

**Czech University of Life Sciences Prague**

**Faculty of Economics and Management**

**Department of Information Technologies**



**Bachelor Thesis**

**Transition from SAP GUI to SAP Fiori**

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# CZECH UNIVERSITY OF LIFE SCIENCES PRAGUE

Faculty of Economics and Management

## BACHELOR THESIS ASSIGNMENT

Ainur Kanatova

Economics Policy and Administration  
Business Administration

Thesis title

**Transition from SAP GUI to SAP Fiori**

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### Objectives of thesis

The main objective of the thesis is to explore difficulties of transition from SAP GUI to SAP Fiori from the business user's perspective.

The partial objectives are:

- to create a comprehensive overview of enterprise information systems with a special focus on SAP ERP and SAP S/4 HANA;
- to conduct user survey to compare Fiori and SAP GUI user experience;
- to evaluate the results of the survey and formulate recommendations for business users.

### Methodology

The methodology of the research work is based on the literature review of SAP ERP and SAP S/4 HANA to compare the transition from SAP GUI to SAP Fiori. A user survey will be conducted and statistically evaluated. The practical part will also include interviews with technical users to explore differences between SAP GUI and SAP Fiori and use them to construct recommendations for business users.

**The proposed extent of the thesis**

60 – 80 pages

**Keywords**

Enterprise Resource Planning (ERP) , Supply chain management, inventory management, transportation, warehouse

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**Recommended information sources**

- KAPPAUF, Jens; LAUTERBACH, Bernd; KOCH, Matthias. Logistic Core Operations with SAP: Inventory Management, Warehousing, Transportation, and Compliance. Springer Science & Business Media, 2012.
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## Declaration

I declare that I have worked on my bachelor thesis titled "Transition from SAP GUI to SAP Fiori" by myself and I have used only the sources mentioned at the end of the thesis. As the author of the bachelor thesis, I declare that the thesis does not break copyrights of any their person.

In Prague on 23.03.2020

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I would like to thank Ing. Miloš Ulman, PhD for all the support and advice during my work on this thesis.

# **Transition from SAP GUI to SAP Fiori**

## **Abstract**

The main purpose of the thesis is to explore difficulties of the transition from SAP GUI to SAP Fiori. The thesis consists of two parts: theoretical and practical part.

In the theoretical part, the author presented an overview of topics such as ERP, SAP S/4 HANA and SAP ERP. This part of the thesis describes the advantages and disadvantages of the SAP GUI and SAP Fiori. Therefore, it provides knowledge for the practical part and helps to formulate recommendations for users.

The practical part of the thesis consists of a user survey and SWOT analysis.

The survey was created based on the literature review, considering the improvements and benefits of the interfaces. Then, Wilcoxon sign-rank test was used, to see if there is a statistical difference between answers of a survey. Also, SWOT analysis used to analyse the strengths and weaknesses of both SAP GUI and SAP Fiori. At the end with the help of practical and theoretical part recommendations for business, users have been constructed.

**Keywords:** SAP GUI, SAP Fiori, ERP, transition, cloud, on-premise, role-based, SAP S/4 HANA.

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# 1 Introduction

As the organizational structure of the company develops and becomes more complex, managers are frequently being asked how to guarantee the productive functioning of the system to stay competitive in today's market. The logistic approach to the management of a manufacturing enterprise today is a fundamental part of the production, one of its most significant parts. It certainly might be very crucial for large international corporations, where subsidiaries and branches cooperate while being in different countries and regions.

One of the leading products currently in the market is SAP ERP, an enterprise resource planning software developed by a German company, SAP SE. SAP SE is a German multinational software corporation that makes enterprise software to manage business operations and customer relations.

In 1996 SAP introduced SAP GUI, powerful ERP tool that was designed to provide an easily manageable graphical interface to work with various SAP software applications. Without any doubt, it was one of the most compelling software at that time. But technology doesn't stay still, it advances all the time. We are now living in the age of powerful smartphones, tablets and laptops. Everyone from a younger age to elderly uses smart devices. Hence, the fact that you can't run old SAP GUI on your smart device makes it problematic. As it was important for SAP to stay competitive and satisfy their customer's needs, in 2013, they launched a new version to old GUI, SAP Fiori.

Developed to run with the SAP HANA in-memory database and S/4 HANA business software, Fiori is in the process of replacing the former generation UX, the old SAP GUI. One practical advantage of the new interface is that it becomes much friendlier, simplifies data entry and system usage.

According to the plan, by 2025, all SAP clients are required to switch from SAP GUI to SAP Fiori, without exceptions. For the past seven years, there has been a rapid rise in the use of SAP Fiori launchpad. However, even small changes can be challenging for some old users that are not willing to switch their entire system, as it may diminish their productivity. The main objective of the thesis is to explore difficulties of transition from

SAP GUI to SAP Fiori and evaluate the results of the comparison done by user survey and SWOT analysis.

## **2 Objectives and Methodology**

### **2.1 Objectives**

The major objective of this study is to explore difficulties of transition from SAP GUI to SAP Fiori from a business users' perspective. A key aspect of this thesis is to determine whether it is worthwhile for companies to switch to new SAP Fiori. The thesis contains three partial goals as well. Firstly, a comprehensive overview of the enterprise information systems will be created with a focus on SAP ERP and SAP S/4 HANA. Secondly, a survey will be conducted to compare SAP Fiori and SAP GUI user experience. Last partial objective is to use the literature and practical part results to formulate recommendations for business users.

### **2.2 Methodology**

The methodology of the research work is based on the literature review of SAP ERP and SAP S/4 HANA to compare the transition from SAP GUI to SAP Fiori. A user survey will be conducted and statistically evaluated. The practical part will also include SWOT analysis for each interface, to explore differences between SAP GUI and SAP Fiori. In the end, all the knowledge obtained from the literature and practical part will be used to formulate recommendations for business users.

### **3 Literature review**

In this part, the author will focus on the literature related to the topic, which is being investigated. Literature review part provides an overview of sources, with a focus on SAP ERP and SAP S/4 HANA. This part is significant, as the literature part provides an insight into our thesis and shows the advantages and disadvantages of each interface.

#### **3.1 ERP**

ERP (Enterprise Resource Planning System) is an integrated information technology-based system for managing the company's internal and external resources. Hossain, Patrick and Rashid (2002) in their study explain that the evolution of ERP started in the 1960s when centralized computing systems became popular among organizations to ease their stock control systems and using inventory control packages. Following this direction, in 1970s material requirements planning was introduced, also known as MRP. It states that the main goal of MRP was the advancement of daily production processes by connecting goods and manufacturing needs. Finally, between the 1980s and 1990s ERP systems appeared in the market with the ability of enterprise-wide inter-functional coordination and integration. (HOSSAIN, PATRICK, & RASHID, 2002) The purpose of the system is to unify the flow of information between all business units within the enterprise and automation of business processes with access to real-time data.

