by high formalization and centralization as well as low specialization and professionalism. Innovation adoption or management reformation is slow and difficult in such hierarchical and rigid public sector organisation (Damanpour and Schneider 2009).

Although public sector is generally hierarchical and follows formalized bureaucracy, research shows that public sectors in developed countries have undergone severe management reformation as a means of creating efficient, transparent, and service-oriented organisation (Christensen & Lægreid 2007; Parker and Bradley 2000).



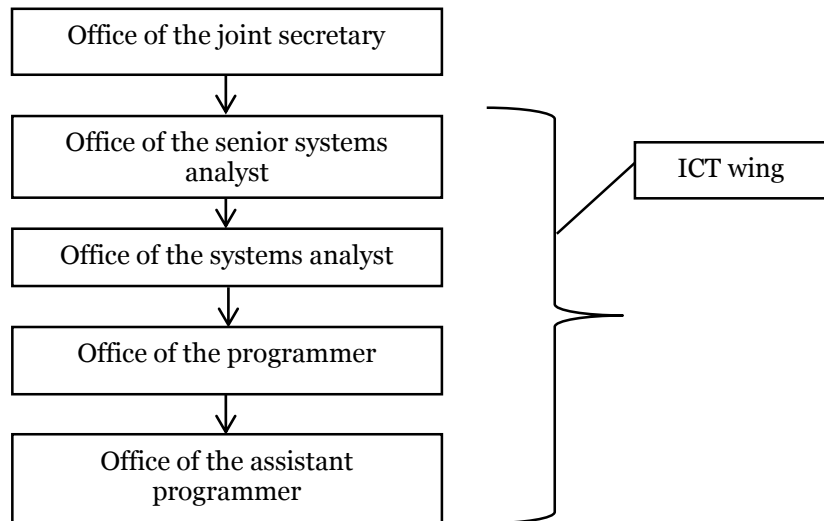


Figure 1: ICT wing in the organogram of MOPA, Bangladesh (Ministry of Public Administration)

For example, the Australian public sector has adopted the “whole of government” approach to create a “value-based government” wherein government agencies work in a collaborative fashion to seamlessly deliver a one-stop shop service (Christensen and Lægneid 2007). As part of this reformation agenda, decades ago Australian Public Service Commission recommended to establish a new structure for appointing a CIO. The CIO is responsible for all ICT functions and activities within the department. In addition to providing ICT application support and development capability, the office of the CIO develops and maintains ICT strategic planning, enterprise architecture, and information management to support the present and future objectives of the department (ACTPS Review Final Report). To understand the structural position of CIO, part of the organogram of the Australian government’s Department of Agriculture and Water Resources is presented in Figure 2.

