

Portuguese ACINGOV® Requisition for Procurement Portal

SAP Project Implemented in ABAP Module

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Internship Report presented as the partial requirement for
obtaining a master's degree in Information Management

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Information Management, Specialization in Information Systems and Technologies Management

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The internship I had with TOINOVATE consulting was an outstanding opportunity to learn SAP modules regarding my professional career. In this internship, many grooming techniques were used for professional and personal development. My managers cooperated with me immensely to teach different methodologies. My seniors provided help to me with some technical problems I had. We had different sessions with various professionals who have formed part of the company for a long time.

My team leader, Paulo Peixoto, helped me substantially in daily scrum meetings and taught me how to deal with these meetings on behalf of tasks that were assigned each week. We used a variety of approaches to achieve this project on time. My team members were always passionate about helping each other.

My supervisor Professor Vitor Santos helped me incalculably to organize my weekly milestones and arranged meetings with me to share his views for my project. He also assisted notably with technical documentation and how to arrange the technical paperwork. We had meetings at the start of every weekend in a congenial environment between the professor and me to share my own ideas.

Finally, after getting this opportunity, I am grateful that I learned much over the last six months, always striving to use the skills and knowledge I have gained as well as possible. I will continue to keep working in such projects. I thank Nova IMS for signing this internship protocol with TOINOVATE Consulting and the Erasmus Office, who provided the necessary help for me to sign this internship contract.

Sincerely,

RAMEEZ QASIM

Abstract

The main goal of this project is to take requests from the ACINGOV® portal, supporting customer requests in the proper SAP format, and finally delivering customer requests to the ACINGOV® portal through the cockpit process, also known as the DBA Cockpit.

In SAP, the basic work format is in ABAP. One must create different internal tables, and to put data in these internal tables, we have one default master table in SAP. Once all the tables have been created, we should design the interface and ALV grids. The interface will represent all the customer requirements that will be requested by the ACINGOV® portal, and forms produce on the customer side will be saved in ALV grids. The primary purpose of this project is to explore the crucial concepts of ALV Grids, Smart forms, Function Builder, Tables, and packages that will be used in our project. After that, we have the concept of web services that will interact on the server-side of the project, and to create web services, we have some transactions in SAP that will create and make transport connections between our program and server.

A critical aspect of ABAP is that it was a reporting language for SAP R/2 in the 1980s, and its utility grew when the next generation of ERP SAP R/3 was introduced in the market. Many parts of the ERP are written in ABAP. In our project, we used the ABAP language overall as the project supporting language.

List of Acronyms

ABAP: Advance Business Application Programming

EP: Electronic Procurement

CS: Consulting Services

ERP: Enterprise Resource Planning

HTTP: Hypertext Transfer Protocol

XML: Extensible Markup Language

SAP: System applications and Products

SOAP: Simple Object Access Protocol

T-Code: Transaction Codes

WSDL: Web Service Description Language

XML: Extensible Markup Language

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1. Introduction

The SAP ABAP Module is a high-level programming language, and nowadays, it is commonly used to develop business applications for large business organizations and financial institutions on the SAP platform. For a deep understanding of SAP ABAP, a basic knowledge of java programming and Database technologies like PL/SQL is required.

ABAP stands for Advanced Business Programming language. It is a 4th generation language, and it is currently placed with java programming. It is the primary language for SAP server-based applications.

Basically, it has three major cores. On the front-end, it has an SAP GUI module for the front-end portal. Essentially this portal is called the presentation layer. It can be a web browser, mobile device, and suchlike. The central processing in SAP has always occurred in the application server. The application server is not just one system itself, but it can be multiple instances of the processing system. The central server usually communicates with a database through another server; it is mostly done for performance and security reasons. Communication always happens from the front-end layer through the ABAP layer with the databases.

ABAP programs run mostly at the application server level. It means all three levels can be installed on top of each other, or each level can be installed on different computers.

The ABAP codes usually reside inside the SAP database. They run under the control of the runtime system that is part of the SAP kernel. The runtime system processes all ABAP statements, controls the flow logic, and responds to user events. The SAP runtime system is considered a virtual machine, and it works like a java virtual machine. The most crucial component of the SAP ABAP system is the database interface system, which converts database-independent systems into the statements understood by the underlying database. SAP can work with different varieties of databases, and the same SAP code can run on all the databases.

1.1. Academic Context

During my time duration at Nova IMS my main area of specialization is Information Systems, and my course work was related with some new tools that plays very important role to complete this internship. I took some courses i.e., business intelligence, data mining that plays vital role for this internship, I was involved in ETL process where we have data integration, data extraction and data population.

I also have subject of Knowledge management and architecture of information technology; project management and these courses gives me proper understanding about the projects. In Knowledge management I understand about the networking of social platforms between different projects and between companies.

In project management I learn how to achieve the deadlines of the project in the required time.

Business intelligence was the main area where I learn about some technical methodologies that was related directly with this project because in this technical frame, I have very strong learning for implementation of this project.

Architecture of information technology is the main course which was related with relational databases and it provides me to achieve all the milestones, because in this subject I got very strong knowledge about the relational databases , how to interact with tables , how to make the relationships between entities and how to made proper data ware house where we can store data for our clients.

I have one subject of business process management which was also helpful in this internship because it was also related with relationships of different entities.

So, at the end academically in Nova IMS these subjects were very helpful for me during this whole period of internship.

1.2. Enterprise Context

The company where I complete my internship is the main stakeholder at this time, they are working in SAP from start of 2005 and until now they achieved different projects in SAP with very good outcome rate.

To innovate is working in different modules of SAP including SAP ABAP, BW on Hana, SAP MM Module, SAP finance Module and SAP Payroll.

The main module I implement in to innovate was SAP ABAP module where I got some technical training about SAP ABAP module which is very productive module in the market.

The company has some protocols with ACIN Gov portal, and they are working with AACIN Gov for requisition of different request on daily basis.

Right now, company received some requests from ACIN GOV portal where they must deal with the main user request in the SAP ALV grids.

The ACIN GO portal changes its requests on runtime when they need to enhance or add some changes in the portal and these changes are directly transferred to innovate for implementation purpose.

To innovate is partner of SAP for last year's and they achieved outstanding performance awards from for his accomplishments.

SAP is taking cloud services from the google, IBM and they have partnership with google and IBM for some cloud services, To innovate has considerable challenges right now to work with SAP because new changes are implemented in SAP.

1.3. Objectives of the Internship

The main objective of this internship is to deliver the main requirements of ACIN Gov Portal, and these services can be provided by facing the direct requirement from the user by using SAP Portal.

The requirements were gathered directly from ACIN GOV portal and once the requirements gathered successfully it would be transfer to SAP through proper communication platform of DBA Cockpit , after performing certain changes it transfer back through the DBA cockpit and stores on cloud and user can check anytime If all the changes done successfully.

SAP cloud playing an important role here because all the changes after implementation is sent back to cloud and user can directly access the cloud platform for alterations suggestions and feedback.

The development process after receiving al the changes and for integration of data I was using SAP ABAP module to populate the data ALV Grids.

My main flow for data integration was SAP ABAP module and I need very strong literature review to complete this project successfully.

To innovate is directly working with ACIN Gov portal and they are expecting data on daily basis to integrate in SAP basically after receiving the requirements from the user the data was transfer to SAP module using DBA cockpit and then I start development using some transactions of SAP , the most commonly I use SAP workbench where I was used to develop ALV grids , Interface for interaction with grids , functions to call one grid to other grid.

The development was processed in step by step process and the steps were following.

- a) The development of ALV grids for populating the data and storing the information it was only possible by proper creation of tables and then made relationships between the tables on behalf of primary and foreign keys.
- b) I have one master table and after that many child tables that was directly related with the master table on relationship basis.
- c) The master table interact with child table on behalf of key relationships and data can be communicated between one child table to other child tables.
- d) In the next part I have main front-end screen painter menu which I used for the development of interface and on this interface, I interact with all others ALV grids that we already created in ABAP workbench.
- e) I create the interface for four different grids in this case because the grids were dependent on each other and sometimes the data fields are similar in all the grids.

I learn a lot in this internship because sometimes I stuck off for some points and I took help of my seniors to sort out the problem and in this pay I was successful to achieve all the milestones on time, this project helps me a lot to be prepared for near future opportunities and to face to real time scenarios.

This project teaches me how to take pressure when need to deliver changes on time with proper format. In the end I have some presentation sessions with my team leader where I give briefing about my project during agile meetings and explain about my performance.

With perfection I was able to explain about my project to the end user and my team leader in the main presentation session where I have opportunity to directly communicate with the client.

I normally work in the team used agile methodology and we have agile meetings where we discuss about our sprint, time to complete the sprint and necessary actions to be well oriented during the sprint.

2. Theoretical Framework

2.1. E-procurement

E-Procurement is simply a platform to share knowledge , generate knowledge and most important how to make knowledge in e-procurement the seller and buyer are the main entities who interact with each other for distribution of things that could be sell or bought by someone.

E-Procurement can be happening between different entities may be for the business use or maybe it could be for some kind relationships that has some business values.

E-Procurement has many kind suppliers, contractors and the most important is the relationships that bound them with each other for long term or for the short term.

It includes different kind of stages that can form the strategy, production, and operation between the entities.

In all the phases of E-Procurement there must be conditions prices or information that play very important role in the process.

