MESG
MESTRADO EM ENGENHARIA DE SERVIÇOS E GESTÃO

Does analytical information, embedded in transactional information, accelerate process efficiency?

Bernardo Filipe Almeida Ferraz

Master Thesis

Supervisor at FEUP: Prof. Alcibiades Guedes
Supervisor at Consteltech: Dr Carlos Russo

U. PORTO
FEUP FACULDADE DE ENGENHARIA
UNIVERSIDADE DO PORTO

2023-09-15

Abstract

This dissertation is part of the dissertation project to complete the Master's Degree in Services Engineering and Management at the Faculty of Engineering of the University of Porto (FEUP). University of Porto (FEUP).

The purpose of this dissertation is to examine SAP's shift from its older SAP GUI to the newer SAP Fiori version. This transition has introduced new features, including embedded analytics, which provides users with real-time analytical information during their transactions. The existing problem is to understand whether these changes enhance process efficiency and, in turn, boost workplace productivity.

This research began with a focused survey targeting SAP users who transitioned from SAP GUI to Fiori. The aim was to comprehend the impact of these changes on daily company operations. Subsequently, interviews were conducted with experienced users to delve deeper into the subject and derive meaningful insights. The primary objective was to gain a comprehensive understanding of the improvements, particularly those related to embedded analytics, experienced by organizations relying on this ERP system in their day-to-day operations.

The survey and interviews yielded valuable insights, offering a comprehensive examination of the research questions. The findings indicate that SAP Fiori is effectively keeping pace with the rapid growth of the ERP market. It empowers users to enhance process efficiency through innovations, a revamped user interface, improved usability, and integrated analytics.

Acknowledgments

I would like to start by thanking all the teachers who have helped me along the way in my academic journey. I genuinely appreciate all the information you have shared with me.

I would also like to express my special thanks to thesis supervisor for all the guidance and patience.

To my family and all my friends, I'm forever grateful for everything you did for me. A very special thank you to my girlfriend who always supported me all the way. You shaped a big part of who I am today, and I wouldn't be able to complete this important milestone, along with all the other milestones in my life, without all of you.

Finally, I would like to thank Consteltech for the project and especially to those who made a direct contribution to my paper, Dr Carlos Russo and all the interviewees.

Table of Contents

List of Tables

List of abbreviations

ERP – Enterprise Resource Planning

IT – Information Technology

IS - Information Systems

GUI – Graphical User Interface

SME - Small and Medium Enterprise

DB - Database

SQL - Structured Query Language

OLTP - Online Transactional Processing

OLAP - Online Analytical Processing

CRM – Customer Relationship Management

BW - Business Warehouse

SEM – Strategic Enterprise Management

UX – User Experience

1 Introduction

1.1 Project background

This Dissertation is part of the completion of the master's in services engineering and management taught by the Faculty of Engineering at the University of Porto.

The project will specifically focus on the use of SAP and its functionalities by using its old (SAP GUI) and new (SAP Fiori) version, SAP is an ERP (Enterprise Resource Planning). A single software system that allows the complete integration of the information flow of all functional areas of a company using a single database accessible through a uniform interface and communication channel (Salmeron & Lopez, 2010).

All dimensions of computing applications across enterprises have been impacted by the tremendous growth of information and communication technologies (ICT), which is driven by microelectronics, computer hardware, and software systems. The business environment is simultaneously getting more complex, with functional units needing an increasing amount of cross-functional data flow for decision-making, timely and effective product part procurement, inventory management, accounting, human resource management, and distribution of goods and services. To increase competitiveness through cost reduction and improved logistics, the management of companies needs effective information systems.

Managers require analytical information about the data that is passed between SAP transactions because of the need to manage information to improve process execution efficiency. This has resulted in a constant need for real-time information analysis of the data that is present in process execution. Analytic data assists managers in making decisions, which ultimately leads to internal growth for the group or business.

SAP underwent major changes in 2015, with the introduction of the HANA database. Before the creation of the HANA database SAP GUI with a multidimensional database (with OLTP protocol) in SQL that passed and updated the information every day at night to the data warehouse, didn't allow a user to access a document with analytical information about transactions. They would have to generate a separate document because the database did not allow OLAP protocols.

After 2015 SAP Fiori was developed based on the S/4 HANA database, which allows OLAP and OLTP protocols in the same database. This allows the user to access real-time transactional information embedded with analytical information about current processes.

1.2 Research Questions

In this research, we assess whether transactional information combined with analytical information increases a process's efficiency and whether employees and supervisors use this information to boost productivity.

- Does analytical information, embedded in transactional information, accelerate process efficiency?

- Are companies really taking advantage of the transition from SAP GUI to SAP Fiori?

1.3 Study and Project Development at Consteltech

The APR Group, with 28 years in the market, aware of the new technological challenges, created CONSTELTECH - Innovation and Consulting Services, Lda. which has a large team with great experience in implementation, consulting, and support of SAP Solutions (Consteltech, 2023a). It has a large and expanding workforce of professional SAP consultants that are committed to delivering a high-value SAP project service. Consteltech, a provider of SAP solutions, has first-hand experience in the field. For this reason, Consteltech has the right context to learn from clients who use it frequently whether the use of SAP Fiori, which gives users access to transactional data embedded with real-time analytical data on any transaction, has increased process efficiency. The project will include a variety of use cases, including companies that still use SAP GUI daily, companies that use both SAP GUI and SAP Fiori, and finally companies that have entirely shifted to SAP Fiori.

Consteltech, which serves clients in a variety of industries including energy, telecommunications, banking, oil and gas, mining, cement, the beverage industry, etc., will be working on the project (Consteltech, 2023b). On this basis, a wide range of SAP applications, including SAP GUI (Graphical User Interface) and SAP Fiori, can be assessed. It will be possible to determine how employees of businesses that already use only SAP Fiori have adapted, whether they use the real-time analytical information available to them, and if so, whether doing so has improved the efficiency of the processes or not.

1.4 Motivation

Every time, and now even more quickly than before since the industrial revolution, the world changes. However, the term "transformation" didn't become popular until the 1990s in reference to numerous organizational and practice changes (Muzyka et al., 1995).

The transformation has become a clear goal for most businesses intending to thrive in the market as one of the fascinating concerns in transformation, "how to replace

humans with computers," has transformed over the past few decades to "how to support humans successfully with computers."

Big Data and information systems play a crucial role in businesses, thus it's crucial to create techniques that build on this idea and use it to accomplish strategic goals and enhance all organizational processes.

This project and dissertation involve a topic related to information systems, namely Enterprise Resource Planning that are typically a part of the larger management information system that is at the forefront of simplifying routine operations by providing managers with analytical information and tools to facilitate critical internal business processes. This project specifically uses the two versions of an ERP called SAP (GUI and Fiori), an ERP that is the market leader in its segment, it will be held at Consteltech that is specialized in consulting and development of SAP solutions.

To determine whether SAP's strategy of combining transactional data with analytical data enhanced business process efficiency, the thesis will look at how organizations use both the SAP GUI and Fiori versions. And to determine whether businesses and their staff members make use of the new SAP Fiori features.

Since SAP only recently made the upgrade that is the subject of this study, there aren't theses, publications, etc. on this specific subject.

As a result, this thesis would provide a unique contribution to the literature on ERP.

1.5   Outline of the project proposal

The remaining portions of the dissertation are organized as follows: First, a literature review and contextualization of several concepts related to the research topic, SAP.

Then, it follows a characterization of the problem at hand, describing the company that allowed the project and its contribution to the research area. Followed by the literature-based justification and description of the used methodology in the development of the dissertation. Then, the presentation of results obtained, its analysis, and finally the conclusion and directions for future research.

2   Literature Review

2.1   ERP Concept Definition and Contextualization

Enterprise resource planning (ERP) systems are defined as a single software system that allows for the complete integration of information flow from all functional areas in businesses using a single database and accessible via a uniform interface and communication channel (Salmeron & Lopez, 2010). Initially, ERP encompassed all current transactions within a company. However, it was eventually extended to include external suppliers and customers (Elhasnaoui, 2021). These systems consist of several modules corresponding to organizational management departments. An ERP system is a component of generic management software that may be tailored for each business.

Companies are urged to combine all business operations into one system due to the constantly changing business environment. ERP systems emerged to examine the requirements of integrated systems as businesses are under pressure to outsource operations that are not a part of their value chain (de Souza & Zwicker, 2001). ERP systems are viewed as very practical solutions and as a tool for managers because they make it simple to find and manage data across all business functions, including production, sales, finance, human resources, and logistics, and they meet the needs of all the various departments by facilitating data sharing and interdepartmental communication. According to Holsapple and Sena (1999), the advantage of ERP systems is that they enhance organizational decision-making; as a result, they argue that ERP and decision support systems should be more integrated, and that additional research and development efforts should be focused in this area. Recently, ERP solutions have been more widely available to small and medium businesses (SMEs) (Klaus et al., 2000).

Control and management of real-time data is a vital success component for every worldwide organization, especially as market competitiveness and instability increase. ERP systems enable businesses to integrate all resources, allowing for continuous and instantaneous communication and information flow (Bingi et al., 1999).

SAP, Oracle, Microsoft Dynamics 365, and Sage are the four major ERP products. SAP is the market leader in terms of size, quality, innovation, and market share (Soellner, 2021).

2.2   SAP Software (GUI and Fiori)

SAP is one of the world's leading producers of software for the management of business processes, developing solutions that facilitate effective data processing and information flow across organizations (SAP, 2022)

The graphical user interface of an SAP system is known as SAP GUI (SAP Graphical User Interface). For users to interact directly with SAP software, an SAP GUI is

required. It is utilized in businesses that still use SAP R/3 and SAP ECC. In addition, SAP GUI is a locally installed application on end devices (Bressler, 2014).

The first version of the R/3 system was released in 1992, while the Internet-enabled Release 3.1 was completed in 1996. The R/3 system has three major function modules: SAP Financials, SAP Human Resources, and SAP Logistics (Lau, 2005). In total, there are more than 8,000 configuration choices available for the R/3 Reference Model. The most recent version of R/3 is SAP R/3® Enterprise, which uses cutting-edge technology to handle collaborative e-business processes while adding new features and enhancing existing ones (Lau, 2005).

