

Design of Enterprise Resource Planning Controlling Module on SAP S/4 HANA with SAP Activate Methodology in Transportation Services

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Abstract— XYZ is a company engaged in transportation services. Service provided by XYZ includes passenger transportation and freight transportation. In deciding on investment, XYZ must consider their financial condition so the investment can be carried out and become profits. As time goes by, there are still many problems with investment report, the absence of integrated system between investments and financial can lead to the making of investment report become intricate, thus hampering the decision-making process in the company. Foremost, the need for data and information regarding assets investment in which every asset has its own depreciation value and treatment method. The solution to this problem is by designing an ERP system with SAP S/4 HANA software and using SAP Activate methodology. With the implementation of the ERP system, it can integrate investment and financial to controlling the costs of procurement and funds in work units and ensure every cost incurred not exceed the budget.

Keywords— ERP, SAP, Activate, Controlling.

1 INTRODUCTION

XYZ is a company engaged in transportation services. Services provided by XYZ includes passenger transportation that divided into executive class, business class, economy class, local train, commuter, airport train, and tourist train. Besides, there is freight transportation that divided into container train, fuel train, fertilizer train, and fast freight train. Service is the key to success in running various services business. According to UU No 25 2009, concerning Public Services it explained that realization of a proper system of public transportation is under the general principle of good governance and corporation.

TABLE 1
XYZ ASSET CONSOLIDATION ANNUAL REPORT

Year	Current Assets	Non-Current Assets	Total Asset
2013	4.137.884	11.520.957	15.658.841
2014	3.806.315	13.506.927	17.313.242
2015	6.204.142	16.188.750	22.392.892
2016	6.204.142	16.188.750	22.392.892
2017	12.248.380	18.684.531	33.538.405

Railroad services affect the enthusiasm of the public to use railroad transportation services, therefore service to passengers remains a priority because it will attract the attention of passenger in the necessity of good service [1]. Based on Table 1, the assets of XYZ increases every year with two assets compositions namely Fixed Assets and Non-Fixed Assets. The company makes investment in fixed assets with the expectation that investment in current assets will be able to recover the funds invested in these fixed assets [2]. The main purpose of an investment is to obtain various benefits in the future. The benefits can be financial or non-financial [3].

Overtime, there are still many problems that occur in the fixed asset investment report owned by the company, the absence of an integrated system of investment with finance can cause the making of investment reports become intricate, thus hampering the decision-making process in the company. Foremost, the need for data and information regarding assets investment in which every asset has its own depreciation value and treatment method. Therefore, we need an information system that can manage all assets owned by the company so it can be easier to manage.

A system is a series of two or more interconnected components, which interact to achieve a goal. Information is data that has been managed and processed to give a meaning and improve the decision-making process [4]. Information system are correlated components that coordinated to process and distribute information to revitalize decision making in an organization [5].

One of the right information system solution to implement at XYZ Company is Enterprise Resource Planning (ERP). ERP system are one of the most specific types of systems in any enterprise, they can integrate data throughout the organization and expansively supporting all the major organizational functions [6]. One of the system information software that is widely used by large companies in the world is System Application and Product (SAP). SAP is a developed software to integrate all existing business processes in the company so it become more effective and efficient.

In this research, researcher used SAP Controlling Module in Financial Accounting to calculate the costs used in asset so the company can find out how much funds are needed for assets and their maintenance which will be generated in the financial statement and ensure cost incurred not exceed planned funds. The process of monitoring and reporting of assets can be integrated and processed in real-time because in controlling module has the function of Profitability Analysis, Product Costing, and Overhead Management which consists of Internal Order, Cost Element Accounting, Cost Center Accounting, and Activity-Based Costing [7]. Therefore, the design and configuration of ERP system at XYZ, especially in controlling module is a solution to overcome the problem at XYZ using SAP Activate Methodology.

According to Forrester, the SAP Activate objective is to empower customers to make full use of the potential in SAP

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S/4 HANA and tailor is to their specific business needs. SAP Activate is the integration of methodology for deployment of S/4 HANA, guided configuration, and SAP best practices [8].

2 LITERATURE STUDY

2.1 Enterprise Resource Planning

Enterprise Resource Planning (ERP) System is an information system for enterprise-level designed to integrate and improve all of the business process in the company [9]. ERP systems are business management system, comprising of a set of comprehensive software designed to integrate and manage all business functions within an organization, these set include application for human resources, financial and accounting, sales and distribution, project management, material management, supply chain management, quality management [10]. Keeping in view the benefits and functionalities of these systems, business organization are investing in information system to improve performance. ERP is generally termed as a system that automate key business functions through integration and support decision making accordingly [11].

