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"Building an Embedded Enterprise Performance Management Solution: An Exploratory Case Study"

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Project Work presented as partial requirement for obtaining the master's degree in Statistics and Information Systems and Information Technologies Management.

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BUILDING AN EMBEDDED ENTERPRISE PERFORMANCE MANAGEMENT SOLUTION: AN EXPLORATORY CASE STUDY

by

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Project Work presented as a partial requirement for obtaining the master's degree in Information Management, with a specialization in Information Systems and Technologies Management

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ABSTRACT

Nowadays most companies are struggling to manage large data and spending a lot of money on storing and capturing. To benefit from the stored data, enterprises implement Business Intelligence solutions and technology-driven processes. The most significant advantage of BI is analyzing actionable information and data-driven business decisions for executives and managers. Since technology is evolving very fast, Business Intelligence processes are getting more advanced every day. These advancements are promoting accountability, visibility, timely actionable information, increased return on investment, connected business processes, standardized management processes and augmented organizational flexibility. In a relationship with BI, enterprise performance management provides more predictable answers on these advancements by improving planning, budgeting, financial reporting, and consolidation.

Therefore, this study aims to contribute to a better understanding of the implementation processes of embedded Enterprise Performance Management Solutions in ERP Embedded BI Platforms by revealing its methodology, steps, significant milestones, and effectiveness of the organizational structure. The embedded approach is going to be maintained by Business Intelligence based Business Planning and Consolidation tool on Enterprise Resource Planning System. Embedded Enterprise Performance Management solutions consist of Analysis Reporting, Business Planning, and Consolidation. Thoroughly they cover budgeting, planning, and consolidation as an advance altogether. The Implementation of an artefact aims to satisfy market competition requirements and to compete with financial demands which are originated from the growth rate at the organizational level

There are several studies in the literature focuses on the critical success factors of BI projects, but there are not many studies which are mainly focused on the process evaluation of embedded enterprise performance management solutions and their success on organizations. This study will be an exploratory design research case study of a Group Company which is professionalized in language translation in 30 different countries on five different continents.

KEYWORDS

Budget Planning, Consolidation, EPM, Enterprise Performance Management, Embedded Systems, Real-Time, Business Intelligence, Finance

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LIST OF ABBREVIATIONS AND ACRONYMS

EPM	Enterprise Performance Management
BI	Business Intelligence
ERP	Enterprise Resource Planning
BPC	Business Planning and Consolidation
IT	Information Technology
IS	Information Systems
DW	Data Warehouse
OLAP	Online Analytical Processing
EDW	Enterprise Data Warehouse
SQL	Structured Query Language
RAM	Random Access Memories
ABAP	Advanced Business Application Programming
SAP	Systems Applications and Products in Data Processing
BW	Business Warehouse
BW-IP	Business Warehouse – Integrated Planning
PAK	Planning Application KIT
ETL	Extract Transform Load
EDM	Enterprise Data Model
CRM	Customer Relationship Management
HR	Human Resources
HRM	Human Resources Management
DBMS	Database Management System
OLTP	Online Transaction Processing Databases
CPM	Corporate Performance Management
PF	Planning Function
PS	Planning Sequence

AFO Analysis for Office

HCM Human Capital Management

1. INTRODUCTION

Lately, organizations are investing a lot of money on storing and capturing data. Most companies are struggling to manage the vast amount of data which is growing day by day with an increasing rate. To maintain the benefits of stored data, enterprises implement technology-driven Business Intelligence processes to extract data-driven business decisions. Since technology is evolving very fast, Business Intelligence processes are getting more advanced every day. Because of that organizations are very eager to maintain.

Meanwhile, timely, accurate, and relevant intelligence to plan and control the entire organization is getting essential. Enterprises are trying to collect the most vital metrics to measure the performance with the help of technology. At this point, the general trend is getting to the idea that all management systems could work together to provide the needs of the organization at the right time. Enterprise Performance Management (EPM) provides these enhancements by improving organizations' planning, budgeting, financial reporting, and consolidation. The primary motivation of Enterprise Performance Management is managing integrated business processes on the strategical, financial and operational level to enable more effective businesses. EPM can provide a competitive aspect for companies which integrate it by allowing their self to anticipate and respond to a changing business environment.

Henceforth, the aim of this study is the development of an embedded enterprise performance management solution in ERP embedded business intelligence platform to maintain foresight capacity and decision-making mechanism for the group company. During the project the chosen embedded enterprise performance management solution will be implemented to provide a clear understanding of improved financial reports with planning approach. In the meantime, the developed system will be providing real-time data for the reporting as well as sustaining real-time planning for a different level of the group company. The ultimate aim is to retain better-informed decisions and plans.

The study paper is organized in several sections. The first section is completely related with problem, motivation, objective and project goals. The second one is entirely dedicated to literature review, where each relevant idea mentioned in the paper is discussed in detail. The third section presents the methodology considered most appropriate for the problem in analysis. It also includes an extensive analysis of the findings that are extracted from artefact development performed during the methodological process. The fourth section is presenting all the significant results and analysis which are collected during and after the implementation. Finally, the last section displays the conclusions extracted throughout the master thesis project.

1.1. CONTEXTUALIZATION

The Group Company which is the main asset of this article has an ERP system which consists of different modules, such as Financial Accounting (FI), Controlling (CO), Asset Accounting (AA), Sales & Distribution (SD), Material Management (MM), Project System (PS), Human Resources (HR), etc. ERP system collects and combines data from the separate modules to provide a complete data store for the company or organization. A complete combination of the data structure in the ERP system is summarized in Figure 1.1.

Figure 1.1: Modules of ERP System

All these modules provide actual data through the central component ERP structure as well as store planning data aside. That is why this study aims to develop an embedded enterprise performance management solution in ERP embedded business intelligence platform to maintain foresight capacity and decision-making mechanism for the group company. Business Intelligence approach will be used to process the data as valuable information. It will lead to a faster, more efficient decision-making processes on enterprise performance management.

1.2. IDENTIFY PROBLEM AND MOTIVATE

Major Problems in Group Company are briefly presented below:

- Basic excel forms are used by central financial services through a process of enterprise performance management. The whole approach is centralized in shared finance services in one company branch and transformations is happening through email connections.
- Many organizations started to use globally connected ERP system related enterprise performance management tools.
- Since the company developed a global financial structure above its partners and shareholders, a new solution for the globally available performance management tool is required.
- Lack of guidance through the application of enterprise performance management solution to improve the orientation of business processes with the business strategy and to develop the ability to measure performance efficiently.
- As a group company, revealing performance indicators demands consistency on the global-based analysis. Direct participation of each peer from every part of the global structure of the group company is also required to maintain control conditions requested by managers. Coordination of activities needed for budget planning and consolidation as an advance through enterprise performance management progress.

1.3. Define Objectives of Solutions

So briefly our objective is: “Propose a method towards the evaluation of the implementation of an embedded enterprise performance management solution in ERP Embedded BI platform of a group company, thereby improving the orientation of business processes with the business strategy and enhancing the ability to measure financial performance by using the advantages of real-time data support.”

1.4. The Main Question Regarding with the Project

Based on the problem and objective, the primary research question is: Is it possible to build a specific artefact to satisfy the needs of the group company. On the other hand, what can be the most suitable solution for the evaluation of the design and implementation of an embedded enterprise performance management solution in ERP embedded BI Platform and what are the properties of this solution to reveal and analyze this question?

Support questions for the workshop are defined according to Span (2009):

- What is the current situation in literature, about enterprise performance management (EPM)?
- What is the current situation in literature, about Business Intelligence (BI)?
- What constraints need to be dealt with through the evaluation of designing and implementing an embedded EPM solution in practice?
- What are the main properties of an embedded EPM solution in real life?
- Which steps can be separated through the evaluation of the design and implementation process of an embedded EPM solution in practice?
- Which steps or activities can be executed through the assessment of developing and implementing an embedded Enterprise Performance Management solution in practice?
- What methods and techniques can be used to reach the objective in practice?

Briefly, the output of this project will be the building of a globally connected enterprise performance management system.

1.5. Project Goals

The primary goal is to develop a methodology for the building of embedded Enterprise Performance Management solution in ERP Embedded BI Platform which has a significant relationship with the new technology in-memory, column-oriented, relational database ERP system.

This objective is right from the IT-Eye perspective and the actual group company’s structure as well. It will be very useful in creating this method to provide and relate to the company`s strategy and to monitor business processes globally. The next step of discovering the applicability of an embedded enterprise performance management solution will help the group company compared to other solutions on the market in decision making and systematize management processes. This should predict new opportunities for the company for further performance improvements. (Span, 2009)

2. LITERATURE REVIEW

In this context, Enterprise Performance Management is not a very popular theoretical topic in the business intelligence area that attracts attention lately. However, it was recently ranked as one of the top ten technology trends that companies should own. It is considered a jump tool ahead of the competition (Ariyachandra, 2008). Below, a literature review of EPM is mentioned briefly by the support of BI understanding of data warehousing. Beside EPM, Business Intelligence approach should be identified, analyzed and understood completely. The reason is; EPM is directly related with Business Intelligence in Information Management Systems and Technologies. EPM and Business Intelligence aspects will be presented briefly in divided sections to cover all the elements of this project.

2.1. ENTERPRISE PERFORMANCE MANAGEMENT

In general, EPM solutions in financial context are formed by Planning & Budgeting, Financial Enterprise Reporting and companywide Consolidation approaches (Gaiss, 1998). It is very crucial that a company has a long and short-term planning mindset which is considering the actual financial history of the organization in each financial term. For big companies, this is one of the most significant requirements (Ariyachandra, 2008).

2.1.1. Planning & Budgeting

Planning & Budgeting is the process by which the group will establish financial goals to reflect its choices and tactics, including the use of actual and historical data to predict the financial outcome of the upcoming months (forecasting). The group's budget method follows a bottom-up approach where individual responsibility centers start to plan future conditions for the company. Subsequent procedures will become more and more centralized along the planning flow, resulting in a corporate budget reflected on projected financial statements and reports. Specifically, budgeting is the method of analyzing the future about how to spend actual money for a defined period. Budget planning includes planned sales volumes and revenues, resource quantities, costs and expenses, assets, liabilities and cash flows (Gaiss, 1998). Creating a future transaction plan allows to control and check if enough money is available to afford needs or planned investments in advance. It is the method of balancing expenses and income altogether. Nowadays budgeting, planning, and forecasting are one of the most crucial processes for companies to estimate the future and prepared for the upcoming financial periods. Because of that preferences, consistency is critical when it comes to future financial analysis. Details can be beneficial, and timing also can reveal risks and shortages. It reveals strategic plans of business units and an organization, activities or events in defined term with measurements (Zeng, 2006).

A budget planning helps to improve the planning of actual operations by demanding consideration on how the conditions might affect the plan and what aids should be taken now by managers. It also encourages managers to consider problems before they arise from a variety of subjects. Helps the coordination of activities in the organization by informing managers to examine relationships between their operation and related departments (Bose, 2006). Other significant roles of the budget include:

- To control resources
- To motivate and encourage managers to achieve budget goals.

- To evaluate the performance
- To provide visibility and clearance into the company's performance
- The support mechanism of responsibility

2.1.2. Consolidation

Consolidation is merging assets, equity, liabilities and operating accounts of a parent firm and its subsidiaries into one financial statement. Joining two or more firms through purchase, merger, or ownership transfer to form a new group company is the basic definition of consolidation. In the corporate dictionary, consolidation is also known as amalgamation which is the merger and acquisition of smaller companies into a more larger group company. In the financial accounting framework, consolidation refers to the combination of financial statements of a group company as consolidated financial statements with a parent-child financial relationship (Loebbecke, 2016).

Consolidation methods occur in a different kind of investment methods. Percentages signify the influence of parent(purchasing) company on a child (Purchased) company. These are 20% ownership or less (Investment), 20% to 50% ownership (Associate Company) and more than 50% ownership (Subsidiary). In this case, a remarkable point is if the company owns more than 50% common stocks of child company, purchasing company has control over the acquired company (Elias, 2012).

Consolidation shows both parent and subsidiaries in a consolidated financial as one single entity. Parent company uses its investment power on subsidiary to make further investments (Bose, 2006).

2.1.3. Business - Enterprise Reporting

Business reporting or enterprise reporting is an analysis of financial data by a business enterprise. On the other hand, reporting is the acquirement of information for decision-makers within an organization to support their work effort. Implementation of a project consists of extract, transform and load (ETL) processes in coordination with business warehouse (Data Warehouse) (Bose, 2006). After these operations finished, reporting tools are used to create provisions from the collected data for decision making. These reports delivered to designated users by different distribution channels like print out, email or cloud-based presentations. Nowadays, with the expansion of information technology and the increases in the desire of corporations, the computer is the only way of reporting. All these approaches are originated from analytics which is discovery and interpretation of meaningful part of data. Organizations apply analytics to their data to describe, provision and improve their business performance in advanced level. Especially, areas of analytics which includes predictive analytics, prescriptive analytics, and enterprise decision management are critical and beneficial. There is also a different analytics method to improve prediction and provisioning. According to that information, we can analyze possible problem which can mostly affect the building process (Bose, 2006).

2.1.4. Usage of EPM

Regarding the usage of the EPM tools, the study of Desroches (2014) presents a lot of facts that are directly related with the motivation of users and EPM. According to Desroches (2014), there is still a significant dependency on the use of spreadsheet-based tools to support EPM activities. This is particularly true for support of planning and budgeting as well as business intelligence and analysis.

Survey analysis shows that more than half of the respondents rely on spreadsheets and manual processes to support planning and budgeting activities.

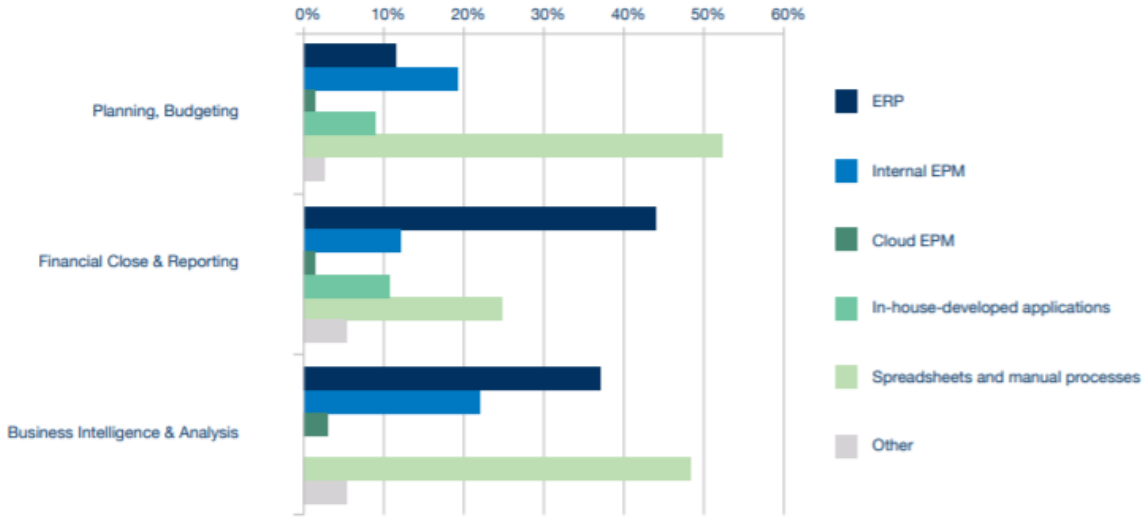


Figure 2.1: Current Architecture by EPM Activity

Source: (Desroches, 2014)

But users who are dependent on the use of spreadsheets and manual processes expressed that their satisfaction level regarding with the technology is the lowest. In the meantime, respondents who are using cloud technology or internal EPM Software to support EPM activities, they expressed the highest overall level of satisfaction among all technologies considered as well as the highest level of satisfaction for supporting financial close and disclosure activity and business intelligence (Desroches, 2014).

