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### The Chief of Information Offices -- performance, skills and job demands

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# The Chief of Information Offices – performance, skills and job demands

## Abstract

*This paper presents a research on the relationship between CIO performance and the CIO skills and CIO job demands. The CIO's literature has many researches about the desirable or expected CIO skills, and few papers about the influence of organizational characteristics on CIO profile. The main contribution of this paper is to analyse the moderator effect of CIO job demands on the relationship between CIO skills and CIO performance. In order to describe this moderator effect, three hypothesis about the dimensions of three concepts are presented. A survey will collect the CIO perceptions about these three concepts. The collected data should be analysed by structural equation modelling.*

**Keywords:** CIO, Chief Information Officer, Competences, Performance, Skills, Job demands

Renato Moraes

## 1.0 Introduction

Some Brazilian companies have placed the Chief of Information Officer (CIO) as Chief of Operation Officer. An example of this transformation is Natura, a leading company in the beauty products sector, which has gradually increased the authority of its CIO from the information systems that support the operation to the sales management and, in the last year, to management of the operation. In these companies, information is an important part of products and, crucially, a crucial element of business processes and decision-making processes. Even in companies where the CIO maintains a more traditional and restricted authority, its role is changing because the role of IT is also changing. New IT technologies, such as cloud computing, big data, analytics, machine learning, Internet of Things (IoT), augmented reality, mobile devices and advanced human-machine interfaces, bring opportunities and challenges for businesses. The importance of IT or, at least, the potential importance of IT, tends to increase. Especially because the impacts and uses of these new technologies are not yet completely clear.

The CIO profile has been used as a proxy measure of the organization's IT capacity (Bharadwaj, 2000; Santhanam & Hartington, 2003). In addition, the literature on the CIO profile presents several lists of desired and necessary competences (Earl, 1996; Periasamy and Seow, 1998; Ravarini et al., 2003; Kitzis and Broadbent, 2005). Nevertheless, the lists of CIO competences do not consider characteristics of the company or its contexts. Besides, there is not a clear distinction between the CIO

personal attributes and the duties and responsibilities of the CIO position – CIO job demands.

The exceptions are Sojer et al. (2006) and Peppard et al. (2011) that used qualitative approach to create type of CIO. Sojer et al. (2006) used the Nolan and McFarlan grid to propose four types of CIO, and Peppard et al. (2011) used two dimensions of IT importance to propose a sort of ladder of CIO's types.

This research analyses the impact of the alignment between CIO skills and CIO job demands on the CIO performance. The contribution of this research is to include the CIO job demands as a moderator construct in the relation between CIO skills and CIO performance. It should improve our understanding about the desirable or expected CIO characteristics, and contribute with processes of CIO selection and development.

## **2.0 Theoretical Background**

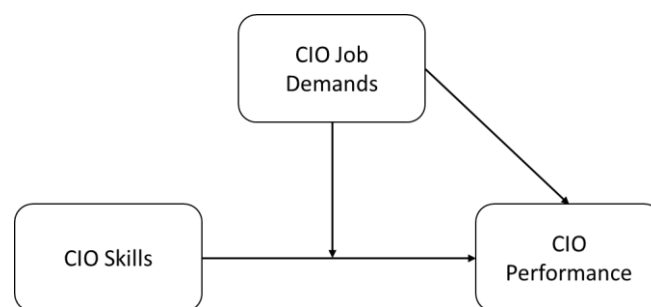
The literature review showed two different major groups of works. The first group the papers on the desired, expected or more important CIO skills (Earl, 1996; Periasamy and Seow, 1998; Ravarini et al., 2003, Kitzis and Broadbent, 2005; Lane and Koronios, 2007; Chen and Wu, 2011, Moraes & Galvão, 2017, Silva and Moraes, 2018, Moraes and Kiste, 2018, Moraes et al, 2018a, Moraes et al, 2018b). These papers bring lists of competencies that are sometimes grouped into categories. The differences between these lists of CIO competencies can be explained by several reasons: the use of different approaches (qualitative research and quantitative research), research context (countries and industries), and by the moment in which the research was done. The evolution of information and communication technologies and the importance of IT in companies may have changed the demands of the CIO that would explain some of the differences between studies carried out at different moments. Often these works do not distinguish between the characteristics of the CIO (personal skills) and the demands of the job (roles and responsibilities). They are distinct objects – the person and the position – whose characteristics must be aligned. Another criticism that can be made of the work of this group is that they did not consider how the organization particularities affect the CIO profile. The second group of research contains the works that present CIO archetypes in function of the role of the IT in the organization (Sojer et al., 2006; Moraes and Galvão, 2018).