The R/3 system was created with business applications and processes like sales orders, material requirement planning, and hiring in mind. The R/3 system's ability to function on any platform, including Unix and Windows NT, is a significant benefit. Additionally, R/3 makes use of an open architecture strategy, enabling third-party software developers to create add-on software packages and include devices like barcode scanners, PDAs, mobile phones, and Global Information Systems with the R/3 system (Buck-Emden, 2000).

SAP advertises its R/3 system as a ground-breaking, effective, and inventive software solution, yet the system has a few flaws. To limit the number of configuration options accessible, various assumptions must be made due to the R/3 system's complexity. All options, however, are fixed and cannot be modified once the system has been established. Additionally, before moving on to the following screen or activity, users must complete all the forms (Jacobs & Whybark, 2000).

In 2015, SAP launched a new version, the SAP Fiori R/4 that allows OLAP and OLTP based in the SAP HANA database.

SAP Fiori is a completely new customer experience (UX) for SAP software and apps. It provides a range of applications utilized in standard service functionalities such as job recommendations, monetary applications, computation apps, and numerous self-service applications. SAP Fiori provides over 300 role-based applications such as HR, Production, and Finance (Valaboju, 2019). When SAP Fiori is combined with the capability of SAP HANA, it provides an unmatched request-response and query-execution opportunity. SAP Fiori user experience (UX) is used to provide a personalized as well as role-based customer experience for enterprise-wide interaction throughout work.

The new SAP UX simplifies the existing GUI and makes it compatible with any tool with any screen size that supports HTML5, including mobile devices. For SAP, this update was a significant step because it involved the adoption of both a user interface design philosophy and an entire innovation (Valaboju, 2020).

As was previously noted, Fiori was developed using the HTML5 framework, with a focus on user-centric apps and a consistent UI idea. This made it easier for SAP to create a responsive user interface (UI) that works on any type of device with an HTML5-compliant web browser and is also compatible with all screen sizes. Fiori was cultivated based on the following concept principles (Valaboju, 2020):

- **Role-based**, each app focuses on a certain user role, such as manager, employee, salesperson, and so forth. The role-based approach helps in the creation of user-focused applications. A user may play several roles. The same

user may carry out various tasks across many business domains, depending on the nature of their responsibilities. Users can be assigned apps depending on their roles that have been created to carry out certain tasks that are associated with various modules (HR, SRM, CRM, and so forth).

- **Responsive**, Fiori is HTML5-based, therefore it functions perfectly on all screen sizes and gadgets with HTML5-compatible browsers. Depending on the amount of screen space available, Fiori apps change their layout. Input methods supported by Fiori include touch-based inputs, keyboards, and mice. Fiori operates without a platform or ecosystem (Windows, Android, or iOS). Across all platforms, the apps operate and respond in the same way.

- **Simple**, the user can do activities quickly and effortlessly because of the simple UI. Fiori apps place a strong emphasis on a 1:1:3 strategy: one user, one use case, and three screens (desktop, tablet, and mobile)

- **Coherent**, Fiori's apps all share the same design footprint, and thus, the same look and feel, regardless of how many there are. This helps users in becoming used to Fiori apps. Because every Fiori app uses the same design language, users are more comfortable using other Fiori apps after using one.

- **Instant Value**, the amount of time spent on user training is minimal. Users can quickly get used to the new UI because it is straightforward and adheres to a consistent design pattern across all apps. As a result, user training expenses are also kept to a minimum.

  SAP Fiori apps are divided into three categories. They are distinguished based on their function and infrastructure requirement (Valaboju, 2019).

- **Transactional Apps**, In SAP Fiori, transactional apps are used to handle transactional tasks such as manager-employee transactions such as leave requests, trip requests, and so on. Transactional Apps perform best on the SAP HANA database, although they can be implemented with any database that provides adequate performance. These apps enable users to do basic SAP transactions on mobile devices as well as desktop or laptop computers.

- **Fact sheets**, Fact sheets are used in corporate operations to drill down on critical facts and contextual information. The use can drill down to more details in SAP Fiori tiles. It is also possible to use fact sheets to navigate to Transactional apps and perform SAP transactions. A few Fact sheets additionally include a geographical map integration option.
- **Analytical Apps**, these apps are used to deliver role-based real-time data regarding business activities. Analytical apps combine SAP HANA's functionality with the SAP business suite. It displays real-time data from a big amount of data in a front-end web browser. Key Performance Indicators (KPIs) can be closely monitored using analytical apps. It allows us to do complex aggregations and computations for business operations and react instantly to

changes in market conditions. SAP Fiori Analytical apps leverage Virtual data models and run on the SAP HANA database.

2.3 SAP Hana Data Base

In the last few years, there have been major changes in the data management needs for corporate systems. For instance, maintaining the traditional boundary between transactional and analytical access patterns is no longer viable. From a business standpoint, queries in transactional contexts on the one hand are calculating the total liabilities per client or creating the sums of already-delivered orders. On the other side, analytical queries need operational data to be immediately accessible in order to enable precise insights and quick decision-making (Färber, Cha, et al., 2012).

Briefly put, the range of necessary application support is extremely varied and displays a wide range of interaction behaviors. The SAP HANA database presents itself as a first step toward a holistic data management platform providing robust and efficient data management services for the needs of modern business applications because traditional SQL-based data management engines are too limited for these application requirements. The whole SAP HANA Appliance, which includes the SAP HANA database, provides the data management framework for updated and newly created SAP applications. The SAP HANA database is intended to serve as the foundation of the SAP HANA Appliance, supporting complex business analytical operations in addition to operational workloads that must be transactionally consistent (Färber, Cha, et al., 2012).

Core Distinctive Features of the SAP HANA Database, before getting into the specifics, it will be briefly discussed some broad distinguishing characteristics and design principles to highlight the main differences from commonly used relational, SQL-based database management systems. The following features represent the foundation of the philosophy behind the SAP HANA database (Färber, Cha, et al., 2012):

- Multi-engine query processing environment, the SAP HANA database includes a multi-engine query processing environment to handle the demands of managing enterprise data with distinct properties in different ways. It also offers SQL-based access to relationally structured data with complete transactional support to enable the fundamental functionalities of enterprise applications. The database provides a text search engine together with its traditional relational query engine, supports "joining" semi-structured data to relations in the traditional model, and supports direct entity extraction operations on semi-structured data. In addition, a graph engine comes with the ability to natively execute graph algorithms on networks of data items to assist business applications like social network analysis, supply chain optimization, and production   planning.

- Representation of application-specific business objects, the SAP HANA database, in contrast to traditional relational databases, may offer a complete understanding of the business objects utilized in the application layer. To push

more application semantics into the data management layer, the SAP HANA database enables the registration of "semantic models" inside the database engine. In addition to registering data structures that are more semantically rich (such OLAP cubes with measures and dimensions), SAP HANA also gives users access to business logic that is built right into the database engine. These application processes are encapsulated in the SAP HANA Business Function Library.

- Exploitation of current hardware developments, the database is designed from the ground up to operate in contexts that prioritize main memory and concurrency. The primary design criterion for all algorithms, from system-level up to application-level, is to provide scalable parallelism.

- Efficient communication with the application layer, SAP HANA development is to improve data type alignment between each and allow shared-memory connectivity with SAP proprietary application servers. On the other hand, to enable the interweaving execution of application logic and database management capabilities, its intended to directly incorporate new application server technology into the SAP HANA database cluster infrastructure.

- SAP HANA database architecture overview, the database is a memory-centric data management system that makes the most of the features of contemporary hardware, particularly very large amounts of main memory, multi-core CPUs, and SDD storage, to enhance the performance of analytical and transactional applications. The HANA database powers the HANA Appliance's high-performance data processing and storage engine.

Business and application logic can be run inside the database kernel of SAP HANA DB. The calculation engine offers an abstraction of logical execution plans for this use, known as calculation models. Calculation models are created, for instance, using SQL Script, a declarative and optimizable language for defining application logic as data flows or by employing procedural logic. If you go this path, you can support a variety of domain-specific languages if a compiler creates the intermediate calculation model representation (Färber, May, et al., 2012). Several application domains can be supported by the calculating engine by incorporating specific operators like statistical algorithms, planning and other special operators.

To conclude, SAP HANA DB differs from other column-stores in that it offers great support for both types of workloads and business application needs. Since most OLAP and OLTP processes are read operations, column-wise compression is advantageous. Additionally, fewer indices are needed, which results in a simpler physical database design and less memory usage. The vast volume of data generated by today's enterprise applications can be distributed throughout a cluster of nodes by SAP HANA DB in order to hold it all in memory. Large data sets can be analyzed orders of magnitude faster than on traditional database systems consequently (Sikka et al., 2012).

2.4 OLTP and OLAP

2.4.1 OLTP

Data processing that focuses on transactions is known as OLTP (Online Transactional Processing). Small amounts of database data are updated, deleted, or inserted. It is frequently used for retail sales, order entry, financial transactions, and CRM. OLTP databases have several characteristics that were developed with the late 1970s computer technology in mind, such as locking-based concurrency management, disk-resident B-trees and heap files, and support for multi-threading. Modern computers are considerably different from those of thirty years ago due to improvements in processors, memory, and networks. Many OLTP databases can now fit in main memory, and the majority of OLTP transactions can be completed in milliseconds or less. But little has changed in database architecture (Harizopoulos et al., 2018).

2.4.2 OLAP

Large business databases are organized using a technology called online analytical processing (OLAP), which also facilitates complicated analysis. Complex analytical queries can be run on it without having an adverse effect on transactional systems. Specifically used for corporate decision-making, a data warehouse is a subject-oriented, integrated, time-varying, non-volatile collection of data. 1 The operational databases of the company are typically kept separate from the data warehouse. There are numerous justifications for doing so. Online analytical processing (OLAP), whose functional and performance requirements differ significantly from those of on-line transaction processing (OLTP) applications normally supported by operational databases, is supported by the data warehouse (Chaudhuri & Dayal, 1997)

OLAP operations include rollup (increasing the level of aggregation) and drill-down (decreasing the level of aggregation or increasing detail) along one or more dimension hierarchies, slice and dice (selection and projection), and pivot (re-orienting the multidimensional view of data) (Chaudhuri & Dayal, 1997).