2.2 SAP Controlling

SAP Controlling (CO) is one of the important financial module in SAP to an organization. SAP CO support monitoring and integrating all of the process in the organization. SAP CO concern about recording both of incurred cost of production and the services provided by organization [12]. Controlling is responsible for internal (or management) accounting, SAP CO focuses on meeting the necessity of information within the organization. Internal accounting is intended to provide management information to manage and control its strategic and daily activities at all levels [7].

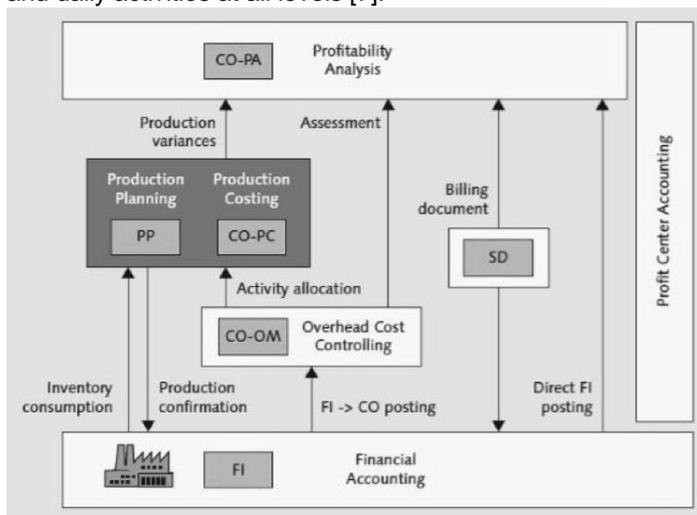


Fig. 1. Architecture of Controlling

Fig. 1 display the basic Controlling architecture of SAP ERP. The various controlling parts are shown, with arrows indicating typical cost flows and amounts of the activity type. This includes brief descriptions of each and how they can be used. Overhead Management (CO-OM) is classified by internal order, cost center, cost elements, and business process [7]. Contain four subcomponents:

1. Cost Element Accounting (CO-CEL)
2. Cost Center Accounting (CO-CCA)
3. Internal Orders (CO-PA)

4. Activity-Based Costing (CO-ABC)

The cost of the production process is allocated to individual products by Product Costing (CO-PC). The cost related to manufactured material are then used in financial and other posting. Profitability Analysis (CO-PA) combines sales and distribution data with CO-OC to enable reporting that can provide comprehensive information including product, profit and loss by customer, plant, and sales for manager [7].

3 RESEARCH METHODOLOGY

3.1 SAP Activate Methodology

In this research will be discussed methodology often used by companies and industries in implementing SAP which is SAP Activate Methodology. SAP Activate is a perspicuous process of structured and solution certain practices. Performed in standardized environment, providing businesses with access to the new capabilities, and the ability to innovate when and how to choose, resulting in clear and maintained competitive advantage. SAP Activate multi-phase deployment of structures to maintain control of the system. This innovation as a service is intended to discrete the strategic decision to move to SAP S/4 HANA [13]. The SAP Activate Methodology consist of discover where the business value and benefits, strategy, implementation, and roadmap are to be identified. Second, the Prepare to begin the project, finalize plans, and allow best practice processes for team and access system. Explore SAP standard drive adoption with a Fit-to-Standard approach, and record delta requirement in order to implements differentiating business practices. Last stage is Realize to configure and test built-in integrated environment, load data and allow business users to operate [14].