Spreadsheet-dependent users are not satisfied enough that their planning and financial close activities are efficient and effective or that they have excellent processes for monitoring performance. Users who are using only ERP, are most likely to believe that their planning and financial close activities are efficient and effective. On the other hand, users who are using cloud technology or internal EPM Software are highly satisfied that their standard reports provide the information needed to perform their job, that their internal stakeholders can run their reports efficiently without relying on accounting or IT, that they have useful tools for answering ad hoc questions, and that their organization has an excellent process for monitoring performance (Desroches, 2014).

2.2. Business Intelligence

Business Intelligence is considered one of the most crucial advantages of the company by many authorities. Ability to store, explore and add value by making decisions are the top benefits of BI tools. Operational systems are where you put data and BI systems is where you get the information out. (Kimball & Ross, 2013)

The success of BI on competitive advantages is driving the market to evolve every day. A lot of studies show the importance of BI platform in decision making and future planning in any organization (Dobrev & Hart, 2015).

On the other hand, maintaining BI has many requirements (Kimball & Ross, 2013):

- Easy Access to Information
- Consistent Information
- Adaptation to changes
- Presentation of information on time
- Security of the Information
- Authority and Trustworthiness of the system
- Acceptation of the success of the system

2.2.1. Data Warehouse and Infrastructure

This section will be related to Data Warehouse and its design processes. The concept of a data warehouse with its benefits and requirements and its design will be covered briefly in this section.

As a first step, some major functional requirements should be identified before starting the design of Data Warehouse (Boateng, Singh, Greeshma, & Singh, 2011).

- Business needs
- Outputs
- Expectations
- An indication of scope for the required data
- The delivery method of the data
- Defining Subject Model
- Documentation of Data

These requirements will help to create a scope of Data Warehouse with its aim, goals, and limitations. After clarifying requirements, choosing the most appropriate architecture will be the next step for maintaining the data warehouse. Nature of user tasks, independent information between organizational units, social and political factors, business constraints, technical issues and compatibility with the existing system are the major factors that can affect this process (Boateng, Singh, Greeshma, & Singh, 2011).

In the meantime, the right questions should be asked regarding with the architecture also (Kimball & Ross, 2013).

- Which tool or system should be used for analysis, data recovery, database management, data migration (ETL, etc.).
- Will, there be parallel processing to maintain the system, or it will be partitioning.

According to Moody and Kortink (2000), steps of Data Warehouse creation is defined as it is presented below:

1. Develop EDM
2. Design Data Warehouse
3. Classify Entities
4. Identify Hierarchies

5. Design Data Marts – design star schema structures for each transactional data source in the data warehouse model.

One of the important data warehouse architecture is defined by Ralph Kimball (2013) which is a Dimensional Data Warehouse Architecture. Dimensional Data Warehouse is a database that is managed independently of an Operational database (OLTP - On-Line Transaction Processing databases), according to Kimball & Ross (2013). It is the favorite technique for the developers because it helps to maintain the analytical data which provides logical data for business users and fast performances on query running. It is straightforward and goal oriented (Kimball & Ross, 2013).

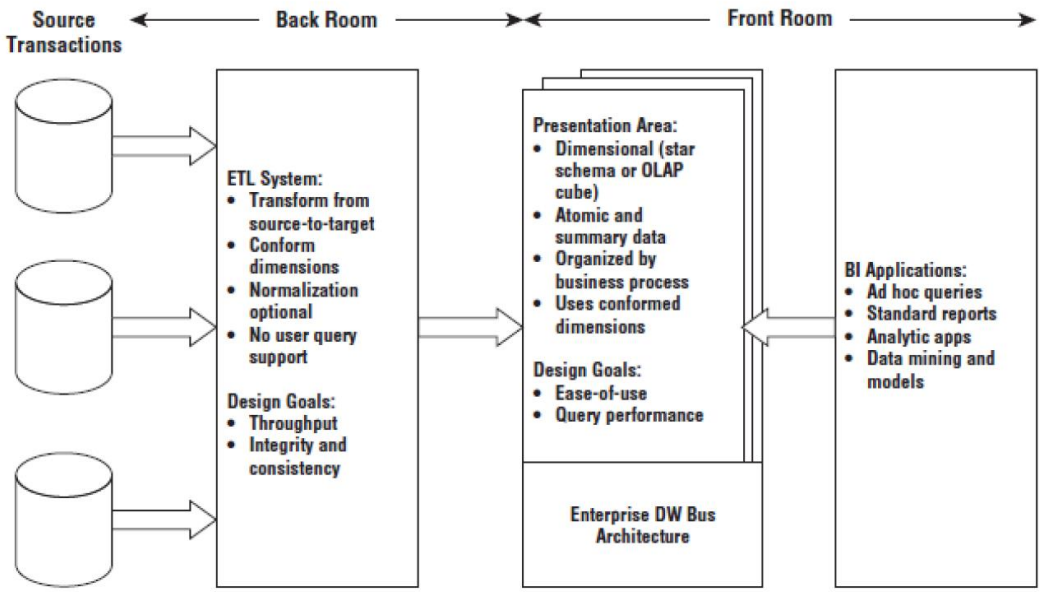


Figure 2.2: Kimball DW Architecture

Source: (Kimball & Ross, 2013)

On dimensional modeling, the Hierarchical structure has an important role. Because it helps to construct the core points of dimensional modeling by maintaining the relationship between each other in Master Data concept (Moody & Kortink, 2000). They are generally maintained in one to many relationships which are aligned all to the same direction.

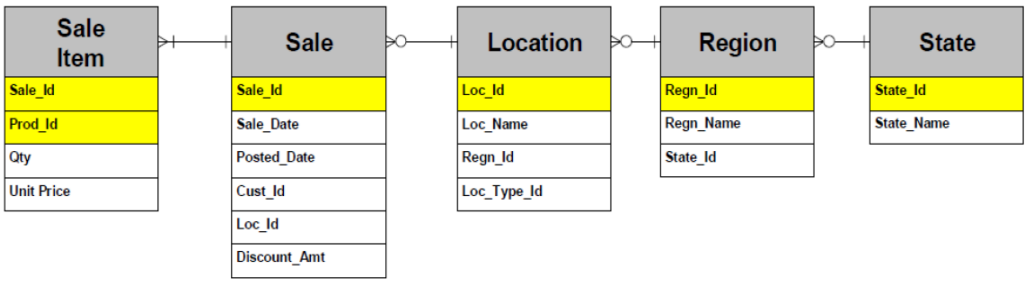


Figure 2.3: Hierarchy Sample

Source: (Moody & Kortink, 2000)

According to Moody & Kortink (2000), a hierarchy in an Entity-Relationship Model is formed as “State” at the top and “Sale Item” at the bottom. As it is presented in Figure 2.3; “State” is the parent of “Region”, “Region” is the child of “State”, “Sale Item” with “Sale Location” and “Region” are all child of “State” as well. In this case “Sale”, “Location”, “Region” and “State” are all parents of “Sale Item”.

As presented in Figure 2.2, Kimball’s Data Warehouse Architecture considers Data Source, ETL, Data presentation area and Business Intelligence Applications as the main components of the structure. In this concept, Data Source keeps the potential of combining useful and business-related data from different kind of business modules-resources. As an example; ERP, CRM or HRM systems are the most favorite ones. These data sources can be structured with relational databases with many tables or different independent databases with spreadsheets and plaintexts. (Ranjan, 2009)

The other concept ETL is defined as the process that consists of Extraction, Transformation, and Load which is the transporting-replicating amount of specific data from the source system to the data warehouse. ETL is very important when it comes to maintaining a good data warehouse with accurate historical or updated and maintenance of the date. To maintain it, it can also be created with full of process which is anti-duplication, character type correction, missing entry or misspelling. It is also very useful on master data change logging which provides the historical information at the Datawarehouse separated from the source system (Vassiliadis, Simitsis, & Skiadopoulos, 2003).

Another concept is the Data Presentation Area. According to Kimball & Ross (2013), it should be organized for the needs of business processes and their events. Data in the presentation area should be dimensional and business process centric. Its structure should be designed for the standard department needs, not individual department needs (Kimball & Ross, 2013). Hereafter, the concept star schema and online analytical process(OLAP) cubes take control of data structure. If the presentation area includes one of these structure designs, it is accepted that the dimensional concept is maintained on the Data Warehouse (Moody & Kortink, 2000).

Moody & Kortink (2000) identifies star schema as a basic building block which is used in Dimensional Modelling. There is a central table which is called “Fact Table” and the number of smaller tables which are called dimension tables are surrounding this fact table (Moody & Kortink, 2000).

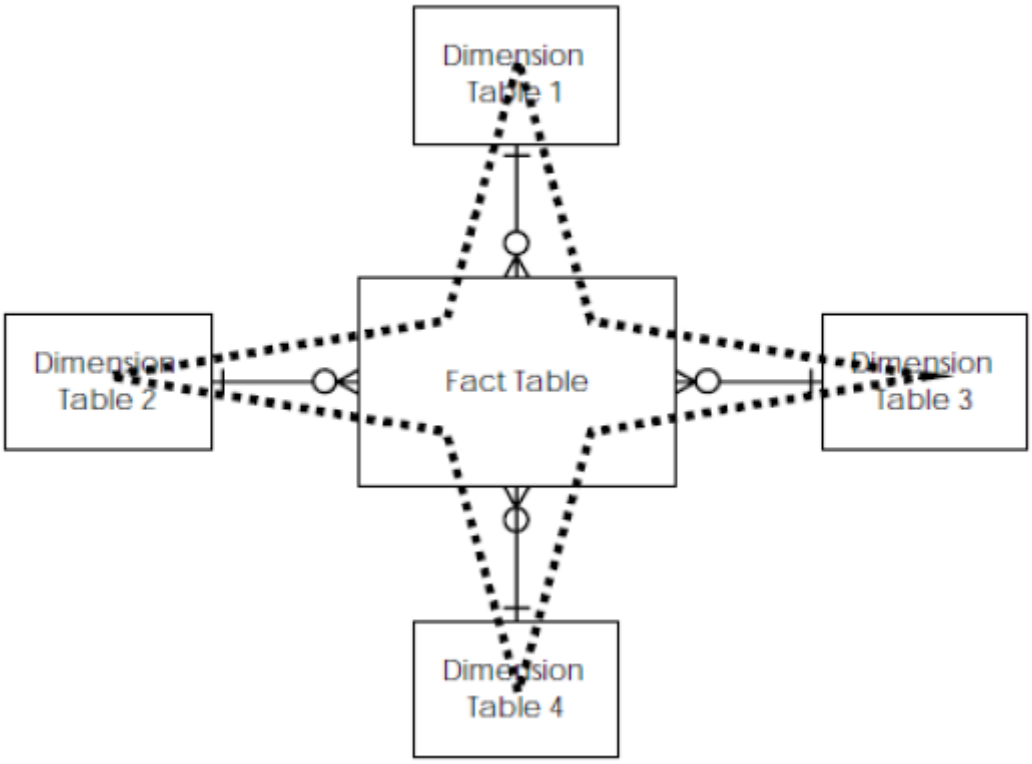


Figure 2.4: Structure of Star Schema

Source: (Moody & Kortink, 2000)

Primary Keys in all dimension tables should be maintained as concatenated in Fact Table. Because fact table is linked to other dimensional tables through those primary keys by one-to-many relationships. With this relationship, dimension tables provide more detailed master data for the element from the fact table when it is needed. In this case, the fact table is designed to store primary keys with measurements (quantity, amount, price) and dimension tables to store master data for each aggregated element from fact table (Moody & Kortink, 2000).

Both Star Schema and OLAP cubes have identifiable dimensions, but their implementation is made differently. When it comes to OLAP cubes, data is deposited with specially formatted indexes which are designed for dimensional data. On the other hand, OLAP Engine is performing pre-calculated summary tables by indexing strategies and other optimizations to provide superior query performances. Time and Hierarchies are the main navigation dimensions to slice and dice and drill down on OLAP cubes concept. OLAP techniques and tools can be used to work with data warehouses or data marts designed for sophisticated enterprise intelligence systems, as reported by Ranjan (2009).

According to Kimball & Ross (2013), the primary benefit of using star schema is that it reduces the number of tables in database and number of relationships between them. It is also stated that it either be implemented with special OLAP tools or using Database management Systems(DBMS).

Since Group Company has in-memory, column-oriented, relational database management system(SAP HANA), it would be much more beneficial to have a solution which is embedded in the system directly. SAP HANA is designed to replicate and ingest structured data from SAP and non-SAP databases, applications, and other systems in a faster way. It has three styles of data replication available which are trigger-based, ETL-based, or log-based and can be used depending on the source system and desired use-case. The replicated data is stored in random access memories (RAM) rather than loaded onto disk drive which is the the traditional method of application data storage concept. Because the data is stored in-RAM, it can be accessed in real-time by analytic and transactional applications that runs on top of HANA (Merz, Hugens, & Blum, Implementing SAP BW on SAP HANA, 2015). Derivation of real-time data will be much faster and effortless. On the other hand, new technology, in-memory, column-oriented, relational database management systems offers to create and manage actual database by integrated development environment (IDE) tools (Pattanayak & Koppolu, 2016).

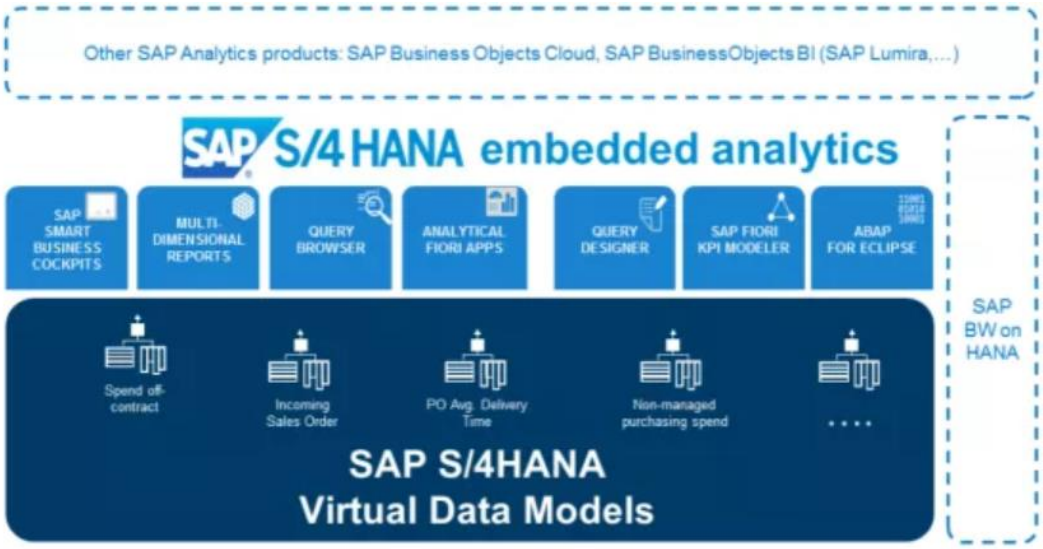


Figure 2.5: SAP S/4HANA

Source: (Pattanayak & Koppolu, 2016)

Creating Data Sources from ERP and establishing a connection between Info Providers can be handled by IDE tools (ABAP for Eclipse) as well. Regarding embedded connection feature, Info Providers can be loaded by real-time data acquisition without any data transfer load process regulation. (Darlak & Christensen, 2014)

2.2.2. Metadata and Optimization

On the second section, metadata will be covered. Importance of Metadata and its usage in Business Intelligence approach will be covered in this section. Metadata is data that keeps information about other data in the system. Examples for metadata can be filenames, author name, file sizes, etc. According to Inmon (2002), Document ID, Data of entry, Description, Source, Classification, Index Words, Purge Date, Physical Location Reference, Length, and Related References should be included as metadata.

