

# ERP and Time Management: A Recommender System

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## INTRODUCTION

As the performance of business computer hardware evolves, software offers more services to users. The software tool most used in business, management software, also evolves over time. Thus companies, as part of their digital transition, require their employees to use an Enterprise Resource Planning (ERP) in order to centralize management and data. The modern ERP implementation methodology encourages and supports a phased approach to business management (Lutovac and al., 2012). In all sectors, the manager is faced with the difficulty of planning the tasks of the team as well as possible. Management software frequently helps the manager to follow the activity of the company but this does not guarantee that each member of the team takes care of the most suitable task according to the criteria imposed by the management.

Standard management software may be ideal for a company that only needs basic functionalities such as sales management, inventory management or customer management (Bronner and al., 2020). On the other hand, when a company wishes to manage and monitor all the information and operational services that make up its activity, it uses an ERP. The objectives of this tool, which is part of the digital transition of companies, are multiple:

- Ensure centralization, security and rapid access to information
- Automate repetitive and time-consuming tasks (low value-added hunting)
- Improve organization between employees and communication between departments
- Plan tasks and coordinate stakeholders
- Analyze performance and profitability in real time
- Have all the useful information on its staff, customers, products, suppliers and subcontractors

In addition, ERPs are also used for time and activity management (TAM). Thus, department heads, whose mission is to organize the activity and guarantee the productivity of their department through the operational planning of their teams, are assisted by the software which allows them to discharge a certain number of control and input operations to focus on more strategic tasks. TAM creates a climate of trust and transparency by making the monitoring of staff working time more reliable, both in terms of consultation and organization. Indeed, the precision of the input information guarantees infallible output processing.

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The major challenge of setting up a TAM is optimal operational management, i.e. scheduling the right person, at the right time, for the right activity, while controlling the associated costs.

Thus, in the commercial sector, it is difficult to know if a user is making the right choice when making a quote for customer A while customer B is also waiting, or vice versa. The time spent for each client is an important factor, as it can be seen as the profitability of the project or it could improve customer satisfaction, but neither the employees nor the manager can control all these parameters. The volume of data stored by an ERP is so large that a user can in no way take into account its entirety. The reality is such that even software struggles to be able to process them effectively, hence the birth of the term big data.

Business Intelligence (BI) tools and techniques used to come on top of the ERP systems in order to help decision makers making quality decisions (Elragal, 2014). Indeed, BI can go deeper to find hidden patterns and unknown facts when using data mining techniques. It is therefore obvious that a system allowing the user of an ERP to suggest an action by matching user's preferences and the analysis of the company's activity is essential.

A recommender system, in which criteria would thus be defined, could ensure the choice of the most appropriate alternative under the constraint of these criteria. One alternative is a task to be done in priority. This recommender system could guide the staff in the next to be done.

Some companies have invested millions in business software that is not used by their employees because they spend more time than expected using the software, or because they have been excluded from the software design process. For this reason we included the staff members in the design of the ERP and we aim to test it in real situation.

In this chapter, we discuss the asymmetry between the staff members and the manager for the next task to be done choice. We present the prototype of the recommendation system which will restore a balance in this asymmetry, with its interface and its database. In this article, we discuss the asymmetry between staff members and manager in choosing the next task to do. We present the prototype of the recommendation system which will restore a balance in this asymmetry, with its interface and its database. Regarding the interface, the main configuration forms are produced, and their operation is revealed. We then detail the structure of the database as well as examples of the content of the main tables. In order to clarify the problem of time management, we explain how the use of an ERP can facilitate the operation of the company's activity but generate difficulties in its use, which can be avoided thanks to recommendations. The source code of some forms are exposed, and the development environment as well.

## **BACKGROUND**

The digital transition of companies is the heart of the strategic decisions taken by managers, both for large groups and small companies. This digitization most often materialized by setting up an ERP system, its implementation is generally a great challenge, and typically requires between one to five years (Mabert and al., 2003). The basis of ERP systems is to generate mandatory, relevant, reliable and timely information (Lecic and al., 2013). This implies that upstream, the information is transformed into a convenient form to be used. This objective is achieved on one hand when the user consults this information via the ERP and considers that he has saved time, on the other hand when the organization is able to better execute all its business processes and when the integrated information system can support the development performance of the enterprise (Boota-Genoulaz and al., 2005). Thus, in addition to the computational aspect, there is also the concern for the information presentation. Indeed, each user has a value system and perceives information in a very personal way. The perceived transparency of ERP system information

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