In all the E-Procurement there must be some kind of rules of regulations to make the business secure and well reformed, these rules could be in form of best price or some constant business value, all parties should be agreed on these rules , so E-Procurement is the main platform who define the rules for all the parties including organizations , stake holders or some kind of negotiators.

E-Procurement is the best platform to remove all kind of paperwork and made the business transactions very easy.

E-Procurement provides the path to purchase something, sell something and to define some kind of business growth, every user needs an account enter into the system and manage the things as per requirement , once the user get the credentials of his account he has access for all the properties and platform options how to can made it more useful for his personal use.

The authorization is main aspect of E-Procurement because every time when user interact with operation the request first goes for approval and then business values can be generated.

Today E-Procurement is saving time for all kind of business because it saves time and expenses, once the business contract sign both parties can communicate with each other with proper platform and relationship contract is fixed through this platform, in that case both parties are agreed on terms and conditions.

Once the request will be submitted from the buyer side then request will be automatically send to the supplier electronically , after the request has been competed it will execute the program and invoice will be generated for from the settlement department.

All the procedures will be in the proper monitoring from the mangers, security persons and other staff who permits all kinds of authorizations.

One last aspect about E-Procurement it can be operated by any platform device connected to the internet that could be smartphones, tablets or laptops etc.

2.2. Consulting Services

Now a days consulting firms has outstanding growth in the market because many projects are deal with consulting firms because main impact is that they provide the top consultants who works for the client and accomplish their goals in the required time period. In consulting business, the most important factor is client requirements and to achieve that requirements they provide the consultant who has very good knowledge of consultation, who knows how to fulfill all the requirements of the client.

Enthusiasm and commitment are main pillar to work for the client and clint hires the consultant for short term or long-term contract or just for the project.

Most of the big groups hires the consultant after one year if consultant give them enormous performance and give him the long-term contract and sometimes, they send back the consultant to their consultancy company.

In the consulting business one thing kept in mind what is happening in the market and how the consumer needs , interaction are changes with time because if points will be clear it would be very easy for taking some decision what kind of consultancy form can give them business value.

Many leading companies are running their business in different areas like banking services insurance-based services or financial services in the form managing goods. AXA, Deloitte, KPMG are the companies who are providing services in the financial area and other tech groups like Microsoft, Google, IBM, Oracle, and SAP they are providing services in cloud and pure tech platform

Communicating properly with the client always plays influential role in the consulting business. Listening the client carefully, speaking with them with proper communication path and engage them withing the project could be very helpful for growing business in consultation.

2.3. ERP Systems

ERP systems is using by many companies today and the main reason why companies are using ERP system is to increase the efficiency of the procedures, to increase the business growth. Companies expect high return in the business value and to achieve these figures ERP systems are very helpful because these systems are more sophisticated, automate the process and reliable for taking any kind of decision in the business.

ERP systems are very accurate because it gives the complete view of the company structure how they manage the different projects and what is happening inside the company.

ERP systems are very helpful for managing all kind of documentation and produce more accurate records and gives the multiple views of the business in different ways. Some areas are included in the ERP systems are,

- CRM
- Big Warehouse for storage
- HR
- Distribution
- Main Purchases (Minor or Major)
- E-Commerce



Figure 1 (ERP Business Process)

Importance of ERP/ Acting Role of ERP

The main objective of ERP system is to manage the resources and produce effectiveness how to make it more useful. BY managing the resource, it could be very easy to know how to streamline the business and process successfully.

ERP basically is the tool that provides the complete overview of the company internal structure and it would be very helpful to improve the process and make the resources to be useful.

The systems that are already running in ERP can be improved by using new technology in ERP systems it can be helpful to improve the allocate resources to make the system more convenient.

The information in ERP is centralized, more agile and accessible because all the data is on same local area.

Excel files can be shifted to ERP easily because in this way its easy to get urgent information we require during the run time why because ERP systems can easily access the information that could be readable.

Advantages of ERP Systems

ERP has many benefits, but the main benefit is that it increases the efficiency and give profit in the business, we can easily achieve many goals by using the ERP systems.

An ERP system is responsible,

- For reducing the cost of the business tools and merge applications in one system.
- Single person can work faster
- Processes are automatic that may be require the workforce.
- Shows the business analytics accurate and to be more decision concluded.
- Improve the customer relationships by providing the solutions in faster way.
- More focus on the business that is aligned with goals and needs.

ERP can be easily combined with current business software and equipment, so therefore no additional spending need to update the system, it can easily accessible through the smartphones and personal computers, it helps to balance the company running cost so avoid the purchasing the new IT equipment's and applications can be used easily that the company already have. It's very easy to install the ERP systems on mobile device and monitoring can be done easily b 24 hours without going to premises every day.

Features of ERP Software

ERP systems can vary from supplier to supplier with different package combination. Therefore, before choosing any ERP tool some of the key point always keep in mind.

The accounting extensions that is the area belongs to the graphical user interface and sales reports orders, and expenses can be visualize in this area so attention is mandatory for these calculations at least system should be very responsive.

The main module of ERP is to keep up to date for warehouse and inventories , which stock is available which stock is out of date which stock is not in the warehouse so ERP makes it very easy to track the information about records and it makes the business process more efficient.it also avoid the mismanagement of shipments , the overstock products or stock out products thus the ERP systems provide the expand services to remain up to date about stocks and inventories.

HR or Human Resource is another important module of ERP system because it manages the payroll expenses, recruitment of employees, attendance, and evaluations etc.

Another module of ERP is CRM and marketing area that is always engaged to know about the customer needs, customer satisfaction and customer interaction towards the products. It always keep focus to maintain the good relationship with the customer to make customer more happy and more engage in the purchasing , so in this module performance can be measured by tracking the phone calls , advertisement on social media a, organize different kind of surveys etc.

Last but not least another important feature of ERP is the project management area which always focus the internal communication and performance of work by organizing the meeting between

the groups or teams so they always be concurrent with client need and efficient results could be produced by engaging them.

Benefits of ERP Clouds

ERP cloud plays an essential role in-premises or in cloud. On-premise the software is installed on any computer and can be linked with the server for usage of data on cloud, the only difference is that on cloud the data could be more secured can access from anywhere around the globe and on-premises the data could be only accessible by the local user. On cloud is more useful now a days because data can be placed on server and can be useful for any use who have direct access to the cloud.

On-premises it could be more expensive because sometimes system requirements does not fulfill and more advance systems could be require to maintain the performance, for that reason may be more man power work is required to install the systems and manage the framework while on cloud just need a steady internet connection to access the documents or data from the clouds, so cloud technology would be more preferable as compared to on premises systems.

The important feature of cloud based systems are the security because customers are always complain about the security of data , so cloud is the only solution to remain data secured , as ERP systems can extract data simultaneously from different environments if data is present on the clouds so clouds are more efficient in that case just by using the internet connection anywhere.

Another aspect about cloud ERP systems it needs less attention from the technical purpose because sometimes issues arise on technical side regarding the maintenance , scheduling , server availability but in reality its less burden on the company shoulders to handle these kind of issues as compare to on-premises because on-premises may be system could be crashed for some reasons, need technical help from the IT support , system stops due sue some ambiguity in the flow so in the end ERP clous are more useful and reliable for the companies. Less man force is required to deal with cloud-based environment, companies can make more revenue by spending less for human work force.

3. Methodologies, Technologies, and Tools

The main methodology we use during the development phase of ACIN GOV was agile based and here I will explain the other methodologies too for better understanding the whole framework.

3.1.A general overview of development Methodologies

There are many methodologies used for the development purpose in the software development cycle which mostly depends upon the working environment that which methodology is suitable for the development here the brief explanation about different methodologies that can be used for development cycle.

❖ Waterfall

The water methodology is old now a days but it was previously used by some of the projects in late 90s, this methodology is based on sequential orders where the implementation of the project can be monitored in sequence, its plan driven methodology used of the short term projects but no more useful now a days, it has main flow of design, maintenance up to implementation but process not be revert.

❖ Feature-Driven Development

Feature driven methodology is also used for the short term projects, it has some common aspects of agile methodology that's why some companies for short term projects consider this approach as useful, basically it's an iterative approach where project can analyzed in iterations, its main focus on the delivery of work with more client centric that's why helpful for the short projects but still an old approach as compare to agile methodology because it still has side effects for larger projects, and could not found useful for long time projects.

3.2. Agile Methodologies

Agile Principles during Software Development

Agile is the ability to create something and almost immediately responding against the impact; it is a way of dealing and making successive improvements in an uncertain and turbulent environment. Agile software development is the technique of developing software using specific methods like Scrum and Feature-driven development. Agile software development is more practical and practiced in environments such as test-driven development, stand-ups, or sprints. Agile software development defines many frameworks and practices based on values and principles expressed in the agile software development manifesto.

In our project, we regularly participated in scrum stand-up meetings, which were scheduled three times a week, where we discussed some milestones and achievements regarding the project and led to:

- Highlighting the need for client feedback about the project workflow
- Changing requirements being embraced for the client's advantage.
- The realization that developers and businesspeople must have an informal and collaborative environment where they share their reviews for the project.
- Within the team, communication plays a vital role for peak output.
- Meetings provide a golden opportunity for improving technical skills and critical thinking for the project to make some considerable changes.
- The team should be well organized and well-motivated
- The team should reflect their changing behavior towards the project at regular intervals to make some necessary and vital changes to the project according to shifting requirements.

