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A BRIEF ANALYSIS OF IT SERVICE MANAGEMENT FRAMEWORKS

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A brief analysis of IT Service Management Frameworks

This paper aims to analyse the available frameworks used to improve the best practices in Information Systems organisations and identify the variables necessary for the proper functioning of Information Systems.

Initially, analysed several frameworks and studies related to the work area. And then, use EDA methods to analyse and identify the weight and what are the most critical variables to be used.

With the results, it is possible to understand the variables most important for the frameworks and what is more used to help the organisations achieve the objectives.

Keywords*:* IT Service Management, Cobit, ITIL, MOF, ISO 20000

1. Introduction

Maintaining and improving the practices of IT teams is a reality at present due to the high demand and the digitisation of services.

Due to this reality, good practices on teams and business quality should be assured to accomplish the organisation and client's objectives.

Organisations have implemented practices to improve the quality service of IT teams and standardised work methods.

Studies have proved that these good practices are efficient and that the teams have augmented the efficiency and improved daily work.

This study, it is analysed the frameworks and their variables to understand what they are and why they are used for. Taking into consideration the most popular frameworks, ITIL V3/V4 (Information Technology Infrastructure Library), COBIT 5 (Control Objectives for Information and Related Technologies) and MOF 4.0 (Microsoft Operations Framework), and other studies related to good practices.

For this study, the following questions are addressed to end the study with the answer to all of them.

- Is there any difference between frameworks?
- Which framework covers the most points within organisations/teams?
- Is there space for a framework improvement?
- Which framework is more efficient to improve the team/organisation's work?

This paper aims to analyse and study these questions and answer them through an empirical study using extract data analysis methods and documentation review.

2. Literature review

In these sections, the life cycle and processes under study are presented from various sources.

Starting with the most used framework, going through the norms, and finishing with a review of several studies on the work area

From ITIL, [1] they say that the benefits are alignment with business, negotiated achievable service levels, predictable and consistent processes, efficiency in service delivery, measurable, improvable services and processes, and gives a common language term with a standard glossary.

For this to be achieved, several processes should be implemented. These are the variables that are in the study in this paper, the processes that are used to improve the services.

2.1. The frameworks

In this subsection, it is analysed the variables from frameworks ITIL, COBIT, and MOF. ITIL and MOF will be used to improve the team's processes, and the other will be used for the entire organisation's processes.

2.1.1. ITIL

Regarding good practices and elevating efficiency within IT teams, ITIL is the most referenced and Used by several companies, including the big ones[1], such as Microsoft, HP, Fujitsu, Disney, and Toyota, among others. When well implemented, it guarantees a service improvement and good efficiency in response to all stakeholders.

From ITIL V3(Citation), all the processes are organised into five service lifecycle stages, Service Strategy, Service Design, Service Transaction, Service Operation, and Continual service improvement. Each of these services is developed to receive and deliver the best service/product from any organisation and team.

Earlier in 2019, a new version was released, the ITIL V4[2], that presents new concepts without invalid the good practices from previous versions.

In this version, ITIL aims to deliver a tailor-made solution to organisations through "practices", with two significant components that enhancements to the previous versions:

- The four Dimensions Model
- The ITIL Service Value System

The four dimensions apply to the ITIL service value systems and directly impact the company's service management. They are divided by:

- Organisation and People.
- Values Streams and Processes.
- Partners and Suppliers.
- and Information and Technology

The ITIL Service Value System (SVS) can be seen as a bird-eye-view of an organisation's service management landscape. The SVS describes the inputs to the system, the different elements of the organisation, and the outputs.

2.1.2. MOF

Microsoft Operations Framework[3] is a series of 23 documents that give the Its professionals the processes of creating, implementing, and managing efficient and cost-effective services.

This framework can be seen as an alternative to ITIL, designed practical,

understandable and concise.

MOF is divided into four quadrants (processes):

- Optimising
- Changing
- Operating
- Supporting

All the phases, and quadrants, describe goals, activities, and accountabilities.

2.1.3. COBIT

COBIT[4], on the other hand, is an IT governance framework that structures IT tasks into generic processes and control objectives.

This framework focuses on IT governance across the entire organisation and is divided into principles.

2.2. Norm ISO 20000

Passing to the norm, the ISO20000[5], [6], the first norm edited by the International Organization for Standardization, and visa under the IT service quality management.

Being a mirror of the ITIL framework, the organisations certified with the ISO20000 norm needs to implement the guidelines presented for establishing, implementing, maintaining, and continually improving a service management system.

For this study, the clauses from ISO 20000-1:2018[7] are sufficient due to this part, which is related to the Service Management system.

This part presents the structure that should be considered for the adjusted organisation's operational needs.

This part is divided into:

- Context of the organisation
- Leadership
- Planning
- Support of the SMS
- Operation
- Performance evaluation
- Improvement

3. Data Study

In this section, it is presented the analysis and results from the study of the variables above.

With this analysis is possible to understand the framework's size and detail from each other and what variables are more used in all of them, thus referring to those that should be considered more important and with more weight for the proper functioning of the information systems.

3.1. Data in use

This study used Excel data and EDA (Extract Data Analysis) techniques in Python. Due to the data visualisation to draw meaningful patterns and insights.

The data used in this analysis come from a CSV file filled with the Processes and categories from each framework. This file was supplied previously by analysing the frameworks and transcribing the processes and activities identified. The file includes the information presented in Table 1. The file is divided into Frameworks and Categories. Inside the Categories, it is given the Processes and Sub-Processes, if available. For all the entries, Processes and Sub-Processes are presented with the Activity that each of them does.