Moraes and Galvão (2018) emphasize that the relationship between the characteristics of the company and the profile of the CIO has a double meaning. Previous studies (Sojer et al., 2006; Peppard et al., 2011) had already indicated that the company characteristics affect the CIO profile, but the CIO profile also affects the role of IT in the company and, consequently, the characteristics of the company. Therefore, these two constructs – company characteristics and CIO profile – have a dynamic interdependence relationship. This same observation (double sense relationship) also appears in Haiek et al (2018) who studied on the CIO roles on the Brazilian chemical industry. They concluded that there is now a perception of great potential for innovation through new applications that can handle large volumes of information. This information would be available in new media and formats, such as social networks and equipment installed at points of sale. This is a result of the emergence of new technologies – IoT, Social Media and Big Data, for example – and the CIOs are aware of this. Thus, the CIO would be at the forefront of the business transformation process through new applications based on emerging technologies.

Thus, the hypothesis of this study is that the CIO performance is the result of the alignment between the characteristics of the CIO (skills) and the characteristics of the CIO position (job demands). The dependent variable is CIO performance, and the independent variables are characteristics of the person and (CIO skills) the characteristics of the position (CIO job demands). The latter represents (or is a reflection of) the characteristics of the organization.

### 3.0 Research model

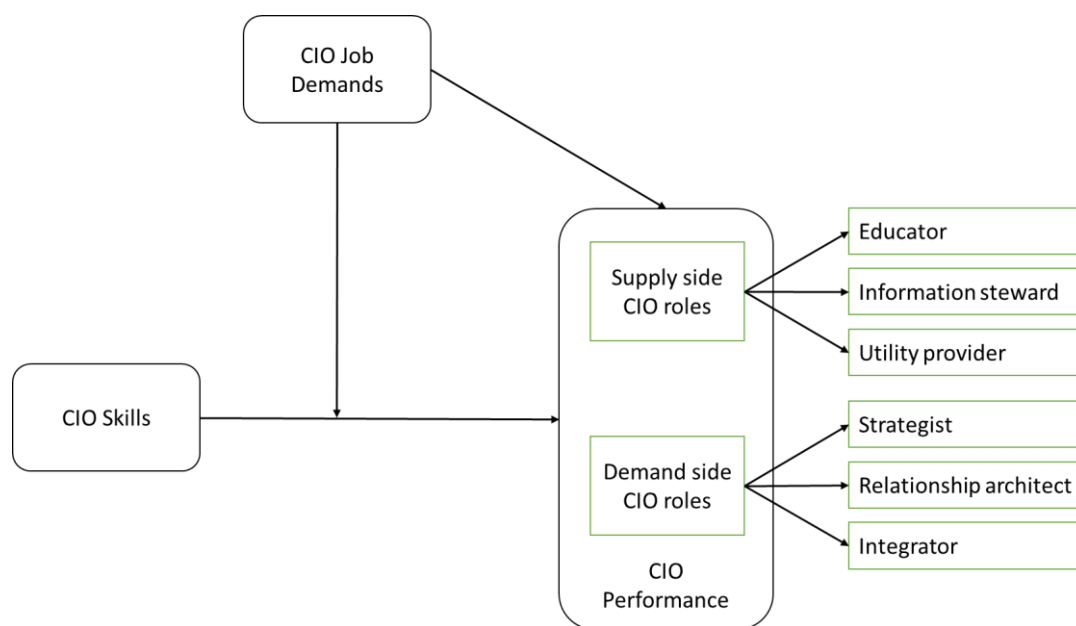
Figure 1 shows the search model. The alignment between the CIO skills and his/her position (CIO job demands) is represented by the CIO job demands moderating effect on the relationship between the CIO skills and CIO performance.