Advantages of Agile Methodology

- a) Better Product Quality: Agile methodology has a proactive approach to quality and to prevent product problems.
- b) Embraces technological excellence, sound design, and a sustainable environment.
- c) Exactly defines the requirements so that knowledge of the project features is always as relevant as possible.
- d) Conducts sprint sessions that allow the scrum team to improve the processes and work continuously.
- e) The most important feature is using the definition of Done, Open, Process, Development, Testing, Integrated, and Documented.
- f) The Agile methodology is beneficial for consumers because consumers are involved and engaged throughout the project.
- g) Includes a product owner who is responsible for the project requirements and consumer needs.
- h) Being part of a self-managing team allows people to be creative, innovative, and acknowledges their expertise. Having a scrum master removes impediments and shields the team from external interference.

- i) Collaboration increases based on the getting together of the development team, product owner, and the scrum master working closely with each daily.

Disadvantages of Agile Methodology

- a) Poor Resource planning because agile is simply an idea, and team members do not know what the end result of the project will be from day one of the operations, so it is challenging to predict efforts like the costs, time, and resources required at the beginning of the project.
- b) Documentation is limited in agile methodology because documentation happens throughout the project and often just in time for building the output, not at the beginning.
- c) In agile methodology, the product can be fragmented because, due to the definition of milestones, nobody is sure what final product will be launched, so rather than a cohesive unit, a fragmented product goes out.
- d) In agile, most time is spent defining at the beginning of the project, and although the time constraints have been defined, nobody is sure what the final product will be at the end.
- e) It is not easy to measure the progress of the project because agile delivers it incrementally; it means we cannot set KPIs at the start, so long-term time consumption makes progress measurement difficult.

Scrum/Sprints

The scrum is the most crucial framework in agile methodology. Scrum has an iterative approach, and its central core element is called a sprint. The Scrum team uses project inspections to ensure that the team is meeting the goals for each part of the project. The scrum approach includes assembling the project requirements and using them to define the project. The sprints can be defined, and each sprint can be divided into its own list of requirements. Daily scrums meetings help to keep the project on a specified target, and reviews can be easily visualized.

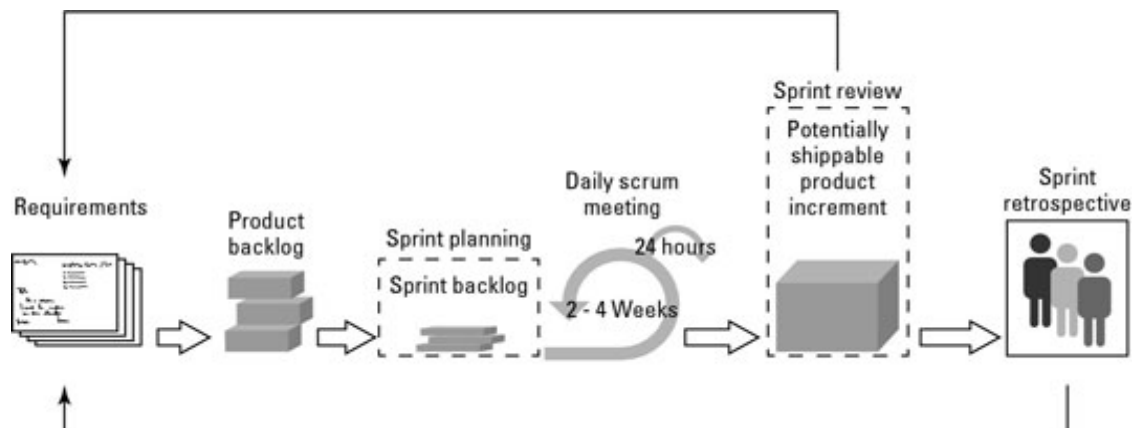


Figure 2 Agile Framework

Within each sprint, the development team builds and tests the functional part of the product until the product owner accepts it, and functionality becomes the transferable product. Mostly in sprints, when one sprint finishes, the other sprint starts. Scrum teams deliver the product

features in increments at the end of each sprint. Finally, the product is released at the end of a sprint, or it may be done after several sprints.

3.3. Technologies and Tools

3.3.1. SAP

Sap is the ERP system that is used now a days by larger organizations , this software was originally based in Germany invented by German scientists in early 90s , SAP plays an important role in the world of ERP systems because it is very accurate and efficient for managing the big projects in the organizations where structure of company is little bit more complex although other ERP systems stands in competition of SAP like Oracle , Microsoft dynamics but still SAP is more suitable a compared to other ones, why SAP ERP system is used by many companies, the main reason is that every organization has many departments and each department need to communicate with other department by some proper channels and success factor of organization lies on the communication between the departments, outside the organization like with suppliers , vendors and mostly with customers.

SAP ERP is based on two kinds of systems.

- a) Decentralized ERP
- b) Centralized ERP

There is brief explanation about these systems are here.

1. Decentralized Systems

The decentralized systems from its name gives a very overview about these kind of systems the data is decentralize means there is no access on the common platform and internal departments cannot communicate each other , very common issue can arise if customer order something from the sales department and sales department do not have direct access from the inventory department to verify the product then It could be a serious issues that customer will choose some other vendor.

So, in the similar the product department do not have access to the sales department that could be time consuming so system failure will occur. There could be some other arise in decentralized ERP where the proper communication is not by common framework and requests would take long time for processing so in that case customer dissatisfaction normally occur here and customer will go to other vendor to purchase the same product.

The major obstacle here is the communication with other departments that could be requested through different platforms so it could not be bearable for the client because client needs to wait for long time. One main problem with this ERP is dependency on one department that may be do not have any concern with the requested purchase so in this case we lose a lot of customers.

To overcome this situation there should be a centralized system that could solve this situation as soon as possible.

2. Centralized Systems

On the other hand, centralized systems are more well oriented and centrally attached with common warehouse, all the departments are attached with each by common platform and data can be accessed any time. The duplication also avoided in these kinds of systems because each department is attached with other by primary relationship, that is helpful for extracting any kind of information without putting extra effort,

The main benefits of this system are.

- Customers are more satisfied
- Efficiency increased after any certain operation
- Decision making become easy
- Business growth support can be monitored easily
- Data inventory tracking become more easy
- Centralized framework for all kind of business needs.

By this implementation, the single truth about the organization can be visualized easily and it control the performance by proper task handling so support the business process.

It is not very easy to install the single ERP systems because the management strategy from the stakeholder needs special attention to implement this system.

Through the centralized ERP all departments are more concurrent with each other so that performance can be measured very easily across them.

So, the centralized systems increased efficiency, more productivity, and gain profits in terms of Sales, in parallel human resources become more effective.

Businesses Need to Implement SAP ERP

Now a days Sap has implementations in many business environments and the main area of implementing Sap is logistics that involves sales , distribution and customer service and some of the activities are mentioned here , different business runs in different format and may be using different kind of technologies but the main concern is that how systems interact with each other , how departments communicate with each other.

Each business has different requirements and different structure, so It depends on the business by which SAP is implemented to process the business.

The implementation of SAP in business could be happen in several ways that could be following

- Integrated by single platform
- Improved customer satisfaction automatically because of delays in product delivery.
- Revenue growth by fewer shortage of stocks and reduce the lost sales.

Business are operated in different areas now a days and SAP is useful for all kind business by saving costs and reduce the time consumption, SAP basically enhance the efficiency of the business by playing vital role in the development of customized solutions so companies can use any module of SAP as per requirement, there are different industry areas who are using SAP right now depending on the main area of interest like pharmaceuticals , finance and insurance etc. so it only depends upon the industry which module they need for the process of business requirements.

Right now all over the world many companies are operating in SAP ,nearly 200 000 companies using different modules of Sap, the main reason for using Sap is to enhance the business growth , the better decisions and to improve the internal organizational process. There are different kinds of layers exist in Sap R/3 architecture and these layers are interlink with each other by using some protocols , the three main layers exist in SAP architecture that is presentation layer , application and database layer distributed among the individual systems in the architecture.

Three types of vies exist in SAP

- The internal Logical View
- Software based View
- Front end Suer View.

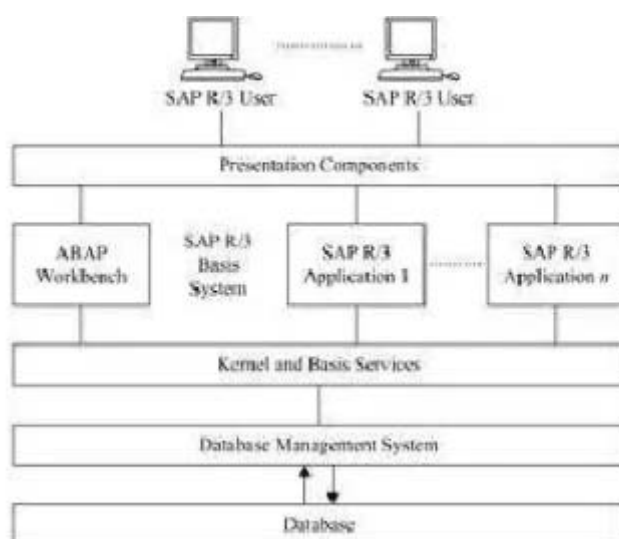


Figure 3 SAP R/3 Architecture

▪ The internal Logical View

This view is mainly related with the logical part of Sap and it helps to execute the applications in Sap logically and the main part of this view is to control the functionality of Sap and correct the functions error in Sap.