Generally, metadata maintenance is handled by ETL suites and data warehouse systems. According to Boateng, Singh, Greeshma, & Singh (2011), metadata capturing and delivery are primary tasks of ETL.

They should be provided by ETL suites already through the processes. Also, data warehouse architecture should be available to maintain and provide metadata repository (Kimball & Ross, 2013).

According to Boateng, Singh, Greeshma, & Singh (2011), the major issues regarding with the optimization are presented as:

- The amount of data in the warehouse
- The growth rate of the warehouse and the expectation
- The number of parallel users
- The complexity of user queries
- Queries and other data access functions should grow linearly with the increase of the data warehouse

Dimensional approach on modeling provides extreme optimization and scalability options. Fact tables are getting bigger every day, and their enlargement increases the arguments about simplicity on data warehousing. As Kimball & Ross (2013) stated that the key factor of data warehousing is the simplicity itself. It enhances the fast maintenance and understanding of data for the business. It also increases the query performances and runs time statistics.

2.2.3. Business and Management Processes

Nowadays, studies on data warehouse projects show that proper management on BI and holistic concepts of BI maturity is critical. Usually, Bi solution life cycle includes implementation and support processes. BI solution implementation and support services can be in-source or out-source. Successful management of BI can be maintained with a close relationship of IT and business through the BI solution life cycle. That is why, Wieder & Ossimitz (2015) suggests that Implementing and retaining a BI solution in support of "effective problem and opportunity identification, critical decision-making, and strategy formulation, implementation, and evaluation" should not be outsourced entirely. It requires internal resources beyond the IT department. Wieder & Ossimitz (2015) also states that organizations can reveal the most benefits out of BI applications if proper management of BI is maintained in the organization. According to their perspective, the relationship between BI Management Quality, Information Quality, and Data Quality are described with bullets below:

- BI management quality is positively related to the quality of managerial decision making
- Information quality is positively associated with the quality of managerial decision making
- Data quality is positively related to information quality
- BI management quality is positively related to data quality
- BI management quality is positively related to information quality

According to Couture (2013) basic dimensions that can be expanded upon over time are presented below:

- Completeness - Source-to-target validation; Monitored and reported
- Timeliness – Defined Service Level Agreements7 (SLAs); Reviewed and approved; Monitored and reported
- Validity – Data profiling8; Data cleansing9; Inline data quality checks; Monitored and reported
- Consistency – Inline data quality; Trended; Monitored and reported

Data integration processes should be, according to Sherman (2014):

- Holistic – avoid costly overlaps and inconsistencies
- Incremental – more manageable and practical
- Iterative – discover and learn from each project
- Reusable – ensure consistency
- Documented – identify data for reuse, and create leverage for future projects
- Auditable – necessary for government regulations and industry standards.

According to Horakova & Skalska (2013), BI tools are more and more often focused on Corporate Performance Management(CPM) or lately it is called Enterprise Performance Management(EPM). CPM is designed for managing and analyzing general business efficiency. Key performance indicators are generally supervised both at the corporate level and at the department or division level. CPM provides metrics for verification of business efficiency development, and BI solutions can support the practical realization of CPM.

According to (Lingle, 1996), organizations using balanced performance measurement systems as the foundation for management perform, are better than those that do not have or use the technique. Because of that companies should at least have a minor knowledge of what is EPM and its advantages on management performance. According to the related importance, there is a massive gap in the literature about EPM and its aspects. There are not enough methodological approaches analyzed and proposed for EPM design and implementation.

As (Dresner, 2008) explains, anyone can approach EPM in multiple ways when different business cases require different approaches as well. This statement may be considered as a restriction on the topic, but it reveals the needed effort on EPM area which has a broad variability within its parameters. Current EPM approaches in the literature include the BPM framework by (Ariyachandra, 2008), the BPM lifecycle by (Zeng, 2006) and PDCA cycle from (Deming, 1986). These approaches are mainly focused on continuous improvement of EPM implementation. This study tries to extend the literature by using an exploratory case study of the building of embedded version of EPM solution on an in-memory, column-oriented, relational database management system. By describing this aspect, the gap which is originated from high variability within EPM and business relation parameters will be decreased (Span, 2009).

2.2.4. Reporting Tools

Kimball & Ross (2013) describes the term BI application as the variety of abilities provided to business users to control the presentation area for analytic decision-making purposes. A BI application can be:

- Ad hoc queries – as simple as an ad hoc query tool or as complex as a sophisticated data mining or modeling application
- Standard reports – Most corporate users will probably access the data through prebuilt parameter is driven applications and templates that do not require users to construct queries directly
- Analytic apps – Ad hoc query tools may be understood and used efficiently by only a minor percentage of the potential data warehouse business users

- Data mining & models – Some of the sophisticated applications, such as modeling tools, might upload results back into the operational source systems, ETL or presentation area

Obeidat, North, Richardson, & Rattanak (2015) mentions that the Business Intelligence applications are rarely used in a popular of search-based applications within a range of areas, such as Business, Security, Finance, Marketing, Law, Education, Visualization, Science, Engineering, Medicine, Bioinformatics, Health Informatics, Humanities, Retailing, and Telecommunications.

Currently, technology vendors are promoting data visualization and Business Intelligence tools more than ever. However, other communities support that successful business intelligence implementations need to have enough human sources with capable knowledge of BI (Few, 2007). At this point, it is essential to maintain the role of the user on the development of the BI solution. As Obeidat, North, Richardson, & Rattanak (2015) recommends that at least one mid-process of the development of report or dashboard solution should be dependent on the end-user. Because users can identify and control the driven data from developed report and dashboard. Relevancy of the data between users and business is very critical in this process.

Figure 2.6: Magic Quadrant for Analytics and BI Platform

Source: (Gartner, 2018)

There are a lot of business intelligence reporting software available on the market. Majority of these tools are focused on reporting and dashboarding. When it comes to input data for budgeting and planning and enterprise performance management solutions, the product range is very different and limited.

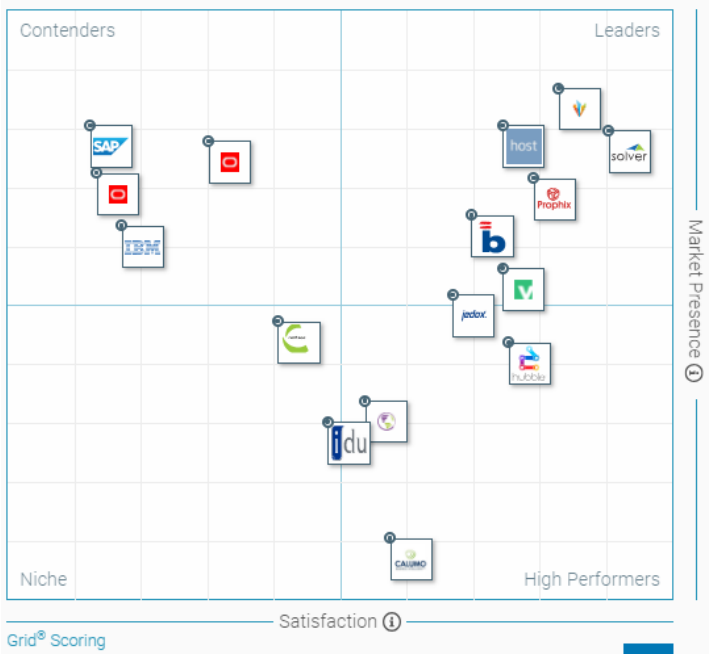


Figure 2.7: Magic Quadrant for EPM Tools

Source: (G2CROWD, 2018)

The comparison of five of these full-scale Enterprise Performance Management solutions are presented below (G2CROWD, 2018):

Compare	Product	Planning	Data Visualization	Data Analysis	Forecasting	Real-Time Data Updates	Collaboration	Custom Reporting	Budgeting
Compare	SAP Business Planning and Consolidation (BPC) 4.0 (17)	✓	✓	✓	✓	✓	✓	✓	✓
Compare	IBM Planning Analytics, powered by IBM TM1 3.9 (22)	✓	✓	✓	✓	✓	✓	✓	✓
Compare	Anaplan 4.3 (2)	✓	✓	✓	✓	✓	✓	✗	✓
Compare	SAP Analytics Cloud 3.0 (2)	✗	✗	✗	✗	✗	✗	✗	✗
Compare	Oracle Hyperion Planning 3.7 (19)	✓	✗	✓	✓	✗	✗	✗	✓

Figure 2.8: Comparison of Wide-Scale EPM Solutions

Source: (G2CROWD, 2018)

In this case, the market provides SAP BPC tool as an option for the artefact. SAP BPC (Business Planning and Consolidation) software delivers planning, budgeting, forecasting, and financial consolidation

capabilities in a single application. Adjustments on planning and budgeting are straightforward and customizable (G2CROWD, 2018).

The Actual ERP System of the group company is built on SAP S/4HANA software and HANA database. HANA is the in-memory, column-oriented, relational database that SAP SE is developed and marketed. S/4HANA is the ERP management suite that is built on operational database system by SAP SE as well (Kilaru, Sharma, Ayuluri, & Darla, 2016). In this case, we have two different options in SAP BPC solution which are BPC Standard and BPC Embedded which is more appropriate for our approach (Bekmezci, 2017):

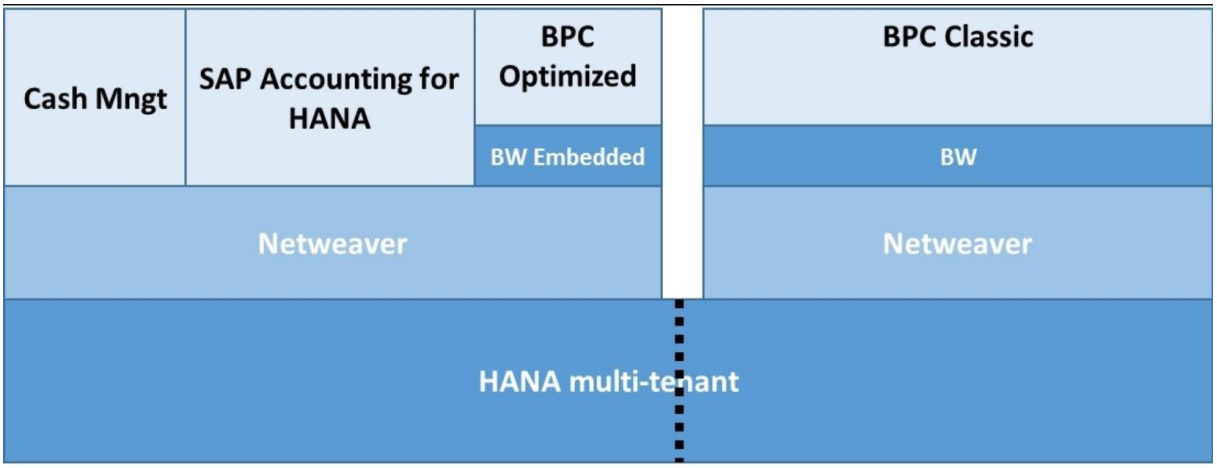


Figure 2.9: SAP BPC Solutions

Source: (Bekmezci, 2017)

BPC Classic is structurally half closed system. (Srinivasan & Srinivasan, 2015) It has its environment and does not have a direct connection with other providers. (Kilaru, Sharma, Ayuluri, & Darla, 2016) Briefly, it is constrained and does not provide real-time info provider connection from BW level. Using transactional info providers from BW is also needed because they will be helpful in providing actual data for the reporting and maintaining satisfactory assumptions. Classic BPC will be useful for Consolidation since it has a well-maintained consolidation structure which is reliable, updated, experienced and trustworthy compared to other solutions on the market (Kilaru, Sharma, Ayuluri, & Darla, 2016).

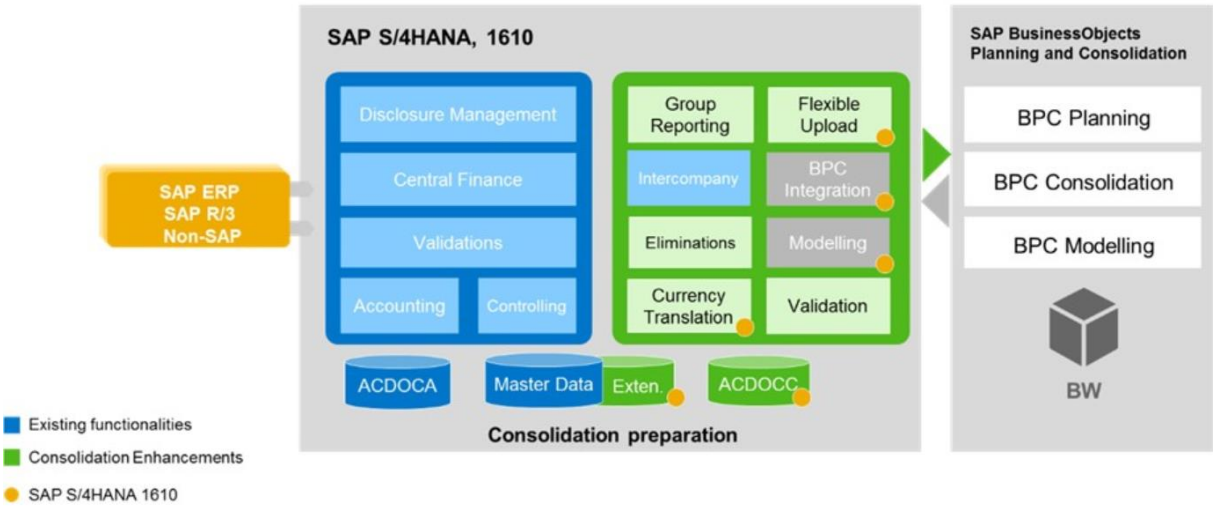


Figure 2.10: SAP BPC Approach on S/4HANA

Source: (Kilaru, Sharma, Ayuluri, & Darla, 2016)

With the S/4HANA optimized BPC approach, it will be easy to maintain all the data from ERP Tables which are fundamental in Hana Multi-Tenant database. In this case, ACDOCA is the main table to keep all the data (Pattanayak & Koppolu, 2016).