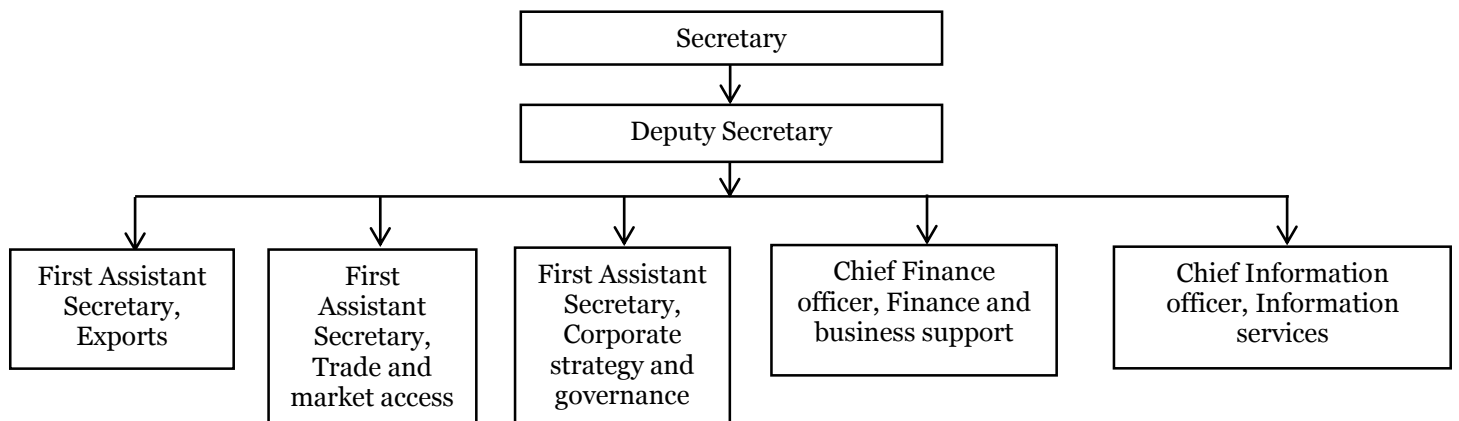


Figure 2: CIO in the organogram of the Department of Agriculture and Water Resources, Australian Government (Department of Agriculture and Water Resources Organisational Chart)

According to the organogram, the CIO of an Australian government agency is a high-level senior executive position that has leadership and decision making authority (WOG ICT strategic workforce plan). As shown in the figure, unlike the Bangladesh public sector, Australian government departments follow a team-based approach in which various functional units are networked and facilitated by modern ICT-based work processes. In this setup, as the traditional management layers are reduced, CIO partners with other executives, understands their business needs and shares information across units to add value to the organisation.

4 THEORETICAL BACKGROUND

Establishing CIO is a complex phenomenon underscoring the interplay of ICT, public sector organisations, and society at large. Institutional theory (Scott 2008) is used as a theoretical lens to explore the problem. This phenomenon involves decisions and discretions from different levels of government, parallel organisations, and other stakeholders. The dynamics of these various units can complicate the entire process. This complex organisational phenomenon is subject to political will, attitudes and perceptions of high public sector officials, competent human capacity, the need for appropriate legal framework, and many other related issues (Hussain et al. 2015). Institutional theory is widely used for innovations in organisations (Luna-Reyes and Gil-Garcia 2011; Zheng et al. 2013) and has the potential to address the multi-level complexity in the structure of institutions such as the public sector of Bangladesh.

“Institutions comprised regulative, normative, and cultural-cognitive elements that, together with associated activities and resources, provide stability and meaning to social life” (Scott 2008 p. 48). Institutions are meant to provide stability and assist organisational changes. Establishing CIO roles may be a result of an organisational change; thus, institutional pressures can explain the process. As actors, public sector organisations may succumb to institutional pressures and create structure that smooths the process of establishing CIOs. Visions of political leaders and policies are akin to coercive pressures that may mandate the establishment of CIO roles through rules, laws, and sanctions. Involvement of senior public officials, specifically, the bureaucrats (i.e., policy makers), in learning ICT through formal and informal institutions and other communication means can result in their awareness and knowledge of ICT driven values and create a common understanding of ICT. Thus, the normalization of a professional group can prompt a shared sense among the senior public officials, thereby resulting in the development of institutional capacity to establish and sustain the CIO role.

5 RESEARCH METHODOLOGY

As the research is profoundly influenced by the interaction between people and social and organisational contexts, a qualitative research method is applied to collect data (Myers and Avison 2002). Case study research approach is used as the research is studying a contemporary phenomenon in real life setting and the boundary between the phenomenon and context is not clearly evident (Yin 2002). Twenty in-depth interviews were conducted at various levels of public organisations in Bangladesh. Interviewees were identified and accessed through personal reference and snow-ball sampling. It should be noted that the public officials were highly inaccessible and that was the biggest challenge for this research. In some cases, especially to interview senior public officials, the researcher had to make multiple attempts and spend hours waiting at their offices. In order to generate a rich picture, most of the interviewees were chosen from among senior public officials. However, interviewees were also selected from mid-level and lower levels of management. Interviews were conducted in the Access to Information (a2i) Programme, which directs and leads many e-government projects and initiatives in Bangladesh and operates in the Office of the Prime Minister of Bangladesh. Interviews were also conducted in several other public sector organisations including the Bangladesh government’s ICT division. In concert with the interviews, web sites and published documents of the government organisations were also reviewed. Moreover, researcher’s observation of the real context has also added rigor to the findings. The objective was to derive rich insights and to confirm validity through triangulation (Yin 2002). A semi-structured interview guide applied with an open mind was used and led to some on-the-spot questions in response to answers given. Primarily, the broad interview question was, “What are the challenges for establishing a chief information officer position in the public sector of Bangladesh?” As the interviews progressed, a range of issues surfaced relevant to the main question. With prior permission interviews were audio-taped and conducted in ‘Bengali’ language to put the interviewee at ease and generate richer and deeper insights. Interview data were translated to English by the researcher himself to ensure accuracy and maintain precision. Once transcribed data were imported into NVivo 11 (qualitative data analysis tool) to perform first cycle coding or open coding (Andrade 2009). In the next stage, data were revisited retrospectively for better understanding and refinement of the initial coding which resulted in the generation of focused coding, category and theme (Andrade 2009). Generation of focused code, category and theme were not done by NVivo software rather they were researchers’ own reflection in correspondence with the research question and theoretical lens. Researchers’ through this structural process came up with two themes: lack of organisational structure and lack of commitment from policy level.