The brief description of the Sap basic component is demonstrated here.

Kernel and Basis Services

These services are related with runtime execution of the programs for all Sap programs and it is more specific to hardware and software executions.

The tasks of thee are described as followings.

- The software executions on Sap architecture.
- Handle administrative tasks on Sap and multiple users can interact on the run time with the system.
- Sap R/3 architecture is also connected to the database system and the applications do not interact with Sap database directly, but it communicates with database with Sap basis module.

- Process of Sap R-3 systems can communicate with other non-Sap systems externally by using the functionality of BAPI.

ABAP Workbench Service

This platform provides the services to develop the ABAP programs using different transactions in sap ABAP module and it can interact with other programs too.

Presentation component Services

Users can interact with Sap R-3 systems by using these components

The software Oriented View

This reprints the different kind of modules as mentioned before that Sap consist of different kinds of modules or layers, so it presents the more software related components. It mostly contains the GUI the front, application servers and message server that makes the Sap system actually , these modules can be places at anywhere on the server or client depends upon the position where it placed in the network. The figure demonstrates the SAP architecture

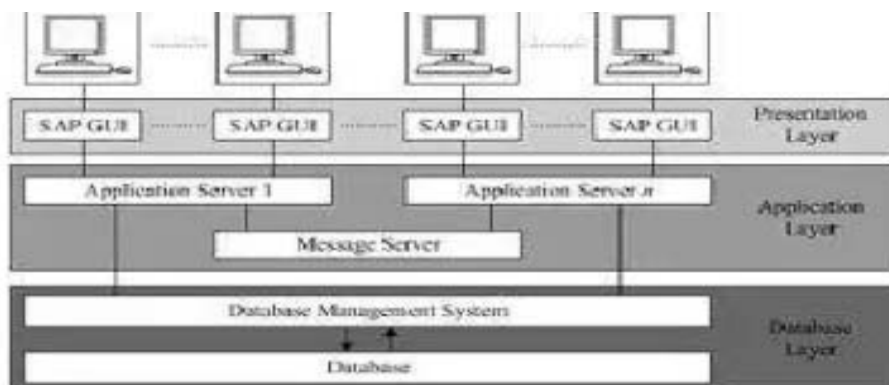


Figure 4 SAP Architecture View (academia.edu)

Three layers compose the software-oriented view as shown in the figure

- Presentation layer
- Application layer
- Database layer

Presentation layer

This layer has multiple servers on Sap that consist of Sap architecture and user interact with the systems by the assistance of graphical interface. The user can see the database contents by submitting the requests in this layer and then the query transfer to the server by the presentation layer that after execution return the query to the database server. So this component can connect with Sap sessions simultaneously while running the sessions.

Application Layer

It mostly belongs to the application logic of Sap architecture and it has message and application server access, the query sends by the server to the database server and retrieves back results from the database server, the server connects to database server and has a lot of features for example handling the flow logic on the screen and give update to SAP architecture.

The picture demonstrates the functionality of this server

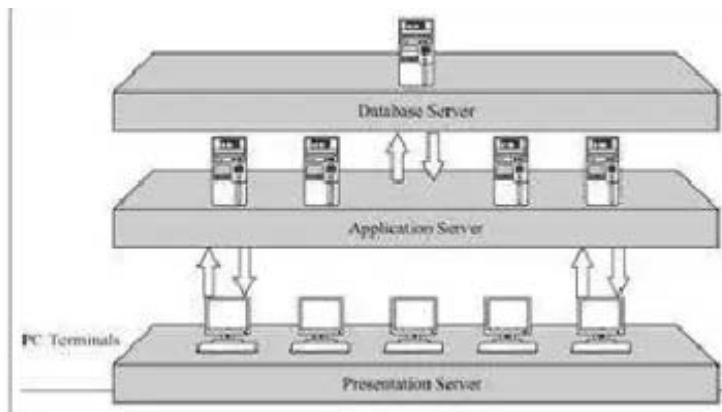


Figure 5 Application Server (academia.edu)

The message server always responsible for the communication among the servers and knows the results workload sharing among the servers and information is helpful for the user to select the server.

The three-layer Sap system make the system totally accessible because it divide the load the among the layers and division make it for Sap perform the concurrent tasks, so application layer is more suitable for communications.

Database Layer

This layer consist of all kinds of databases in Sap systems , the most common database are DBMS and the Sap architecture provides more databases like DB2 , Informix and Oracle etc. , Sap system saves the data of all kinds with some exceptions like master data the databases created in ABAP dictionary are stored in Sap repository and Sap does not divisions of databases

The User-Oriented View

This is the top view on SAP server and it has e main interaction with the user because user logon to the Sap logon by using Sap logon screen and then user interact with the other key features of Sap logon with extraction of data and then using then start performing the main transactions in Sap.

3.3.2. ABAP Programming Language

ABAP is the programming developed that is mostly used for developing the programs , is the one of the module of SAP that was originally based in Germany , ABAP is the low level coding language that has the similarity with Cobol language because the coding methods are almost same in both languages.

ABAP is used for developing programs related with databases and these programs saves the data in database for use of other modules in SAP.

ABAP has the same coding methods that we use for the C and C++ because definition of variables in the similar way like in object oriented , in ABAP the definition of loops , the control statements and defining the databases , link the databases almost follow the same steps.

In ABAP language the language interpreter, database and the processor are link with each other.

Some examples of control statement in ABAP language are demonstrated herewith details

Example of Control Statements

```
If [not] exp [and / or [not] exp].  
.....  
[Else if exp.  
.....]  
[Else.  
.....]  
End if.
```

Example of Loop Statement:

```
While <logical expression>.  
.....  
.....  
End while.  
Do <n> times.  
.....  
.....  
Ends do.
```

In SAP, a significant part is the SAP editor, where most of the time, some changes have to be made, and some programs are implemented.

ABAP Editor: Initial Screen

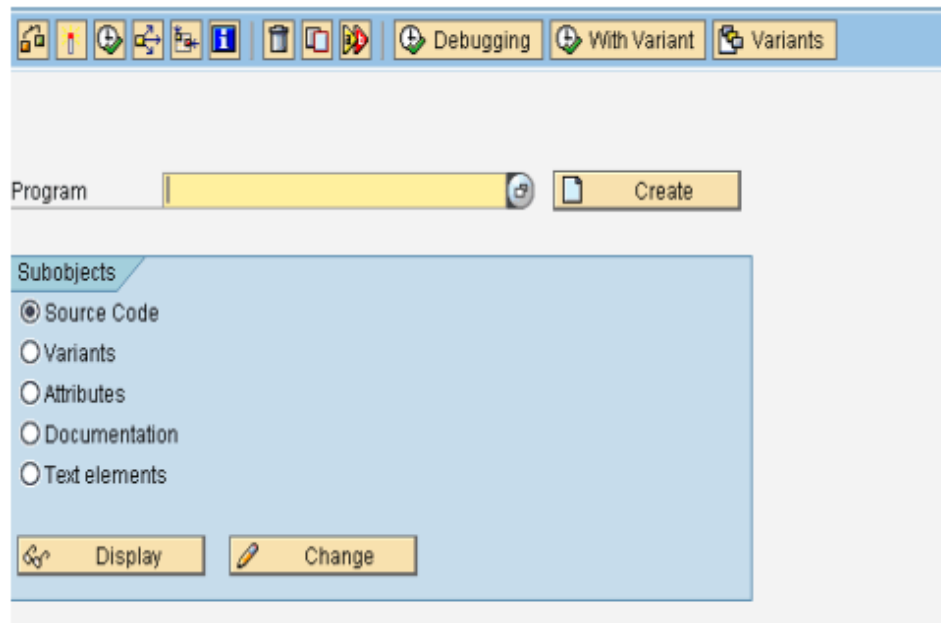


Figure 6 ABAP workbench Initial screens

ABAP is the language that was developed in early 80s and in start it was just used for the big organization for developing the business applications to manage the data for financial companies and consulting firms.

ABAP is the language that introduce first time the concept of logical database and it extracts the data from the main frame database systems.

In the first phase ABAP was only used of developing the Sap architecture data and the main programs was written in Sap ABAP+ language.

There are some following sets of modules in now Sap that are using days by different companies.

- Finance Module
- Product Management Module
- Material Management Module
- Control Module
- Human Resource Module
- Business Warehouse Module
- Application Management Module
- Basis Module
- Advanced application for Development module

These are some functions related with ABAP module , ABAP is also used to create the applications in SAP and except the reporting and interface , customization is the another feature of ABAP module , there are some other standard features in ABAP language .

- **Data Sharing**

Data sharing is the feature where data can be shared among the systems but cannot create the copy.

- **Exception Handling**

It helps to figure out the error situation in control flow and provide details about it.

- **Data persistency**

Data is permanently storing in database and it is feature related with the relational database

- **Making Enhancements**

It enhances the main functionality without editing the code

ABAP Implementations:

SAP ABAP is executable unit that its code can be reused but cannot be separated useable.

Two types of executable ABAP have.

- Reporting
- Module

Others are non-executable programs

- Include Directories
- Routine pools
- Functional groups
- classes
- Interfaces

ABAP Workbench:

It's part of ABAP, only accessible by SAP GUI and has multiple dictionary tools.