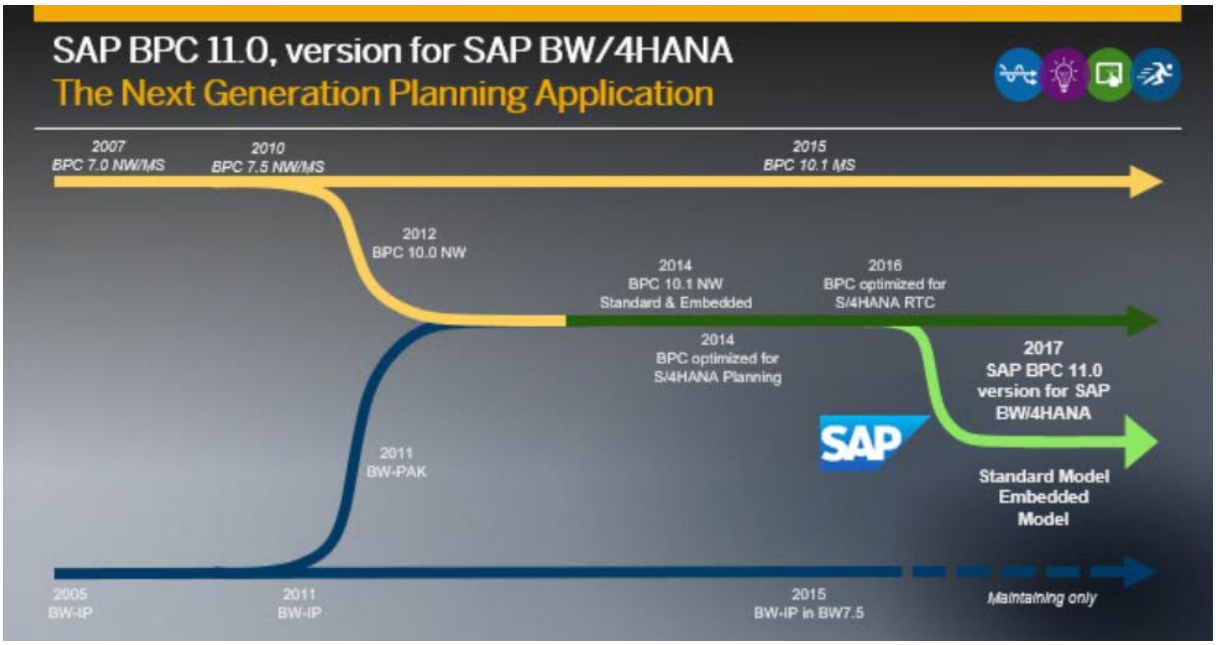


Figure 2.11: SAP BPC Version List

Source: (Bekmezci, 2017)

As it is shown in Figure 2.11, SAP BPC 10.1 NW version which optimized for S/4HANA Planning is also using old planning method of SAP BW which BI-IP approach as a support at the planning level (Kilaru, Sharma, Ayuluri, & Darla, 2016).

2.2.5. Development Methodologies

2.2.5.1. Waterfall

Waterfall methodology is one of the top software development approaches. It is designed as a sequential top-down flowing model that only continues to the next step when the step before is finished (Mahadevan, Kettinger, & Meservy, 2015). It is also described as a phase-oriented approach. Each phase is separated by defined quality gates to review the results of the previous phase and to authorize work on the subsequent phase. As Royce (1970) stated that waterfall methodology consists of implementation steps to develop a large computer program for delivery to a customer. Methodology is focused on milestones. It provides the separation of the project scope into end-to-end features.

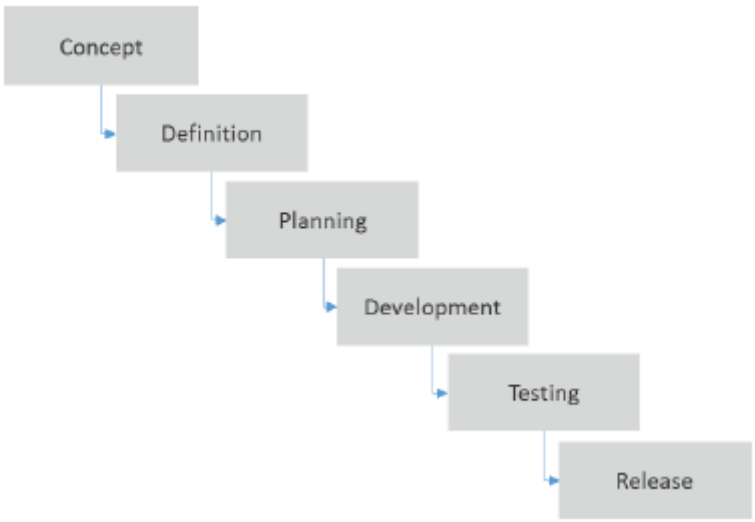


Figure 2.12: Waterfall Methodology

Source: (Grech, 2015).

Because of the structure, waterfall methodology is very open to adapt to shifting teams. Because it is forcing structured organization, control processes are fundamental. Key decision-makers who have a deep understanding of the system should be identified clearly for each step. Authorization structure of the project should also be identified by the other team members (Grech, 2015).

2.2.5.2. Agile

Nowadays, global scale projects and market conditions are pressuring for more dynamic environments and more flexible services when it comes to software development and implementation. Every day changing business systems are getting more common and flexible requirements with important changes during the project cycle are increasing day by day (Mahadevan, Kettinger, & Meservy, 2015). Agile supporters claim that changes and learning must take place throughout a project. It is designed to deliver increased efficiency, quality and project success (Ionel, 2009).

Some authorities define Agile as a lightweight approach to project management because of its iterative and change driven aspect. Like the name implies, agile stands for faster turnaround and the dynamic

ability to quickly adapt to required changes or developments. The agile approach has a habit of taking more people-centric perspective, implementing short, iterative phases which are called sprints. Sprints depend on ongoing feedback that continuously restructures and enhances the project design and plan (Mahadevan, Kettinger, & Meservy, 2015).

In 2001, seventeen authors released the agile manifesto which has finished the reign of traditional methodologies. Authors presented twelve principles about how the agile methodology should be practiced. Customer value, iterative delivery, intense collaboration, small integrated teams, self-organization, and small-continuous improvements were primary focuses (Mahadevan, Kettinger, & Meservy, 2015).

Principles (Beedle, et al., 2001):

1. Our highest priority is to satisfy the customer through the early and continuous delivery of valuable software
2. Welcome changing requirements, even late in development. Agile processes harness change for the customer's competitive advantage
3. Deliver working software frequently, from a couple of weeks to a couple of months, with a preference to the shorter timescale
4. Business people and developers must work together daily throughout the project
5. Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done
6. The most efficient and effective method of conveying information to and within a development team is a face-to-face conversation
7. Working software is the primary measure of progress
8. Agile processes promote sustainable development. The sponsors, developers, and users should be able to maintain a constant pace indefinitely
9. Continuous attention to technical excellence and good design enhances agility
10. Simplicity--the art of maximizing the amount of work not done--is essential
11. The best architectures, requirements, and designs emerge from self-organizing teams
12. At regular intervals, the team reflects on how to become more active, then tunes and adjusts its behavior accordingly.

Mahadevan, Kettinger, & Meservy (2015) states that In the Waterfall approach, responsibility is often gathered in the information systems function. In the Agile approach, shared project responsibility is assigned to the information systems function and business function areas. During the project, representatives from both functions are located accordingly. Agile team members cooperatively provide status reports daily. Iteration cycles which are called “Sprints” are only a few weeks long and involve customer and management feedback at the end of each session to mark the main points of the actual sprints. Requirements are continuously evaluated, and priorities are changed depending on customer involvement. Cooperative responsibility, daily reporting, multiple quick iterations, and volatility in requirements adjust the Agile methodology a significant organizational conversion (Mahadevan, Kettinger, & Meservy, 2015).

Ionel (2009) also suggests two main assumptions between agile and traditional methodologies:

- Traditional methodologies assume that customers are not capable of arranging their future requirements. In this case, developers need to provide extra functionalities to meet these unexpected future needs. This generally leads to the overdesigned system. Briefly, in traditional methodologies, developers require a detailed specification at the beginning of the project.
- Agile methodologies assume that both customers and developers don't have a complete understanding of requirements when the project starts. In agile methodologies, customers and developers need to learn together about the system requirements throughout the project. Basically, in the Agile development process evolves in time.

3. METHODOLOGY

In management theory, there is no uniform approach to define the central concept (Dresner, 2008). Because of that, the methodology of this study is related to the creation of organizational and economically associated enterprise performance management system to provide global wide enterprise performance analysis. Since the primary objective is the development of the methodology to create a new artefact to solve the problem of the company, design science research methods are the most appropriate elements to finalize this progress from top to bottom. At this point artefact building, approaches will be used to support the primary outcome.

This exploratory case study was exercised at the group company to reveal the success performances of the building of an Embedded Enterprise Performance Management software. This study aims to comply with the criteria of relevance, applicability, and specificity, as proposed by Cheng(1983). The integrity of organization research and practice also be taken into consideration as Loebbecke(2016) presented.

Presented Group Company is selected because the organization is trying to implement the first ERP level EPM solution with an embedded approach for the very first time. Because of that the process itself, vulnerable to propose challenges and difficulties. The company does not have any Business Intelligence department but has a big shared financial services team which is mainly working with spreadsheets.

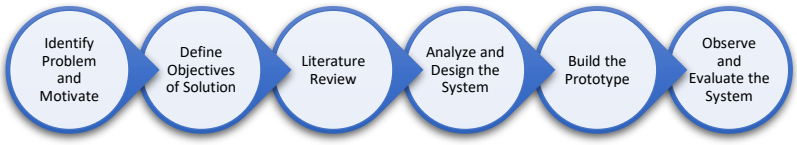


Table 3.1: Methodology Overview

According to methodology, the first three steps are already covered at Section 1 and Section 2 which are presented above. Remaining steps will be covered below:

3.1. ANALYZE AND DESIGN THE SYSTEM

Analysis of the system and work structure is done by the Technical Team and Project Team. Group Company wants to implement a planning and budgeting tool to accomplish business goals at a planning level, integrated with reviewed processes that can be more aligned with the benefits that can be achieved by the tool. SAP BPC optimized for S/4HANA is ready to interact and communicate with SAP S/4HANA using the same infrastructure, taking advantage of other tools as Analysis for Office. (Kilaru, Sharma, Ayuluri, & Darla, 2016). SAP BPC is also providing embedded consolidation which is considered as future development regarding this project.

Group Company is present in 21 countries with 28 fully owned companies.

This document is prepared to present all details regarding with all processes that are defined and major solution definitions related to Planning implementation. It is also included that how business processes are supported by the system.

The planning and budgeting process in scope:

- Project Revenues and Cost Planning
- HR Planning
- CAPEX Planning
- Other OPEX Planning
- Financial Statements Planning (Profit & Loss, Balance Sheets, and Cashflow)

The current planning model is based on Excel sheets. For each planning process, Group Company resources use Excel file where they can introduce the planning values. Those files are not integrated, and there are a lot of time-consuming processes. It is also mandatory that whenever there are changes, files need to be created/updated with a line (e.g., new account; new cost center). There is no master plan to connect between different planning sheets (i.e., don't have any business rule to link the Balance Sheet with P&L).

3.2. BUILD THE PROTOTYPE

Figure 3.1 represents the planning and budgeting process to be implemented in a functional perspective. It represents the concept of the planning model.

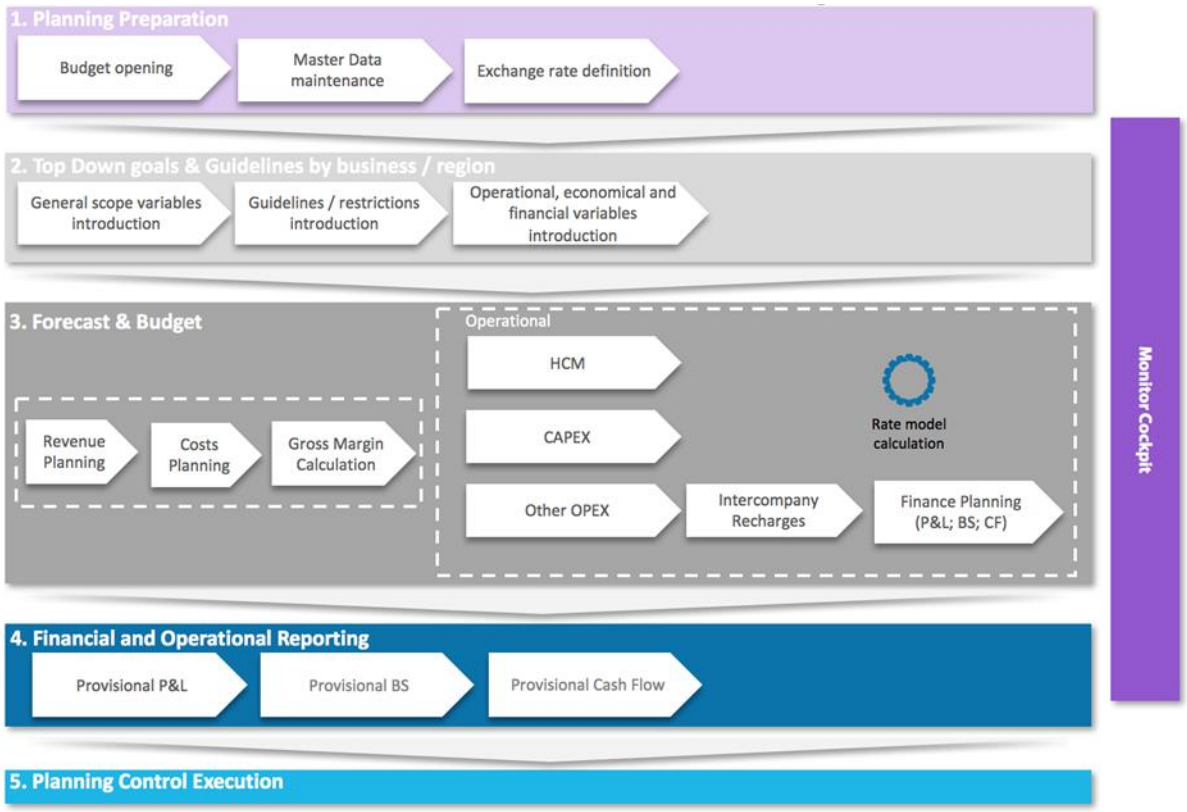


Figure 3.1: Macro Vision of Planning Process

The optimization of the current budget and planning process, as the premise of a new sustainable, scalable and transversal process for the group is split into five different steps:

1. **Planning preparation** → manual operations for a new planning cycle as define, adjust master data and exchange rate definition;
2. **Top-down goals & guidelines** → introduced by top-level Group Company administration/direction, it reflects the main goals of the organization;
3. **Forecast & Budget** → forecast calculation for the time periods of non-actual data of the current year and the introduction of planning data for operational and financial budgeting;
4. **Financial and Operational Reporting** → Reporting figures based on planning data introduced;
5. **Planning Control Execution** → Reports for Real vs. Planning control during the current year.