Since the appearance of ERP in the market, there have been many studies showing the benefits of the system to the organization. According to Parthasarthy (2007), there are direct and indirect benefits of implementing ERP. Direct benefits are improved efficiency, integration of the information and reduction of response time to the customers. Indirect benefits include a high-grade corporate image, improved customer goodwill and most importantly customer satisfaction. ERP system is very flexible which is very crucial for the development and maintenance of the company. The tool will be very helpful for organizations that have offices in different parts of the world, like different languages, currencies and so on can be covered in a single system to ensure effectiveness and automation of the usage. (PARTHASARTHY, 2007.)

Having all the data in real-time is what makes ERP great tool for the management of the organization. Basically, in the ERP system, all the data automatically updates at the time when the transaction occurs, and it will also ensure that all the transactional data

transforms into useful one that can be used for analysing and using it for business matters. Also, having data in real-time is helpful for business organizations to make smart decisions promptly.

Another advantage that made many companies switch to ERP systems is the simplification of storage and share of the data across the company. In the ERP system, all departments update a central information system. For instance, when a customer approaches the sales team to buy a product, the sales team will have real-time information access to departments such as inventory, finance, HR, production planning and shop floor execution. With the help of ERP salesperson can easily determine the delivery date and as a result, it saves time and has a significant positive impact on customer goodwill. (PARTHASARTHY, 2007)

All system may have flaws in it. For instance, Parthasarthy (2007) asserts that ERP systems are primarily intended for enrolling what has already occurred, rather than planning for what will happen in the future. These systems can process requests, but they do not examine business circumstances to provide insight into future courses of action. (PARTHASARTHY, 2007.)

Risks of implementing ERP by Parthasarthy (2007):

- User Resistance/Revolt ;
- A mismatch between the ERP system and Organizational Culture. It can occur when the ERP best practices do not match the structure and goal of the organization;
- Inability to manage technology;
- Illogical processing;
- Inability to stop processing quickly;
- Cascading errors;
- Repetition of Errors;
- The concentration of data.

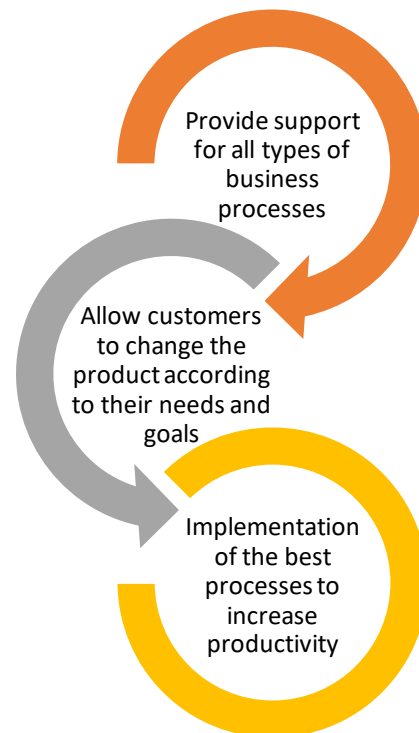
Murthy (2020) states that companies that buy the ERP but have not planned the future with it or didn't analyse the system good enough will not see any benefit from implementing it. Indeed, you cannot expect success from the implementation of a product without checking whether the system matches with the goal of the organization. So, who needs the ERP product? ERP system suits the companies that have a vision for leadership in the

competitive market and faces a daily volume of the highest level of communication among the workers due to the complexity of a business process. (MURTHY, 2008)

Popularity for ERP products rose in the mid-90s when several big companies started selling their ERP systems.

The leading vendors in the market are: (MURTHY, 2008)

- SAP AG
- People soft
- IFS
- Baan
- JD Edwards
- Oracle
- SSA



**Figure 1 Benefits of implementing ERP**

(Source: MURTHY, *CSV Enterprise resource planning and management information systems: (text and case studies)*. Himalaya Publishing House Pvt. Limited, 2008)

## **3.2 Operation of ERP**

Since the 1990s, implementation of ERP has become popular among companies of any size all over the world. Formerly, the only way to deploy the software was through internal hosting by user organization, also known as on-premise software. The traditional version of installation requires it to be installed locally on the company's internal servers or computers. It is important to note that, the on-premise version has several disadvantages that kept some users doubt the worthiness of installation, such as very expensive licensing fees, time-consuming customizations and additional charges for hardware. With the help of cloud computing technologies, those difficulties found in on-premise ERP are expected to be significantly enhanced. (PENG & GALA, 2014)

Peng and Gala (2014) on their paper state that on-premise software alarms customers with its high cost for implementation and individual approach for an upgrade, which can be time-consuming as it must be done individually for each user's PC. As a solution, ERP now operates with cloud software, which is ideal to utilize ERP benefits for growing and expanding their businesses.

All the hype for cloud version is supported by the fact that companies are continuously seeking for ways to diminish costs and operate more efficiently to remain competitive in the market and the new approach can help them to achieve these goals. (PUROHIT, JAISWAL, & PANDEY, 2012)

### **3.2.1 On-premise**

On-premise ERP solutions are usually acquired via a license model. The software is loaded onto servers and computers in-house. The enterprise also controls the infrastructure and platforms. We can say that on-premise software is a traditional method, where you buy software and install it in internal hardware.

On-premises ERP solutions typically have deeper functionality as they are considered to be more advanced solutions and propose significant adjustment and customization abilities to fit individual requirements. Installation of on-premise software enables companies to have more control over the software, which indicates that it's possible to run the software even if there is no internet connection. For instance, if the vendor goes out of business, or the

company decides to stop paying maintenance. (Maliza Salleh, Yen Teoh, & Chan, 2012)

On-premises Software Cost:

- Software License (Customers will only pay once for the license)
- Software Maintenance and Support (annually)
- Implementation Services (One-time cost)
- Hardware (One-time cost)
- Maintenance and Support Personnel (Annual cost) (ARNESEN, 2013)

### **3.2.2 Cloud**

Unlike, on-premise, the cloud version of ERP is adapted to the new technologies and can get easily accessed by any smart devices, such as mobile phones, tablets, laptops and computers. The difference is that cloud version requires the internet, but the performance is faster than on-premise software.

It is important to note the main advantage of cloud ERP is the low entry price. No need to acquire expensive equipment or make certain that you have enough infrastructure to manage the system. Easily download a software application onto computers and let a hosting company implement the service.