Following are the ABAP components

- **EDIT Component:** to edit the programs
- **Dictionary Object:** to keep the dictionary
- **Repository Structure:** To show the hierarchy of the components.
- **Screen Painter:** To develop the GUI
- **Information System:** To keep the information about models, data structure and functions.
- **Function Builder:** used to create the functions for development.
- **Test and Analysis:** for syntax Correction
- **Data Modeler:** Graphic representation of data.
- **Workbench Organizer:** To maintain the projects

Data Dictionary

Here we use the most common feature. The data dictionary is a central source of information for data extraction, the function of data dictionary is for supporting and management of data definitions.

In ABAP dictionary there are three levels that would be supportive for reusing and levels are.

A: Structures and tables

B: All Data of Elements

C: Domains.

These levels are described briefly below:

Domains: This describe the technical characteristics of a table and specifies main value range which describes the allowed data values for fields and fields refer to the same domain are changed when a modification is made to the domain, and finally, uniformity is ensured.

Data elements: Data element basically define the name of the field and for some data element and it contains the information related to field.

Tables: the table basically is the main part of the database where data exists, and each table defines independently in the ABAP dictionary and in tables the fields are define with specific data types and lengths.

Structures: These are the records that does not correspond with the database tables and it seems to be same as user define data type and it can be access from the ABAP programs ,Structures only contain data during run time execution.

- SE11: Initial Screen Data Dictionary
- SE13: ABAP Related Dictionary
- SE14: Utility Related
- SE15: Repositories
- SE16: Browser of Database
- SE17: Main table Display
- SE55: Table View
- SM30: For maintenance of Tables

We used different kinds of tables: mainly internal tables and work areas in this project.

Internal Table

Internal table is basically fetching data for dynamic use and the line in internal table has same field by structure, the main functionality of internal table is storing and formatting data from the database inside the program. Work area is the part of the internal table and it has the same format as internal table and it only used to process the data as one line in internal table

Screen Painter

Screen painter is the interface tool in ABAP that mostly used for the creation of front-end interface and the main code of transaction code for this SE51 and there are some elements that have some attributes.

- Input-Output files
- Names of all fields
- Boxes
- Buttons
- Boxes
- Other Sub Screens

- Buttons with no fixed position.

Web Services

Web service is the main communication path via the internet through some protocols that is commonly used is XML and HTTP. So, it's easy to imagine that any computer if have access to the internet must have access to the web service and after the deployment of web service we can easily use this through common protocols i.e. XML and HTTP. Web service can easily provide the details of any person using social security number of the person and this service finally available to all any of the clients who needs to use this.

The main requirement of web service is as following.

- ❖ A common format of data representation so that communication and data exchange should be platform.
- ❖ Standard protocols for sending messages to web service and receiving messages in the form of acknowledgement.
- ❖ Standard format to describe the web service.
- ❖ Standards define to publish and to make discoverable for web service.

The requirements that define above is based on some standards that are SOAP, XML and HTTP.

- ❖ XML transfer the data over the internet through a cross platform and it could be understandable for any software and hardware.
- ❖ There is another protocol that is common protocol that used for the communication i.e., SOAP. Soap is basically Microsoft based protocol that is responsible for the transportation of messages between network applications and other protocols like HTTP an SMTP etc. XML is used here for information exchange. The messages are called here as response and receive. These are based on XML and described by WSDL for web service.
- ❖ WSDL are publicly available methods provide by the web service. The information it provides name of methods, parameters passed, and values return in web service. WSDL is also XL based web service.

Definitions

The root element of the web service and namespace.

Types

Define the data types of the web service

Message

Describe incoming and outgoing messages.

Port Type

Describe the input and output request and response the message involved

Bindings

The way of transporting the messages how message will be bound during the transfer

Documentation

Provide the main documentation.

UDDI

Access for the clients for discovering the web service and service provider can make the web service discoverable by register in UDDI and provides WSDL for describing the web service.

SAP ALV Grids

ALV stands for ABAP List Viewer; ALV gives us a standard list format and user interface to all our ABAP reports. ALV is created by a set of standard function modules provided by SAP. ALV provides many inbuilt functions to our reports and some of the functions that are as follows.

- Sorting of records
- Filtering of records
- Totaling subtotals
- Downloading the report to excel/HTML
- Changing the order of the columns in the report
- Hiding the unwanted columns from the report

Because of the above functions, ALV substantially decreases the report development time. ALV takes care of rendering the list, and we can concentrate only on the data retrieval part. Some of the function modules used to create the ALV reports are listed below.

Function Module	Description
REUSE_ALV_LIST_DISPLAY	Displays an ALV list
REUSE_ALV_GRID_DISPLAY	Displays an ALV grid
REUSE_ALV_COMMENTARY_WRITE	Outputs List header information
REUSE_ALV_VARIANT_F4	Displays variant selection dialog box
REUSE_ALV_VARIANT_EXISTENCE	Checks whether a variant exists
REUSE_ALV_FIELDCATALOG_MERGE	Creates a field catalog from dictionary structure or internal table

ALV Grid Control Baseline functionality

The screen below shows the tab-strip with an ALV Grid Control, and its integrated toolbar enables mouse-oriented access to a variety of list handling functions.

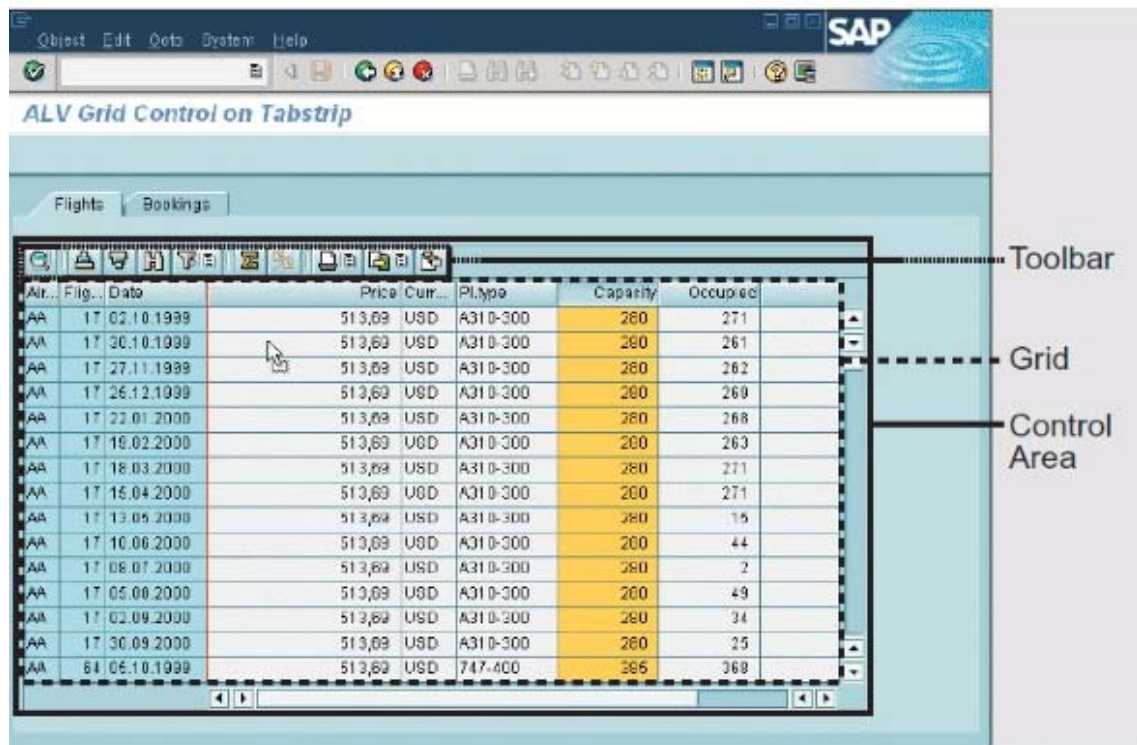


Figure 7 ALV Grid

Columns can be adjusted at different position as per requirement and users can call the function or selected column directly. The ALV grid control is placed in SAP GUI and it can perform different functionalities for example record the data in repository.

