The Technology Executive Role: A Study of the Main Competencies and Capabilities of the CIO / CTO

Carlos Sampaio
CESAR – Recife Center for Advanced Studies and Systems
Email: ccbs@cesar.org.br

Carlos Sampaio
CESAR – Recife Center for Advanced Studies and Systems
Recife, Brazil
Email: ccbs@cesar.org.br

Felipe Silva Ferraz
CESAR – Recife Center for Advanced Studies and Systems
Recife, Brazil
Email: fsf@cesar.org.br

Carlos Sampaio

Carlos Sampaio is an experienced senior Technology Executive with a confirmed history of working in the information technology and services industry, currently acting as Head of IT&Sec at CESAR Innovation Institute, as a faculty member at CESAR School for information Security post-graduation courses' and a Ph.D. candidate. Carlos has a strong Information Technology background. He conducts research groups in Cloud Computing, Networking, Data Centers, IT Management, Information Security, Privacy and Compliance, Blockchain, IT Service Management, and Team Development.

The Objective

This study is a systematic review of the literature. Where we purposed to evaluate the adoption of the "Everything as a Service" concept in the offering of the technical, behavioral, and business skills associated with a Technology Executive. The work aimed to answer three research questions:

RQ1 - What studies on defining the technology executive role have previously been conducted?

RQ2 - What are the responsibilities of the technology executive role?

RQ3 - How are the competencies associated with the role of the technology executive categorized?

The Protocol

- Search Strategy - We used the Population, Intervention, Comparison, Outcome, and Context (PICOC) criteria to define the structure of research questions;
- Automatic Search and Selection - Due to time constraints we selected only two data sources for this study, namely, The IEEE Xplore and the ACM Digital Library. Then we chose to compose specific strings to match each PICOC criteria;
- Identification of Inclusion and Exclusion Criteria - We used a date cut of criteria of studies published between 2017 and 2020, among other criteria that served as a filter for the results from the search step;
- Critical Evaluation - The results were analyzed sequentially in increasing depth analysis at each step. We used the candidate studies that reached the final step to extract data for synthesis and statistical analysis

General Results

The proposed research process resulted in 10 primary studies, written by 34 authors, linked to 15 institutions, based in 10 different countries, spread over four continents, and were published between the years of 2017 and 2020. The combined keyword number from the studies assessed by this paper yield a total of 49 distinct entries.

	Search/Selection			
	IEEE	***ACM.dl***	***Consolidated / Deduplicated***	***Excluded by criteria***
Population	394	1476	2848	1980
Intervention	344	425		
Control	194	902		
Outcome	63	409		
Context	n/a	n/a		
			Total of Included	***868***
	Extraction			
	Cut-off range, Inclusion and Exclusion Criteria	***Title***	***Abstract***	***Introduction***
Excluded	630	193	29	6
Included	238	45	16	10
			Final Selected Studies	***10***

Conclusion

According to the result of this literature review, the skills of the Technology Executive can be divided into five main groups, namely, Technologist, Strategist, Enabler, Financial, and Innovator.

Some limitations should be noted in the present study. First, the potential bias due to the design of the methodology using a single researcher only. Second, the limited amount of data sources and absence of options outside the academic environment, such as social networks and specialized market research companies.

In future works, we intend to perform studies including other data sources.