The planning and budgeting process will be done in two different perspectives:

- In S/4HANA;
- In BPC.

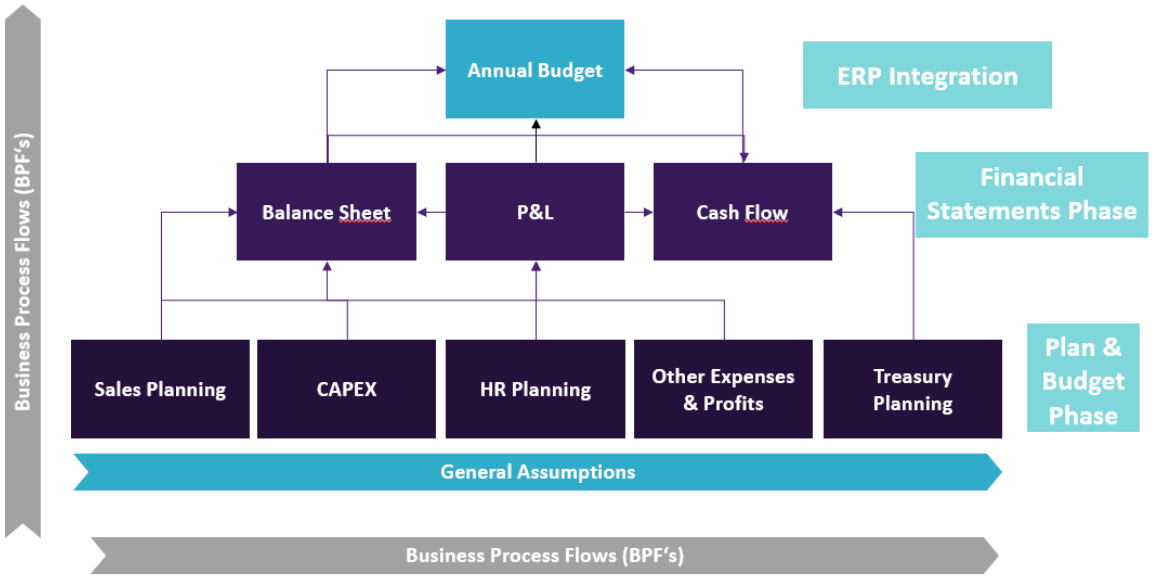


Figure 3.2: Planning and Budgeting Approach

The Project Revenue and Cost Planning and CAPEX Planning will be done in S/4HANA environment, using existing process planning tool on standard ERP. The HCM Planning, Other Opex (Cost Center planning), Intercompany Recharges and Financial Statements Model (Finance Planning) will be developed using BPC embedded tools. The picture below illustrates those two perspectives divided into three stages:

Table 3.2: Business Steps of Planning

B1 → Planning in S/4HANA

B2 → HCM Planning in BPC

B3 → Intercompany Recharges and Finance Planning in BPC

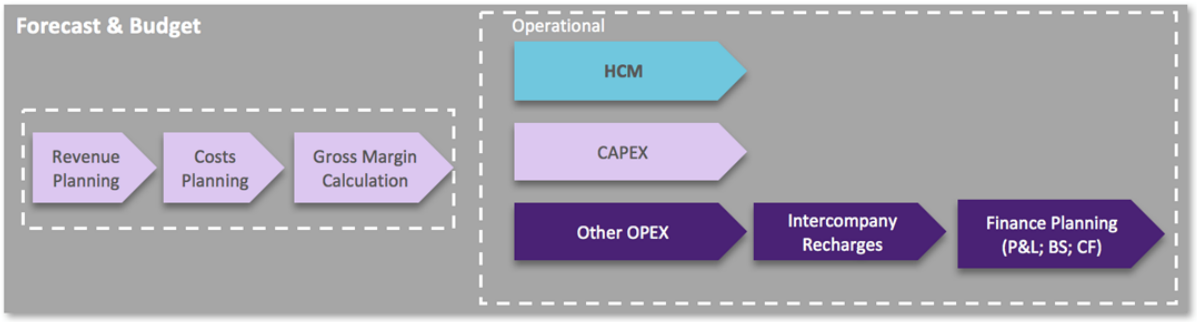


Figure 3.3: Forecast & Budget Process

Figure 3.4: The legend of Figure 3.3

3.3. Assumptions and Limitations

During the project, some assumptions were made to keep the efficiency of the process high and complexity low. Beside assumptions, there were limitations as well.

First, top-down goals and guidelines are delivered by business/region. These guidelines are taken as main process flow materials and given to the responsible users to execute the Planning and Budgeting processes.

On the other hand, the company is IFRS compliant regarding the accounting structure. During the meetings, the purpose of EPM and Planning & Budgeting clarified by the technical team to other shareholders. According to main goals and new performance strategy, by the request of the group company, accounting elements are adjusted from regular account numbers to collective "*999" account numbers. Because of that planning and budgeting structure is developed to be processed only in "*999" collective version of accounts. These accounts will be called Planning Accounts.

The last, intercompany recharges for planned data will not be calculated automatically by the system because of the unstructured financial environment of the Group Company. To maintain this, each related transaction will be inserted from Cost Center Planning and Profit Center Planning with their trading partner information accordingly.

As a limitation, SAP BPC 10.1 needed to be used. Because SAP BPC 11.0 was not released yet for the specific time of the project but was announced with all specifications.

3.4. OBSERVE AND EVALUATE THE SYSTEM

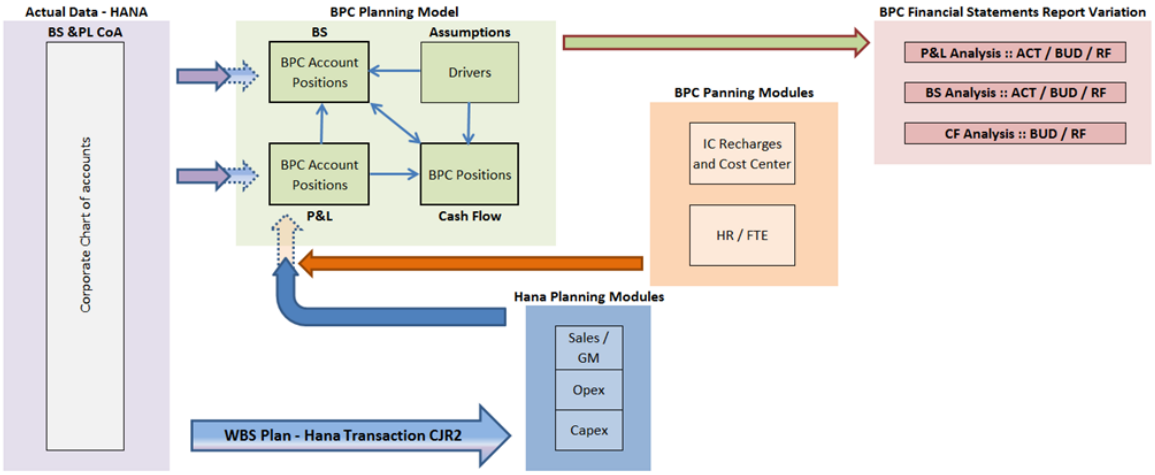


Figure 3.5: Functional Architecture of the Planning Solution

The activities follow the steps from Macro Planning Process Overview. The central planning process is the Revenue and Cost planning, that should be approved before going on to the next phases. Only the HCM and Financial Statement Model will have Business Process Flow to accomplish the planning process. This picture represents the concept for the overall planning process, but it will not be automatically replicated in the final solution.

3.4.1. Project Management Plan

Macro project management plan was designed based on waterfall methodology. Each phase is separated by defined quality gates to review the results of the previous phase and to authorize work on the subsequent phase.

Methodology is focused on milestones. It provides the separation of the project scope into end-to-end features. Waterfall was chosen because project needs are well structured, and guidelines are well maintained regarding business processes. After the analysis of development steps, creation of macro project plan finalized. It is observed that waterfall methodology can be applicable.

Each implementation steps presented on Figure 3.6:

EPM Implementation							
ID	Task Name	Owner	Progress	Start	Duration (workdays)	Finish	Status
1	EPM Implementation		100%	26-10	114	3-04	On Track
2	**Design**		100%	26-10	61	18-01	On Track
3	User rights and profiles		100%	26-10	11	9-11	On Track
4	OnSite analysis		100%	26-10	5	2-11	On Track
5	Documentation preparation		100%	2-11	5	9-11	On Track
6	Accounts customizations		100%	26-10	16	16-11	On Track
7	OnSite analysis		100%	26-10	10	9-11	On Track
8	Documentation preparation		100%	2-11	10	16-11	On Track
9	Opportunities customizations		100%	16-11	11	30-11	On Track
10	OnSite analysis		100%	16-11	5	23-11	On Track
11	Documentation preparation		100%	23-11	5	30-11	On Track
12	Specification approval		100%	30-11	16	21-12	On Track
13	Customer review		100%	30-11	5	7-12	On Track
14	Final changes and fixes		100%	7-12	5	14-12	On Track
15	Formal approval		100%	14-12	5	21-12	On Track
16	Acceptance Tests		100%	14-12	26	18-01	On Track
17	Preparation		100%	14-12	10	28-12	On Track
18	Customer review		100%	28-12	5	4-01	On Track
19	Final changes and fixes		100%	4-01	5	11-01	On Track
20	Formal approval		100%	11-01	5	18-01	On Track
21	**Development**		100%	21-12	32	4-02	On Track
22	Accounts customizations		100%	21-12	32	4-02	On Track
23	Change #001		100%	21-12	9	2-01	On Track
24	Development		100%	21-12	5	28-12	On Track
25	Technical tests		100%	28-12	3	2-01	On Track
26	Change #002		100%	21-12	16	11-01	On Track
27	Development		100%	21-12	10	4-01	On Track
28	Technical tests		100%	4-01	5	11-01	On Track
29	Integration tests		100%	11-01	5	18-01	On Track
30	Regression tests		100%	18-01	5	25-01	On Track
31	Acceptance tests walkthrough		100%	28-01	5	4-02	On Track
32	Opportunities customizations		100%	4-02	26	11-03	On Track
33	Change #003		100%	4-02	11	18-02	On Track
34	Development		100%	4-02	5	11-02	On Track
35	Technical tests		100%	11-02	5	18-02	On Track
36	Integration tests		100%	18-02	5	25-02	On Track
37	Regression tests		100%	25-02	5	4-03	On Track
38	Acceptance tests walkthrough		100%	4-03	5	11-03	On Track
39	User rights and profiles		100%	11-03	8	20-03	On Track
40	Setup		100%	11-03	3	14-03	On Track
41	Profile1 tests		100%	14-03	1	15-03	On Track
42	Profile2 tests		100%	14-03	1	15-03	On Track
43	Regression tests		100%	15-03	3	20-03	On Track
44	General acceptance tests walkthrough		100%	20-03	10	3-04	On Track

Figure 3.6: Macro Project Plan

3.4.2. Planning Preparation

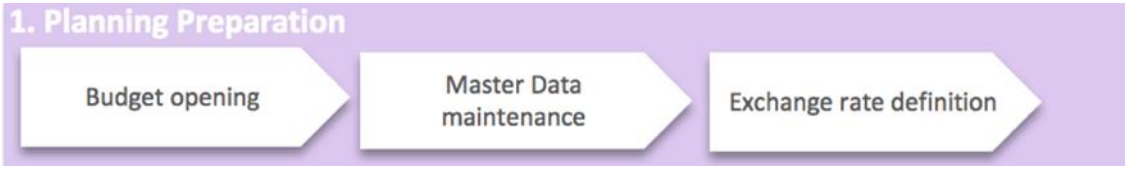


Figure 3.7: Planning Preparation

The planning process starts with a formal opening (can be done by email or by another internal process) to inform all participants that a new planning cycle is going to start. The responsible must assure the correct maintenance of Master Data involved in the process.

This task is necessary to maintain updated information in the BI system. Maintenance of master data for the BI system is already managed centrally and aligned with the master data of ERP. The advantage is precise since some master data dimensions are maintained in the SAP ERP system which BW system is embedded.

Master data maintenance is associated with synchronizing “master data” for the enterprise, enabling their application in the Budget and Planning process. The data will be maintained containing information used for BI purposes: group accounts, company and intercompany codes, transaction types and different business segments, WBSs, Cost Centers and Cost Elements, etc. Since the system

is embedded, SAP BW and SAP BPC will be using the data in real time. In this case, the source of master data maintenance is ERP itself by Standard Hana Views which are specifically designed for standard Characteristics (Dimensions) of BW 7.5 Embedded on S/4HANA (Pattanayak & Koppolu, 2016).

The exchange rates are also maintained for the planning year. It is important to have a currency type by planning year to see always the same figures in the reporting layer. For the currency exchange purposes, standard currency exchange method that is designed in the Analysis for Office is used. Reports are using exchange rates in ERP system automatically to convert any exchange rate to default exchange rate by considering date dimension in the report.

Any storing data, calculation, data retraction, transformation, and transportation will be held by standard BW and BPC elements which are presented below:

The designed unified model comprises a set of objects whose purpose is to store, relate, display and enable, manual input of data. To be able to interpret the future Planning & Budgeting technical model, it is useful to be aware of data warehouse technical concepts. The list below describes the most relevant and essential concepts that apply to a data warehouse system.

1) **Info Package** – An Info Package is a data loading scheduler where data from the source system is extracted from the data warehouse system.
2) **Transformation** – A transformation allows data consolidation, cleansing, and integration. It converts the fields of the source into the format of the target.
3) **Info Cube** – From an analytical perspective, an Info Cube describes a self-contained dataset, for example, for a business-orientated area. It is structured by a set of relational tables that follow the extended star schema where one fact table is surrounded by several dimension tables. It is used to store aggregated data for long periods of time, on which a user can execute queries.
4) **Info Object** – An Info Object is the smallest units of BI. It can be defined as a business evaluation object divided into characteristics (for example, customers), key figures (for example, revenue), units (for example, currency, amount unit), time characteristics (for example, fiscal year) and technical characteristics (for example, purchase number).
5) **Data Store Object** - A DataStore object, serves as a storage location for consolidated and cleansed transaction data or master data on a document (atomic) level.

   A Data Store object contains key fields (such as document number, document item) and data fields that, in addition to key figures, can also include character fields (such as order status, customer). The data from a DataStore object can be updated with a delta update into Info Cubes (standard) and other DataStore objects or master data tables (attributes or texts) in the same system or across different systems.
6) **Info Provider** - Info Providers are various metadata objects that can be seen as uniform data providers from the viewpoint of a query definition. Their data can, therefore, be analyzed uniformly. The type of data staging and the degree of detail or 'proximity' to the source system in the data flow diagram differs from Info Provider to Info Provider (Bekmezci, 2017).
7) **Multi-Provider** - A Multi-Provider is a type of Info Provider that combines data from some Info Providers and makes it available for analysis purposes. The Multi-Provider itself does not contain any data. Its data comes entirely from the Info Providers on which it is based. These Info Providers are connected by a union operation.

8) **Aggregation level** - Aggregation levels are used as Info Providers for planning: with an aggregation level, the system can model levels whose data can be changed manually using input-ready queries or automatically using planning functions. An aggregation level is set using a set of characteristics and key figures from the underlying Info Provider (Bekmezci, 2017).