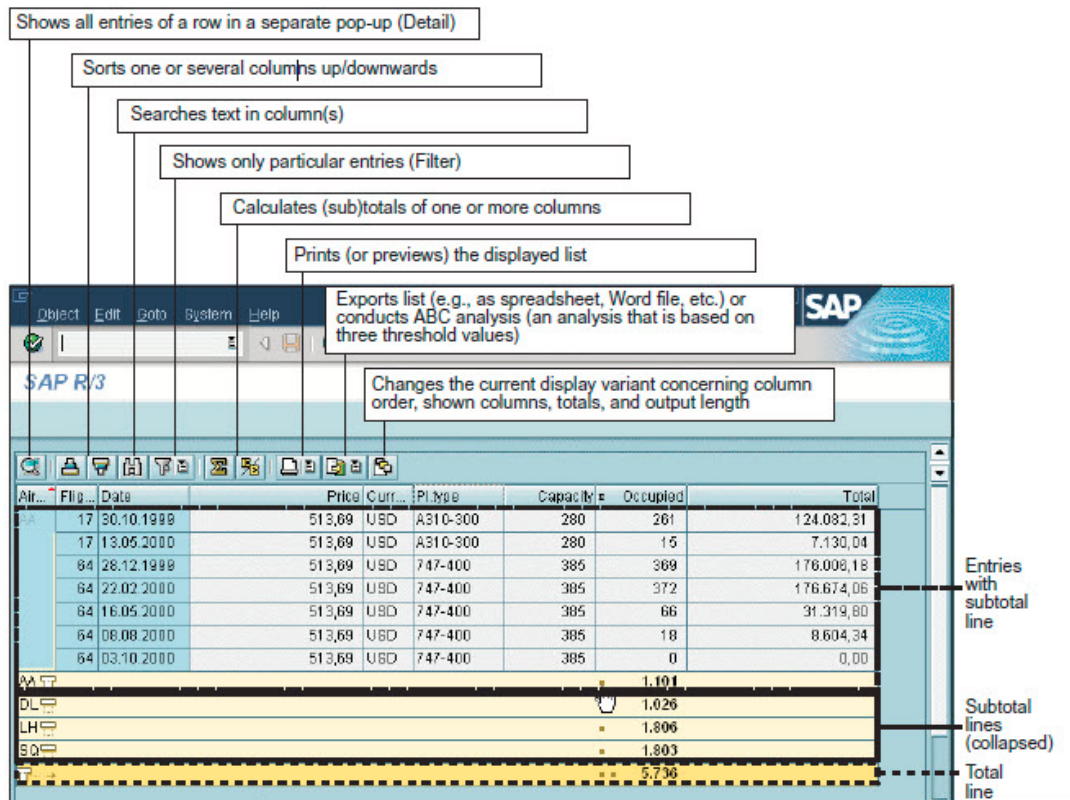


Figure 8 ALV with Grid Controls

User can calculate the data in different manners including the sort list or more columns filter totals and subtotals , its very easy to determine the column length to retrieve the concern information , there are some functionalities that are included in toolbar for better visualizations of list that contains many columns or rows. ALV grids can be used in many different manners including the calculations of totals and subtotals and the analysis of data can also be done by exporting data on excel files and for that purpose list viewer print the list of the data.

Integration the ALV Grid Control

The ABAP processor is manage the single list or multiple for storing , displaying , the statements used in ABAP store the list on the application server during the program execution and by help of list processor displays them on special container screen.

Integrating the ALV grid Control onto a Screen

Container control assistance is used to display on the ALV grid control, it is responsible for displaying one or more controls on the screen. For integrating a control different kinds of container control could be used.

Command Line_CUSTOM_CONTAINER

Command Line _DOCKING_CONTAINER

Command Line _SPLITTER_CONTAINER

Command Line _EASY_SPLITTER_CONTAINER

Command Line _DIALOGBOX_CONTAINER

It is very flexible to place the ALV grids control on the screen, the container is always created using create object statement and then linked to an area on the screen. While selecting control we can use the container control as the parent, we can have the multiple container by having the parent child relationships but they should belong to the similar class and in this way we can call the ALV grids by having the single call .

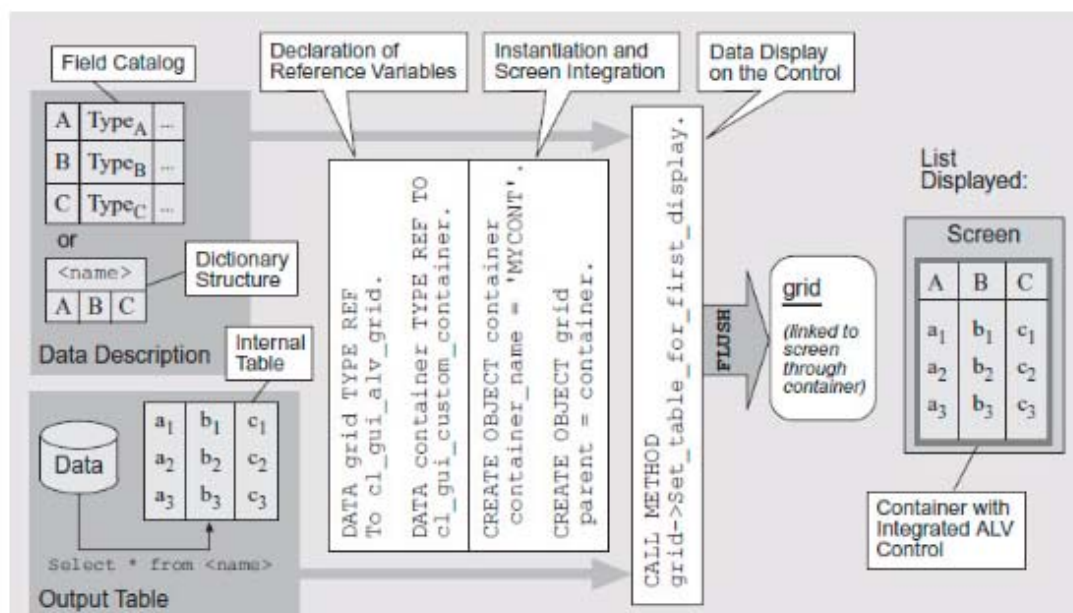


Figure 9 Data Manipulation ALV Grid

In the ALV grids the instance are not specific to the ALVs , while selecting the data that needs to be displayed there is instance needs to create but that instance is not specific to ALV grid control ,data that would be passed along with the ALV grids require two types of following information from the output table and field catalog at a minimum.

Th internal table is used as an output table and the structure of the output table is already exist in the ABAP dictionary , the fields would be created automatically , the fields can be created in several ways , with some specified fields , the description of the data must be declared in the ALV grid by use of catalog and corresponding ABAP dictionary structure.

4 Developed Activities

In the developed activities section, the project flow will be described in detail. How the requests to be considered for the ACINGOV® Portal development were undertaken and transmitted after completion.

4.1. ACINGOV® Project Auditing

ACINGOV® is the most complete procurement platform. It offers a set of legal and administrative support mechanisms, this process guides users over the entire procurement process. Due to its functionalities and characteristics, ACINGOV® is the most advanced functional and economical public procurement platform operating in the Portuguese market. The contracting solution of ACINGOV® supports all public purchasing procedures from direct adjustment to public bidding for a myriad of goods, services, and works. The ACINGOV® portal is fully committed and invested in innovation in Portugal. To facilitate the preparation of the parts of the procurement procedure, it mostly provides the entities involved with the possibility of automatic generation of documents and reports in PDF and Word format. These records are called the opening of the procedure, invitation letter, program procedure, preliminary report, and final reports, awarding information, and draft agreement.

In order to guarantee streamlined, fast and efficient access to all the information for submitting proposals ACINGOV® electronic platform allows the preparation of comparative tables for all the accepted proposals with the specifications of all the factors and sub-factors submitted to the call for proposals. The ACINGOV® electronic platform also allows the automatic preparation of the ordering proposal based on the information entered in the proposal form. Mechanisms are also available that allow the automatic generation of the evaluation report.

Project Description

The basis for the ACINGOV® portal project was the development of a gateway where a user could submit requests with particular requirements for public procurement, and after the given stipulations had been entered, these had to interact with SAP so that the necessary fields could be produced.

Contribution

In this project, tables would be created using SQL queries defined by ABAP format queries that would be built based on the requirements; we placed all the mandatory fields that each query had.

After that, the master table would be created, which would interact with child tables for data access, and through this master table, we made the possible interaction with different queries that we would then produce in the next steps.

In the next phase, the DBA cockpit concept would be implemented. All remaining phases would be covered in this cockpit.

The next important part of this project was the interface. To create the interface, we employed transaction se51 in the ABAP workbench to create different screens. On these screens, data would be accessed from our tables, and different screens could access different data, depending on which table needed to be accessed.

The first screen was the main screen, where we created some buttons and guide strips so that users could interact with other screens. It would be called the main screen. Then we had some sub-screens where we created all consults, and in this case, there are four consults that we have in the documentation.

In this interface, which we will call the sunscreens as required and put data for mandatory fields, and we can also put data for optional fields, although it was not necessary.

In the third phase, four ALV grids were produced that communicated with the interface using screens

To produce these ALV grids, we created some structures, internal tables, and used some methods to interact with data from the main table that was defined in our SAP system.

Here, in this case, the primary study table that we defined was ZACIN_HOSTORICO.

We had four ALVs, and for each consultation, there was a particular ALV that had required mandatory fields and some optional fields. The requirements were different in each ALV.

In the fourth phase, ALVs were called from the interface. We created a link between the ALVs and the interface screen because we have four consults in the interface, and after clicking on each consult, it would call the particular ALV grid, and data would be populated in that ALV.

Finally, in the last phase, web services were created for our ALVs. A central web service and customer service for each ALV was created, called the web service.

For web services, we created function modules, and in functions modules, we then presented our service on the web. After creating the web service, we created the customer service in the main package. We used the operation SOAMANAGER to test these web services. We used web services and consumer services separately in SOAMANAGER and named this vice versa. To use consumer services, we had to follow the web services on SOAMANAGER first.

Here is a short explanation about how the project works with a diagrammatic flow. The diagram below presents the different consults of this project that was produced using the screen painter.

In this consult, the data was accessed using all the mandatory fields. This example is a simple consult of our project.

