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CIOCB: A framework of competences for the Chief Information Officer – preliminary study

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Abstract

The role of the Chief Information Officer and the expectations about its performance have undergone significant changes in recent years. This transformation was not only driven by the evolution of information technologies and information systems but was also due to its growing importance within organizations. The integration of the information systems manager into the top management team in many organizations also had a direct impact on the profile and competences required to carry out its activities. A review on the set of competences currently required from these managers is therefore required. This research-in-progress paper proposes a framework, named CIOCB, which identifies a broad set of competences needed for the Chief Information Officer.

Keywords: Chief Information Officer, CIO, role, profile, competence, baseline, framework.

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1. Introduction

The growing complexity of organizations has led to an increase in the amount of information to be managed, creating an urgent need for systems that support the collection, storage, processing, and distribution of information efficiently and effectively. As a result, Information Technologies/Information Systems (IT/IS) have undergone significant evolution over the last decades in order to meet the new requirements. Today IT/IS are important agents of change and catalysts for innovation in organizations [1-3].

The Information Systems Function (ISF) (other common names of the Information Systems Function are, for instance, IT Organization [4] or IT/IS department [5]) has a central role here, ensuring that, in the context of organizations, all elements and resources of IT/IS are applied correctly in the support and development of the business [6, 7]. In fact, when IT/IS governance go awry, "the results can be devastating" [8, 9].

Following the evolution of IT/IS and the growing importance of ISF within organizations, the role of the Chief Information Officer (CIO) and the expectations surrounding her/his performance have also undergone significant changes. Nowadays, CIOs, as top managers of the ISF [7, 10], are deeply involved in the organization of the business, acting as strategists and process innovators [11, 12], assisting top management in defining and implementing strategies [13].

The required alignment between IT/IS and the business turns Chief Executive Officers (CEOs) and CIOs to work together, develop strategies, and explore the potential of technologies to increase competitiveness and drive business performance. Currently, in most companies, CIOs are part of the top management team [14]. We are, therefore, a long way from the primary role of the CIO, in which s/he was "only" responsible for implementing and controlling the company's IT [15, 16].

The evolution observed in the role in the CIO in recent decades has brought new demands concerning the training and experience required for the correct exercise of her/his function. Given the lack of a structured framework of competences for a CIO, this research-in-progress article seeks to answer the research question "What competences should a CIO currently have?", presenting a new competency framework called CIOCB - CIO Competence Baseline.

The article is structured as follows: the next section presents the background; the third section is about the research method; the forth section briefly presents CIOCB; finally, the last section presents some conclusions and further work.

2. Background

In the last decades, the role of the CIO has received significant attention from researchers [17].

According to Ives [18], the precursor of the CIO role can be summarized as predominantly an operational manager whose main tasks were to develop new systems and to operate existing systems with a high level of reliability [19].

One of the first characterizations of the CIO was produced in the 1980s and defined it as "a senior executive, responsible for establishing the company's information policies, as well as the standards and management control of all company information resources" [15]. This definition was suitable during the first decades of computing but, over time, it became outdated because information technologies were gaining the status of fundamental elements for the development of organizations.

It was in the mid-1990s that the CIO title emerged, specifically in forward-looking companies, to describe a new type of IS manager, belonging to the top management team and in charge of managing the information resources in the company [11]. The CIOs had to change their initial profile, from exclusively technological manager, to technology and business manager, capable of leading efforts to implement IS in order to generate added value for their company [20]. The CIO has come to be valued for its business thinking and change management skills, beyond its technical know-how [21-24].

The growing importance of IT for business has transformed the role of the CIO, bringing it to a more strategic level. For several years, the management of IT has been widely recognized as a strategic element for the competitive development of organizations [17, 25]. With the growing recognition of the importance of IT and its management, the role and functions of the CIO have also radically changed, both in terms of relevance and in terms of mission and objectives [10].

To sum up, the role of the CIO has been redefined over time. In the beginning, it was clear that it had a technological focus, and its only concern was to provide the necessary technology (hardware and software) for the development of

the various business processes. This technological focus remained for some decades. Until the 1990s, and still today for some companies, the CIO's main function still encompassed the supervision and maintenance of computer and telecommunications systems. Thus, according to several authors, the CIO is described, first, as a technologist and, secondly, as a manager of human resources; in a third place, as a business manager [26-28]. Nowadays, in virtually all medium and large organizations, IT is part of the business and is inseparable from it. If IT fails, or its performance level goes down, every operation suffers, and to the limit, the result is business stoppage [28]. The awareness of the potential of IT as a generator of competitive advantage has led to a paradigm change. IT has ceased to be viewed as merely a cost and has come to be seen as a valuable resource for competitiveness [29, 30].