**Figure 1.** Research general model

The conceptualization of CIO performance will be the same adopted by Smaltz et al. (2006) e Al-Taie et al (2018). The CIO performance has two dimensions (Figure 2). The first, called Supply side, refers to the operational demands, and it has three roles: Educator, Information steward and Utility provider. The second dimension of the CIO performance, called Demand side, refers to the business demands, and it has three roles, also: Strategist, Relationship architect and Integrator.

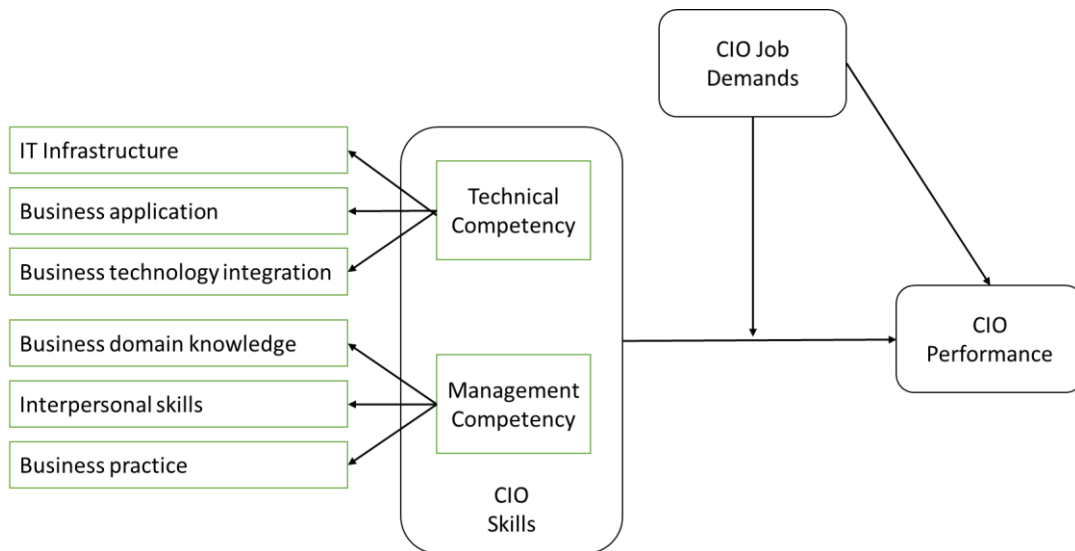
The CIO skills will be evaluated through Cheng and Hu (2011) approach (Figure 3). They used two dimension to IT capability: information technology competency and management competency. It has similarities with other researches. Moraes & Kiste (2018, 2018c) splitted the CIOs competences on technical and managerial. The information technology competency has three dimensions: IT Infrastructure, Business application and Business-technology integration. The management competency dimension has three dimensions: Business domain knowledge, Interpersonal skills, and Business practice.