System Help

Interface SAP com o Portal acnGov: EMEF

Interface SAP Portal acnGov: Empresa de Manutenção de Equipamento Ferroviários (EMEF)

Tipo de contrato:

- Consulta simples
- Consulta direta
- Consulta aberta
- Proc. real f. da plataforma

Informações:

Utilizador: FORM04

Data: 17.10.17

Plataforma real fora da plataforma

- Referência do procedimento: Proc. real f. da Plat.
- Tipo de contrato:
- Classificação CPV (Vocabulário Principal)
- Descrição sucinta do objecto de contrato:
- Regime legal aplicável:
- Local da execução do contrato:
- Código NUTS:
- Prazo da execução do contrato (dias):
- Órgão responsável pela decisão de contratar:
- Outras entidades adjudicantes associadas:
- Tipo de critério:
- Preço Máximo Admitido:
- Artigos:
- Lotes:
- Convidados:
- Observações complementares:
- Responsáveis pelo procedimento:

Campos obrigatórios Consultar dados

Figure 1-1 SAP Interface Procedure Consult

In this consult, the data is to be processed using the same consult again. Data can also be processed as per requirement.

Interface SAP com o Portal acinGov: EMEF

Interface SAP Portal acinGov: Empresa de Manutenção de Equipamento Ferroviários (EMEF)

Tipo de contrato:

- Consulta simples
- Consulta direta
- Consulta aberta
- Proc. real f. da plataforma

Informações:

Utilizador: FORM04

Data: 17.10.17

Consulta aberta

Referência do procedimento: Consulta aberta

Tipo de contrato: Consulta aberta

Classificação CPV (Vocabulário Principal):

Descrição sucinta do objecto de contrato:

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Local da execução do contrato:

Código NUTS:

Prazo da execução do contrato (dias):

Órgão responsável pela decisão de contratar:

Outras entidades adjudicantes associadas:

Tipo de critério:

Preço Máximo Admitido:

Artigos:

Lotes:

Observações complementares:

Responsáveis pelo procedimento:

Critério de adjudicação:

Fatores de avaliação:

Critérios de desempate:

Comissão de apreciação:

Documentos apresentados com a proposta:

Prazo para a apresentação de propostas (dias):

Hora limite para apresentação de propostas:

Prazo durante o qual os concorrentes são obrigados a manter respectiva proposta:

É adm. a apresentação de propostas variantes:

Número de propostas variantes:

Dispensa de prestação de caução?

Campos obrigatórios

Consultar dados

Figure 1-2 SAP Interface with Open Consult

In this diagram, the data can be easily visualized by using the ALV grids that we already built in our SAP ABAP workbench.

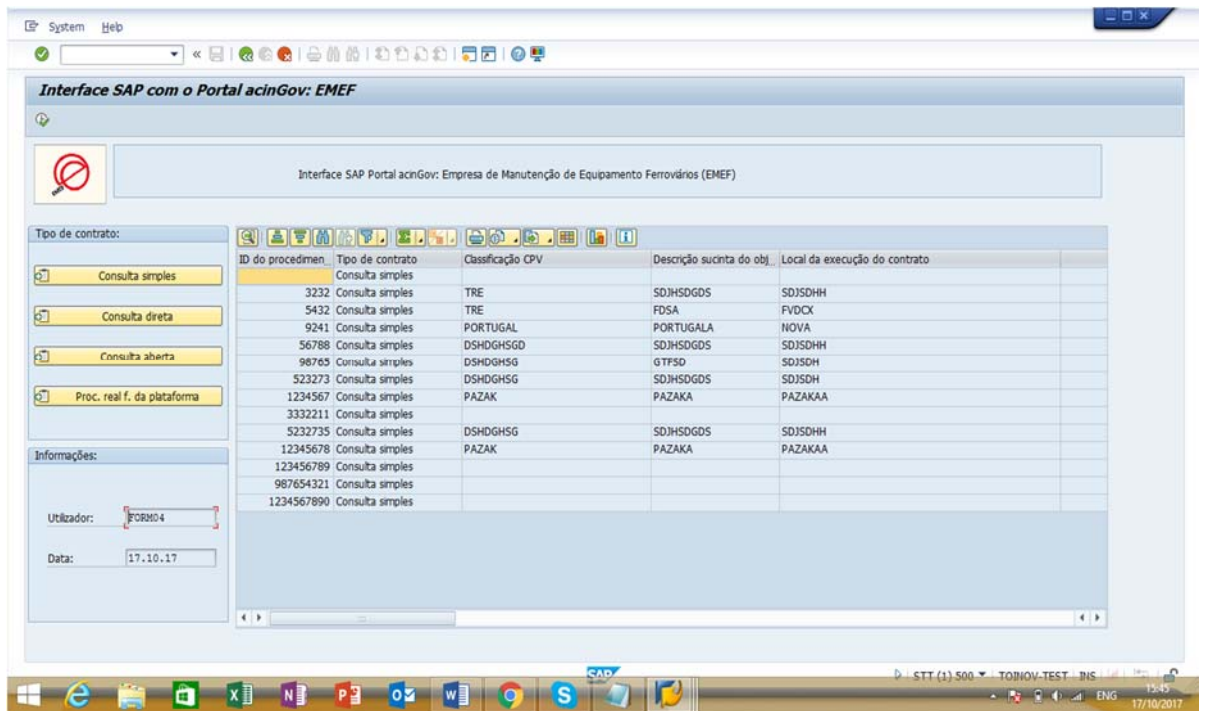


Figure 1-3 SAP Interface with ALV Grid

After that, we have the web services part where we publish our data on the server-side by using web services, and it can be readily acknowledged anytime.

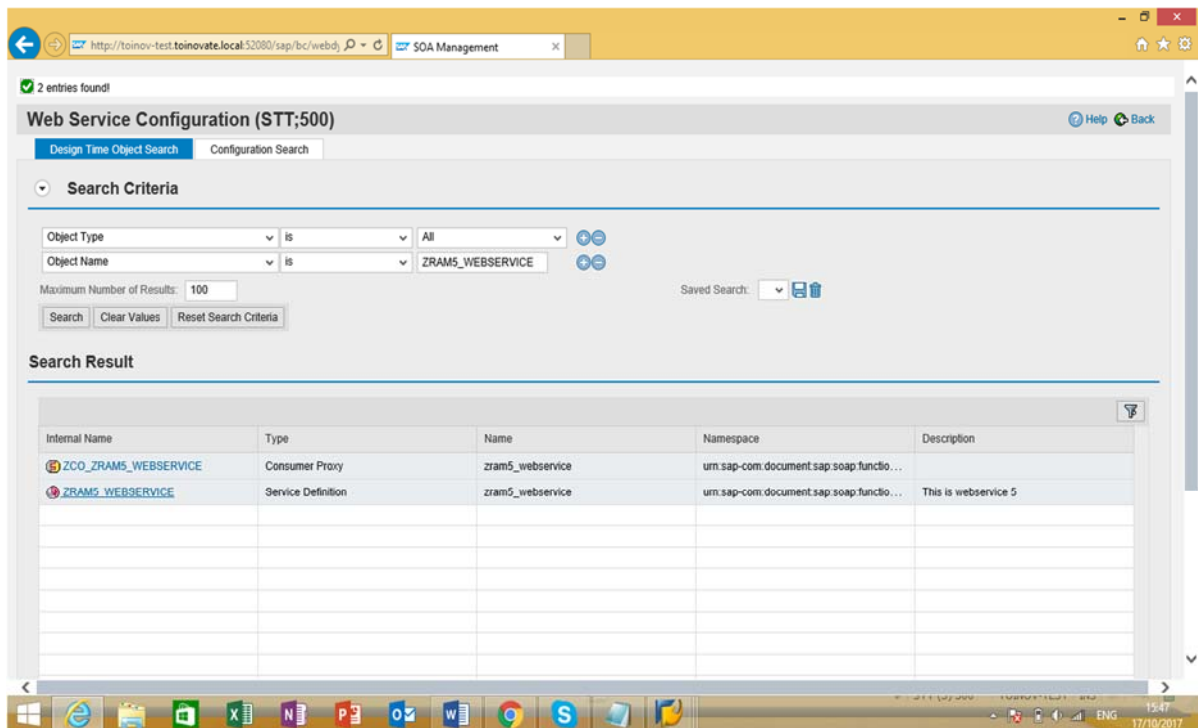


Figure 1-4 Web Service on Production

4.2. Difficulties

The primary outcome after starting this internship was to learn about how to bear stress and how to react in cases of unexpected urgent requirements. The serious attitude towards my project and very few short breaks during work time were also fundamental lessons from the first day of this internship. However, apparently, this is the best way to avoid burn out and to stay focused on projects. Overcoming hurdles in communication between teammates were always part of the project; nevertheless, everyone always looked out for each other without question. Another important and the most conscious part of this internship is to become proficient in SQL programming language, and I was always instructed to improve this area as soon as possible. I tackled this issue over time and got hands-on experience. This experience helped me improve my critical thinking and enhance my problem-solving skills for any software. However, this was my course work in university for data warehousing where I had some practical experience, but in a real-time scenario, I dealt with large databases that were not so easy because we had multiple resources of data. I used YouTube tutorials and the Google search engine to solve my main issues and to understand the ABAP language precisely. Despite that, Tolnovate is a leading Portuguese company where many people have technical expertise in the ABAP language, and they were always readily willing to explain the main concepts to help me understand.

4.3. Lesson Learned

While working on this project, I learned many lessons. I learned to be more resilient, although working with a new programming language and learning how to use new tools was always challenging, and it takes time primarily because of the inordinate debugging involved. Nonetheless, the most crucial thing was failing a lot and repeatedly trying to be more results oriented. My seniors helped me immensely to be more autonomous for long term projects. In this way, I would say I became more self-dependent to tackle tasks in a better way. Here I would also add about the company TOINOVATE with whom I worked on a long term project for a client who is very active regarding the requirements analysis from their customers because we were dealing with the extensive database they have in Microsoft tools and SAP.