9) **Planning Functions** – Planning functions are used to perform mass updates in planning scenarios such as copying actual to plan, deletions, and calculating revenue.

10) **Planning Sequences** – A Planning Sequence, is used to group planning functions. It allows saving groups of planning functions in a sorted sequence and executing groups of planning functions sequentially.

11) **Filters** - A Filter is an object that describes a multidimensional segment of data from a dataset. Filters are used in reporting, analysis, and planning, for example, to restrict data to a specific business area, certain product groups or specific time periods.

12) **Characteristics** – Characteristics are descriptive attributes used to describe entities such as Customers, Vendor, Materials, Plants, etc. These represent who, what, when, where scenario.

13) **Master Data Characteristics –** Master Data Characteristics are the characteristics that contain text, attributes and sometimes hierarchies. In general, master data will be loaded into these characteristics using a direct update from the source system (Merz, Hugens, & Blum, Implementing SAP BW on SAP HANA, 2015).

14) **Key Figures** – Key Figures are operational attributes, which indicates statistical measures such as amount related, Weight-related, a quantity related, etc. These represent how much and how many scenarios.

15) **Data Manager Packages** - All transactional data for performing a consolidation is sourced from the respective ledger (IFRS or Local) maintained in SAP ERP, according to each Scope and Version of Data selected. Initially, data will be extracted from the SAP ERP system into SAP BW staging info provider. Once this extraction process is completed, key users in SAP BPC, using a data manager package, will load data on demand.

    The data loaded from BW will also require creating BPC transformation and conversion files that will complete the process of transforming the general ledger data into the record with valid SAP BPC dimension members.

    SAP BW system will be the collector of data from different source systems: flat-files (for Out-SAP companies) and SAP ERP. Business routines, transformations and specific rules to the Group Company consolidation process will be applied throughout this process stage. SAP BW embedded will be the only system responsible for the BPC's data storage.

16) **Manual Journal entry** – Each application can have one journal entry template which can be used to enter financial transactions on manual type data sources in BPC. These can represent various journal entries such as reporting reclassifications, which are not natively part of the data loaded from G/L

17) **Manual Input Schedules** – While most transaction data would come via data obtained from the general ledger using a data manager package, there are additional unstructured data that would be required by the system to process a consolidation. In cases where loading data from BW or files does not make sense, then such data would be loaded using manual input schedules (Bekmezci, 2017).

3.4.3. Top Down Goals and Guidelines

Figure 3.8: Top-down Goals and Guidelines

At the step; top-down goals and guidelines, the responsible must communicate the general guidelines for the overall planning process reflecting the main goals of the organization. (Responsible: Board and BU Management)

3.4.4. B1-Forecast and Budget

3.4.4.1. Project Revenue and Cost Planning

Figure 3.9: Project Revenue and Cost Planning

The Revenue and Production Cost Planning (to obtain the Gross Margin) is the precedent planning process of overall process. The main dimension is the Project (PS Module). In planning model, the user must enter the respective figures using the standard layouts.

Considering the business function perspective, project revenue and costs planning will be executed in 3 different perspectives:

- Revenue and costs from existing projects - Existing projects on S/4HANA. They are planned in a monthly based for Fixed Fee projects. For other project types Project/Service managers must update planning quarterly (or according to the planning process defined calendar)
- Revenue from opportunities - Existing project opportunities on S/4HANA planned according to the planning process defined calendar
- Revenue for unidentified project plans - A bulk of future projects expected to occur during the planning years. This project type and structure will be created in S/4HANA

For 2018 budget Group Company decided to use only projects and opportunities.

The planning will be done directly in S/4HANA layouts. Also, standard excel layouts can be loaded into the system.

This solution will enable:

- 5-year plan: 1 budget year + 4 trends;
- Turnover and margin plan;

- Forecasts: can be done for a new budget cycle or during budget revision.

Main Structure in BW regarding with OPEX, P&L, Balance Sheet, Cash Flow planning includes structures below:

Three types of Data providers are used to maintain the store, union, and aggregate in SAP S/4HANA Embedded Business Warehouse. Each cube has either planning or reporting property enabled and each of aggregation regarding with those cubes are running planning functions to make the calculations by the limitation of filters which are also designed for them. Aggregation levels are getting created on Multi Providers which consist both actual data info cube and planning info cube underneath. Actual data info cubes are connected to real-time Hana views to show live data from ERP. Hana Views are views of ERP tables which store real-time data. These real-time data is also presented in the Info Cubes on live.

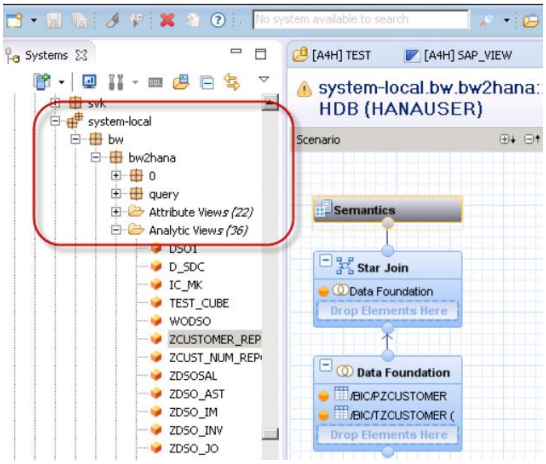
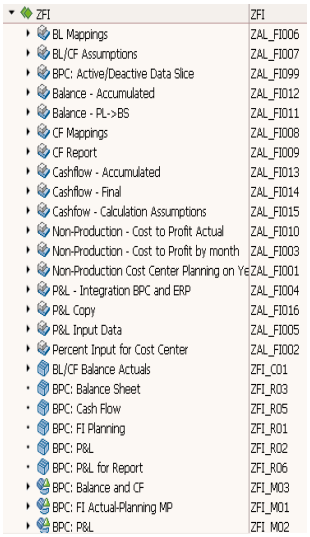


Figure 3.10: HANA Studio Overview

Planning cubes are open for planning for the budget inputs from Analysis for Office Input Reports which are presented below. Function Modules are used for any calculation on Aggregation levels. These Functions can be available to run from Analysis for Office Reports by assigning to buttons or links via macros. When the user clicks on these buttons, Planning Engines runs the functions on the aggregation level that they are assigned and make the calculated values visible on the reports on time. These calculated values are on the air if they are not saved by the save function.



OPEX, P&L, BS, CF

Description	Type	Technical ID	Planning Divison	Information	Input Planning Objects
ZFI	Info Area	N/A	N/A	N/A	N/A
BL Mappings	Aggregation	ZAL_FI006	BS, CF Planning	BL Account Mappings	ZFI_M03
BL/CF Assumptions	Aggregation	ZAL_FI007	BS, CF Planning	BL/CF Assumptions Input Aggregation	ZFI_M03
BPC:Active/Deactive Data Slice	Aggregation	ZAL_FI099	Data Slice	Time Data Slice for Planning	ZFI_M01
Balance - Accumulated	Aggregation	ZAL_FI012	BS, CF Planning	BL Accumulated Data	ZFI_M03
Balance - PL->BS	Aggregation	ZAL_FI011	BS, CF Planning	Data Transformation from PL to BS	ZFI_M03
CF Mappings	Aggregation	ZAL_FI008	BS, CF Planning	CF Account Mappings	ZFI_M03
CF Report	Aggregation	ZAL_FI009	BS, CF Planning	CF Reporting Data	ZFI_M03
Cash Flow - Accumulated	Aggregation	ZAL_FI013	BS, CF Planning	CF Accumulated Data	ZFI_M03
Cash Flow - Final	Aggregation	ZAL_FI014	BS, CF Planning	CF Final Data	ZFI_M03
Cash Flow - Calculation Assumptions	Aggregation	ZAL_FI015	BS, CF Planning	CF Assumption Data	ZFI_M03
Non-Production - Cost to Profit Actual	Aggregation	ZAL_FI010	OPEX	OPEX Cost to Profit Center Actual	ZFI_M01
Non-Production - Cost to Profit by month	Aggregation	ZAL_FI003	OPEX	OPEX Cost to Profit Center Actual by Month	ZFI_M01
Non-Production Cost Center Planning on Years	Aggregation	ZAL_FI001	OPEX	OPEX Cost Center Planning on Years	ZFI_M01
P&L - Integration BPC and ERP	Aggregation	ZAL_FI004	P&L Planning	P&L All Data Collection Aggregation	ZFI_M02
P&L Copy	Aggregation	ZAL_FI016	P&L Planning	Not Used	ZFI_M04
P&L Input Data	Aggregation	ZAL_FI005	P&L Planning	P&L Input Data	ZFI_M02
Percent Input for Cost Center	Aggregation	ZAL_FI002	OPEX	OPEX Percentage Input Aggregation	ZFI_M01
BL/CF Balance Actuals	Cube	ZFI_C01	BS, CF Planning	BS, CF Planning Actuals from FI Data Source	ZFI_M03
BPC: Balance Sheet	Cube	ZFI_R03	BS, CF Planning	Balance Sheet Cube	ZFI_M03
BPC: Cash Flow	Cube	ZFI_R05	BS, CF Planning	Cash Flow Cube	ZFI_M03
BPC: FI Planning	Cube	ZFI_R01	OPEX	OPEX Cube	ZFI_M01
BPC: P&L	Cube	ZFI_R02	P&L Planning	P&L Cube	ZFI_M02
BPC: P&L for Report	Cube	ZFI_R06	P&L Planning	P&L Cube for only Reporting(not input ready)	ZFI_M02
BPC: Balance and CF	Multi Provid	ZFI_M03	BS, CF Planning	BS and CF MP(Details are below)	ZFI_M03
BPC: FI Actual-Planning MP	Multi Provid	ZFI_M01	OPEX	OPEX MP(Details are below)	ZFI_M01
BPC: P&L	Multi Provid	ZFI_M02	P&L Planning	P&L MP(Details are below)	ZFI_M02
BPC FI Cost Center Plan Comments(Direct Update)	DSO	ZFI_O01	OPEX	OPEX Input Planning Comments	N/A

Figure 3.11: Main Info Providers of OPEX and FI Functions

Each Planning cube has a standard data slice which is supported by an external function. This function enables and cancels the data slice of the planning cubes with the help of “run command” from planning functions. Each planning sequences have these activate and deactivate planning functions at the begging and end of planning sequence.

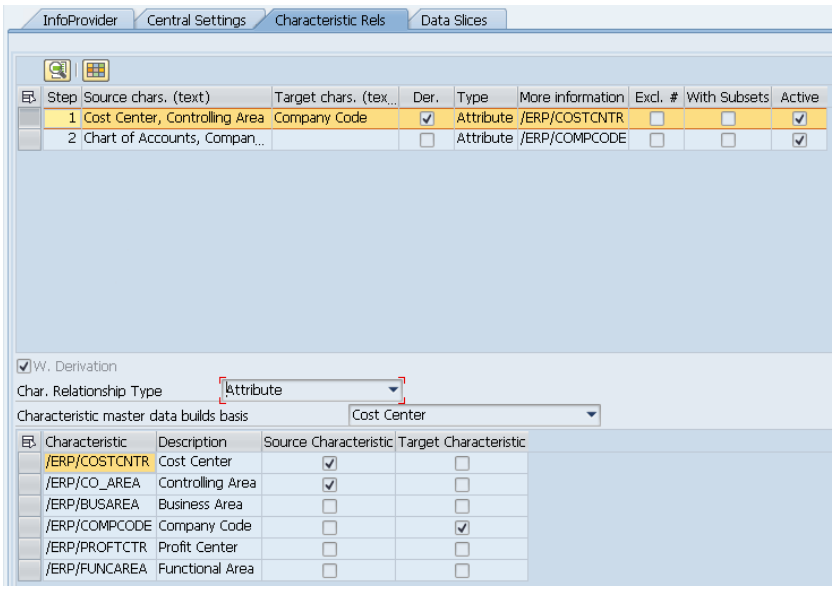


Figure 3.12: ZFI_R01 Characteristic Relationships

Number	Description	Active	Type	Type	Name of Exit Class
1	Actual Data	☑	E	Exit	Z_DS_FI
2	0002	☐	S	Selection	

Figure 3.13: Data Slices

These planning functions are presented at Annexes – Figure 8.6, Table 8.1 and Table 8.2. Purpose of the data slice is to block the time interval which is out of the planning period. On Figure 3.13, Data Slice can be identified clearly. When months before June has a purple color and not open to plan, the rest

of the year has a white color and data cells are open to plan. The reason is, the system is designed to work with a planning period of June 2017. So, a data slice is blocking the months before June which are supposed to be realized already and not needed to be planned anymore. The configuration of the planning period is covered on Preliminary Processes section and presented in Figure 3.17.

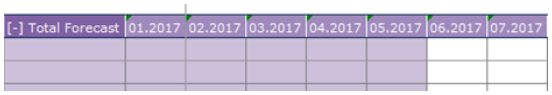


Figure 3.14: Data Slice of planning for June 2017

3.4.4.2. Preliminary Processes

To maintain all functions of Planning and Budgeting Structure, there are some preliminary processes defined for the user to be finalized before starting the planning process. As they are presented below, processes are very crucial that it can change the functionality of the whole system with any wrong adjustment.

Step nº	Step description	Transaction code or Technical Name of Workbook
1	Create Category	(Configuration)
2	Insert period and default revenue account for each category	ZBPC001
3	Insert actual account with mapped *99999 accounts	ZBPC003
4	Insert mapped revenue accounts of each account	ZBPC004
5	Check Accounts not mapped	ZWB_FI_04

Table 3.3: Preliminary Processes Steps

First, all the planning accounts must be created individually in ERP to be considered as master data. After that, it will be needed to update the planning account hierarchy using the sap transaction “OB58”. This hierarchy will be used on AFO reports as an account structure.

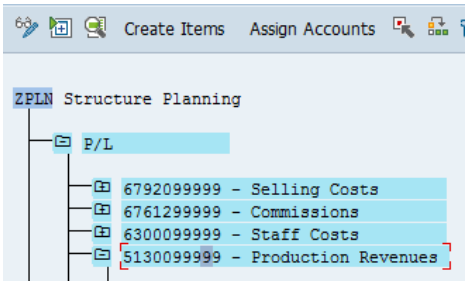


Figure 3.15: Planning Account Structure for P&L with *999 Planning Accounts

Second, “Category” which is the identifier between real data and planning data should be created in ERP. Transaction code SPRO needs to be used to create a category. Below, system categories can be observed clearly. “PLAN01” is newly created for defining planning data.