Moreover, organizations that use the cloud version of the software can reduce their implementation costs, as these services will be directly provided from the expert system manager, which also includes support with system hardware failures (KIADEHI & MOHAMMADI, 2012; KIADEHI & MOHAMMADI, 2012) Also, to avoid getting sensitive information leaked, it is vital for the companies, switching to the cloud, properly train their employees how to work with new software. (Maliza Salleh, Yen Teoh, & Chan, 2012; Maliza Salleh, Yen Teoh, & Chan, 2012)

Cloud Software Cost:

- Software Subscription Fee Modules (Annual/monthly cost, depending on the functionalities)
- Software Subscription Fee Users (Cost depends on the number of users that will be accessing the system)
- Implementation Services (One-time cost)
- Support (Annual cost). (ARNESEN, 2013; ARNESEN, 2013)



	Cost factor	Time factor
On-premise software	<p>Implementation of on-premise software is highly costly due to following reasons:</p> <p>Firstly, software licensing fees could be very expensive and most of the time is not affordable for small or mid-sized companies.</p> <p>Secondly, hardware purchase, software implementation costs such as operating system and database management system (DBMS) comes with additional charges.</p>	<p>The disadvantage of on-premise software is that training the employees to use the software takes longer time than cloud version of it. It is due to the complexity of the system.</p>
Cloud software	<p>Advantage of the cloud version is that implementation costs are lower, making the product affordable to many users across the world.</p> <p>Software subscription can be on a monthly or yearly basis and the fee is 30 and 360 euros accordingly. Moreover, customers that purchase the cloud version must install fewer or no machines at all, which cuts all the unnecessary expenses for the company.</p>	<p>Firstly, because there is no need for acquisition of the hardware, it decreases time spent on installations.</p> <p>Secondly, the Cloud version of the software is less complex than the on-premise version, which means time for training purposes will be decreased as well.</p>

**Table 1 Comparison of Cloud and On-premise software**

(Source: ELRAGAL, Ahmed; EL KOMMOS, Malak. In-house versus in-cloud ERP systems: a comparative study. *Journal of Enterprise Resource Planning Studies*, 2012, 2012: 1.)

### 3.3 Historical development of SAP ERP

“In 1972, Hasso Plattner, Dietmar Hopp, Hans-Werner Hector, Klaus Tschira and Claus Wellenreuther founded a company called Systems, Applications, Products in Data Processing or SAP for short” (MISSBACH, 2016) SAP SE was the first company to build a packaged enterprise system SAP ERP, which is designed as a single piece of software that is used by many companies. Before that time, software developers had to create customized software for every company, which was prohibitively expensive. (MAGAL & WORD, 2011; MAGAL & WORD, 2011) SAP software is a solution to this problem as it is meant to be a single piece of software that covers all aspects of the company’s activities (human resource, finances, asset management, sales distribution, production planning, material management etc).

The history behind the SAP ERP starts when SAP first launches its end-to-end enterprise system, called SAP R/3, in 1992. The “R” in R/3 stands for “real-time” (MAGAL & WORD, 2011; MAGAL & WORD, 2011) Because all the data is available in real-time, R/3 enables you to decrease the measure of manual work.

The years from 1991-2000 is called The SAP R/3 era. And there is a reason for that. After introducing SAP R/3 to the general public in 1992, of its DM 831 million in total revenue, SAP is now generating nearly 50% of it outside of Germany. Meanwhile, its global workforce grows to 3,157 employees by the end of the year. Not only did SAP launch their first ERP system, but it also introduced its new sales and development centre by the end of 1992. (SAP, no date)

In 1994, SAP starts working with Microsoft, the world's biggest programming producer, to transfer SAP R/3 to the Windows NT operating system. The year of 1996 is marked red for the company, as it finally goes online and introduces its joint internet strategy with Microsoft. Customers can now connect the online application to their SAP R/3 systems, using open interfaces. In 1997, SAP R/3 software is implemented by well-known and leading customers, such as Deutsche Post AG, Daimler-Benz, and General Motors. It ended the year strong with the release 4.0 version of SAP R/3 and having more than two billion users work with SAP solutions. (SAP, no date)

In 2004, SAP delivered the very first version of SAP ECC 5.0. ECC is the newest embodiment of the famous SAP R/3. The main components of SAP ECC are SAP Financials (FI), Sales and Distribution (SD), Production Planning (PP), Quality

Management (QM) Warehouse Management (WM), Logistics Execution System (LES), Project Management (PS), and Plant Maintenance (PM). Human Resources (HR) and Human Capital Management (HCM) provide functions for payroll, time management, gratuities, incentives, statutory reporting, and cost planning. (MISSBACH, 2016)

### 3.4 SAP ERP 6.0

The latest version of SAP ERP 6.0 offers over 300 functional enhancements that can improve the performance of the processes. It has been announced by SAP in 2006. Besides, it unites the roles of most SAP industry solutions. (SAP, no date) Hence, these solutions don't require to be set up or established separately.

Appealing and integrated user-interface makes it easier to deal with everyday tasks and increase user productivity and satisfaction. Since the release of SAP 6.0, it's been updated through enhancement packages, the most recent of which was presented in 2016.

“ERP upgrades are an essential process that helps organizations derive greater value from their ERP software and prolong the useful life of this very important asset. A key part of the upgrade strategy process is getting a critical mass of employees to understand ERP upgrades are a normal part of the product life cycle.”

One of the benefits of updating to SAP ERP 6.0 is that it has a new deployment technology called the SAP enhancement package.

Simply put, SAP ERP 6.0 comes with two packages, which are listed below.

- enhancement packages (mandatory)
- support packages (voluntary)

The support package is mandatory for installation. It only consists of corrections made to the previous version and some legal changes.

On the contrary, enhancement packages can be selected and installed according to the preference of the company. Therefore, it will help the users to match their needs with the new functions, so it will profit their business.

SAP ERP 6.0 version lets you keep the current state of your landscape. Its new approach guarantees that the systems remain constant and submissive. (OEHLER & WEISS, 2009) Following the update, you can implement the new software innovation in a way that suits your business. Hence, you can activate selected innovations without any disturbance to your ongoing processes, while having access to the old ERP functions.

This feature is essential for big and innovative companies, who prefer to avoid any issues which may arise during training or disturbing adjustments to the new features. It will ensure that the upgrades in the system are suitably arranged and can be chosen according to the company's standards.

### 3.5 SAP HANA

SAP HANA is a business application server, which is based on in-memory computing. “Based upon several existing technologies, SAP HANA is a database system, designed to greatly speed up database accesses when reading data, while not slowing the data insertion” (WALKER, 2012) In-memory computing technology was the foundation of the business intelligence product, which was introduced by a company called QlikView in 1997. (BERG & PENNY, 2012) In-memory computing is the technology that is used to process a huge amount of data in the main memory, that can be used for providing results from the analysis in a short period.