Our main client was CTT, and we were always sending reports to the client after one week to get their feedback. Internally we were using the agile methodology to be more proficient regarding the project. Our reports sent to the clients were proof that we were on track during this period of the internship, and the methodology we were using helped us considerably to complete this project as soon as possible. In these four months, I also learned about teamwork, namely, how to collaborate with team members, how to solve complex technical problems, and how to report to seniors if I found difficulties with a complex issue. This internship also helped me understand large organizational aspects because, in my case, CTT is a big organization, and the interaction with other teams always gave me new knowledge about the different aspects of the organization.

In the end, this internship aided me in understanding different cultures, different teams, and organizational aspects as far as how to work within a big organization, how to collaborate with a variety of teams that may belong to diverse cultures, and how to be more efficient with different tools used in organizations. So, I would say that in the end, this internship helped me overwhelmingly to become a very good professional open to future opportunities, and it assisted me in my next project.

5. Conclusion

The conclusion of this internship is the central aspect that I learned professionally and personally. I will try to conclude my internship assessment here. I will conclude how my internship played an essential role in my career growth and improved my motivational power with a substantial impact on accepting new challenges.

This internship also dealt with the critical appraisal of work developed at TOINOVATE that I will explain further.

5.1. Assessment of Internship

I joined the TOINOVATE consulting company for this internship because of its market growth for providing SAP consulting services. My bachelor's degree also played a major role in this internship because I had already gone through the main concepts of databases that I dealt with in this internship. At the start, when I had a meeting with my managers, they asked me about my know-how of the consulting business. My answer was not very satisfactory because it was also my first time dealing with SAP systems. I said that I did not know too much but that over time after having interactions with the system and the SAP ABAP module databases, I would undoubtedly become accustomed to the system. Secondly, it was an excellent opportunity to work with one of the good consulting companies that has substantial market links to start your career, and it is always helpful to be employed in any company after some time. Companies that offer some international experience also look good in a career profile. Herein TOINOVATE gave me an outstanding experience because it would be my first time working in the market as a trainee, especially for the SAP ABAP module. I was always engaged with the managers and partners to understand the systems very well. They always helped me interrelate the concepts of my master's degree and the courses I had been learning until now, so this accomplished the primary purpose of this internship.

Now I will explain the advantages and drawbacks of the internship. What I learned during my six-month stay and what kind of improvements I need to enhance my capabilities further.

My understanding during this internship was that I was on my route path that I would carry out while working on the project.

Working on SQL database concepts that improved my programming skills when I worked with the SQL database concepts of the ABAP system. It also improved my problem-solving skills and made me stronger to work independently and had a major impact on how to manage IT-based projects. Another benefit of this internship was to work with the client directly, to work in teams, and to be responsible for team planning. As a junior consultant, companies mostly believe that the consultant should be able to work independently with the client.

Lastly, I learned a lot about teamwork - how to be more trustworthy with one's colleagues in the team. How to control oneself, especially in terms of emotions. How to control one's temper in the form of friction and avoid disputes within teams. I am particularly grateful for the flexibility within the TOINOVATE consulting company, where everyone always showed respect and created a comfortable working environment where I felt my colleagues were interested in listening and in delivering positive and fruitful results and sharing robust, healthy, and wholesome corporate values.

There are a few drawbacks of this internship with which I feel that I should conclude here in parallel with the advantages of the internship, against the business value of TOINOVATE consulting mostly preferred in the business value while ignoring the training in the development of technical skills. On the other hand, I was also involved with other projects that lost my attention for the main objective of my concerned domain, and for these kinds of switching, there must be some time and training

needs, which to be more efficient for other auditing projects. It is a matter of fact that employees mostly do switching from one department to another department with mature decisions.

As I see in TOINOVATE, they always try to increase their market share and to groom their market value to do so they need to hire young talent who are willing to work in SAP ERP systems and to do so they must do some Open days to attract the young talent to work in SAP ERP systems. Very frequently, this issue is common in the IT market, where companies always try to engage and interact with new talent, and, I would say this internship was rewarding and enriching.

5.2. Critical Analysis of Work Done

The critical analysis of the work mostly depended upon my manager, my colleagues, and the most crucial factor was the client for whom I worked. I will discuss the analysis of my manager, Paulo Peixoto, during my work time at TOINOVATE, Paulo always looked upon my work and gave me some time to understand the basic concepts of the ABAP language. He gave me space to understand the workflow of the project. Basically, we were two people who were responsible for the key development of the project because I was more responsible for the ALV grid section, and my colleague HELDER was responsible for the interface of the application. However, due to my lack of technical skills at the beginning, my manager gave me the time of two weeks to understand the tools very well.

He always gave me regular feedback regarding the client and what the client thought about my work. He always informed me about my professional behavior with the client, especially in moments of a tenser environment. One of the shortcomings he mentioned to me was my difficulty in following his advice and my hesitation to express my doubts towards my manager. As my manager told me that the client was satisfied with my work since we managed to deliver the work on schedule and with all requested features, so we complied with the right budget and reached our goals.

The main point I will discuss here is that it is not easy to assess myself, especially in this environment, where the work will not only be assessed by the company itself but will also be evaluated by NOVA IMS. I will therefore not write much about my assessment here; nonetheless, I will complete this section with the words that I am fortunate to have been part of this project, now I am confident for my future challenges. I will kick off in IT projects faster and be able to contribute to other teams more efficiently and always be confident to accept new challenges.

5.3. Future Perspectives

Now, in the end, I will roll up about my road maps and possibilities to join some other challenging projects shortly. Now after this internship, I can make some positive decisions about my career, in the coming future, I am looking forward to many opportunities that SAP ERP could bring at well-known multinational companies like Deloitte, Accenture, and even SAP itself. I recently gained a position at AXA group Operations for the recent opportunity that is in SAP Basis Module. This opportunity helped me immensely in the deep learning of SAP modules, so I would say after signing the contract with AXA group solutions, I am able to get in touch within the international market where I have challenging clients, and I have many things to learn and achieve.

Besides these exciting offers, if I talk about my SAP domain, then I would say to work in SAP as a consultant; it is more challenging because, in SAP, I will be working with different technologies, especially with Microsoft for the cloud sharing platform.

Now working in SAP will take me over the other modules of SAP, such as BW, Finance, etc. SAP gave me a new platform with which to work in information and knowledge-based projects related to ERP systems. SAP also uses the cloud platform of Microsoft, and for that purpose, they actively enhance the capabilities in the SAP workforce. So would say this is just the start for me; with time, it will rise with the exciting knowledge of the SAP area and will have a powerful impact on my career growth. Now I am fully prepared to accept new challenges in the IT domain and showed me where I could learn other concepts more related to IT projects. SAP is a keen initiative for my career growth it groomed my stamina to work in IT projects and gave me some ideas how I could work as a multi-tasker, demonstrated why I could not just rely on one single platform, proved I can work for different tools and always be independent of any environment.

Bibliography

Founded (1996). Consulting Business: Overview of Consulting Business.

BizFillings. com. (1996). About Consulting Business? <https://www.BIZFILLINGS.com/>:
<https://www.BIZFILLINGS.com/docs/default-source/pdfs/guide-consulting-business.pdf>

SAP in consulting Business: SAP Implementation in Consulting Business.

Infopulse.com. Implementation of SAP in Consulting Business? <http://www.infopulse.com/>:
<https://www.infopulse.com/blog/why-do-companies-implement-sap-software/>

Purchasecontrol.com: What is E-Procurement?

Purchasecontrol.com. E-Procurement? <https://www.purchasecontrol.com>
<https://www.purchasecontrol.com/uk/blog/e-procurement/> (Apr 26, 2019)

Edem-eGOV.org: Use of ERP Systems

Edem-eGOV.org. Use of ERP Systems? <https://www.Edem-eGOV.org>
https://edem-eGOV.org/docs/Chapter_3_eProcurement.pdf

learnsap.com: ABAP Programming Module.

Learnsap.com. ABAP Programming Module? [http:// www.learnsap.com /:](http://www.learnsap.com/)
https://www.learnsap.com/pdf/ABAP_sample.pdf/

Peter MOXON (2014). BEGINNERS GUIDE TO SAP ABAP Kindle Edition

saphub.com: SAP ALV GRID.

Saphub.com ALV Grid. [https://www. saptechnical.com](https://www.saptechnical.com)
<http://www.saphub.com> › ABAP-tutorial › what-is-ABAP-ALV (Jan 29, 2012)

Krishna RUNGTA (2016). Learn ABAP Definitive Guide to Learn SAP ABAP Programming...

Boris RUBARTH (2013). First Steps in ABAP - Your Beginner's Guide to SAP ABAP

Thomas STUTENBAUMER (2016). Practical Guide to SAP ABAP: Conceptual Design, Development, Debugging

Agilealliance.org: Agile Framework

Agilealliance.org. Agile Framework. <https://www.agilealliance.org>
<https://www.agilealliance.org/agile101/>

Essential Scrum by Addison-Wesley Signature (2012). A Practical Guide to the Most Popular Agile Process

Leankit.com: Disadvantages of Agile

Leankit.com. Disadvantages of Agile. <https://leankit.com>
<https://leankit.com/learn/agile/what-are-the-disadvantages-of-agile/>