6 RESULTS

6.1 Findings and Analysis from Depth Interviews

Lack of structure in the existing organogram of public sector and lack of commitment at policy level are the most reflected issues in the interviews. These two powerful challenges currently hinder the establishment of CIO role. These challenges are not mutually exclusive: rather, they are mutually related and reinforcing because they reflect collective thoughts of the public sector towards establishing CIO role as well as ICT. The challenges are discussed in detail.

6.1.1 Lack of organisational structure

At present the public sector of Bangladesh does not have proper organisational structure to establish CIO role. Establishing CIO role is a lengthy process that requires an institutionalized approach by creating organisational structure in the present organogram of public sector organisations. One public official comments on the necessity of CIO role and the absence of organisational structure to accommodate the role,

“It means to institutionalize the CIO in the framework of our country we do not have such institutionalize work, in our organogram there is no such post [CIO] to look after the IT section or IT related issue. Again, creating a new structural position is a lengthy process and involves multi-body decisions. “Interview 1, 13 September 2015”

According to the rules of Bangladesh public administration, a proposal for creating a new position must be submitted to the MOPA, in which the organisation and management wing evaluates and scrutinizes the proposal. Upon approval by MOPA, the matter is forwarded to the Ministry of Finance and Planning because the decision involves financial implications for the republic. The Finance division (FD) has the authority to further evaluate the proposal and increase/decrease the number of positions. If the proposal is positive, the FD will allocate budget for the newly created position and notifies the MOPA. In the final step, according to the decision of the Finance Ministry, the MOPA approves the creation of the new position and circulates an order to make changes to the organogram of the concerned ministry or division (Ministry of Public Administration). It should be noted that the issue of establishing a CIO role is new to Bangladesh. Therefore, the duties and responsibilities of this role need to be defined in the country's 'Rules of Business', which is a coordinated and concerted task at the Cabinet division. In this entire process, if any of the government body does not approve the proposal at the initial stage and asks for further explanation on the matter, recursion occurs and extends the process. For example, in 2015, Bangladesh Police made a proposal to the Ministry of Home Affairs to recruit 50,000 new police members to meet the state requirements. The Ministry of Finance and Planning reduced the number to 20,000 and approved the proposal after a series of meetings and correspondences among the concerned bodies. However, the decision has yet to be implemented (Daily Prothom Alo, July 22, 2016). In spite of being an existing position, recruitment of police members is taking such a long time, it is obvious that the time it may take to establish the CIO position in the organogram of public sector would likely be significant. This conclusion was supported in the comment of another interviewee,

“This organogram is a big challenge in the way of IT expansion in our country. According to our structure we cannot so easily change our organogram whether it is IT related or non IT related. It takes a long time to change our organogram. In some cases it may take 6 months or even 6 years”. “Interview 6, 11 October 2015”

Based on the traditional practice and procedural complexity of administration, structural change is apparently a lengthy process involving decisions from different bodies and various levels, which adhere to the rules and policies of Bangladesh public administration. Thus, any change in the organisational structure is exceedingly difficult. The structure of public service in Bangladesh is deeply rooted to its historical context. The public sector culture of Bangladesh inherits a colonial legacy in its entire administrative system with high power distance (Hofstede, 2001; Jahan, 2006). Since the British colonial era, the administrative system has been centralized, hierarchical and heavily dominated by power politics with respect to its internal processes and external dealings with the citizens. There has been minimal structural change since the British era (Jamil 2007; Jahan 2006; Zafarullah and Huque 2001). Experience in developed countries indicates that an ICT-based structure requires a complete shift from a hierarchical to a team-based approach, which appears to be a great departure from the traditional culture in which a strong resistance to change from all levels is expected.