From time-to-time prices for in-memory technology has declined, which attracted many companies that would like to improve their system’s efficiency, such as SAP, that has always been working on ways to build quicker and more affordable solutions for its users. (BERG & PENNY, 2012)

SAP HANA 1.0 was first introduced to the world on the 18th of June 2011.

It is worth to mention that SAP HANA’s success in managing large data is directly connected with the idea of column-based storage of data, as it is much more practical than storing it in rows.

One of the advantages of column-based storage over row-based one is that each column can represent the key for data retrieval, making access to the relevant data incredibly simple.

Moreover, unlike the row-based system, only suitable data will be read in the selection process, which is crucial for the companies with a huge amount of data that requires a solution for decreasing time wasted on transactions.

The database which powers SAP HANA system is also known as column-based RDBMS. It was made with the help of already existing three of SAP’s products:

- Trex, which stands for Text Retrieval and Information Extraction. It’s SAP’s search engine with various settings for searching. Unlike other databases, TREX stores its data as a flat-file.

- MaxDB is SAP's database management system with various built-in self-administrating features. Its key characteristics unite convenience, approachability and excellent achievement with low cost. (SAP, 2020)
- “P\* Time is OLTP in-memory RDBMS system is a row-based data store.” (BERG & PENNY, 2012)

### **3.6 SAP S/4 Hana**

SAP S/4 HANA is a new version of the ERP system, a creation which is based on the “in-memory” SAP HANA platform. The letter “S” stands for simple and “4” stands for 4th generation business suite. Since the launch of the SAP R/3 system, SAP has always been looking for ways of integrating and improving their system. It’s understandable because there are new technological advances made regularly. (WAGNER & MATHAS, 2016) The new version of the ERP business suite, SAP S/4 HANA, is completely based on high-level in-memory SAP HANA database and user-friendly new user experience, SAP Fiori. S/4 HANA is very adaptable, providing several choices of deployment for the customers to such as on-premise, cloud and hybrid.

#### **3.6.1 On-premise**

SAP S/4 HANA on-premise uses traditional licensing and the customer oversees all the deployment and support with their own IT staff, including control over the speed of innovation, planned downtimes and any other changes within the system.

S/4 HANA on-premise can use full ERP scope from SAP Business Suite and it can also be integrated with other SAP cloud solutions such as SAP SuccessFactors Employee Central, SAP Fieldglass, SAP Hybris Marketing, SAP Jam and SAP Ariba Network. New innovations for on-premise edition are delivered on an annual basis. (WAGNER & MATHAS, 2016)

#### **3.6.2 Cloud**

SAP S/4 HANA cloud version uses subscription licensing and in the cloud, version SAP is liable for the system maintenance. such as the execution of patches and release of upgrades. Implementation approach for the cloud version is not individual, it requires customers to follow best-practices configuration to make business processes faster and more productive. Unlike on-premise edition, in cloud customers get quarterly innovations for the SAP S/4 HANA. (WAGNER & MATHAS, 2016)

### 3.7 SAP GUI

SAP GUI is the old technology of user interface implementation for all SAP applications such as SAP ERP, SAP Business Suite and Business Intelligence. SAP GUI can run on OS, LINUX and windows.

GUI stands for Graphical User Interface and the main function of the SAP GUI is to grant the user with the facility to connect to the information system, demonstrate current processes, accept input data, etc. It has built-in integration with the ABAP dictionary, which lets you do automatic checks for compatibility of screen data fields.

SAP GUI solution supports three main platforms, which are listed below: (SELMECI & OROSZ, 2014)

- SAP GUI for Windows was designed to support MS Windows operation system with the help of OLE interfaces or ActiveX platforms.
- SAP GUI for Java is known for its platform-independent architecture that can be installed on Windows, Linux and Mac Os.
- SAP GUI for HTML also known as WebGUI, this is service provided by ITS. The way it works is that it converts standard SAP data into HTML business functions. Unlike new generation SAP Fiori, SAP GUI must be installed on the front-end desktop.

SAP GUI is a client-server-based software technology that allows their clients to adjust their transaction screen to suit the company's needs, making it simple to read and work with. Using the above-mentioned tool, you can modify and new elements on any transaction in SAP, but core coding (ABAP and Dynpros) will stay unaffected.

GuiXT is a client-server-based software technology that provides user interface customization solutions to SAP applications. SAP GUI introduced SAP GUIXT and the GUI Sculpting. (Ahuja, 2009)

SAP GUIXT is a tool provided with SAP that enables firms to tailor SAP transaction screens to the narrower requirements of specific jobs within the organization while leaving



essential SAP coding (ABAP and Dynpros) untouched. (Ahuja, 2009) This is a great opportunity for SAP customers that are striving to reduce the time for training and add more efficiency to their productivity as all buttons and options can be designed and adjusted by them. It's important to highlight that there is no need for installation and additional costs.

SAP Gui Scripting is a different tool comparing with SAP GuiXT. It does not change the screen layout; it eases the transaction process by recording already exiting transaction that happens repeatedly. By having macros ready to go, creating and checking transactions becomes straightforward and dynamic. (SELMECI & OROSZ, 2014)

### **3.8 SAP Fiori**

SAP Fiori is a simple and fast new user interface (UX) for SAP software and application. Unlike the previous interface, SAP Fiori is based on HTML5 framework, for the creation of which is used flat UI design and user-centric apps. Newly added functions allowed SAP Fiori to be flexible with all screen sizes. Additionally, it runs on every device which has an HTML5-compatible browser. (MATHEW, 2015)

Moreover, SAP Fiori minimizes the time required for training purposes, as the new user interface follows the same design principle in apps, making the transition as smooth as possible. Therefore, it simplifies the usage of the system for employees that do not use all the fields and configurations. To make it easier, SAP made a whole set of 25 applications, specifically created according to the role of the user in the company such as managers, employees, sales representatives and purchasing agents. (MATHEW, 2015) Depending on their role and job status they will have certain restrictions, allowing them to see only the applications that they need avoiding inconvenience working with the system

#### **3.8.1 SAP Fiori design**

User-friendly design that was used for the creation of SAP Fiori is called flat design. Popularity for flat designs, came after Microsoft successfully adapted it in Windows 8 and the trend for it was immediately trailed by other tech companies such as Apple and Google. In comparison to its predecessor skeuomorphic design, the flat design uses two-dimensional elements and bright colours, resulting in a reduction of the size. As a result, loading times and movements from one screen then onto the next are smooth. Secondly, clean and colourful design makes it appear more modern, making it more user-friendly for the clients. (MATHEW, 2015)