2.4.3 OLTP vs OLAP

Earlier on-line operational systems were responsible for transaction and query processing. As a result, they are also known as OLTP systems. Users or knowledge workers use data warehouse systems for data analysis and decision-making. Such systems can arrange and show data in a variety of formats to meet the unique demands of different users. These are known as OLAP systems. Relational databases are extraordinarily well adapted for transactional purposes, and they have spread throughout the business enterprise as the primary technology for hosting and maintaining operational data. The OLAP environment is very different from the OLTP environment and serves a different business function. Data from the transactional OLTP environment is extracted, transformed, and fed into the OLAP environment, where advanced DBMS systems can deliver business insight using analytics native to the Structured Query Language (SQL) release 3 (1999) standard. The OLAP environment was created to facilitate the implementation of Decision Support System applications (Conn, 2005).

The extraction, transformation, and loading process can be time expensive and is a major determinant of the frequency with which the OLAP environment is updated. To this extent, the data in the data warehouse may be less effective in decision support because it is not "real time" data like that found in an OLTP system. OLTP and OLAP run simultaneously with Sap Fiori and are hosted by the SAP HANA DB, so the user can make transactions and obtain real-time data about those transactions (analytical data), without the disruption of the transactional performance (Conn, 2005).

2.5 KPI Definition and Contextualization in ERP

Key performance indicator (KPI) is a quantifiable measure of performance over time for a specific objective. Institutions and businesses must assess their performance to evaluate the level to which their objectives have been met. Measuring performance, for which businesses rely on measures known as Key Performance Indicators, is one method of doing this evaluation (KPI). KPIs are a set of metrics that concentrate on organizational performance areas that are most important for the organization's current and future success (Domínguez et al., 2019).

It is critical from an ERP perspective to select the appropriate KPIs. What is relevant frequently depends on the department assessing performance; for example, the KPIs beneficial to finance will differ greatly from those assigned to sales or human resources, and that's not even mentioning information technology or application support. Performance indicator selection is frequently strongly linked to the employment of different methodologies, actions to analyze the status of the business or product, and its main activities since it is necessary to have a solid understanding of what is important. Since these analyses frequently reveal areas for improvement or bottlenecks, performance indicators are frequently linked to them (Selmeci et al., 2012).

For development and support purposes as well as to assess the quality and level of deliveries, SAP as a firm has established its own KPIs. These are crucial since SAP demands extra payment for providing 'Enterprise support' Customers expect greater level services for this support level, of course. The use of KPIs is done to reach the higher level and to understand how they differ. Business Warehouse (SAP BW), a component of the Business Intelligent (BI) solution, is SAP's own OLAP design. This system has the capacity to gather, examine, and assess certain performance indicators (Selmeci et al., 2012).

To support the performance management lifecycle for the entire ERP solution, SAP developed the Business Warehouse (BW) based Strategic Enterprise Management (SEM) tool. Planning, forecasting, and budgeting activities (SEM-BPC), corporate level performance management (SAP-CPM), and scorecard tools are all included in the SEM from a KPI and decision-making perspective.

Role-based real-time information on business activities is provided by analytical apps. The power of SAP HANA is integrated with the SAP business suite through analytical apps. It gives front-end web browser users real-time information from a huge amount of data.

Using Analytical apps, it's possible to be closer to monitor Key Performance indicators KPIs. It can perform complex aggregations and calculations of businesses operations

and react immediately to changes in the market condition. SAP Fiori Analytical apps run on SAP HANA database and use Virtual data models.

There are two types of Analytical Apps: SMART Business and Virtual Data Models. The most crucial KPIs may be tracked in real time using SAP Fiori smart business apps, and changes can be made right away in response to market conditions. The HANA database can process high volumes of data with the use of virtual data models. These views can be viewed by a UI-rich client without the need for any additional software. Employing KPI Modeler is a tool for modelling KPI and report tiles for Fiori Launchpad business data monitoring. It is possible to provide KPIs and reports to which we can apply various calculations, allowing us to change as necessary to reflect shifting market conditions. It enables setting up drill-down views.

Therefore, by giving users a wide range of analytical tools with real-time KPIs to assist their tasks and decisions, sap Fiori is more than capable of empowering users.

2.6 Embedded Analytics

Embedded analytics refers to the incorporation of analytical capabilities and data visualizations within software programs such as ERPs.

ERP systems are mostly transaction-focused on internal data, businesses that have analytics built into their ERP may rapidly and easily use data for management accounting and control as well as managerial choices. Particularly, Portuguese SMEs view ERPs as the primary control systems when implementing new strategies because their use and value have a direct impact on companies' cost management and performance measurement. Granlund (2011) asserts that the most frequently used ERP system, SAP, has horizontal functionality built into the German idea of "Controlling," and that a large portion of the currently available ERP software adheres to this logic (Ruivo, 2013).

Businesses use ERP in their daily operations, but analytics is more crucial to boosting performance. This effect can probably be explained by the fact that if there is a close link (an integrated system) between analytics capabilities and the ERP system, employees will likely learn how to use and grow the utilization of the analytics capacity in the system as they use the ERP system more frequently. Another argument is that the need for embedded analytics in ERP systems is growing as more real-time operational reports and insights are required. Which could indicate that businesses are seeking an integrated OLTP + OLAP system, such as SAP S/4 HANA (SAP Fiori) (Ruivo et al., 2014).

3   Problem Characterization

3.1   Consteltech

This project development process is in-house at Consteltech – Innovation and Consulting Services.

Consteltech – Innovation and Consulting Services, was created by the APR Group, a 30-year-old company, focused on the IT sector and in the Business to Business (B2B) market.

APR was established in November 1992 with the intention of supplying high-quality professional services in the field of information technology that may enhance the bottom line for its clients' businesses. operating in the B2B sector. APR, guided by its mission of fostering the diffusion and the correct use of new technologies, operates in the areas of Business Solutions, Systems, and Business Apps (APR, 2023)

Founded in 2020, Consteltech provides implementation, consultancy, and support services on SAP solutions. It counts with a vast and growing team of experienced SAP consultants determined to deliver a high value offer of SAP projects highlighting the areas of SAP Implementation Consultancy Projects, SAP Maintenance Consultancy Projects, SAP Migration Strategy Advisory Projects, and SAP ABAP and Fiori Development Consultancy Projects (Consteltech, 2023a)

3.2   Problem

As the literature review reveals, the switch from SAP GUI to SAP Fiori resulted in several new features, including a new UX design and new functionalities. However, most importantly, and in a way that addresses the research questions previously mentioned in this document, it resulted in the ability for the user to view real-time analytical information within the applications that carry out transactional processes. This analytical information consists of a set of KPIs and metrics.

Being an SAP solutions provider, Consteltech can observe these issues firsthand in the interactions between its clients and consultants. So, the main problem of this thesis is to understand if effectively the change that companies that use SAP must make until 2027 (date of end of SAP GUI operation) for SAP Fiori, will really be beneficial for users and if it will cause an increase in process efficiency. In short, to verify if users are effectively using the embedded analytics that are made available along with the transactions in real time, to make better decisions, to manage their work more efficiently, thus increasing the effectiveness of the processes.

The thesis will examine how companies use both the SAP GUI and SAP Fiori versions to discover whether SAP's strategy of integrating transactional data with analytical data enhanced business process efficiency. Additionally, to identify whether companies and their employees use the fresh SAP Fiori features.

There aren't any theses, articles, etc. on this subject because SAP just recently made the improvement that is the focus of this study.

As a result, this thesis would add something special to the research literature on ERP.

4   Methodology

This chapter provides the justification for the technique chosen to conduct the research of this dissertation.

4.1   Methodology Contextualization

This thesis will use a qualitative research method to understand and explore the problem explained in the previous section of this dissertation.

The Gioia Methodology (GM) is a qualitative methodological approach to develop data analysis that can meet the rigorous standards of trustworthy research. The GM is a comprehensive approach to concept development that strikes a compromise between the (sometimes contradictory) necessity to inductively discover new concepts and the high criteria for rigor required by prestigious journals (Magnani & Gioia, 2022).

When Gioia and Chittipeddi (1991) submitted an ethnographic study to Strategic Management Journal, a venue with few qualitative studies published at the time, the inaugural GM approach was conceptualized. Later, in 2013, Gioia, Corley, and Hamilton published a thorough explanation of the methodology and its philosophical foundations in Organizational Research Methods. This publication quickly gained popularity, as shown by Reay et al (2019) .'s review of qualitative/interpretive articles in the Academy of Management Journal, which found that the GM had a significant impact on papers published from 2014 to 2018 (Magnani & Gioia, 2022).

The GM offers greater rigor than unstructured single or multiple case study designs with a lack of methodical data-coding and data-analysis methodologies because it uses a more organized research strategy.

This entails constructing data analysis through three crucial phases:

1. **The creation of analytic codes and categories**, assembled into a data structure containing 1st-order (informant centered) codes and 2nd-order (theory centered) themes and aggregate dimensions.

2. **The development of a grounded theoretical model**, via constant comparison of data over time and across informants.

3. **The presentation of the study's findings**, using a detailed, data-based narrative that frequently makes use of the informants' 1st-order quotations and 2nd-order themes and aggregated dimensions.

Overall, GM complies with the requirements for quantitative research due to its systematic approach to data collection and coding. Perhaps more importantly, the GM can add to our knowledge because it employs an inferential method that includes both induction and abduction, better permitting new theoretical discoveries. As a result, it makes it possible to develop "best explanations" or "creative hypotheses" on the phenomenon of interest (Magnani & Gioia, 2022).

GM's proponents recommend utilizing a data structure that is methodically derived to account for both first order [informant-based] and second order [researcher-based] understandings. By creating this type of data structure, researchers can present their findings from a variety of angles and provide evidence to back up any conclusions they

may reach (and, therefore, convincingly shows data-to-theory connections) (Gioia et al., 2013).

A methodological technique intended to promote both imaginative creativity and methodological rigor when undertaking qualitative, grounded theory research follow the following steps (Gioia et al., 2013):

- **Research design**, explain a clearly defined phenomenon of interest and the research question(s) (which should be expressed in "how" words to bring out concepts and their interactions with one another), and consult existing material initially, suspending judgment regarding its conclusions to promote the discovery of new perspectives.

- **Data Collection** gives interviewees, who are viewed as competent agents, an excellent voice. Maintain the ability to change the interview process in response to interviewees responses and do questions that come up in later interviews, what would require that the researcher "backtrack" to earlier interviewees.