Thus, just as the role of IS evolved and gained importance within the organization, so did the role of the CIO. As a result, nowadays many CIOs are deeply involved in the business organization, being responsible for all IS success facets [31] and assisting CEOs in defining strategies and business unit leaders in their operation [11], assuming the role of business strategists and process innovators.

3. Method

The research method was defined aiming to find answers to the question: "What competences should a CIO currently have?". It comprised the following activities:

- Literature review focused on the competences of the CIO - aiming to identify, through the literature, what competences are currently necessary to perform the function of CIO;

- Elaboration of the initial version of the competences framework - based on the existing literature, was created the first version of the competences framework for the CIO (CIOCB);

- Empirical validation - it was carried out a multi-case study, that included the definition of the data collection strategy and respective instruments, selection of cases and CIOs to participate in the study, data collection (interviews, with audio recording), interviews audio transcription, and content analysis;

- Revision of the CIOCB framework - revision of the framework of competences, with the contributions from the cases;

- Discussion and conclusions - discussion of the results and presentation of the main conclusions.

The cases studied are the following:

Case 01 - Public Hospital Center constituted by four hospitals, with about 3000 employees – interviewee: CIO;

Case 02 - Business group in the civil construction sector, with approximately 1000 employees – interviewee: CIO;

Case 03 - Private Hospital Unit, with approximately 200 employees and 100 service providers – interviewee: CIO;

Case 04 - City Council, counting on about 550 employees – interviewee: Head of IT Office;

Case 05 - Private and cooperative teaching establishment, with more than 2000 students and 180 employees – interviewee: Head of IT Office.

The interview script was organized into two parts. In the first part (open response), CIOs were asked to indicate the competences relevant to accomplish their duties. In the second part, with a closed response, they were asked to indicate the importance of the competences identified in the initial theoretical framework, as well as the influence of experience and training to obtain the competences. In this way, it was possible to evaluate the proposed framework and to characterize several aspects relevant to the achievement of competences. It should be noted that, at the end of each case studied, the data collected was compared with the CIOCB framework. The cases were repeated until theoretical saturation (when no new contributions were verified).

The developed work allowed the proposal and evaluation of a new competences framework for the CIO, the CIOCB - CIO Competence Baseline, which is briefly presented in the next section.

4. CIOCB - CIO Competence Baseline

The term competence is manifestly diffuse and therefore difficult to define [32]. However, according to the Organisation for Economic Co-operation and Development (OECD) [33], "competence" is more than knowledge and aptitude: it is a set of skills, knowledge and related skills that enable a person (or organization) to act effectively in a

particular service or situation. Competence indicates the sufficiency of knowledge and the capacities that enable one to act in a wide variety of situations. In other words, competence is the demonstrated ability to apply knowledge or skills and, where relevant, personal attributes; is a set of specific knowledge, skills, abilities, attitudes and behaviours; it is also a compilation of knowledge, personal attitudes, skills, and relevant experience to be successful in a given function [34].

In an organization, it is common that a large part of the activities of the ISF is organized in projects [35]. On the other hand, several studies point to project management as a fundamental element of CIO action [5, 30, 36]. Given the importance of project management, for the organization of the CIO competences framework proposed here, named *CIOCB - CIO Competences Baseline*, was taken as the starting point the ICB of International Project Management Association (IPMA) [34].

In the CIOCB framework, in order to facilitate its understanding, the elements of competences of the CIO were organized into three groups, or dimensions of competences, that together describe their nature and function:

1. Technical dimension - represents competences related to the knowledge and ability to use methods, processes, procedures, and techniques;

2. Behavioural dimension - describes competences related to attitudes and behaviours;

3. Contextual dimension - describes competences related to the context of the organization, the project, and others. Each dimension contains several relevant competences for exercising the CIO profession, as shown in Fig. 1. As this is a research-in-progress, these elements will be detailed in further work.