Fiori apps can be broken down into three main parts:

- Transactional apps
- Analytical apps
- Fact sheets

Transactional applications allow users to have access to transactions, which can be modified or created according to the user's preference, such as creating leave and travel requests, approving purchase orders, and so on. SAP Fiori guides while making changes or creating tasks, making the interface even more convenient and simple to work with. Unlike Fact sheet apps and analytical apps, transactional apps can operate on any database, but SAP HANA is preferred. (MATHEW, 2015)

Analytical applications are used for reports and allow you to obtain a real-time overview to your business, by collecting the data using key components. Additionally, it lets you check the key performance indicator, to react and analyse the changes in operations. Analytical apps operate using the SAP HANA database. (MATHEW, 2015)

Facts sheet apps help the user to get a compact overview of the subject and it can also navigate between related objects. It is possible to get access to the Fact sheet apps by looking it up on a search bar, by navigating from another fact sheet or by analytical and transactional apps. Fact sheet apps can only work on SAP HANA system. (MATHEW, 2015)

## 4 Practical Part

The practical part is based on a survey and SWOT analysis of SAP GUI and SAP Fiori based on data collected in a survey. The survey was conducted among the employees of a shared business centre working extensively with SAP software.

The second part of the practical part is the SWOT analysis. It is important to analyse the strength and weaknesses of the interfaces. All the results conducted from the practical part will help us to provide answers to our objectives.

### 4.1 Research design

Research for this study is conducted by analysing a literature review for both SAP GUI and SAP Fiori, including a comprehensive overview of enterprise information systems with a special focus on SAP ERP and SAP S/4 HANA. Moreover, to make this study useful for business users, the author decided that it is important to survey a real user that are using both systems on their everyday work life. It was decided to make a survey focused on usability. In total, two surveys were created, and 21 participants were selected for the study. To check if there are differences between the responses of users regarding the usability, it's important to do the statistical analysis after getting the results from the survey. Questions for the survey were selected after carefully analysing the literature and understanding the main differences that were mentioned in the literature review of this research. Then, surveys were sent to managers of SAP by email, and they were asked to complete the two surveys for both UI's. It took over 2 weeks to get all the results from users to start doing the statistical analysis.

All the participants of the survey have experience in working both in SAP GUI and SAP Fiori to do their daily tasks at work. They were asked to answer two surveys with the same questions for each interface. This will help to compare results and to see if there is a relationship between two interfaces.

Results from the survey will be then tested using Wilcoxon sign test, a nonparametric statistical test that compares two paired groups. Based on the results of the Wilcoxon signed test, we will be able to tell if there is a relationship between two UI's.

For the comparison, two applications will be used, “Unified ticketing” for SAP Fiori and “Reporting” for SAP GUI. To have a better view and compare both UI’s, it was decided to conduct the survey only with people that use both applications. The assumption was that these users would also share possible difficulties of transition from their perspective.[UM1]

## 4.2 Data collection

Questions for the survey were formulated based on the literature. It was important to have a link between questions in the survey and the aim of the research.

Surveys were focused on the usability of the interface, such as ease of use, design, responsiveness, learnability, clearness of the information provided in the interface. A total of 21 participants were recruited for this study and in all cases, participants’ consent was obtained. After all, participants completed and sent back the survey via email, it was decided that the best statistical analysis for this study was the Wilcoxon signed-rank test.[UM2] This statistical method was chosen because the data is not distributed normally and it is one of the most practical ways to check if there is a statistical difference between the old SAP GUI and new SAP Fiori.

### 4.3 Wilcoxon sign rank test

Statistical analyses were performed by using the Wilcoxon sign rank test, applying a significance level of 5%. Also, it was decided that this statistical method will be performed in Excel.

In order to perform the test, we need to follow the steps shown below.

- The first step is to create two columns and fill the cells with the results of the survey. The first column represents the results of the survey for SAP GUI ( $x_i$ ), the second column represents the results of the survey for SAP Fiori ( $y_i$ ).

- After, we will calculate the difference between two observations, where  $d_i$  represents the difference.

$$d_i = x_i - y_i$$

- The third column will be used to identify positive and negative results. To do that, we will need to use a formula in excel =IF (cell>0,1, -1), meaning that it will assign 1 if the value is greater than 0 and assign -1 if the value is less or equal to 0. In cases, where the difference equals 0, the cell will be empty.
- Subsequently, we create a new column to give a rank for each cell. Column representing rank will be calculated using the formula in Excel, called =RANK (cell, ref, [order]). Using this formula, we want to find the rank of the cell, by comparing it to the list of 21 numbers that we have. Ref represents the list of numbers that need to be ranked, to make it easier, and to copy the formula down for the rest, cells with dollar signs will be set. Ranks will be represented in ascending order, for that we type number 1 after ref. In ascending order, the lowest number gets number 1 and the highest number gets number 21. In situations, when assigned ranks are the same, the average of the ranks will be assigned for each of the cells. For instance, if we have ranks 1,2,3 with the same result, average number, which is 2, will be assigned.
- The next step is to calculate signed-rank, that is done by multiplying columns rank and column sign accordingly to each cell.

When the above steps are completed, we are now ready to calculate  $W^-$  and  $W^+$ .  $W^-$  equals to the sum of all negative numbers in column signed-rank,  $W^+$  equals the sum of all positive numbers in column signed-rank. The formula for which formula will be used in Excel calculation. The absolute value of  $W^+$  and  $W^-$  will be compared and the least number will be the test statistics.

Our last step is to check the hypothesis using all the results obtained from previous steps.

In order to reject the null hypothesis:

- our z-score must be  $1.96 < z$ , or  $z > -1.96$ . It's the critical value for the Z table with 95% confidence. As we are doing a two-tailed test, we select both 1.96 and -1.96.

-test statistics must be less than the critical value. The critical value for  $n=21$ , alpha 0.05 is 58.

In order to calculate z value, we need to first calculate the standard error, mean and test statistics.

Formula to calculate the mean:

$$\mu_w = \frac{n(n+1)}{4}$$

Formula to calculate standard error:

$$\sigma_w = \sqrt{\frac{n(n+1)(2n+1)}{24}}$$

It is important to note that because we have a scale from 1-5, it is possible to have the same values for differences, which give us the same ranks in cell "ranks". In this case, formula

$$\frac{t^3-t}{48}$$

needs to be used, it will be subtracted from the original formula of Z inside of the square root. T represents the number of times certain value was repeated.