- **Data Analysis**, in data analysis performs initial data coding, maintaining the integrity of 1st-order (interviewee centric) terms. First-order (interviewee centric) terms' integrity is maintained when performing initial data coding. Create a thorough glossary of first-order terms. First-order codes should be arranged into second order (theory-centric) themes. Condense second-order topics into broad theoretical dimensions (if necessary) and create a "data structure" by putting phrases, topics, and dimensions together.

- **Grounded Theory Articulation**, Create dynamic connections between the data structure's second-order ideas. Adapt a static grounded theory model to a dynamic data structure and improve the articulation of emerging concepts and linkages, review the literature once again.

As seen GM must be seen more like a set of principles (a methodology) instead of steps to be followed (a method) for generating theory.

4.2   Research Structure used in the Project

Qualitive research adopted in this project will follow closely these approaches, combining two approaches in what it relates to data collection:

1. The first approach is to build a specific survey about the change from SAP GUI to SAP Fiori to measure the use of embedded analytics in SAP Fiori and its benefit for the efficiency of the work done daily versus the use of SAP GUI (which did not contain embedded analytics).
2. The second approach will be to interview Consteltech clients who regularly utilize SAP GUI and/or Fiori in their departments as part of their routine job tasks and in line with their competencies.

Together, these two approaches will be able to respond to the two research questions in this thesis, draw conclusions, and conduct a critical analysis of SAP's decision to

make this upgrade. They also got to the crux of the issue, which was to determine whether the availability and presence of transactional applications in the system that users use to carry out their daily tasks has resulted in an increase in process efficiency.

4.3   Survey Design

To compare the integrated analytics provided in SAP Fiori to what was available to employees on the SAP GUI, a survey was created with the goal of understanding their utility and impact in the efficiency of the work done by employees.

This survey (APPENDIX A: Survey) was designed to be practical and pragmatic to facilitate its posterior analysis, and with the specific objective of measuring the use of embedded analytics in SAP Fiori and its benefit for the efficiency of daily work versus the use of SAP GUI (which did not contain embedded analytics).

The **first question** compares the access to important information in real time in the two versions, with the goal of determining if the analytics embedded in Fiori improved access to KPIs and analytical data.

The **second question** is related to the first, as is attempting to determine whether there is a causal link between improved access to indicators and analytical information and the decisions that come from this access.

The purpose of the **third question** is to assess whether it is easier to monitor key performance indicators (KPIs) as part of daily activities when using SAP Fiori. This question focuses on the usability and efficiency of KPI monitoring within the SAP Fiori interface, without making direct comparisons to other systems or versions.

The **fourth question** determines if the availability of real-time analytical information in SAP Fiori has led to a reduction in the time users spend searching for relevant data, in comparison to their experience with SAP GUI. Given that in the first question we asked whether access to analytical information had improved, this question aims to reinforce that idea, with the time factor in the equation.

Following the logic of the argument, the **fifth question** seeks to determine whether users can better comprehend the performance of the processes and the organization in general now that they have improved access to and availability of KPIs and analytical information on the transactions they do.

The **sixth question** reinforces the idea built up in the previous question, and in a direct and pragmatic way measures whether SAP Fiori contributes to increasing process efficiency or not.

The **seventh question** is presented in the context of whether, if access to KPIs and analytical information has improved with SAP Fiori, if the user can better understand his own and his processes' performance, and if the user wastes less time looking for relevant information, can it be concluded that his productivity in monitoring and data analysis activities has increased?

This survey used a scale of 1 to 5 because of its simplicity, speed of response and it also facilitates grouping and analysis of results, making data interpretation more direct.

4.4   Interview design

The interview was designed with a pragmatic approach, aligning with the primary aim of this dissertation, which is to assess the impact of embedding analytical information within transactional data on process efficiency. To maintain focus on the core study objectives, the interview script was deliberately kept concise and direct. Given the breadth of the SAP subject and its various subtopics, clear communication of the interview's purpose and goals was essential to ensure that the responses obtained would align with the research questions and the overall objectives of this dissertation.

The Interview script (APPENDIX B: Interview Script) is semi-structured interview, that targets consultants, end-users, and expert-users, with the objective of assessing the impact of embedding analytical information within transactional data on process efficiency.

The interviews started by explaining the dissertation purpose and their alignment with innovation/transition done by SAP.

The **first question** investigates SAP's decision to switch its interface from GUI to Fiori, contextualizing the specificity of the dissertation topic in the broader context of the SAP universe.

The sub-question goes directly to the intended subject, questioning the significance of the great novelty, embedded analytics, making the answer direct to the subject, but with a little contextualization behind it to better understand the subject.

The **second question** aims to understand the benefits of migrating from SAP GUI to SAP Fiori, given that the migration may not have been due solely and exclusively to embedded analytics, thus trying once again to understand the specificity of embedded analytics in the overall picture.

The sub-question goes straight to the key issue for the dissertation, which aims to weigh up and clarify the importance of integrated analysis in the benefits felt after migrating to Fiori.

The **third question** and its sub-question follow the logic of the previous questions and raises the question of whether SAP Fiori made users increase their productivity and process efficiency at work, and whether this increase was mainly due to the presence of real-time embedded analytics in the transactions they carry out in their work processes daily.

With the previous questions, we intend to put the interviewees in the proper context, comprehend the benefits of moving to Fiori and, consequently, embedded analytics, get to the heart of the matter, combine the variables, and determine whether user productivity and efficiency have increased.

5   Results and Analysis

This section shows and interprets the data gathered from the survey and interviews that use or implemented SAP Fiori in different companies.

5.1   Survey Result Analysis

In order to clearly differentiate the desired purpose and the types of people answering the survey (APPENDIX A: Survey), there are seven very targeted and specific questions in the survey.

1. Compared to the previous version SAP GUI, has SAP Fiori improved your ability to access relevant analytical information in real-time?
10 respostas
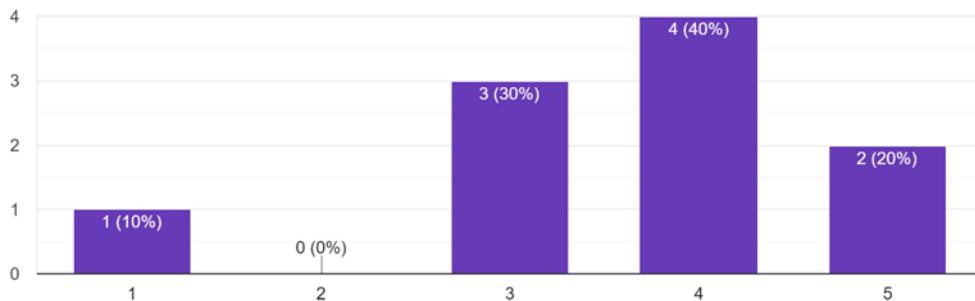
-**Question one**, *Compared to the previous version SAP GUI, has SAP Fiori improved your ability to access relevant analytical information in real-time?* had an average response of 4 on a scale of 1 to 5. The respondents consider that SAP Fiori was able to improve how users access analytical information and access it in real time.

The new interface revolutionizes access to analytical data, allowing users to access analytical data on their transactions in real time.

2. Has the use of analytics built into SAP Fiori helped you make more informed decisions based on the available data or indicators?
10 respostas
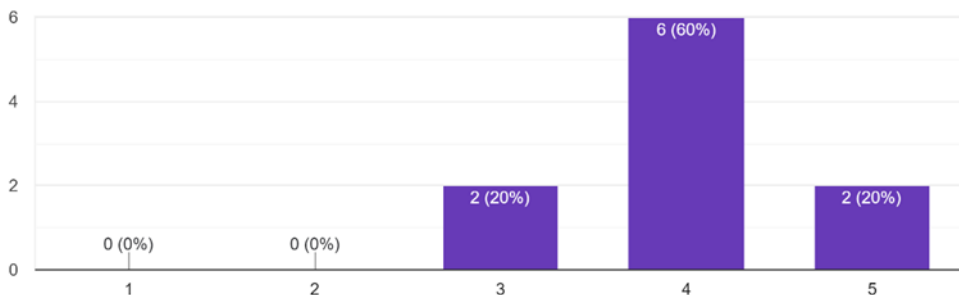
-**Question two**, *Has the use of analytics built into SAP Fiori helped you make more informed decisions based on the available data or indicators?* had an average response of 4 on a scale of 1 to 5. These responses demonstrate what was suggested

in response to question one: users, including managers, directors, etc., can improve their decision-making, making decisions in a more informed and efficient manner thanks to analytical information being embedded and available in real time in sap Fiori.

The decision-making process improves, causing the best decisions to be made up front, leading to a better flow of work and overall efficiency.

3. Does SAP Fiori make it simple to measure and monitor key performance indicators (KPIs) important to your everyday activities?

10 respostas
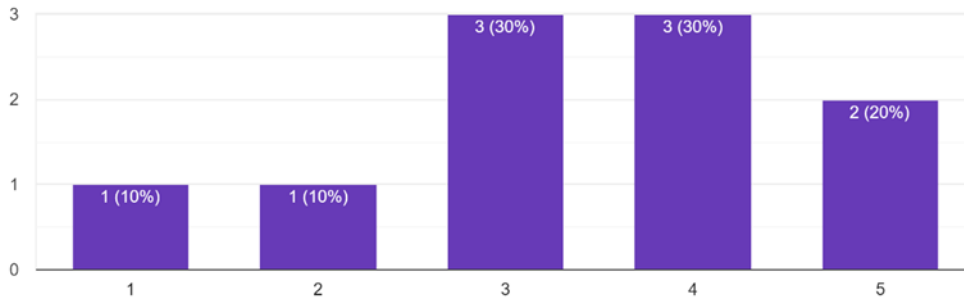
-**Question three**, *Does SAP Fiori make it simple to measure and monitor key performance indicators (KPIs) important to your everyday activities?* had an average response of 3.4 on a scale of 1 to 5. We were able to determine from the responses to this question that SAP Fiori allows for a simpler KPI monitoring process; however, some users believe that the change may be difficult because they are more accustomed to SAP GUI.

However, it's crucial to recognize that not every user feels the same way. Some respondents expressed concerns about the change, noting difficulties related to their knowledge of SAP GUI. People frequently find change to be intimidating at first, especially if they have been accustomed to a specific interface or workflow over time.

4. The availability of real-time analytical information in SAP Fiori has reduced the time that you spent searching for relevant data compared to SAP GUI ?