Technical dimension
- Project management
- Stakeholder management
- Risk management
- Quality management
- Teamwork / interpersonal relationship
- Problem resolution
- Time management
- Resource management
- Control & reports
- Information & documentation
- Communication
- Technological innovations
- Technical and business knowledge

Behavioural dimension
- Leadership, motivation & engagement
- Self-control
- Assertiveness & self-confidence
- Stress management
- Openness/ diplomacy
- Creativity
- Results orientation
- Efficiency and effectiveness
- Consultation & negotiation
- Conflict & crisis
- Reliability
- Ethics

Contextual dimension
- Vision and business thinking
- Systems, products & technology
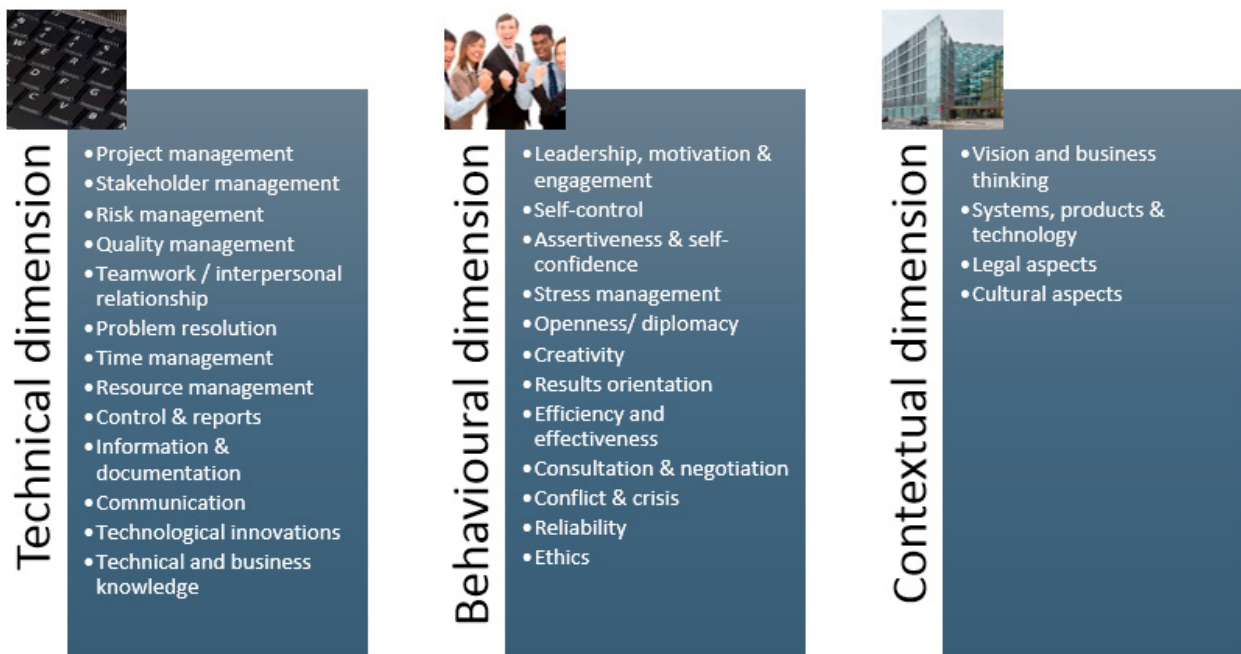- Legal aspects
- Cultural aspects

Fig. 1. CIOCB – CIO Competence Baseline.

5. Conclusion

The technological breakthroughs of the last decades have given rise to an environment in which organizations are forced to actively seek new cost-cutting options while simultaneously seeking to compete more effectively in their markets. This environment requires focused, agile, more flexible, and competitive organizations, often requiring radical changes in how they conduct business, employ people, and use technologies [37].

One of the aspects that brought significant changes in how companies compete was the evolution of IT and its growing adoption by organizations. As a consequence, there has been a significant change in what organizations expect from the performance of ISF and hence the CIO.

The CIO ceased to be "just" the executive responsible for IT management and joined the top management team. Currently acting as strategist and process innovator, the CIO has an important role in developing strategies and promoting alignment between the IT/IS and the business, thus being of great value for the development, competitiveness, and performance of the organization.

The evolution of the CIO role has brought with it the need for a new set of competences, not only of a technical type but also of a behavioural and contextual nature. With the emergence of new tech-related positions as, for instance, Chief Digital Officer, Chief Data Officer or Chief Innovation Officer, CIOs can either fill these needs themselves or serve as connective tissue for integrating it [38].

Seeking to answer the central research question "What competences should a CIO currently have?", this research-in-progress paper proposes the CIOCB - CIO Competence Baseline, a framework of competences for the CIO. The work will proceed aiming to describe all the CIOCB's competences, as well as to find answers to the complementary research question "To what extent do education/training and experience contribute to the achievement of the required competences to the CIO?".

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