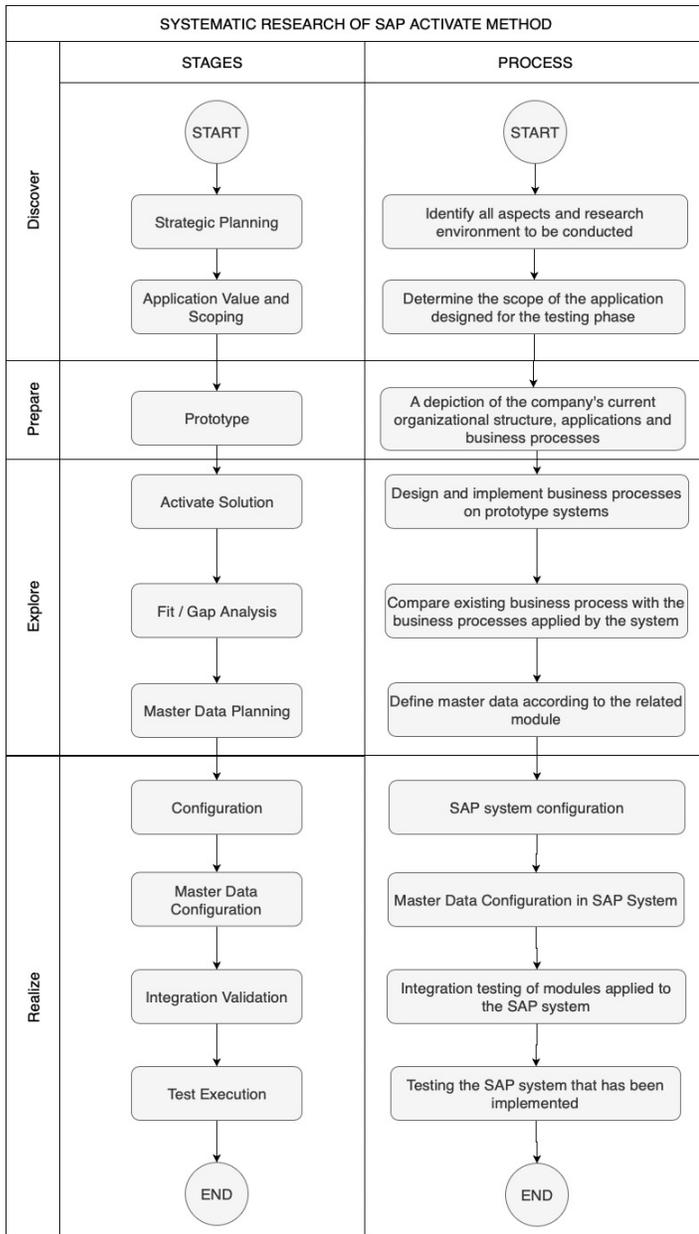


Fig. 2. Systematic research of SAP Activate Methodology

Based on Fig. 2, the first stage Discover is the initial stage carried out on the SAP Activate Methodology. The processes are strategic planning to identify and defining all aspect and planning that will be done, determine the scope and value limits expected in SAP implementation. Second stage called Prepare, this stage is the preparation phase of research planning and analyzing when the project officially starts. User will be given an overview of the system that will be implemented in the form of a prototype include company's organizational structure. Third stage called Explore, at this stage, the target business process design will be adjusted to SAP and comparing the situation before and after implementation of the system with Fit and Gap analysis also master data planning. Last stage called Realize, at this stage the company runs a configuration on the ERP system using SAP application in accordance with the design in the previous phase. At this stage, integration validation and text execution are carried out to perform testing after configuration is completed.

3.2 Conceptual Modelling

Based on Fig. 3, an information system research framework conceptual modelling is known to be essential in simulation development to giving a concept of system in the early stage of development to gain a better quality of requirements and also increase the communication between two important stakeholders between users and developers which oriented to the simplicity of the software [14].

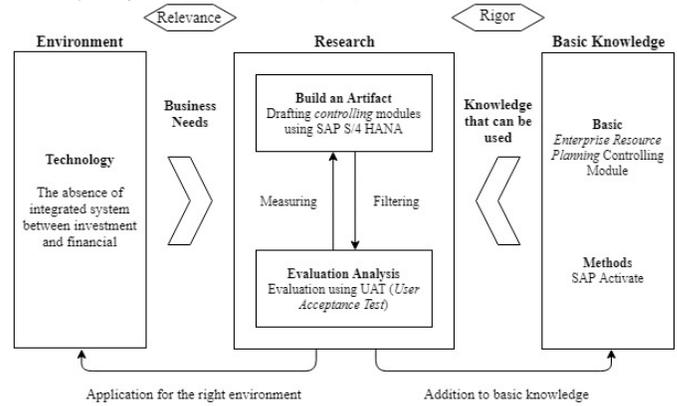


Fig. 3. Conceptual modelling

A. R Hevner has shown the current expansion of the initial design framework in Fig. 3 which describe three cycle view designs science proposed relevance through identification of requirement and field testing in environment for the artefact that inflexibility to appropriately grounding the research based on existing foundations, methodologies and design theories afterward forming contributions to enhance the existing knowledge base [15].

Based on the conceptual model in Fig. 3 shows the conceptual model in the financial section of XYZ Company. It was explained there were three aspects discussed in the conceptual model namely environment, research, and basic knowledge. In the environment aspect, there are people in controlling as part of the financial accounting and technology to be used is the SAP S/4 HANA Controlling module with the basic knowledge of Enterprise Resource Planning.

