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# Crew Concept as an Organizational Knowledge Instrument vital for Operations

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**Abstract**

To cope with nowadays adversities, it is imperative to adopt new mechanisms that provide effective and efficient management of the increasingly scarce resources that the organization has at its disposal. With the aim of increasing efficiency, Portuguese Air Force uses the Air Force Integrated Management Support System. This tool covers various areas, with modules that support personnel management, maintenance and operation, among others. This paper addresses one of these branches, the Operational Management Module. The referred module is used at the operational level for recording data on the performed operations, evidencing several flaws compared to its purpose as an integrated management tool. Regarding flight operations, an essential element is the Crew, which manages the Aircraft, in turn used to execute the Mission. In order to meet the above objective, it is important that Crews management, which includes their composition and promptness verification, is implemented in Operational Management Module. It is therefore the object of study of this paper, to find out whether, how and to what depth, is the Crew concept incorporated in the information system and if this is actually used in the operating theater of the Portuguese Air Force.

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*Keywords:* Information System; Information Architecture; Crew Composition; Organizational Engineering; Organizational Self-Awareness; Portuguese Air Force.

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## 1. Introduction

The Portuguese Air Force (PRT AF) uses an information system (IS) that provides operational related information, thereby increasing efficiency and effectiveness to air operations. This IS is the Air Force Integrated Management Support System (SIAGFA) and it is composed by several modules. This paper focuses on the Operational Management Module (MGO) and some of the interactions with other modules such as Human Resources Module (MRH) and Maintenance Management Module (MMG).

It was found, after studying the operation and interaction between those modules, that the information collected, stored and processed regarding crews is insufficient for an effective crew management. In order to improve the operational process, as well as for readiness, planning and crew composition, it is essential that the concept of available crew is defined and included in the PRT AF's IS. With this enhancement it can be considered a management tool useful in helping the organization to effectively improve its awareness, and facilitating the accomplishment of its mission.

Naturally, a comparison was made with other solutions, in order to evaluate similar models implemented to achieve NRT control over operations. The authors analyzed Sabre Airline Solutions@, which provide functionalities such as managing change and resource synchronization for airplanes, crews, ground support personnel and equipment. However, as the solution is dedicated to the civil aviation sphere, it does not cover the specificities of a military organization. Therefore, although using similar concepts, the research covers military specificities.

This work intends to contribute to the improvement and development of MGO, mainly through the introduction of crews as an Informational Entity (IE), thus enabling its composition and management in this platform. It is further intended that this platform becomes an instrument with tools in Near Real-Time (NRT), therefore facilitating the task of the managers at the same time it contributes to the organization and its operational mission and increases the Organizational Self Awareness (OSA).

To achieve the purpose previously stated, this article was divided in the following sections: section 2 revises the essential literature and concepts related to the subject; in section 3, the model for Crew Composition is presented and explained; section 4 presents the authors conclusions.

## 2. Concepts and Application

This section briefly describes the theoretical fundamentals directly relevant and necessary to the model of 'Crew Composition' presented in the third section.

### *2.1. Enterprise Engineering and Organizational Self-Awareness*

Enterprise Engineering is "*the body of knowledge, principles and practices having to do with the analysis, design, implementation and operation of an enterprise*" [1]. The world we live in presents us with scenarios in which change and an unpredictable competition are constant, bringing us Enterprise Engineering to a fundamental question which is the following, "*How to design and improve all elements associated with the total enterprise through the use of engineering and analysis methods and tools to more effectively achieve its goals and objectives?*" [1].

There are three principles on which Enterprise Engineering lies. The first principle says that an organization can be seen as a complex system, due to the fact that in organizations, systems are of an organized complexity, in result of the multiplicity of interactions between man and the various components of the system. As a result, the engineering principles can be applied. The second principle states that organizations should be seen as a system of business processes, and these may be developed individually and/or together. Finally, the third principle admits the use of engineering rigor in the transformation process of the organization. Based on the above referred principles, some techniques are developed for modeling, designing and then implementing the organization or some of its features.

In short, Enterprise Engineering provides a set of principles and practices which lead to a fundamental question that exposes the challenge of its existence: "*How to draw and improve, in a holistic approach, all elements associated with a business, through the use of analytical methods and tools, so that it better achieves its strategic objectives*" [1].

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