The issue of organisational structure for the CIO position is further aggravated by other subtle reasons. An in-depth investigation on the data revealed that lack of commitment at the policy level is a hurdle against structural change.

6.1.2 Lack of commitment from policy level

Disinterest from among policy makers to assimilate ICT throughout the public sector and therefore to establish a CIO position is rooted in the organisational culture. Bureaucratic culture combined with paternalism creates an institutional inertia that confronts any innovation and reformation. (Jamil 2007; Zafarullah and Huque 2001). This policy level apathy is an outcome of the bureaucratic culture of the public sector in Bangladesh. If policy makers show interest, the path to establishing a CIO role will not be difficult. As concluded by one senior IT executive,

“As a matter of fact, first, in the existing culture it is tough to establish CIO. And we [policy makers] don’t have the mentality to create the window that is needed to establish CIO. But if the decision makers want it is not at all difficult”. “Interview 5, 11 October 2015”

Policy makers are real implementers of any innovation, whether it is ICT oriented or not. In the administrative mechanism of Bangladesh, policy makers have the authority to internalize innovation. As the administration is hierarchical, any decision or approval from the top becomes ubiquitous practice. One interviewee concludes by saying,

“I think the policy makers need to come forward in this matter. If policy makers take the decision then it would be easier to establish CIO position. Unfortunately, there is a lack of commitment from our bureaucrats”. “Interview 2, 16 September 2015”

Although policy makers are better aware of the “Digital Bangladesh” and “Vision 2021” agenda of government. A critical analysis of the interview data reveals that nature of discourse in public sector of Bangladesh is cleverly disconnected from the underlying reality. The politicized public sector works for personal interests, and informal behaviours and practices are buried in the strict formalities or formal bureaucracy (Heeks, 2005; Zafarullah & Huque, 2001). As reflected in the words of one interviewee,

“They [bureaucrats] will not support to establish CIO or implement ICT because they know it will stop their personal gains and cease their power”. Interview 19, 24 November 2015”

Although senior public servants or bureaucrats appear supportive to ICT in public forum and government agenda, in reality they are far away from the actual practice of it. This duality in behaviour is reflected in Argyris’ notion (1985) of two levels of theory that guide such actions: ‘Espoused theory represents the values and beliefs individuals claim to hold and publicly support, while theory-in-use represents the values and beliefs individuals actually follow’ (quoted in Heeks 2005 p. 60).

Further analysis of the data reveals that a lack of knowledge and a narrow perception of ICT held by senior public officials are the root causes of weak policy level commitment. A lack of knowledge and a narrow perception of ICT are closely related and they are complementary.

a) Lack of knowledge of ICT

Most of the senior Bangladesh public officials and decision makers neither received any institutional education nor had any informal orientation about ICT. This is because they were educated in the 1970s or early 1980s, a time when computer technology was largely absent in Bangladesh. Moreover, in order to popularize computer mediated work processes, the presence of Internet is essential. Although the Internet was introduced in Bangladesh in the late 1990s, it was expensive, slow and accessed by only a few private organisations at a very limited scale, particularly banks and telecommunications companies. The public sector was nowhere near the thought and use of ICT in the reengineering of work processes at the time. Furthermore, senior public servants are afraid of facing the unknown and are thus reluctant to undergo ICT training. They further believe that ICT training will take away their comfort zone and shred their structural power. One interviewee comments on this connection,

“Senior officials and policy makers are old, ignorant about the ICT matters. They think computers, and internets are a burden of both cost and learning... people love to work in the comfort zone”. “Interview 4, 6 October 2015”

This level of unawareness about the benefits of ICT still remains among the top level management of public sector, who view ICT in terms of actual technology such as computers, printers, etc. (Imran and Gregor 2010). However, they are interested to have the technology in their office, partly due to government pressure and partly because of the status symbol they represent. However, how to integrate the technology into the work processes for efficiency and transparency are ideas largely absent among them. This is reflected in the conclusions of one senior government servant:

“See I have ICT [indicates computers, printers, and the Internet] in my office, so we are digitized. But we are still using manual system in our works because ICT is still not robust that we have to do everything using ICT”. “Interview 8, 19 October 2015”

Senior public officials do not have knowledge about the strategic use of ICT (Imran and Gregor 2010). To the best of their knowledge ICT is a technical area which should be looked after by some specialists. Specialists would perform the computer troubleshooting work and not intrude in the decision making level.

b) Narrow perception of ICT

Senior public servants including policy makers tend to view ICT as another buzzword of government’s political ambition. Hence, they tend to keep ICT at a superficial level rather than assimilating it in the work processes. Ever since ICT became a key focus of the Prime Minister’s office, bureaucrats are going along with digitization, but in reality, they are either keeping ICT in an isolated state or letting ICT make very slow progress. This narrow perception intrinsically creates a negative feeling towards the use of ICT among the bureaucrats and thus bypassing the notion of value creation through ICT.

A2i, the ICT think tank decided to introduce a Chief Innovation Officer in the public organisations. It is voluntarily assumed by a senior public official supplemental to his primary duties with no additional remuneration. Moreover, this move avoids enabling ICT and is discordant to the ‘Digital Bangladesh’ political agenda. A2i, the ICT think tank of Bangladesh, concealed this irrelevant shift by emphasizing the notion that the case of Bangladesh is different from other countries and a chief innovation officer would create a culture of innovation to transform government through ICT and/or non-ICT oriented approaches. A senior official of a2i said:

“We don’t need chief information officer. We have moved away from ICT to chief innovation officer which could be both technology and non-technology driven”. “Interview 10, 5 November 2015”

The role of chief innovation officer is sharply different from that of CIO. A chief innovation officer is an executive with power and practice who understands the role of innovation and give the foundation of innovation-friendly atmosphere throughout the organisation wherein innovation acts as a springboard for any business decision (Di Fiore, 2014). Despite the fact that a chief innovation officer is severely different from a CIO, policy makers in Bangladesh shift toward chief innovation officer as an ICT leadership.

The preceding analytical discussion of the findings indicates that a lack of organisational structure and a lack of political commitment are two important hurdles toward establishing the CIO position in the public sector of Bangladesh. Being deeply rooted in the organisational culture of the public sector these two challenges unless uprooted completely, establishing the CIO position would be an insurmountable effort.

7 DISCUSSION

This research addresses an important issue: establishing the CIO position in the public sector of Bangladesh. It has revealed critical challenges: a lack of organisational structure and a lack of policy level commitment. These challenges are interconnected and mutually reinforcing. Because there is no commitment from the top level of the bureaucracy, there is no structure in the existing organogram for the CIO position to be housed. Again as the present organogram does not have a set up for establishing CIO position, policy makers are showing inertia to make any effort towards it. Commitment from top level has been identified by prior research as an important driver to implement any ICT initiative in the organisation (Anthopoulos et al. 2016; Zheng et al. 2013). In public sector top management is seen as the only boundary spanners as their beliefs and behaviours signal how the organisation will respond to an innovation. No matter how much external pressure is there, top management makes important decisions on shaping internal capabilities and leveraging resources to adopt ICT. External pressures alone cannot do anything unless top management nurtures the human agency in the organisation towards assimilating ICT based innovation (Ho 2002; Zheng et al. 2013). By mobilising both financial and human resources top management provides the stepping stone for institutionalizing the innovation. Present research although corroborates prior research in this respect, it offers a fresh perspective on establishing CIO by articulating the critical role of policy makers in the public sector of Bangladesh.

Moreover, our findings: lack of knowledge of ICT and narrow perception of ICT feed the policy level inertia towards establishing CIO position. Knowledge and perception syndrome about ICT uptake in Bangladesh public sector were articulated as key inhibitors in prior literatures (Gregor et al. 2013; Imran

and Gregor 2010). These inhibitors were featured as primary influencer for other inhibitors including poor infrastructure, low socio-economic conditions and a lack of leadership towards ICT uptake in the public sector of Bangladesh (Gregor et al. 2013). Present research corroborates lack of knowledge and narrow perception of ICT as important root causes that hold back policy level commitment necessary for establishing CIO position. Furthermore, these underlying causes reflect the concomitant attitude of public sector decision makers' who proscribe the possibility of a shared understanding of ICT therein. Shared understanding (Earl and Feeny 1995; Preston and Karahanna 2009) of ICT ensembles learning to collaborate and collaborating to learn (McCormick, 2004). This type of collaborative learning atmosphere engenders and nurtures a community of people who bears similar mindset of sharing, exchanging, and welcoming ICT related innovations.