4 RESULT AND ANALYSIS

4.1 Analysis of Existing Business Process

The existing business process in the financial division, especially the Controlling department before implementing SAP software do not yet have a related system to support the concept of cost allocation transaction, profitability analysis, settlement, and closing. The current reporting is record in manual and it take quite a long time when auditing financial statement and verifying accounting document.

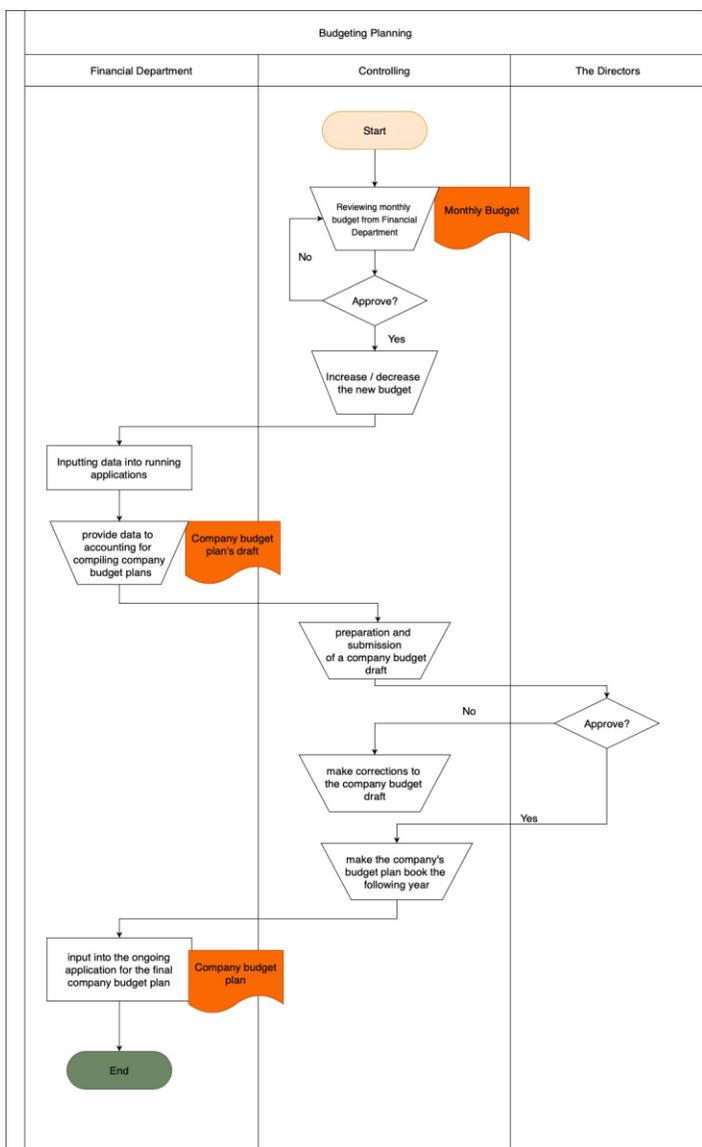


Fig. 4. Planning for budgeting existing business process

Fig. 4, shows the existing business process of planning for budgeting. After controlling reviewing the monthly budget, financial department will input data into running application to compiling budget plans, after that controlling department will prepare and submit budget plan draft to the director. After the company's budget draft approved by director, financial department will input the final company's budget plan into the application.

4.2 Business Solution

XYZ Company needs a solution that can support to carrying out its business processes so the company's business can run optimally. The solution to be implemented is to use the best practices offered by SAP application.