Formula to calculate Z-score:

$$Z = \frac{\max(W^+, W^-) - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}}$$

#### 4.1.1 Results

Hypothesis	Wilcoxon test statistics	Critical value (Wilcoxon table)	z-score	Critical z-score value (alpha 0.05, two tailed)	Results
Hypothesis 1	28	58	2.42	To reject must be $z > 1.96$ or $z > -1.96$ . For Wilcoxon test (Test stat < Critical value)	$28 < 58$ (Wilcoxon test) $2.42 > 1.96$ (z-score) Reject $H_0$
Hypothesis 2	21	58	3.2	To reject must be $z > 1.96$ or $z > -1.96$ For Wilcoxon test (Test stat < Critical value)	$21 < 58$ (Wilcoxon test) $3.2 > 1.96$ (z-score) Reject $H_0$
Hypothesis 3	40	58	2.65	To reject must be $z > 1.96$ or $z > -1.96$ For Wilcoxon test (Test stat < Critical value)	$40 < 58$ (Wilcoxon test) $2.65 > 1.96$ (z-score) Reject $H_0$
Hypothesis 4	38	58	2.4	To reject must be $z > 1.96$ or $z > -1.96$ For Wilcoxon test (Test stat < Critical value)	$38 < 58$ (Wilcoxon test) $2.4 > 1.96$ (z-score) Reject $H_0$
Hypothesis 5	14	58	3.57	To reject must be $z > 1.96$ or $z > -1.96$ For Wilcoxon test (Test stat < Critical value)	$14 < 58$ (Wilcoxon test) $3.57 > 1.96$ (z-score) Reject $H_0$

**Table 2 Results of the Wilcoxon sign-rank test  
(Source: made by the author)**



### **4.1.2 Hypothesis 1**

In first hypothesis, Wilcoxon method will be used to determine if there is a difference in “ease of use” between SAP GUI and SAP Fiori, according to the results from the survey.

Null Hypothesis  $H_0$ =There is no significant difference in “ease of use” between SAP GUI and SAP Fiori.

Alternate Hypothesis  $H_1$ = There is a significant difference in “ease of use” between SAP GUI and SAP Fiori.

In the first hypothesis, by calculations with excel, we can see the results test statistics equals the least number in between  $W^-$  and  $W^+$ , which in our case is 28. Our critical value for 21 samples in Wilcoxon table is 58. As we can see, our test statistics is less than the critical value, so we reject the null hypothesis. It is also possible to check the hypothesis with Z-score. For the first hypothesis, z-score is 2.42, it is more than 1.96. As our value is more than 1.96, we reject the null hypothesis. From both points, there is a significant difference in “ease of use” between SAP GUI and SAP Fiori.

### **4.1.3 Hypothesis 2**

Is there a significant difference in design between SAP GUI and SAP Fiori interfaces?

Null Hypothesis  $H_0$ =There is no significant difference in “design of the interface” between SAP GUI and SAP Fiori.

Alternate Hypothesis  $H_1$ = There is a significant difference in “design of the interface” between SAP GUI and SAP Fiori.

From the results provided in table 2, our test statistics is less than critical value, which means we reject the null hypothesis. It also shows that Z-score is more than 1.96. As mentioned before, if the z-score is more than 1.96, we reject null hypothesis and accept alternate hypothesis. There is a significant difference in “design of the interface” between SAP GUI and SAP Fiori.

#### **4.1.4 Hypothesis 3**

Is there are significant difference in the clarity of the information provided between SAP GUI and SAP Fiori?

Null Hypothesis  $H_0$ =There is no significant difference in “??” between SAP GUI and SAP Fiori.

Alternate Hypothesis  $H_1$ = There is a significant difference in “design of the interface” between SAP GUI and SAP Fiori.

Table 2 represents the results of the Wilcoxon sign rank test, which was done in Excel. As it is shown in the table, for the third hypothesis our test statistics is less than the critical value. Moreover, our Z-score is more than 1.96. We reject the null hypothesis and accept the alternate hypothesis. We can conclude that there is a significant difference in “design of the interface” between SAP GUI and SAP Fiori.

#### **4.1.5 Hypothesis 4**

Is there are significant difference in the responsiveness of the interface?

Null Hypothesis  $H_0$ =There is no significant difference in “responsiveness of the interface” between SAP GUI and SAP Fiori.

Alternate Hypothesis  $H_1$ = There is a significant difference in “responsiveness of the interface” between SAP GUI and SAP Fiori.

As showing in table 2, z-score is more than 1.96. In addition to that, test statistics is 38 and it is less than critical value 58. Therefore, we reject the null hypothesis, saying that there is no difference in terms of responsiveness of the interface. Because our calculations show that there is a significant difference between interfaces.

#### **4.1.6 Hypothesis 5**

Is there are significant difference in the responsiveness of the interface?

Null Hypothesis  $H_0$ =There is no significant difference in “responsiveness of the interface” between SAP GUI and SAP Fiori.

Alternate Hypothesis  $H_1$ = There is a significant difference in “responsiveness of the interface” between SAP GUI and SAP Fiori.

In our last hypothesis, we can see from table 2 that our test statistics is less than the critical value ( $14 < 58$ ). Also, our z score is more than 1.96, meaning that we can reject the null hypothesis. There is a significant difference between answers for interface usability.

#### 4.4 SWOT analysis for SAP GUI and SAP Fiori

SWOT analysis used to analyse the strengths and weaknesses of an organization or an object. It consists of four elements, which are strength, weakness, opportunities and threats. Each of them is important to fully analyse the benefits and limitations that may help for decision making for companies. This approach for analysis is chosen by the author and will include the knowledge gained from the literature and the survey results. (HELMS & NIXON, 2010)

##### 4.2.3 SWOT analysis for SAP GUI

Strength	Weakness
<ul style="list-style-type: none"> <li>○ The first user interface introduced by SAP for its applications.</li> </ul>	<ul style="list-style-type: none"> <li>-complex menus</li> <li>- not role-based</li> <li>- can only be accessed via desktop</li> </ul>
<ul style="list-style-type: none"> <li>○ More familiar to the old users of SAP products.</li> </ul>	
Opportunities	Threats
<p>Possibility to work with the data using the interface, even if there is no internet connection.</p>	<p>SAP announced that all SAP GUI users must switch to the new SAP Fiori by 2025, which may result in difficulties for companies that are not willing to do that. So, the threat is that they may look for a new company for support.</p> <ul style="list-style-type: none"> <li>-the decrease in demand because of smart devices</li> </ul>

**Table 3 SWOT analysis of SAP GUI Source: made by the author of the thesis**  
(Source: made by the author)

The main strength of the application could be its popularity among old users. Not many companies are fond of change, as it may diminish productivity. Considering how different is SAP Fiori from SAP GUI, it is possible to have difficulties in the transition process, such as cost that appear after switching from one to another.