Reluctance from policy level is associated with the hierarchical nature of public sector of Bangladesh (Zafarullah and Huque 2001) where a strict top down approach embodying centralized decision making does not allow an opportunity to create organisational structure for CIO. CIO position would seek to form and flourish a more networked organisation with flat structure requiring flexibility and decentralized authority on the part of the policy level.

8 CONCLUSION

Present research identifies critical challenges toward establishing the CIO in the public sector of Bangladesh, the first step in that battle. The research is underpinned by Scott's (2008) institutional theory. Unfortunately, institutional theory is abstract in nature and while it allows analysis of the issues surrounding implementing such an organisational innovation, it does not offer specific factors or steps that can guide the innovation's adoption. The research presents a novel discourse on challenges of establishing the CIO position in the context of Bangladesh. While institutional theory is used to study IS adoption from techno-centric point of view (Zheng et al. 2013; Luna-Reyes and Gil-Garcia 2011), this research extends institutional theory to a first-hand agenda of CIO research which, unlike the other research, is people oriented and management reformation related. How the dynamic and flexible CIO role interacts with conditions and events situated in the unique context of Bangladesh is interesting and worth researching.

A lack of organisational structure has been identified and confirmed as the most critical challenge for establishing the CIO position. The existing hierarchical structure, instead of team based structure, does not put ICT at the strategic forefront and it has not allowed various departments to share information for the greater performance of the organisation. It also seems that bureaucrats maintain ICT only as a technical, supporting function. This stereotype of ICT is not an isolated phenomenon; it is a collective thought of the entire public sector especially among the senior public servants. In the Bangladesh public sector context, policy makers play a vital role and all other factors and issues are interlinked with them. Surprisingly, the pressure from the Prime Minister's level to assimilate ICT in all spheres of government has not passed through the layers of public sector. The policy makers act as buffer between government intention and organisational implementation, not only in the agenda of CIO establishment but in all other ICT uptake. Nonetheless, a number of initiatives including introduction of National Portal Framework (NPF) to provide all public information using a single platform, introduction of 4547 Union Digital Center (UDC) to provide one stop service at the lowest tier of local government, District e-Service Center (DESC) in 64 Deputy Commissioners office, ICT facilitated multimedia classrooms in 15700 schools, Jatiyo e-Tathyakosh (national e-Content repository) in Bangla (native) language, 18000 e-Purjee (sms based agricultural tool) to benefit farmers in doing transactions with government are the few examples of ICT success in Bangladesh. These initiatives demonstrate current government's positive intent to transform government. If policy makers come forward with a full commitment to ICT and the idea of a CIO position, devising policy, creating structures and developing organisational capacity to establish and institutionalize the CIO position would only have been a matter of time. The research has practical implications as it can guide policy makers to understand the challenges and their underlying causes towards establishing CIO position to ensure effective ICT leadership in the public sector of Bangladesh.

The research has limitations in that it is based on the context of a single LDC, Bangladesh. A key consideration of the research is to identify the unique characteristics of Bangladesh that must be accommodated in implementing the general idea of CIOs in the public sector. Consequently, any attempts to generalize the findings to other situations may generate flawed outcomes. However, if the contextual complexities and their dynamics of any country are similar to the case of Bangladesh, this research could assist in comprehending the new context. The present research identifies challenges and offers a starting point for establishing the CIO position in Bangladesh's public sector and gives foundations for future research in this area.

This research is part of an ongoing PhD program and therefore does not yet provide discourse on strategies to overcome these challenges. During the PhD tenure it is expected to come up with a holistic process model combining the challenges and strategies that will guide public sector of Bangladesh to make transition from its existing structure to CIO position. Based on Scott's institutional theory (2008) the emergent process model would contribute to the body of knowledge.

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