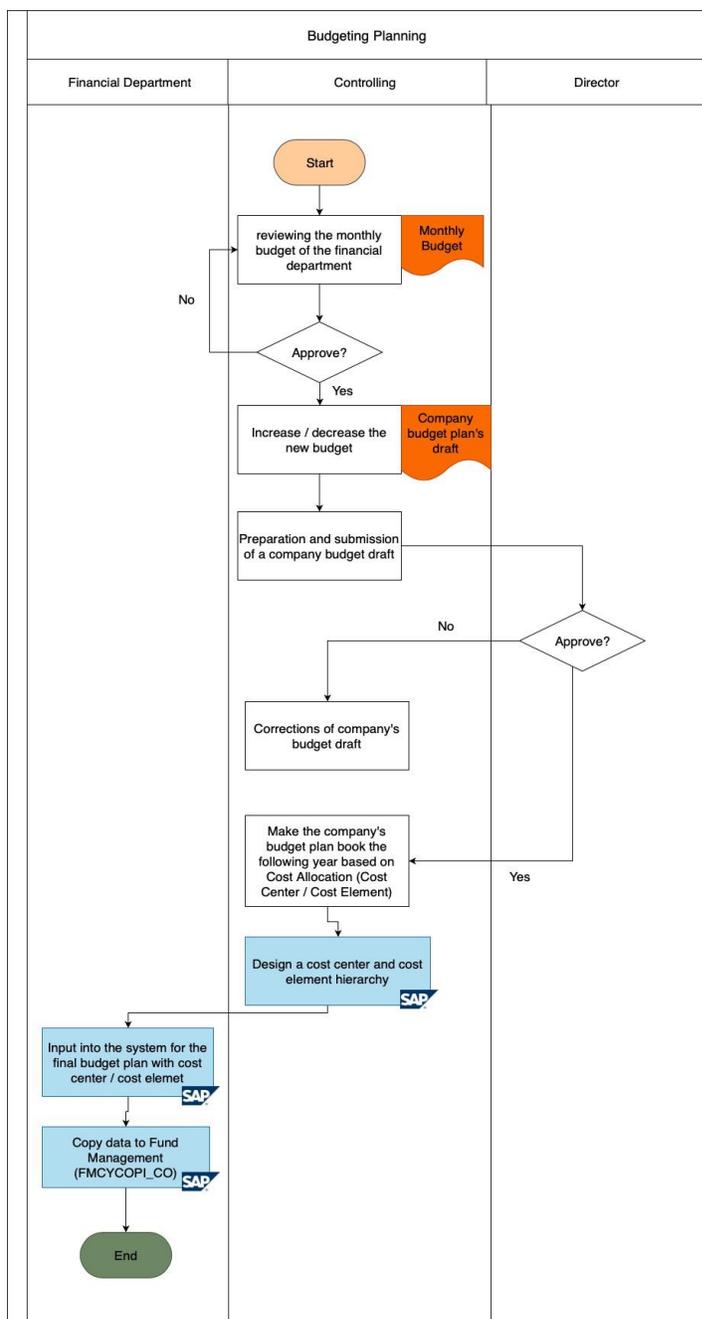


Fig. 5. Planning for budgeting targeting business process

Fig. 5 shows the targeting business process of planning for budgeting. The Controlling department will be reviewing monthly budget, after the company's budget draft approved by director, controlling will design a cost center and cost element hierarchy. After that financial department will input into the system for the final budget plan with cost center or cost element and copy data to fund management using SAP. System will automatically record transaction so the controlling department can monitor the cost incurred by every cost center or cost element.

4.3 Controlling Master Data

Master Data is centrally developed in SAP and is accessible to all applications and approved users. Master data centrally implies data records are coherent, up-to-date and redundant-free at all times. It has an organizational aspect because the

information is assigned to organizational views. [16]. The master data used in the controlling module are as follows.

1. Cost Center

Cost center is used to determine where organizational expenses are incurred. The expenses will be assigned to the corresponding cost center when expenses are incurred [17].

**TABLE 2
XYZ COST CENTER**

Cost Center	Name	Cost Center Group
XYZ	XYZ Company	XYZ9
1100000	President Director	1100000
11DVLNP	Logistic Directorate	11DVLNP
12DVLOG	Logistic Division	11DVLNP
12DPPRO	Procurement Department	11DVLNP
12DPVEN	Vendor	11DVLNP
11DVKEU	Financial Directorate	11DVKEU
12DVKON	Financial Consolidation Division	11DVKEU
12DVAUD	Internal Audit Division	11DVKEU
12TRUPS	RUPS Team	11DVKEU
12DPKOK	Financial Corporation Department	12DPKOK
13DPADK	Financial Administration Department	12DPKOK
13DPAPU	Tax Department	12DPKOK
13DPANG	Budgeting Department	12DPKOK
13DPKEU	Financial Accounting Department	12DPKOK
13DPINI	Initiator	12DPKOK
11DVLNB	Building and Asset Directorate	11DVLNB
12DVPAB	Asset Maintenance Division	12DVPAB
12DPAPA	Maintenance and Architecture Department	12DVPAB
12DPABG	Building Asset Department	12DVPAB
12DVPGA	Development Division	11DVLNB

An example of cost center numbering from Table 2 is "12DVLOG", which means:

- "1" is company code of XYZ Company,
- "2" is division code of XYZ Company,
- "DV" is character conversion of Division,
- "LOG" is unique character from division, which is Logistic.