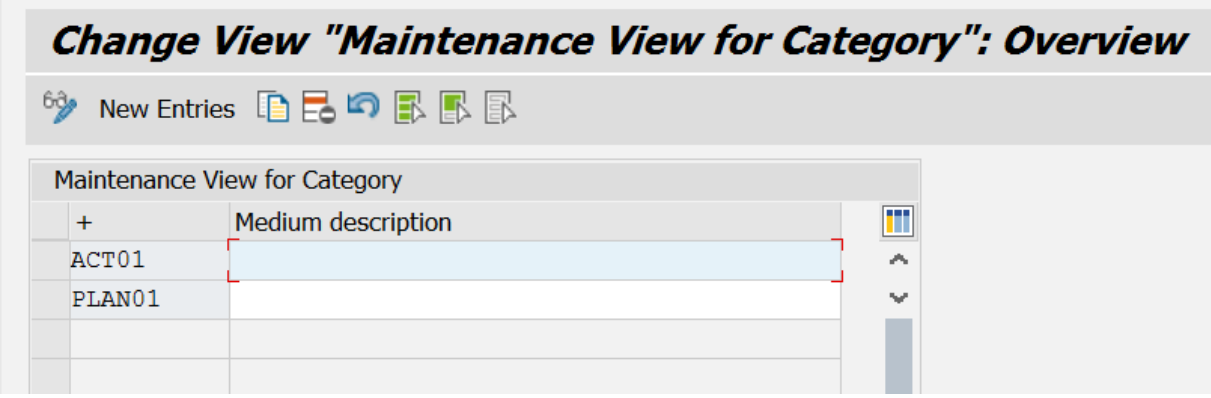


Figure 3.16: Categories in SPRO

Then the planning period needs to be addressed in the system through custom transaction code "ZBPC0003".

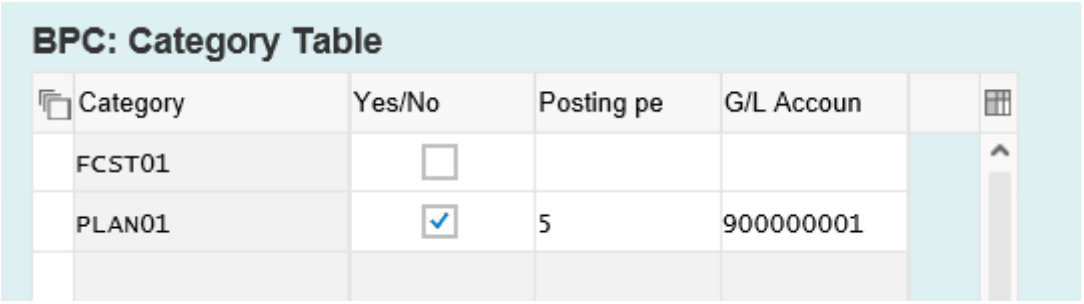


Figure 3.17: Planning Period for Category in SPRO

After that mapped *999 planning accounts need to be introduced in the system with their related actual accounts. For this function, the custom table is created with custom SAP transaction code "ZBPC0003".

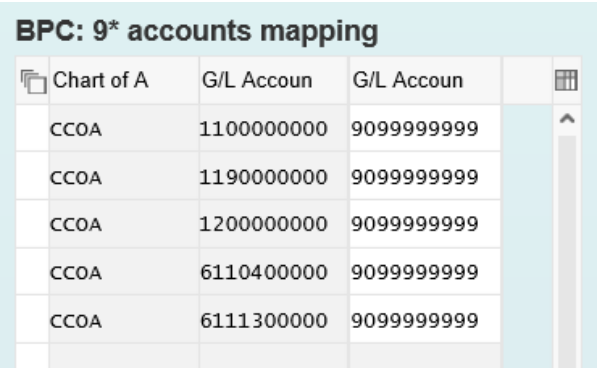


Figure 3.18: Actual Accounts to *999 Planning Accounts mapping

To have a checkpoint, "AFO Report Accounts not Mapped" is created advance. It will show all the accounts that have actual values to the year selected and will be possible to check which accounts are still not mapped.

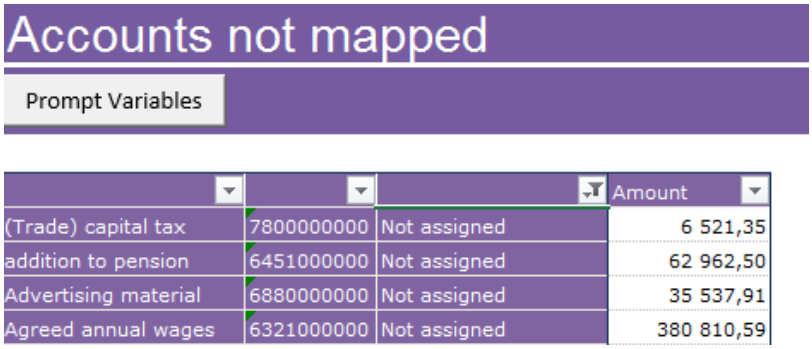


Figure 3.19: Accounts not Mapped AFO Report

At last every actual revenue account for each actual cost accounts needs to be addressed in the custom transaction code “ZBPC0004”. If the cost account is not mapped to any revenue account on this table, the revenue account of that account will be assumed as the same revenue account which is designated for the category itself as it is presented in Figure 3.17.

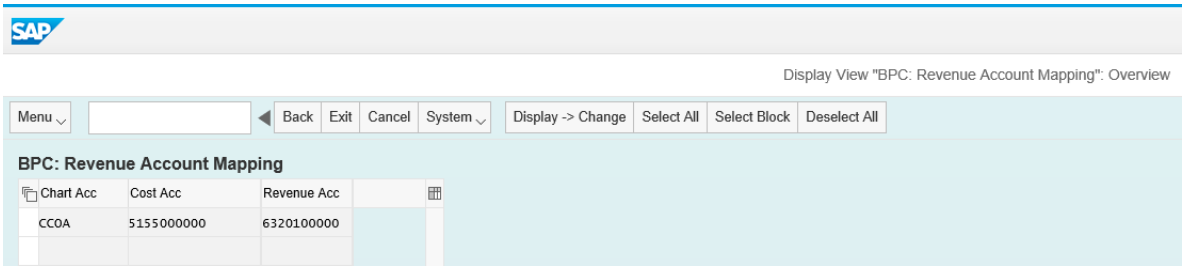


Figure 3.20: Revenue Account Mapping

3.4.4.3. CAPEX

For CAPEX two different approaches will be taken:

- Investment Projects
- Investment Projects to fixed assets.

The CAPEX planning will be done by different users in S/4HANA at WBS level. This process already exists in S/4HANA (ERP) environment. This functionality allows the user to plan values by cost element for a project in ERP itself. This is an ERP standard process that is designed to keep planned costs in the FI module of ERP.

SAP FIORI APP: S/4HANA Menu

SAP TCODE: CJR2

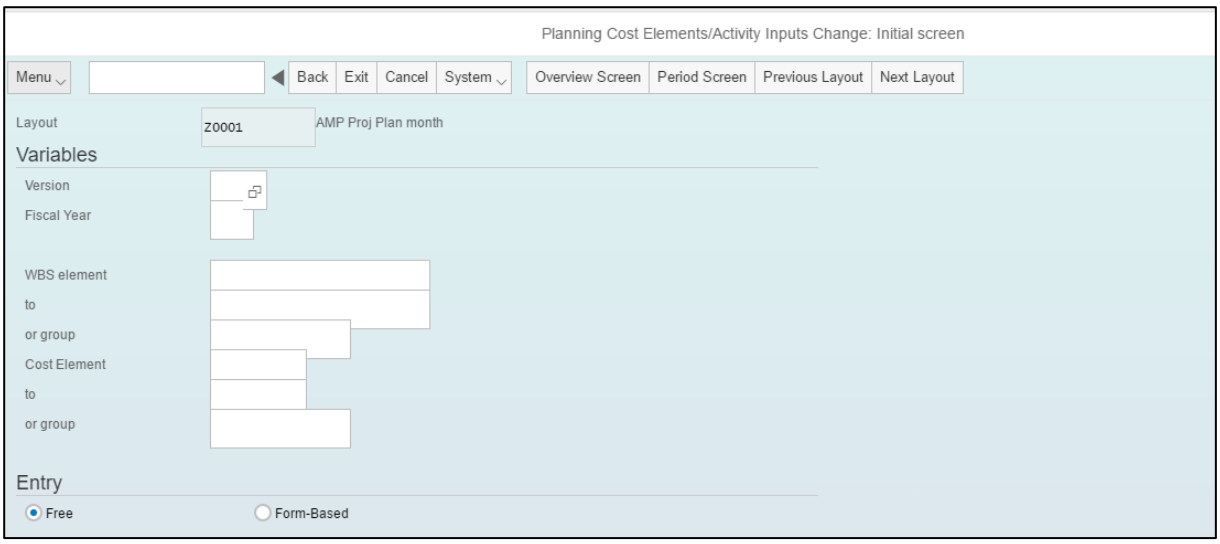
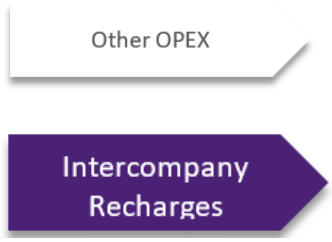


Figure 3.21: CJR2 CAPEX Planning Input Screen on S/4HANA

3.4.4.4. OPEX Planning



Other OPEX can be planned by using a specific Analysis for Office Input Report. This layout will be developed in BPC side because the standard Cost Center Planning in S/4HANA doesn't have Trading Partner dimension available.

The user must insert the respective costs of his entity by year, and the system will split by budget months, but the user can change monthly.

Step nº	Step description	Transaction code or Technical Name of Workbook
1	Load actual and insert actual year forecast or 5 years' trend.	ZWB_FI_01
2	Insert Actual Year Forecast and Budget Year by month	ZWB_FI_05
3	Insert percentages to change budget years.	ZWB_FI_02

Table 3.4: OPEX Planning Applicable Steps

As the project planning is an important operation at a project level, because it gives the project manager an overview of the costs, different versions will be available to do the planning. Therefore, history will be available with all the changes which can be compared at any time. The currency is fixed as "EURO" by default.

Analysis for Office Reports				
Analysis for Office Report ID	**Analysis for Office Report Description**	**Report Element**	**Related Planning Sequence/Function ID**	**Related Planning Sequence/Function Description**
ZWB_FI_09	BS/CF - Assumptions	Standard AFO Functions	N/A	N/A
ZWB_FI_07	BS/CF - Mapping Tables	Standard AFO Functions	N/A	N/A
ZWB_FI_12	CF - Mapping Tables	Standard AFO Functions	N/A	N/A
ZWB_FI_13	CF/BS - CashFlow and Balance Sheet Report	Fill CF&BS Table	ZPS_FI09_001	BPC: Cash Flow copy from PL
	CF/BS - CashFlow and Balance Sheet Report	CF Calculate	ZPS_FI09_002	BPC: Cash Flow Adjusted Calculation
ZWB_FI_04	FI - Check Accounts not mapped	Standard AFO Functions	N/A	N/A
ZWB_FI_01	FI - Cost Center Planning	Load Actual	ZPS_FI01_002	BPC: Copy Actual
		Calculate - Calculate Budget?	ZPF_FI01_001	Budget Calculation
		Calculate - Calculate Budget?	ZPF_FI01_002	BPC: Calculate Trend Years
		Forecast Distribution	ZPS_FI01_003	BPC: Monthly Distribution
		Forecast Year	ZPF_FI01_004	BPC: Year Aggregation
		Budget Distribution	ZPF_FI01_005	BPC: Monthly Distribution Year + 1
		Budget Year	ZPS_FI01_006	BPC: Year Aggregation Year+1
ZWB_FI_02	FI - Increase Percentage (Cost Center Plan)	Standard AFO Functions	N/A	N/A
ZWB_FI_05	FI - Profit Center Planning	Same as "ZWB_FI_01"	Same as "ZWB_FI_01"	Same as "ZWB_FI_01"
ZWB_FI_15	P&L - Actual and Plan	Standard AFO Functions	N/A	N/A
ZWB_FI_06	P&L - Input Template	Full Integration	ZPS_FI04_001	BPC: PL - Full Integration
		WBS Integration	ZPS_FI04_002	BPC: PL - WBS Integration
		CC Integration	ZPS_FI04_003	BPC: PL - Cost and Profit Integration
		HR Integration	ZPS_FI04_004	BPC: PL - HR Integration
		Copy to Adjusted P&L	ZPS_FI04_005	BPC: PL - Copy PL to Adjusted PL
ZWB_FI_08	P&L - Report	Standard AFO Functions	N/A	N/A
ZWB_HR_02	BPC: HR P&L Reports	Standard AFO Functions	N/A	N/A
ZWB_HR_01	BPC: HR Planning	FTE Check	ZPF_HR01_005	BPC: FTE Distribution 1
		Planning HR	ZPS_HR01_002	BPC: HR Planning Sequence
ZWB_HR_03	BPC: HR Planning(With Salary Increase)	Standard AFO Functions	N/A	N/A

Figure 3.22: AFO Reports and Planning Elements

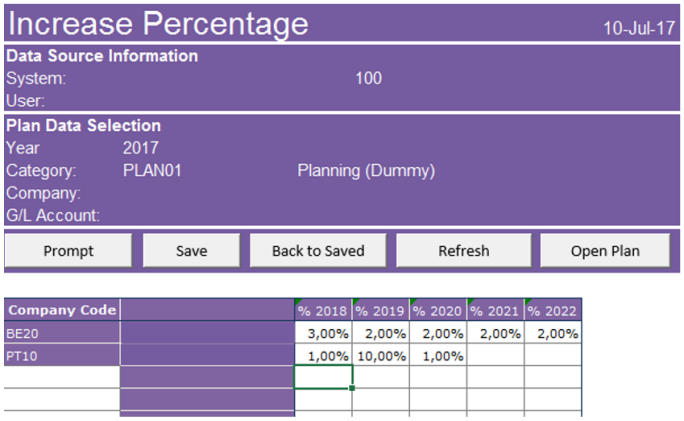


Figure 3.23: Increased Percentage Input Enabled AFO Report

Increased Percentage Input Enabled AFO Report enables the user to insert percentage changes for each company according to their trend year aggregations. According to these percentages, planned data for 2017 will be automatically calculated to the trend years (2018-2022) with the increase.