10 respostas
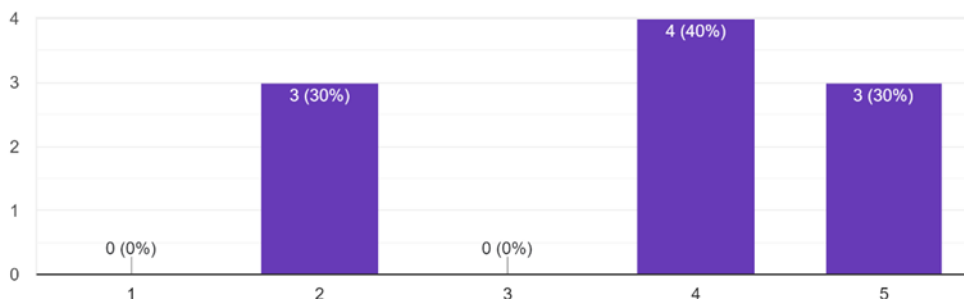

-The **fourth question**, *which focuses on the time saved when searching for relevant data* had an average response of 3.7 on a scale of 1 to 5. The respondents have provided compelling insights. The consensus among those surveyed is that the

availability of real-time analytical information within SAP Fiori has led to a reduction in the time previously spent searching for relevant data compared to their experience with SAP GUI.

5. Does accessing real-time indicators in SAP Fiori improve your understanding of processes and company performance?

10 respostas
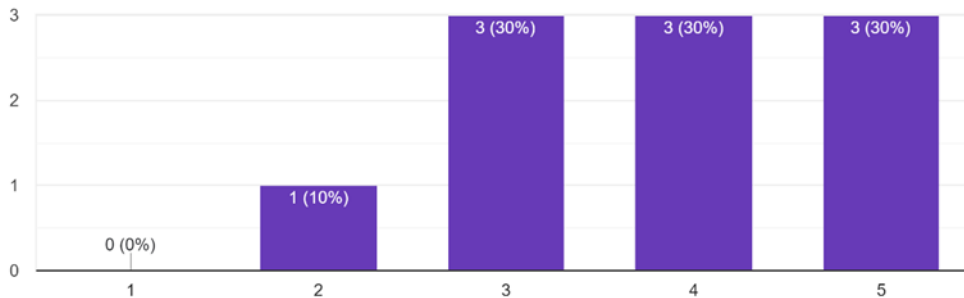
-The **fifth question** *does accessing real-time indicators in SAP Fiori improve your understanding of processes and company performance?* had an average response of 3.8 on a scale of 1 to 5. These outcomes show that access to real-time indicators improves the understanding of processes and visualization of company performance. Their understanding of processes is improved by SAP Fiori, which also offers a more vivid representation of the business' performance.

6. The use of SAP Fiori has contributed to the efficiency of your work processes?

10 respostas
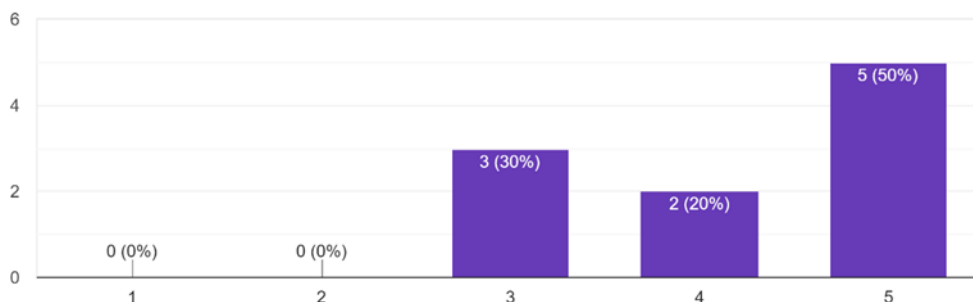
-The **sixth question**, *the use of SAP Fiori has contributed to the efficiency of your work processes?* had an average response of 4.2 on a scale of 1 to 5. This clearly shows that the efficiency of the users' day-to-day processes increased as a result of the sap Fiori improvements. Confirming that using SAP Fiori has resulted in significant increases in the efficiency of users' day-to-day work activities. This improvement affects all levels of the organization, ultimately contributing to increased production and achievement of organizational objectives.

7. Has the use of SAP Fiori improved your productivity when performing tasks related to data analysis and indicator monitoring?

10 respostas
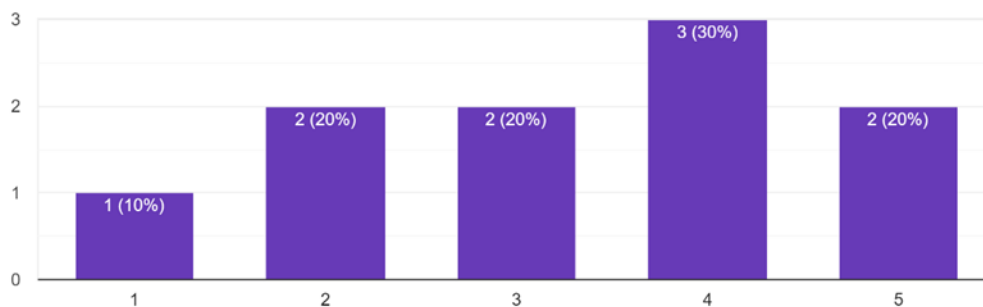
-The last question (**Seventh question**), *Has the use of SAP Fiori improved your productivity when performing tasks related to data analysis and indicator monitoring?* had an average response of 4.3 on a scale of 1 to 5. The majority of respondents believe that their productivity in data analysis and indicator segmentation has improved. This confirms that users' efficiency performing data analysis and indicator monitoring has significantly increased because of the implementation of SAP Fiori. This increase in productivity is evidence of SAP Fiori's transformational effects on data-driven decision-making and organizational performance.

5.2   Survey Results Conclusion

Users' interactions with data have gone through an important transformation as a result of the switch to SAP Fiori. Users can now easily access real-time data within their transactions thanks to this ground-breaking interface, which has completely changed how users' access and engage with analytical information. As a result of this paradigm change, users are now well-equipped to make quick, data-driven decisions that are precise. The respondents stated that this gain in real-time accessibility to analytical insights has caused a noticeable improvement in the general efficiency and effectiveness of organizational procedures.

By putting a variety of data and indicators at users' fingertips, the integration of analytics within SAP Fiori has proven to be a game-changer, enabling users to make better informed decisions. This improvement includes management and strategic decisions in addition to day-to-day operational ones. When equipped with readily accessible analytical insights, decision-makers may handle difficult scenarios with greater assurance and effectiveness.

Direct integration of analytical insights into Fiori apps is a revolutionary advance for users. They no longer needed to navigate through a confusing array of panels or reports to reach the data they require, which was a typical problem in the SAP GUI environment. Instead, relevant data is seamlessly included into their transactions, allowing users to quickly learn the information needed to make wise and calculated decisions.

Overall, SAP Fiori can play a critical role in the transformation of business operations by fostering efficiency, agility, and the ability to make real time data-driven decisions.

5.3 Interviews Analysis

Table 1 - Interviewees' Characteristics

Interviewees	Academic Background	SAP Experience (years)
Interviewee A	Management	13
Interviewee B	Economics	23
Interviewee C	Software Engineering	14

All clients used the SAP GUI to manage their work and tasks to be completed daily, and both required access to analytical data about the transactions that were carried out. The identical transactions are now carried out using SAP Fiori, but because analytical applications are available on the same screen as the transaction screen, KPIs are now available in real time. The research questions raised in this thesis can be answered with the help of these interviews.

The three interviews began with an explanation of the main concern of the dissertation, with the specificity of the topic within the SAP universe, its relevance to the area of ERPs, SAP being the number one ERP on the market. All the interviewees had different backgrounds and different years of experience in SAP, all of them had worked and been in different perspectives, as users and as consultants, and above all and most importantly, all of them had experienced the change from SAP GUI to SAP Fiori and were able to explain the changes felt on the ground by themselves, their companies, and their colleagues.

Main reasons for migrating to SAP Fiori

The interviewees (APPENDIX C: Interview Transcript) mentioned that by switching from the old SAP GUI to the cutting-edge SAP Fiori, SAP started a notable innovation. The fact that the prior interface, in use for two decades, was becoming out of date in contrast to modern standards and the interfaces provided by rivals like Navision or Oracle, was what drove this change.

In response to this, SAP sought to revamp its user interface to create a more user-friendly and aesthetically pleasing platform. It's important to note that SAP Fiori represents not a programming language but a design language. This transition encompassed a significant overhaul of the platform, with an emphasis on user experience and design aesthetics.

The interviewees also said that SAP Fiori was developed with versatility in mind, capable of housing responsive applications that seamlessly adapt to various platforms. These platforms range from mobile devices such as cell phones and tablets to larger screens like televisions and computers. The adaptability of SAP Fiori ensures that users can access the system effortlessly across different devices, enhancing accessibility and usability.

In summary, SAP's update from SAP GUI to SAP Fiori was driven by the need to modernize its user interface, align with contemporary design standards, and offer a more user-friendly experience. This change encompasses not just a visual makeover but also a commitment to responsive design, ensuring accessibility across a range of

devices like cell phones, tablets, television screens etc. However, all this was only possible with the adoption of the new S/4 HANA database that allowed the transition to the Fiori interface. Customers have chosen to migrate to the new interface to take advantage of these new improvements and functionality in SAP's interface.

Main benefits observed after migrating to SAP Fiori

The availability of embedded analytical data in real time on user transactions was undoubtedly the biggest benefit of the switch to FIORI, but this was only made possible because Fiori is based on the S/4 HANA database, which allows live calculation and is the source of the embedded analytics.

The interviewees (APPENDIX C: Interview Transcript) also mentioned usability, retention rates, new user acceptance of the system, ease of use of each application, greater variety, and specificity of the applications available, and the fact that each application is specific to a task, allowing the user to focus more on their task and see only what is necessary for their task, without wasting unnecessary time. The streamlined design of FIORI minimizes the number of clicks, screens, and data entry fields, ensuring that users have exactly what they need.

Due to the fact that the majority of Fiori users attempt to export data to Excel in order to construct graphs and display KPIs, SAP also hopes to remove users away from Excel using embedded analytics. With Fiori, this stigma may be removed from users since they can have an analysis that is tailored to their needs displayed on the screen thanks to embedded analytics.

In short, the three main benefits of Fiori are usability, embedded analytics with information, data live available directly in the ERP itself and the easiness of time-to-market.