2. Cost Center Hierarchy

Cost center hierarchy field shows the standard node of hierarchy assigned to the cost center. This field must be filled in to allow it to be used in Cost Center Accounting as a control function [18]. The cost center hierarchy at XYZ Company as shown in Fig. 6, is created based on XYZ Company's organizational structure.

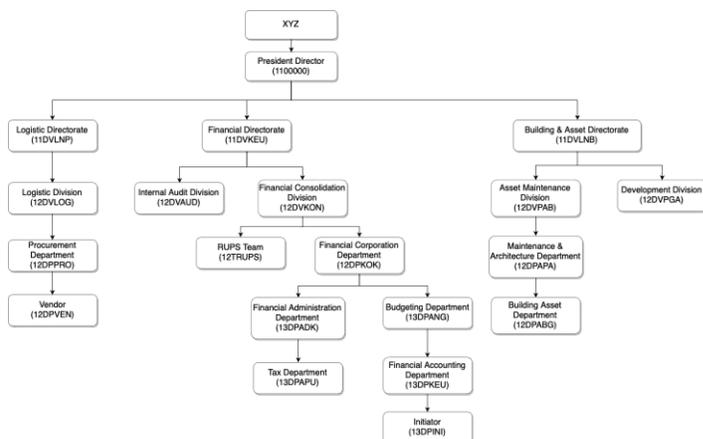


Fig. 6. Cost center hierarchy

3. Profit Center

Profit Center is an organizational unit based on management that is used for internal controlling purposes. Profit center can evaluate responsibility and delegate accountability to distributed units. Profit Center Accounting allows the inner aspects of profitability to be concluded [18].

**TABLE 3
XYZ PROFIT CENTER**

Profit Center	Name	Profit Center Group
XYZ	XYZ Company	XYZ9
100000	President Director	100000
200000	Logistic Directorate	200000
200100	Logistic Division	200000
200200	Procurement Department	200000
200300	Vendor	200000
300000	Financial Directorate	300000
300100	Financial Consolidation Division	300000
300110	Internal Audit Division	300000
300120	RUPS Team	300000
300121	Financial Corporation Department	300000
300122	Financial Administration Department	300000
300123	Tax Department	300000
300124	Budgeting Department	300000
300125	Financial Accounting Department	300000
300200	Initiator	300000
400000	Building and Asset Directorate	400000
400100	Asset Maintenance Division	400000
400110	Maintenance and Architecture Department	400000
400120	Building Asset Department	400000
400200	Development Division	400000

4. Cost Element

Cost elements describe the origin of costs [17]. Cost Element Accounting classifies the cost and profits reported in accounting for management. It also allows cost to be reconciled between management and financial accounting. In its master record, each cost element is assigned a category of cost elements that determines the type of transaction for which a cost element may be used [7]. Primary cost element is a cost or profit item in the chart of account for which Financial

Accounting has a corresponding general ledger account [19].

TABLE 4
XYZ COST ELEMENT

Account	Description	Type	Details
1101010101	Cash	Primary	Cost
1102010101	Asset Under Construction Station	Primary	Cost
1102010102	Asset Under Construction Operational	Primary	Cost
1102010103	Asset Under Construction Warehouse	Primary	Cost
1102010104	Asset Under Construction Project	Primary	Cost
1102010105	Land	Primary	Cost
1102010106	Infrastructure	Primary	Cost
1103010101	Bank Account	Primary	Cost
1104010401	ATDO Asset	Primary	Cost
1105010101	Operational Asset	Primary	Cost
2101010101	Project Vehicle Rent	Primary	Cost
2101010102	Project Machine Rent	Primary	Cost
2101010103	Project Utilities Rent	Primary	Cost
2101010104	Warehouse Utilities Rent	Primary	Cost

5 CONCLUSION

The conclusion of this research is development of the ERP system is a solution for XYZ Company. SAP is one of the application that is widely used by large company. The implementation of SAP S/4 HANA using SAP Activate methodology can make full use of the potential in SAP and tailor is to company's specific business needs with best practices of SAP. In implementation of SAP using conceptual model is known to giving a concept of system in the early stage of development to gain a better quality of requirements and also increase the communication between two important stakeholders between users and developers which oriented to the simplicity of the software. With the implementation of ERP system, it can integrate investment and financial to control the funds in work units and ensure every cost incurred not exceed the budget.

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