One of the weaknesses of the GUI interface is that it has complex menus. It may be disadvantageous for users, as not all of them are IT experts, they may work in accounting or finance team. So, the unnecessary complication of the system might affect the productiveness. It is not role-based, so seeing many applications might confuse users while working on a daily task with the help of the interface.

As SAP GUI runs on desktops that usually does not require the internet, it is safer than cloud versions. So, if there is no internet connection, it is still possible to access the data and work with it using the interface.

Another point to mention is that the SAP GUI can only run on a desktop, making it not compatible in today's market. In today's world, smart devices, such as phones, tablets, laptops are in more demand than desktops.

By 2025, all users are required to switch to the new SAP Fiori, which implicates that SAP is trying to replace the SAP GUI with the new SAP Fiori. It will affect old users, that are still not convinced enough to switch their interface. A possible outcome could be that they may ask for support from a different company.

#### 4.2.1 SWOT analysis for SAP Fiori

Strength	Weakness
Modern design	SAP Fiori cannot run on any database. It runs on HANA. So, it could create a problem for people that do not want to switch to HANA, just because of the user interface.
Ability to run on any screen size that supports HTML5, including mobile devices.	
Role-based applications	
Opportunities	Threats
Decreases costs for training	Some big companies that are already been using SAP GUI might not want to switch. The primary cause will be that they've already spent cash to implement and teach to use the vintage SAP GUI.
Low cost of implementation	

**Table 4 SWOT analysis of SAP Fiori  
(Source: made by the author of the thesis)**

Table 4 shows a SWOT analysis table with its main four parts: strength, weakness, opportunities, threats.

Strengths of the SAP Fiori are design, ability to run on any device that supports HTML5 and role-based applications. Design of the interface and its ease of use is crucial for customer satisfaction. It improves the efficiency and for customers that use SAP applications daily, it automates most of the process, making it easy to use for users. As we live in a world of smart devices, it is hard to imagine a company that didn't want to adapt to the new trends. The main rule to stay competitive in the market is to analyse and understand the desire of the customers. Customers want an easy interface that would offer

a company as many benefits as possible. Fiori's ability to run on any device that supports HTML5 is one of the important changes that SAP made for its users.

Moreover, as it was previously mentioned in the literature review part, SAP Fiori has role-specific applications. That means, there is no need having unwanted and not relevant applications which user do not need. Instead, the user can focus on the applications that they use on a daily basis. It makes the interface more user-friendly and simpler.

Even though it has many advantages, SAP Fiori does also have weaknesses. As not all customers of SAP use HANA database, it means they need to switch to HANA first. This may be a problem for companies that do not need HANA as their database.

Opportunities that come with the UI are decreased in cost for training and low cost of implementation. Reduce in price always benefits the company.

It's also important to note that changing the routine, that has been fixed in a company is a hard decision. Also, it might be too risky for companies that are not so flexible when it comes to changes. With improper training, productivity might go low.

## **5 Results and Discussions**

In this section, the author describes the difficulties of the transition process that may happen to companies that are trying to switch from SAP GUI to SAP Fiori. Literature review and results from the survey and SWOT analysis will be used to describe the difficulties of transition and give recommendations for business users.

### **5.1 Potential obstacles for the transition from SAP GUI to SAP Fiori**

Since the SAP GUI is the product of SAP, that has been in the market for a long time, it has more popularity among old customers of the company. Generally, big organizations that have been in the market for a long time tend not to like drastic changes that may diminish productivity. As they tend to like being more on the risk-free side, adopting a new interface might be a big decision for them. Moreover, these companies may already invest enough money for the implementation of the interface and costs for training purposes. Another obstacle for transition might be the training for the new interface. Big corporations that use ERP usually have a busy work life and do many transactions on a daily basis. From their point of view, it might not be the best for them to implement something new, that may decrease the productivity caused by employee's lack of training. In most cases, it has been observed that it takes time for employees to get back on track, whenever they implement something new in the workplace.

In the SWOT analysis, it has been found from the literature part that by the year of 2025, all SAP customers must switch from old SAP GUI to the new SAP Fiori. Although there has been a rapid rise for the SAP Fiori for the last 6 years, there are some customers that are not willing to change their interface. As it was mentioned before, SAP Fiori runs on HANA database. Even though there are so many benefits of the implementation that have been proven by other studies as well, it is still may not be the best interest for the company. As a result, it is possible that they may choose different vendor for their ERP product.



## 5.2 Recommendations for the users

After careful reading of the literature and considering the results of the survey and SWOT analysis, the author came up with the recommendations for users.

- To get the best out of the new UI, companies should consider investing more on training purposes, as it is very vital for the productivity of users. SAP Fiori is much more simplified and easier to use according to the survey participants. Proper training sessions would be a big help, as it increases the user's productivity in general and it helps for a smooth transition.
- In SWOT analysis, it was mentioned that all users are required to switch from SAP GUI to SAP Fiori without exceptions. The author suggests that for the smoother transition, it would be best if the company started doing the research beforehand, to have a view of how transitioning will affect the company.
- Moreover, the author also suggests having a team that would be in charge of the implementation process of the new interface. To avoid having issues with the implementation process, it will be helpful to have a team that will monitor the process even after the implementation.

## 6 Conclusion

In the conclusion part, the author will focus on each objective and the main findings that have been found in this thesis. Also, it will focus on the limitations of the research and the significance of the study.

The main objective was to explore difficulties of transition from SAP GUI to SAP Fiori from a business users' perspective.

The first partial objective was to create a comprehensive overview of enterprise information systems with a special focus on SAP ERP and SAP S/4 HANA. It was done on the literature review part of the thesis. The author presented an overview that will help the reader to understand topics such as enterprise resource planning, SAP ERP and SAP S/4 HANA system. After analyzing all the literature about SAP GUI and SAP Fiori, the author selected the literature that might help for distinguishing the advantages and disadvantages of the interfaces. This part also provides knowledge for the practical part and helps to formulate recommendations for users.

The second partial objective was to conduct a user survey to compare SAP Fiori and SAP GUI user experience. All processes such as data analysis, research design, statistical analysis were described in the practical part of this thesis. Moreover, the survey was created based on the literature review, considering the improvements and benefits of the interfaces. In the end, two surveys were created with a total of 5 questions regarding the usability of interfaces. As soon as the results were collected, Wilcoxon sign-rank test was used, to see if there is a statistical difference between two answers. It was clear from the results that there is a significant difference in answers between SAP GUI and SAP Fiori.