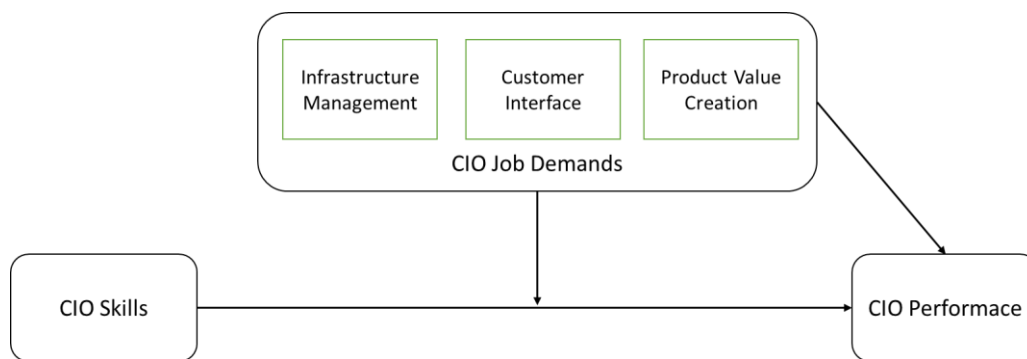
**Figure 2. CIO performance**

The IT strategic impact grid (Nolan and McFarlan, 2005) is a well know model and very used to describe the impact of IT organization importance on IT management. Sojer et al. (2006) and Moraes and Galvão (2018) used the IT strategic impact grid to

describe how IT organizational characteristics affects the CIO profile. Silva (2019) evaluated the influence of one dimension of Nolan and McFarlan model (need for new information technology) on the CIO profile and did not find any correlation between them. Therefore, the model from Steininger (2018) was used to assess the CIO job demands. Steininger (2018) analysed how IT enables digital entrepreneurship. The CIO importance and his contribution to organization is a result of organization IT importance. In companies where IT has a great importance are similar to digital entrepreneurship since IT is a success key element. His analyse is based on the use of IT in the three pillars of business models: management infrastructure, customer interface and value creation. Therefore, these three pillars will be the dimensions of CIO job demands (Figure 4).



**Figure 3. CIO Skills**



**Figure 4. CIO position characteristics**

CIO Skills and CIO performance have both two dimensions and they are conceptually linked each other. Technical competency (CIO skills dimension) is related with supply side CIO roles (CIO performance dimension), as management competency and demand side CIO roles. The moderator effect on these two relation must be also with specific dimension of CIO job demand. Therefore, three hypotheses are made:

H1: The Infrastructure management (CIO job demand dimension) positively moderates the positive relationship between Technical competency (CIO skills dimension) and Supply side CIO roles (CIO performance dimension).

H2: The Customer interface (CIO job demand dimension) positively moderates the positive relationship between Management competency (CIO skills dimension) and Demand side CIO roles (CIO performance dimension).

H3: The Product value creation (CIO job demand dimension) positively moderates the positive relationship between Management competency (CIO skills dimension) and Demand side CIO roles (CIO performance dimension).

#### **4.0 Methodological Approach**

This research uses a positivist paradigm and a quantitative approach. A survey with CIOs will be done in order to collect the data. The research population is the Brazilian CIOs. Therefore, a questionnaire will collect the CIO perception about three concepts: CIO performance, CIO skills, and CIO job demands. The CIO performance associated constructs will be measured by scales adapted from Al-Taie et al (2018). The CIO skills associated constructs will be measured by scales adapted from Chen and Wu (2011). All these constructs are reflective constructs.

The constructs associated to CIO job demand are formative and adapted from Steininger (2018). The scales for this constructs should yet be developed or identified. The collected data will be analysed by structural equation modelling (SEM). As the model has formative and reflexive constructs, the moderating effect should be evaluated by two stage approach (Hair et al 2017)

#### **5.0 Anticipated contributions**

The paper presents a model to explain the CIO performance by the CIO personal skills and the CIO job demands. This is a conceptual contribution since the literature

has not yet analysed simultaneously these two concepts as predecessors of CIO performance. It integrates previous research (Cheng and Hu, 2011; Smaltz et al., 2006; Moraes and Galvão, 2018) in a bigger and integrated scope model.

It also shed light on the importance of the alignment of these two predecessors. From a practitioner's point of view, the research can contribute shedding light on the CIO selection process and development competences process

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