After the file conclusion, all this data is analysed using EDA methods. This is described in the next section.

4. Data Analysis

For the data analysis, it was used Exploratory Data Analysis or EDA. In simple terms, it allows us to uncover patterns and insights, often with visual methods. Used as the first step of the data modelling process, this study is used to understand better what is presented in the CVS file.

With this, it was possible to understand what is presented in each framework, Category, and so on.

Checking the number of variables identified in each framework, as shown in figure 1, ITIL was the framework with more variables, followed by COBIT. This result is influenced by the detailed description of these two frameworks.

Comparing it with ISO 20000 and MOF, this considerable discrepancy was because ISO 20000 is divided into guidelines that need to be implemented for the organisation to receive the certification, and MOF is divided into specific quadrants and more enfaced into Operations processes.

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---- Framework ----
ITIL        198
COBIT       194
ISO20000     29
MOF          20
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Figure 1 - Total variables by Framework

In Figure 2, it is possible to understand the total number of Lifecycles or Services in each category for each framework. In COBIT is possible to realise that Management Capacity is more present. Since this framework is more focused on IT governance, it was expected to see this result.

ITIL is very well divided, without emphasising a specific category.

Like ITIL, ISO 20000 is well divided with the same number of guidelines for each Category. Only Service Agility receives one more guideline.

MOF, as said earlier, is more focused on Operations, so the processes are more focused on the Categories of Operations and Team Capacity.

Framework	Rating_Categories	Lifecycle_ServiceValue
COBIT	Information Security	10
	Management Capacity	101
	Operations	14
	Service Agility	27
	Strategic vision	22
	Team Capacity	20
ISO20000	Management Capacity	7
	Operations	7
	Service Agility	8
	Strategic Vision	7
ITIL	Information Security	22
	Management Capacity	22
	Operations	32
	Service Agility	36
	Strategic vision	48
	Team Capacity	38
MOF	Information Security	1
	Management Capacity	2
	Operations	7
	Team Capacity	10

Figure 2 - Total Lifecycles and Services in each Category, group by frameworks

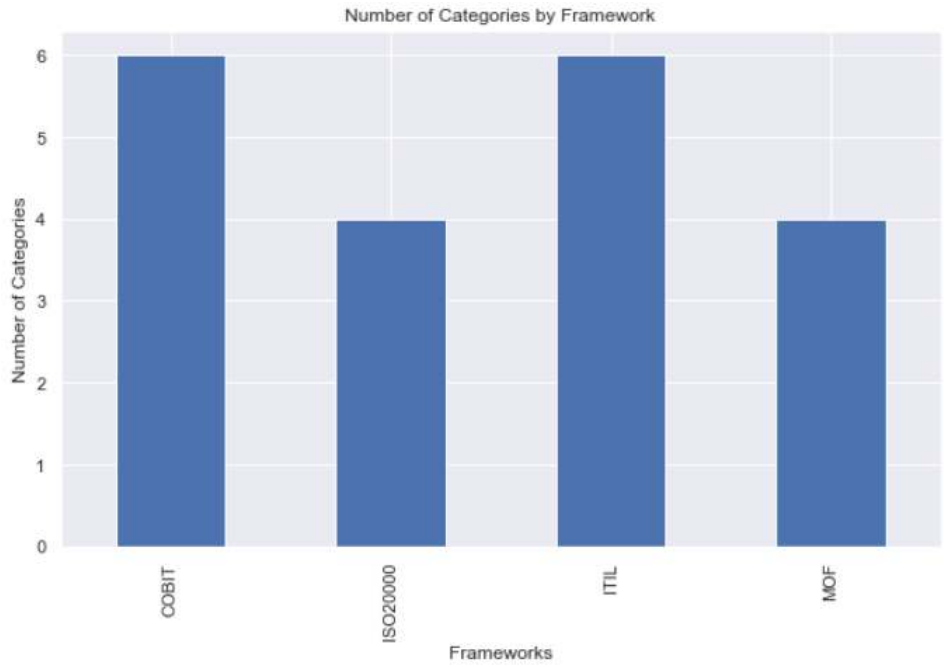

Figure 3 - Total number of categories by Framework

By dividing the lifecycles and processes into Categories, ITIL and COBIT have the same division, and the other two have fewer categories.

---- Lifecycle_ServiceValue ----		---- Processes ----	
Align Plan and Organize	83	Information security management	22
Build Acquire and Implement	64	Financial Management for IT services	19
Service Design	60	Change evaluation	15
Service Transation	57	Strategy management for IT services	14
Service strategy	48	Manage Solutions Idenitification and Build	12

Figure 4 - Top total for each Lifecycle, Process

Management Capacity	132
Strategic Vision	77
Service Agility	71
Team Capacity	68
Operations	60
Information Security	33

Figure 5 – Total of Categories

5. Conclusion

In conclusion, this study helped to understand how several frameworks and norms are divided and where they can be implemented to help teams and organisations improve their practices.

ITIL and COBIT are more detailed and with a significant number of definitions, cycles, and processes that can be implemented and improve a lot of processes inside the teams. The apparent difference between the two is the big difference in the management capacity within COBIT. On the other hand, ITIL has the most well-divided processes.

MOF framework is less detailed and more focused on Team Capacity.

And ISO 2000 0 doesn’t have the same detail as ITIL but guidelines to implement processes and services, although they are a mirror of each other.

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