The third partial objective was to formulate recommendations for business users, by using the results of the survey and SWOT analysis. As we can see from the results and discussions part, most participants' answers tend to have more positive answers for SAP Fiori and more negative answers for SAP GUI. This may be due to the complexity of the SAP GUI. As mentioned before, technology evolves each day and operating with the old interface does not make sense for most of the customers. With all the smartphones and tablets, pretty much everyone expects to have a nice design and easy way of doing tasks. With the help of users input and SWOT analysis results, it might be very advantageous for companies to switch for several reasons, such as simplified interface, role-based

applications and better responsiveness of tasks. But before doing that, the author recommends checking the recommendations part which has been mentioned in the results and discussions part of the thesis.

### **Limitations of the research**

One of the key limitations of the research was the number of people who took the survey. Finding the employees that have experience in both interfaces was challenging, therefore it has affected the number of people in the survey.

In most cases, it was observed that employees who use SAP GUI for their job have never used SAP Fiori, and customers that use SAP Fiori for daily tasks have not previously used SAP GUI. The author, therefore, decided to send the survey to the people, who use both interfaces in their job.

In a conclusion, this research mainly focused on the advantages and disadvantages of each interface and it might be helpful for businesses using SAP GUI and thinking of changing it to Fiori, as it provides them with valuable insight into the usability of those interfaces.

Finally, because it provides literature for future research, this research can also be used by other researchers on their work.

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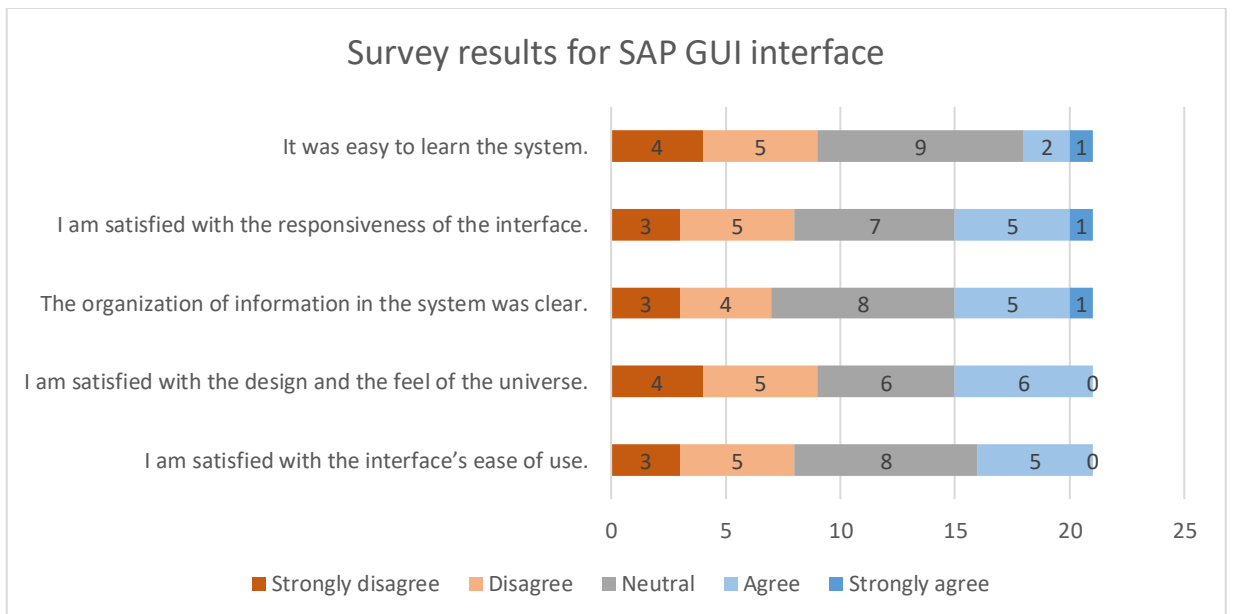
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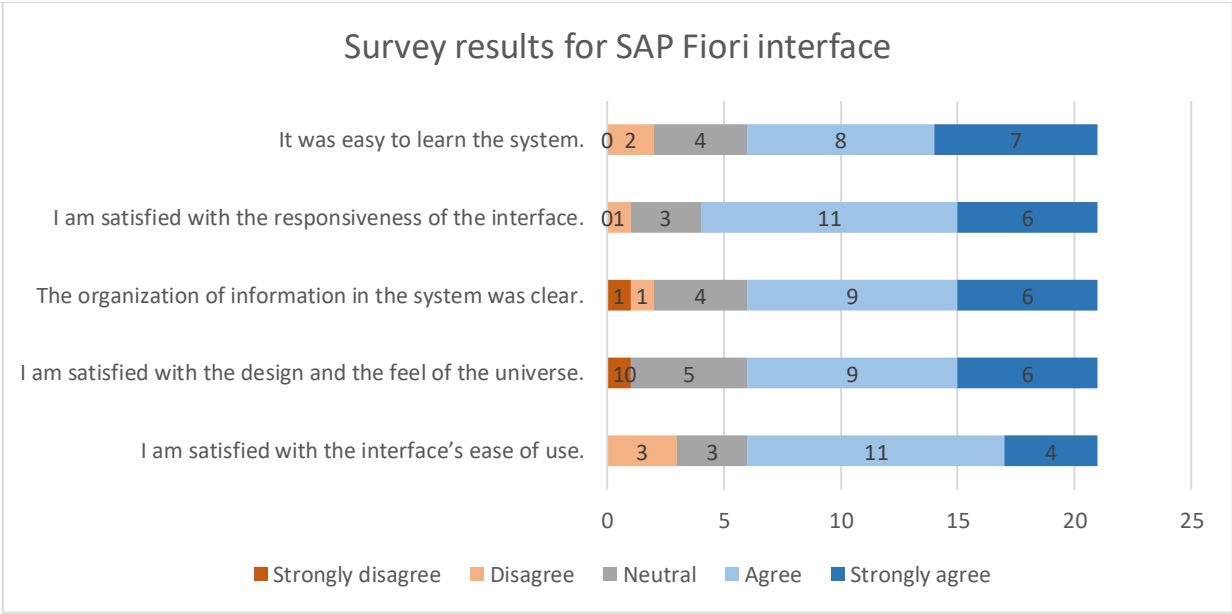
## 8 Appendix

Numbering	1	2	3	4	5
	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
1. I am satisfied with the interface's ease of use.					
2. I am satisfied with the design and the feel of the universe.					
3. I am satisfied with the design and the feel of the universe.					
4. I am satisfied with the responsiveness of the interface.					
5. It was easy to learn the system.					

**Table 5 Survey structure**  
(Source: made by the author)



**Figure 2 Survey results for SAP GUI**  
(Source: made by the author)



**Figure 3 Survey results for SAP Fiori**  
(Source: made by the author )