The Impact of SAP Fiori on Company Productivity and Work Efficiency

As was already indicated, the switch to Fiori resulted in an increase in the number of applications available for the ERP. This growth has made it possible to manage and facilitate numerous elements of the business, giving users access to a wider range of tools to organize their daily activities and operate more efficiently.

The interviewees felt that the integration of real-time embedded analytics into transactional processes has been the key element causing an increase in productivity and efficiency. As a result, several internal processes—including data collecting, processing, visualization, and more—have considerably improved. Real-time analytics' accessibility has been crucial in raising the general efficacy and efficiency of these fundamental commercial operations.

It is important to note that the new version benefits a lot more users who are new to working with SAP (without experience) and common users; however, users who have experience with GUI may take longer to accept the transition due to their extensive expertise/familiarity with the previous version.

6   Conclusion and Future Research

This dissertation concluded that SAP's decision to create a new interface, Fiori, supported by a new database, HANA, with embedded analytics available to users was a game changer, proving that embedded analytics in transactional information accelerate process efficiency and that businesses are taking advantage of the transition.

The survey and interviews that were performed gave rise to insightful results by providing a thorough study of the research questions. The results show that SAP Fiori enables users to use these technologies to increase process efficiency through its innovations, redesigned user interface, improved usability, and embedded analytics.

Although SAP presently dominates the industry and upholds a culture of constant innovation, there are still opportunities for advancement. These include, among other things, tackling resistance to change inside businesses, strengthening support for smooth software version upgrades, increasing investments in optimizing the mobile user experience, and continuing work to standardize various interfaces.

Some businesses have already begun to make use of the benefits and functionality of the new interface (Fiori) to increase the efficiency of their processes. However, many businesses continue to use both interfaces and are not making the most of the new interface.

In conclusion, this subject is highly relevant to literature. Companies must make a seamless transition because of the release of the SAP Fiori interface in 2014 and the expected end of the GUI version by 2027. The impact, however, goes beyond simple adaptation. Companies should proactively accept this shift and communicate with SAP, providing insightful input. This cooperative approach not only makes the transition simple, but it also gives businesses a chance to shape how SAP Fiori develops.

Companies may contribute to the improvement of SAP Fiori's strengths and the refining of its features by sharing their opinions and requests. This iterative approach guarantees that the interface is tightly aligned with its user base's individual demands and preferences, resulting in a more robust and user-centric platform.

Further research to improve this study would be a larger sample, a greater number of interviews with Fiori users and interviewing a more variety of business sectors.

References

APR. (2023). *A Nossa Empresa*. https://www.apr.pt/sobre/quem-somos/

Bingi, P., Sharma, M. K., & Godla, J. K. (1999). Critical issues affecting an ERP implementation. *Inf. Syst. Manag., 16*(3), 7-14.

Bressler, L. (2014). Teaching an online accounting information systems course: Student perceptions of SAP/ERP active learning. *Journal of Finance and Accountancy, 15*, 1.

Buck-Emden, R. (2000). *The SAP R/3 system: An introduction to ERP and business software rechnology*. Addison-Wesley.

Chaudhuri, S., & Dayal, U. (1997). An overview of data warehousing and OLAP technology. *ACM Sigmod Record, 26*(1), 65-74.

Conn, S. S. (2005). OLTP and OLAP data integration: a review of feasible implementation methods and architectures for real time data analysis. Proceedings. IEEE SoutheastCon, 2005.,

Consteltech. (2023a). *A Nossa História*. https://www.consteltech.com/sobre-nos/

Consteltech. (2023b). Setores de Negócio. https://www.consteltech.com/setores-de-negocio/

de Souza, C. A., & Zwicker, R. (2001). ERP systems' life cycle: findings and recommendations from a multiple-case study in Brazilian companies. *Available at SSRN 270774*.

Domínguez, E., Pérez, B., Rubio, A. L., & Zapata, M. A. (2019). A taxonomy for key performance indicators management. *Computer Standards & Interfaces, 64*, 24-40.

Elhasnaoui, S. (2021). Analysis of the Role of IT Governance on ERP Systems Implementation. *International Journal of Web-Based Learning and Teaching Technologies (IJWLTT), 16*(1), 18-26. https://doi.org/10.4018/IJWLTT.2021010103

Färber, F., Cha, S. K., Primsch, J., Bornhövd, C., Sigg, S., & Lehner, W. (2012). SAP HANA database: data management for modern business applications. *ACM Sigmod Record, 40*(4), 45-51.

Färber, F., May, N., Lehner, W., Große, P., Müller, I., Rauhe, H., & Dees, J. (2012). The SAP HANA Database--An Architecture Overview. *IEEE Data Eng. Bull., 35*(1), 28-33.

Gioia, D. A., Corley, K. G., & Hamilton, A. L. (2013). Seeking qualitative rigor in inductive research: Notes on the Gioia methodology. *Organizational research methods, 16*(1), 15-31.

Harizopoulos, S., Abadi, D. J., Madden, S., & Stonebraker, M. (2018). OLTP through the looking glass, and what we found there. In *Making Databases Work: the Pragmatic Wisdom of Michael Stonebraker* (pp. 409-439).

Jacobs, F. R., & Whybark, D. C. (2000). *Why ERP?: A primer on SAP implementation* (Vol. 31). Irwin/McGraw-Hill New York.

Klaus, H., Rosemann, M., & Gable, G. G. (2000). What is ERP? *Information systems frontiers, 2*(2), 141-162.

Lau, L. K. (2005). An overview of SAP technology. *Managing Business with SAP: Planning Implementation and Evaluation*, 33-43.

Magnani, G., & Gioia, D. (2022). Using the Gioia Methodology in international business and entrepreneurship research. *International Business Review*, 102097.

Muzyka, D., De Koning, A., & Churchill, N. (1995). On transformation and adaptation: Building the entrepreneurial corporation. *European Management Journal, 13*(4), 346-362.

Ruivo, P., Oliveira, T., & Neto, M. (2014). Examine ERP post-implementation stages of use and value: Empirical evidence from Portuguese SMEs. *International journal of accounting information systems, 15*(2), 166-184.

Ruivo, P. M. F. (2013). *A technology diffusion perspective of Enterprise Resource Planning across European Small and Medium Enterprises: from determinants to Use to Value* Universidade NOVA de Lisboa (Portugal)].

Salmeron, J. L., & Lopez, C. (2010). A multicriteria approach for risks assessment in ERP maintenance. *Journal of systems and software, 83*(10), 1941-1953.

SAP. (2022). *What is SAP?* https://www.sap.com/portugal/about/company/what-is-sap.html

Selmeci, A., Orosz, I., Györök, G., & Orosz, T. (2012). Key Performance Indicators used in ERP performance measurement applications. 2012 IEEE 10th Jubilee International Symposium on Intelligent Systems and Informatics,

Sikka, V., Färber, F., Lehner, W., Cha, S. K., Peh, T., & Bornhövd, C. (2012). Efficient transaction processing in SAP HANA database: the end of a column store myth. Proceedings of the 2012 ACM SIGMOD International Conference on Management of Data,

Soellner, S. (2021). Digital Elements for SAP ERP Education and Training: Results from a Systematic Literature Review. *International Journal of Engineering Pedagogy, 11*(4).

Valaboju, Y. (2019). Capabilities and Key Benefits of Sap NetWeaver Gateway. *International Journal of Innovative Research in Computer and Communication Engineering, 7*(1).

Valaboju, Y. (2020). A Study on SAP Fiori Apps and Fiori Design Principles. *International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET), 9*(6).

APPENDIX A: Survey

Type: Structured Survey

Target: Consultants, End-users, and Expert-users

Objective: To measure the use of embedded analytics in SAP Fiori and its benefit for the efficiency of the work done daily versus the use of SAP GUI (which did not contain embedded analytics).

Questions:

1. Compared to the previous version of SAP GUI, has SAP Fiori improved your ability to access relevant analytical information in real-time?

2. Has the use of analytics built into SAP Fiori helped you make more informed decisions based on the available data or indicators?

3. Does SAP Fiori make it simple to measure and monitor key performance indicators (KPIs) important to your everyday activities?

4. The availability of real-time analytical information in SAP Fiori has reduced the time that you spend searching for relevant data compared to SAP GUI?

5. Does accessing real-time indicators in SAP Fiori improve your understanding of processes and company performance?

6. The use of SAP Fiori has contributed to the efficiency of your work processes?

7. Has the use of SAP Fiori improved your productivity when performing tasks related to data analysis and indicator monitoring?

Link: https://forms.gle/C8nN6BifuuEW8fsZ6

SAP GUI and Fiori users

My name is Bernardo Ferraz, and I am a final year student of the Master in Service Engineering and Management at FEUP. As part of my *thesis*, I ask that only users who have used SAP Gui in their day-to-day work activities and now use SAP Fiori (new version) answer this questionnaire.

Please answer only if you were or are a user of both

Objective: To measure the use of embedded analytics in SAP Fiori and its benefit for the efficiency of the work done daily versus the use of SAP GUI (which did not contain embedded analytics).
Resolution time: 3 minutes

Thank you very much.
Any clarification: bernardo-filipe-ferraz@hotmail.com

APPENDIX B: Interview Script

Type: Semi-structured interview

Target: Consultants, End-users, and Expert-users

Objective: To measure the use of embedded analytics in SAP Fiori and its benefit for the efficiency of the work done daily versus the use of SAP GUI (which did not contain embedded analytics).

Script:

1. What were the main reasons for migrating to SAP Fiori?

      a. How important was the embedded analytics component?

2. What were the main benefits observed after migrating to SAP Fiori?

      a. What share does embedded analytics represent in the benefits?

3. How has SAP Fiori affected productivity and work efficiency in the company?

      a. Do users report that embedded analytics has affected their productivity and efficiency?

APPENDIX C: Interview Transcript

Interviewee A

Interviewer: A entrevista é um bocadinho mais para você me explicar as suas experiências a nível mais pessoal.

Interviewer: Este projeto é muito específico. É algo micro dentro do SAP que só estou a tentar mesmo única e exclusivamente perceber quais os motivos e porque é que a SAP decidiu fazer esta mudança da interface Gui para o FIORI, que contem dentro das aplicações transacionais, a analítica embebida que permite aos utilizadores então aceder a indicadores em tempo real sobre aquelas transações que estão a fazer ou seja. Só estou a avaliar mesmo este ponto específico, eu pretendia arranjar utilizadores que tivessem utilizado SAP GUI e que agora usam FIORI e perceber aqui, quais é que se foram as mais valias de as aplicações transacionais conterem então a analítica embebida, se efetivamente melhorou o seu trabalho e a sua eficiência de processos. O tema é mesmo específico, não pretendo abordar algo diferente porque sairia um bocadinho do âmbito da tese.

Interviewer: Tenho aqui então três questões. Pode responder da forma que achar melhor, quais foram os principais motivos da migração para o SAP Fiori? Qual foi a importância da analítica embebida nessa migração? porque é que achas que se tens alguma opinião sobre isto porque é que a SAP decidiu tomar esta iniciativa.

Interviewee A: Eu vejo que pode haver vários motivos, pronto em primeiro lugar, há que ver que a analítica embebida uma grande mudança que eles fizeram foi na própria base de dados normal para a base de dados HANA. Não vou aqui entrar pronto, mas tornou muito mais rápido o acesso à base de dados e com o aumento exponencial de performance eles conseguem chegar a este mundo da analítica embebida da analítica tempo real. Pronto, isto é uma das componentes e depois o que eu acho que eles pensaram foi nós temos há 20 ou 30 anos o mesmo layout. Toda a gente dizia layout algo feio, e tentaram-se atualizar um pouco e entrar no mundo do mobile dos tablets, conseguir o acesso pelos tablets e nós sabemos que muitas vezes há CEOs ou diretores que mal estão em frente ao computador, mas se recebem no telemóvel ou no tablet conseguem rapidamente ver e trabalhar a partir daí e aceder entre outras coisas a tal analítica embebida, e visualizar os KPI me os reports que necessitem e eu acho que no fundo foi esse o motivo, que foi aproveitar o facto terem uma base de dados como uma performance bastante superior e no fundo conseguir colmatar um problema que eu sei que já há muito tinham que era a parte do reporting e terem muitas vezes que que fazer muitas vezes em BW ou fazerem outras ferramentas à medida digamos.

Interviewer: Muito Obrigado pelos vários inputs. A segunda pergunta seria. Quais foram os principais benefícios que tu observaste após a migração para o SAP Fiori, já me referiste alguns desde o reporting, o acesso a KPI

Interviewee A: Sim e se fores à parte operacional, eles têm muitas apresentações em que dizem. Olha eu antigamente para lançar um documento precisava de 30 cliques

e agora consegui reduzir isto para 10 pronto eles apresentam várias métricas a nível de performance.

Interviewer: Existe alguma coisa que tu achas que precisa de ser melhorado efetivamente.

Interviewee A: Olha eu acho que eles agora já começam a mudar um bocadinho, mas acho que são um bocado fechados nas coisas que representam, posso te dar posso dar um exemplo muito muito simples, um projeto na empresa X e que na altura a empresa X tem uma lógica de olhar muitas coisas pelo setor de negócio o setor de negócio traduzias em SAP na Business Area, e eles queriam ter reporting, KPIs, por exemplo um relatório de aging, mas queriam visualizar dentro da companhia se aquilo pertencia aos transportes se pertencia ao setor da energia, mas estavas dentro de uma empresa ,mas cada companhia tem mais do que uma área de negócio, eles queriam ver num relatório de aging, Por exemplo um relatório de clientes ou de fornecedores, que é há quanto há quanto tempo o cliente não paga ou quanto tempo a empresa demora a pagar ao cliente queriam ver por Business Area, e a SAP não tinha uma resposta para isto e era tão simples quanto se calhar adicionares uma característica aquele report e automaticamente já ia estar essa informação, mas na fase em que estávamos na altura, eu acho que isso ainda não mudou nesse caso específico era impossível no desenvolvimento em que estávamos e estamos a falar de uma coisa bastante simples que é não quero visualizar como uma empresa, mas pelos setores de negócios. Acho que eles também têm algum propósito em muitas das coisas que fizeram que foi tentar direcionar, eles tentaram alterar as práticas das empresas, porque as empresas estavam muito habituadas a ter SAP, mas depois fazem tudo o que é desenvolvimento, estou a trabalhar num cliente no setor de retalho e eles usam transações desenvolvidas para tudo tudo tudo ao ponto de que eles dizem para perceber isto quando tens uma upgrade tem sempre um desafio aqui que é adaptar os teus desenvolvimentos que têm normalmente por base um pouco de standard, quando tens um upgrade do sistema há coisas no standard que mudam e podem te impactar o desenvolvimentos.

Interviewer: O exemplo foi bom, mas para não desviar da pergunta André, voltemos a atras.

Interviewee A: Sim, desculpa. A SAP tentou orientar os processos dizem que fizeram um grande estudo junto de várias empresas e que tentaram orientar os processos e montá-los dessa forma e dizer olha vocês com o FIORI, vão conseguir fazer tudo, não é bem assim a realidade nunca é 100% assim, nem que seja porque as pessoas são resistentes à mudança. E dizem olha, mas eu durante 10 anos no meu sistema antigo fazia desta maneira e agora quero fazer igual e às vezes não tem a capacidade de se adaptar a uma nova realidade e a uma nova forma de trabalhar.

Interviewer: Isso também contribui para o facto de haver poucos utilizadores em Portugal, em FIORI, e nem é só os utilizadores também as próprias empresas não quererem migrar já, não é porque supostamente tem a meta até 2027.

Interviewer: Pronto. Acho que me respondeste à maior parte das perguntas, contudo tenho uma última que é um bocadinho mais específica que é sobre a produtividade eficiência dos processos se foram ou não melhorados.

Interviewee A: Isso depende muito do role na empresa, mas lá está utilizador que tenham disponíveis apps que coadunam com o seu role, aumentaram imenso a sua eficiência e produtividade no trabalho, contudo outros utilizadores devido a vários fatores, pode não acontecer de forma tão exponencial.

Interviewee B

Interviewer: Bom dia, Não sei se teve a oportunidade de responder ao meu questionário.

Interviewee B: sim já o fiz.

Interviewer: Eu quis fazer entrevista para conseguir avaliar mais a fundo, e obter algumas da experiência que você tem, e é sempre uma mais valia falar diretamente com a pessoa em questão. Eu tenho um conjunto de perguntas, a primeira é algo mais geral para dar contexto e suporte, qual que você acha como aqui profissional na área? Quais foram os principais motivos que poderiam levar a SAP passado tantos anos a desistir de algo não é desistir, mas a querer melhorar algo que já tem tantos anos e então o FIORI e mais especificamente ter colocado analítica embebida não é e ter migrado para a base de dados HANA que permitiu a novidade a nível nacionalidade digamos assim. Se tem alguma opinião alguma coisa acrescentar

Interviewee B: Pronto, o que acontece da minha experiência enquanto implementadora e utilizadora porque eu estou atualmente mais na parte de implementação, mas fui utilizador apenas durante muitos anos. O que acontece é relativamente as funcionalidades base do sistema houve de facto coisas melhores, coisas muito mais desenvolvidas, digamos assim novas funcionalidades. No entanto digamos que o Core do sistema se mantém mais ou menos idêntico, contudo há muitas coisas novas etc., mas o core em si manteve-se idêntico, o que acontece é que o que eu tenho visto é que de fato existem algumas novidades no FIORI que acabam por algumas aplicações que acabam por facilitar imenso a consulta de informação. O processamento sei lá de vários documentos ao mesmo tempo em formato de lista em vez de no SC normal sem ser FIORI, tem de ser um a um, ali já temos uma lista, já conseguem também fazer massivamente, que eram coisas que que antes não estavam disponíveis e que os utilizadores se queixavam muito, em termos mais daquilo que estavas a perguntar em termos analíticos foi sempre de facto um calcanhar de Aquiles do SAP ou seja aquilo o tipo de reporting. Realmente era graficamente aquilo que apresentavam em termos de reporting era tudo muito rudimentar, de difícil uso para as pessoas e a maioria das vezes aquilo que faziam era extrair informação para Excel e depois trabalhavam em Excel. Ok pronto e isto é sempre foi assim e sempre os Excel de fora ou então realmente desenvolviam-se relatórios ou punham-se aqui outras camadas de reporting em cima BW etc. para permitir trabalhar.

Interviewer: Ou seja, em vez de simplificar estava a complicar o trabalho das pessoas

Interviewee B: Exatamente, pronto essas tarefas, é que com o FIORI de facto existem uma série de novas aplicações que de uma forma muito sintética dão por exemplo ao planeador uma visão, vou te falar por exemplo na área de manutenção que é uma das áreas ou área de produção em que o planeador entra num só reporting e consegue perceber ordens que estão por aprovar requisições de compra para as suas ordens que estão por aprovar consegue fazer dali diretamente o dispatching para as

várias pessoas que vão realizar essas tarefas portanto ou seja entram num modo em que tem uma visão global daquilo que está em andamento e depois ainda mais ao detalhe conseguem ver os detalhes das coisas e processa-las e dar andamento portanto e de uma forma muito mais simples que era uma coisa que não existia em S/4.

Interviewer: Obrigado, já me referiu motivos para migrar e os principais benefícios observados após a migração e pronto e depois tenho aqui a última pergunta porque eu tinha três e cada uma tem uma sua pergunta, mas já tocou em vários pontos e consigo aproveitar para cada uma delas, mas a última era depois de implementado. Tem tido o bom feedback, ou não, as pessoas têm tido resistência à mudança a mudar por exemplo de GUI para Fiori, dado que quem estavam habituadas a trabalhar há muito tempo em GUI e agora passam a trabalhar em Fiori, conseguiram aumentar a sua eficiência de processos devido à analítica embebida ou não.

Interviewee B: exatamente tenho visto alguma resistência, isto porque costuma-se dizer que o SAP primeiro estranha-se e depois entranha-se, ou seja, as pessoas no início não gostam é feio, mas depois acabam por se adaptar. Quando efetuo migração de GUI para FIORI, do meu ponto de vista das funcionalidades muito mais user-friendly, no Fiori do que no Gui, portanto, numa só aplicação conseguem ter uma visão muito mais global e tomar melhores decisões. Por exemplo na gestão de materiais, verificar se poderão ter roturas de stock ou não, tem tudo muito em indicadores gráficos, analises do histórico de consumo, previsões do futuro, do que será necessário, tudo graficamente no mesmo sítio que acho que é muito, muito bom para quem seja utilizador e quem perceba tudo aquilo que lá está tem muita informação e gráfica que acho que é muito importante para quem para quem trabalha e quer melhorar o seu trabalho e a sua eficiência.

Interviewer: Vale a pena uma empresa tanto uma nova que adote Fiori logo ou então mesmo uma que migra, acha que vale a pena o investimento?

Interviewee B: Eu acho que sim, porque acima de tudo o Fiori

em si o seu racional da sua lógica por trás mantém-se, mas efetivamente acho que está a ver uma grande aposta da SAP e cada vez estão a aparecer mais aplicações analíticas que são efetivamente uteis no dia a dia.

A SAP está também a apostar muito neste momento na versão webizada, mas o próximo passo será ir para cloud, ou seja, e a cloud basicamente é tudo em aplicações Fiori, não é pronto para o utilizador uma forma de interagir com o sistema diferente e mais fácil e em que o utilizador não precisa de preencher cinquenta campos, fazendo com que seja mais eficiente no trabalho.

Interviewee C

Interviewer: Tenho três perguntinhas. A primeira é quais foram os principais motivos que levar uma empresa como a SAP a desistir, ou seja, a querer melhorar e a passar de GUI e ir para Fiori neste caso aqui com o peso da analítica embebida ou seja terem tomado a decisão de que aquilo que tinham não era tão bom quanto pensavam e que é claro que todas as empresas têm de evoluir. Mas qual é que será aqui no seu ver um peso para terem posto a analítica embebida?

Interviewee C: A explicação base é uma razão muito simples, chama-se user experience, eu como utilizador de SAP já há uns anos valentes ainda com o SAP GUI ainda em clientes e na altura que era consultor ainda com versões muito antigas de SAP sempre tive essa visão. O SAP é feio, melhor era feio, o meu pai foi utilizador de SAP desde 95 e dizia isso também é feio, é cinzento, portanto para mim é das principais razões da SAP naturalmente foi acompanhar o mercado também, e a aposta da SAP para mim a principal razão é esta chama-se user experience o FIORI em si não é uma linguagem de programação, é uma linguagem de design portanto é uma linguagem de user experience e essa foi a principal razão, obviamente que anexado a isso vem toda a capacidade que a SAP conseguiu lançar com isso de ter aplicações, por exemplo, responsive a serem utilizadas em várias equipamentos de ter na analítica que era o teu ponto de foco é completamente diferente um CEO ou um diretor apresentar dados ao bordo apresentar dados a alguém num tablet dados analíticos dados live apresentar dados a alguém do que é ter que ter um sistema afazer share screen etc.

Interviewer: Sim faz sentido.

Interviewee C: Resumindo a resposta a user experience, a usabilidade aquilo que é a experiência de utilizador em SAP foi sem dúvida para mim e para o mercado em geral a maior razão. Portanto a SAP teve que evoluir a SAP começou por ter 25 aplicações em 2014 ou 2015, 25 aplicações que eram muito centradas nos recursos humanos e na logística portanto para fazer uma ordem de venda para fazer uma guia de remessa, e especialmente para recursos humanos, hoje tem mais de 12.000, 13.000 aplicações naturalmente porque percebeu que a evolução funcionou e que a tecnologia também tem que evoluir porque o Fiori não era possível, a evolução para Fiori e as aplicações analíticas não eram possíveis sem outras evoluções de outras áreas na área das bases dados o HANA, permitiu o cálculo em live que é main que é a principal fonte da analítica em Fiori, o Fiori é cara é o fronted visual, mas para que aquilo seja possível para que seja possível ter dados em real time, a serem apresentados ao utilizador eu tenho que ter por trás um sistema que tem essa capacidade isso foi evolução para HANA, o HANA é a verdadeira para mim maior a chave a maior evolução que a SAP teve e que permitiu tudo o resto, porque ter o FIORI e se tivesse que ser, eu desenvolvi em conjunto com algumas pessoas em 2015 a nossa primeira aplicação FIORI e era real time, mas tinha que ter uma complexidade enorme por trás para conseguirmos mostrar dados reais na altura de vendas por regiões, num ecrã hoje isso com o HANA é muito mais simples.

Interviewer: Então quais foram os principais benefícios que observou após a migração para SAP Fiori neste caso claro, com a analítica embebida aqui por trás

Interviewee C: Então mais uma vez a usabilidade, os utilizadores são mais cativados é muito mais simples a utilização de cada aplicação, portanto a SAP tinha um conceito de transações, e em cada transação é possível fazer mil coisas. É óbvio, que quem é um expert em uma determinada área depois domina a diferença é que quando se migrou para Fiori quando se fez esta transição cada aplicação se tornou mais atômica e portanto cada aplicação se tornou o local onde fazer uma determinada ação, se eu sou um gestor de compras ou de vendas melhor dizendo portanto numa venda, existe a venda, a fatura, a remessa, o print e por aí fora. Antigamente isso fazia-se tudo numa transação que dessa conseguia saltar e fazer todas as outras ações, atualmente

há uma aplicação para cada uma dessas porque a ciência por trás disto é cada aplicação deve ser atómica deve ser para uma funcionalidade foi feita pela mesma pessoa a pessoa tem quatro aplicações, mas se forem pessoas diferentes a fazer cada uma delas cada uma só vai ver aquilo que é essencial e este é um dos focos do Fiori neste tal conceito de user experience o foco é eu ter cada vez menos cliques cada vez menos screens e cada vez menos campos, é eu ter o que é essencial para mim este é o ponto número.

Interviewer: Ok e analítica embebida?

Interviewee C: Na analítica, no embedded analytics e naquilo que foi evolução do próprio saque que é feito em Fiori também, dentro do principio Fiori, é que consiga ter visualmente algo que seja mais apelativo e que me faça utilizar e que me faça fugir daquilo que é o grande inimigo do ERP que é o Excel maior parte dos utilizadores de analítica dizem, como é que os exporto isto, é muito bonito, mas como é que exporto isto para excel, o que se conseguiu com analítica embebida no Fiori e com os querie viewers e com o saque por aí fora foi acabaram com esse estigma ou com essa necessidade porque as pessoas passaram a perceber que conseguem ter em ecrã uma análise exatamente como eles querem, não tem que passar para um Excel e criar colunas e tira colunas. Este motor de analítica em Fiori consegue fazer isso e consegue mostrar isso não quer dizer que tenha sido 100% bem sucedido, porque muitos deles continuam a querer ir para o Excel e o Excel vai ser sempre o inimigo principal do SAP e de qualquer outro ERP, mas foi muito por aí, portanto a capacidade analítica foi também uma grande uma grande melhoria, a responsividade, portanto o facto de se poder dizia há pouco poder usar uma mesma aplicação em diversos tipos de dispositivos, desde um telemóvel que é pequenino e portanto só se vai ver o essencial, ou um tablet onde já tens um conjunto de informação maior ou ecrã de computador onde já tens quase tudo e até um ecrã televisão onde consegues ter gráficos e indicadores e KPIs misturados.

O Fiori trouxe esta capacidade de termos aplicações responsive que são desenvolvidas muito mais facilmente logo o time to market é muito menor.

Obviamente a complexidade das aplicações não pode ser tão customizada, não é não podes ter tudo o que quiseres, mas do ponto de vista de análise dados do ponto de vista da análise de ações de ERP é muito melhor para mim são os três grandes benefícios de utilizar isto: a usabilidade aquilo que analítica trouxe e a capacidade análise dados em real time e em live diretamente no próprio ERP e a facilidade de time to market ou o tempo do time to market.

Interviewer: Muito obrigado pela resposta, já tocou noutras perguntas até o que agradeço, estou também a tentar perceber mais pontos negativos do SAP por exemplo

Interviewee C: Sim. Depende da pessoa, portanto se nós estivermos a falar de um end-user que não é um expert em SAP é muito mais fácil para ele utilizar o Fiori, no entanto se formos aquele utilizador mais experiente que sabe as transações de cor, sabe tudo o que pode fazer em todos os tabs em tudo isso se calhar esse tipo de utilizador teve mais dificuldade em adaptar-se ao Fiori porque como é tudo mais unitário e tudo mais restrito. Obviamente para quem não percebe nada é muito mais fácil não há ali um sem fim de campos que ninguém faz ideia, o que é que são mas para o utilizador para o expert naquilo para o consultor talvez tenha sido não é um

drawback, mas algo que não é tão positivo obviamente que SAP ainda mantém o GUI e portanto posso utilizar e dependendo das ações que vamos fazer, noutro sentido a facilidade de manipulação também é algo que anda para trás, o que é bom o sentido do que a SAP quer, que é, cada vez menos cada vez se usa mais as coisas como elas são e não ter os customs e por aí fora portanto, tudo aquilo que era adaptabilidade que a SAP tinha dizia assim tens aqui uns screen em Gui mete-lhe para aqui o que quiseres transforma e isto vai funcionar. Mas como as aplicações são da sua grande maioria nativas, standard há uma maior dificuldade, pode então ser considerado também um drawback para quem é, os tais especialistas. Portanto o nível de aptidão técnica que cada um tem e falando de utilizadores de negócio, mesmo assim há pessoas que utilizam SAP há 20 anos e quando isso acontece as pessoas estão tão habituadas àquilo estão habituadas a ter transações na cabeça, que o facto de terem de procurar num sem fim de Fiori que estão no launchpad pode complicar.

Interviewer: E para o utilizador final?

Interviewee C: Para o utilizador final para aquele utilizador de dia a dia que só vai fazer as suas ações, a sua produtividade vai ser melhorar também porque é muito mais similar a tudo aquilo que já existe no mercado não é porque a própria sap que comprou o ariba comprou o success factos, o concur e uma das últimas ações que fez 2019 2020 é uniformizar o aspeto entre todos, portanto posicionamento de botões de cores e etc. Mas hoje já adaptaram e já visualmente até o posicionamento dos botões, dos screens, as cores os temas são todos iguais e deste ponto de vista é muito mais fácil, mas muito mais fácil.

É muito mais fácil utilizar uma ferramenta de aprovação de purchase orders em Fiori, para verificar a purchase order, porque aparece logo tudo e é muito mais intuitivo do que ter de procurar essa order em milhentos campos, por exemplo em Fiori vejo todo o detalhe no mesmo ecrã.

Respondendo à pergunta final, efetivamente o Fiori ao trazer a analítica embebida, uma melhor user experience, mais responsive, o trabalho torna-se mais eficiente, mais simples e produtivo,