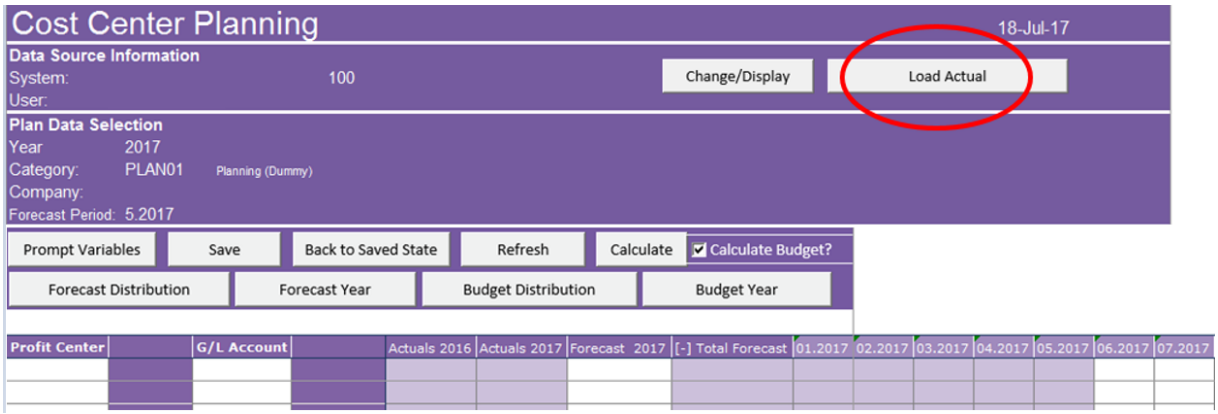


Figure 3.24: Cost Center Planning Input Enabled AFO Report

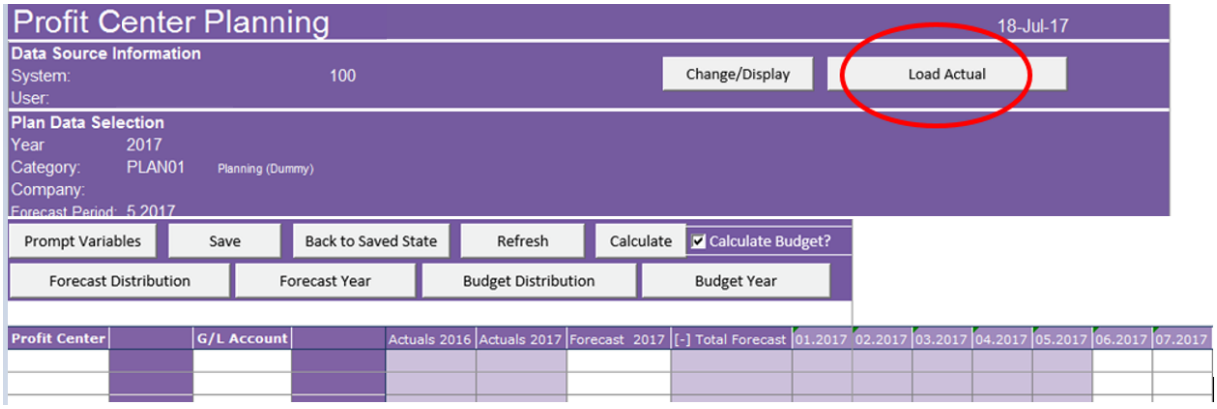


Figure 3.25: Profit Center Planning Input Enabled AFO Report

Regarding the functionality of both reports, Cost Center Planning Input Enabled AFO Report and Profit Center Planning Input Enabled AFO Report has the same settings. The only difference is Cost Center and Profit Center relations. On Figure 3.24 and Figure 3.25, screenshots of both reports are presented partially to maintain data privacy regulations of the group company. In the normal view, there is also Trading Partner Column next to the G/L Account to maintain intercompany relations regarding the transactions. Macro buttons that are visible on reports has an objective to run planning sequences or planning functions in the background according to the command of the user by "click". These planning functions are also presented in Figure 3.22 with their technical names and descriptions. SAP screenshots and FOX formula codes of these PS and PF can be found between at Annexes – Figure 8.7 to Figure 8.65, Table 8.1 to Table 8.13. Purposes of macro buttons are also summarized below to provide a better overview of the report:

Change/Display	Changes the status of AFO report from reading only to input planning enabled. This is a standard command of AFO. No PS or PF is assigned for this button
Load Data	This button needs to be initiated to see the actuals on *9999 accounts, when function initiated, amount of actual data will be seen on the related columns. The user can Insert amount changes for each cost center according to their trend year, and account aggregations on the input enabled cells.
Prompt Variables	Opens the prompt window (Figure 3.26) that enables you to choose the user-specific starting filters of the report such as Budget Year, Legal Entity, Division, etc. This is a standard command of AFO. No PS or PF is assigned for this button
Save	Saves the data that is inputted on the input enabled cells into the database. This is a

	standard command of AFO. No PS or PF is assigned for this button.
Back to Saved State	It returns the state of report back to the last saved state. This is a standard command of AFO. No PS or PF is assigned for this button
Refresh	This button refreshes the report data with the server data. This is a standard command of AFO. No PS or PF is assigned for this button
Calculate – Calculate Budget Checkbox	To calculate the trend years according to planned percentages which are inserted in the "Increased Percentage Input Enabled AFO Report" workbook, click on "Calculate" button. "Calculate Budget" option is for changing the calculation method from actual year data to forecasted actual year data.
Forecast Distribution	It distributes the data in the Forecast 2017(Year is dynamic it can change according to the Budget Year Settings) to the 2017 forecast months (06,07,08,09,10,11,12) divided equally.
Forecast Year	It calculates the Forecast 2017 data by doing the summation of the forecast months (06,07,08,09,10,11,12) of 2017(Year is dynamic it can change according to the Budget Year Settings).
Budget Distribution	It distributes the data in the Budget 2018(Year is dynamic it can change according to the Budget Year Settings) to the 2018 budget months (whole months) divided equally.
Budget Year	It calculates the Budget 2018 data by doing the summation of the budget months (whole months) of 2018(Year is dynamic it can change according to the Budget Year Settings).

Table 3.5: Profit Center Planning Input Enabled AFO Report Macro Buttons and Functions

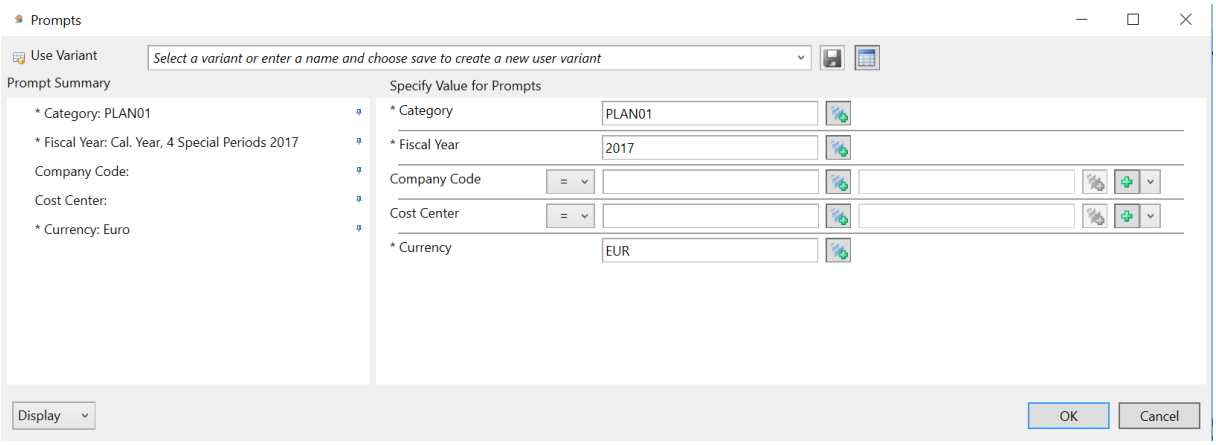


Figure 3.26: AFO Report Prompt

3.4.5. B2-HCM Planning

Input will be done via layouts in BPC Analysis for Office. The group currency "EUR" will be used for all inputs. The Human Resources planning will be done by the Finance team with the support of Functional Managers with Local HR Directions. Finance Team will send empty templates to Local HRs and Functional Managers. After that, filled templates will be collected, and BPC inputs will be done by the Finance Team.

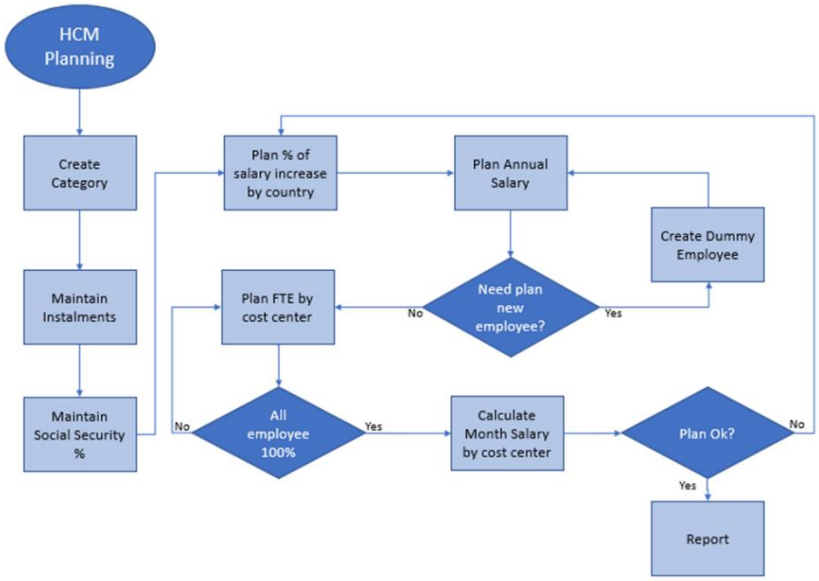


Figure 3.27: HCM Planning

Regarding with HR actual data, all the data is provided by HANA Views. Important BW elements and their data sources are presented below. Annexes – Figure 8.1 is showing the main structure of HANA View. View consists joins, unions and aggregations of ERP or custom HANA based tables. Annexes –

Figure 8.2 to Figure 8.4 are showing the main details of SAP BW structure of Info Cubes and their design1.

ZEMPLOYEE: CV_EMPLOYEE_DM

/ERP/COSTCNTR: CV_COSTCENTER_DM

ZHR_V02: CV_HR_01 (Test)

ZHR_V01: CV_HRSALARY TOTAL (Real)

All HR HANA Views:

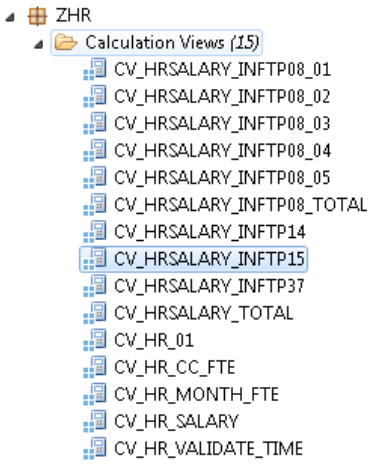


Figure 3.28: All HR HANA Views for Actual Data

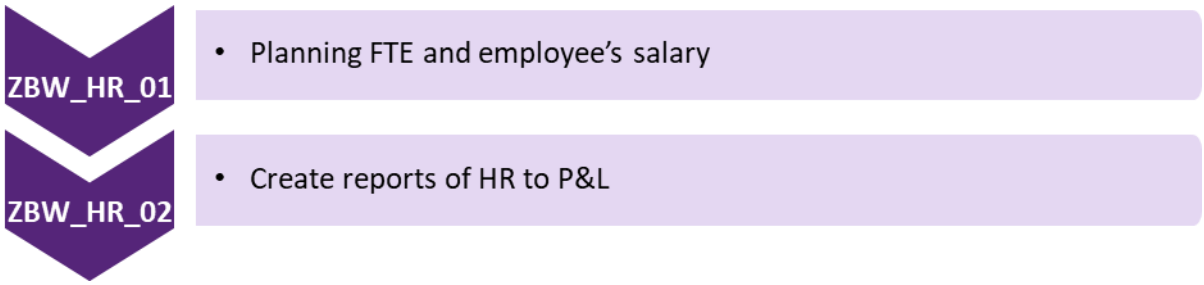


Figure 3.29: HR-HCM Planning Applicable Steps

FTE – Employee Input Enabled AFO Report allows the user to plan employee's salary and FTEs. On this report, the actual FTEs for the actual year, by the employee, will be shown as well. It is possible to change the planning data, by filling the input enabled cells. The months that will be available for input, dependent on the planning period that is assigned. So actual months before the planning period are locked to plan. Planning of FTEs for the next year is fully available without any lock.

[1] Because of the data and metadata privacy limitations from the business side, details of used Info Cubes and HANA Views are not presented in the annexes. Example structures from the system is presented to cover all functionalities which are used.

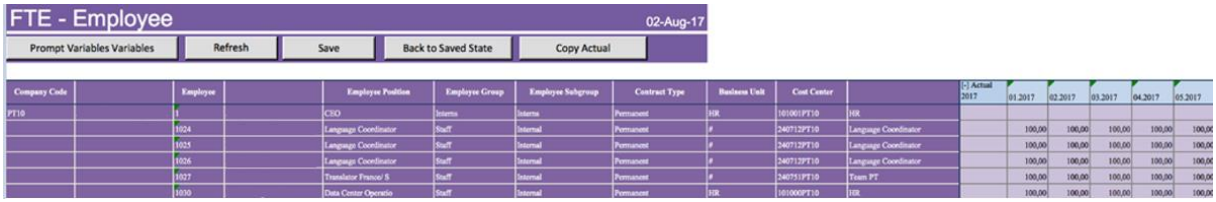


Figure 3.30: HCM Planning FTE - Employee Input Enabled AFO Report

HCM Planning Annual Salary - Employee Input Enabled AFO Report allows the user to plan every detail of the cost of an employee including salary, benefits, promotions and, etc. “Planning Sequence” button will run the planning sequence calculation presented in Annexes – Figure 8.54 that is calculating the total cost for each employee. Involved planning functions are also presented in Annexes – Figure 3.22 with their technical names and descriptions. SAP screenshots and FOX formula codes of these planning sequences and planning functions can be found at Annexes – Figure 8.51 to Figure 8.67 and Table 8.13 to Table 8.18.

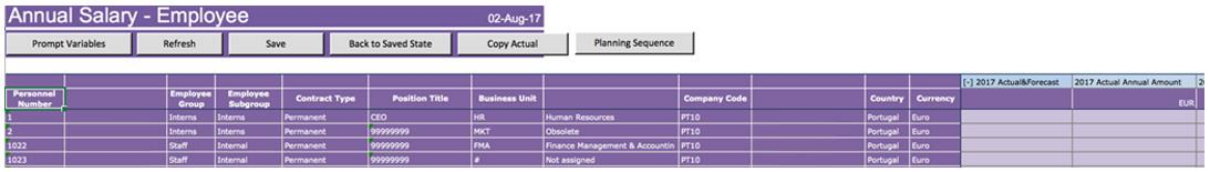


Figure 3.31: HCM Planning Annual Salary - Employee Input Enabled AFO Report

3.4.6. B3-Financial and Operational Reporting

Figure 3.32: Financial and Operational Reporting Elements

It was defined a new P&L (Profit and Loss), BS (Balance Sheet) and CF (Cash Flow) structure for planning purposes and a new set of business rules to derive the BS and CF statements directly from P&L. This structure must be defined in the BPC solution, and the engine derivation will be created specifically for this process. Customized tables and specific ABAP programs will be developed to accomplish this functionality.

The Finance Planning is the aggregation of data from operational budgets (Project Revenues and Costs, CAPEX, HCM, and other OPEX) and Intercompany Recharge planning to generate automatically Financial Statements by the entity. It will be created several tables in the system to customize the accounting rules for Financial Statements derivation (P&L - BS; P&L - CF; CF - BS). The engine derivation will read the input data from previous budgets and populate P&L Input Layout. From here the system will calculate the Balance Sheet and Cash Flow based on accounting rules previously defined.

During the current planning year, the user can execute the existent reports in S/4HANA side and the reports developed for this solution to control the deviation from actuals and plan data.

The reports to be developed are:

- P&L actuals vs. Budget
- Balance Sheet actuals vs. Budget
- Cash Flow actuals vs. Budget

The user must select the year/period in the report to analyze the deviations.

An example of the reports in general terms can be seen below:

Input parameters:	
Entity *a)	BE20
Business Unit a)	
Trading Partner a)	
Year *	2018
Month *a)	1 - 3

		A	B	B - A	
		Actuals	Budget	Deviation	[-] % Deviation
G/L Account	G/L Account Description	EUR	EUR	EUR	
6800099999	Furniture	1200	1230	30,00	3%
6841099999	Travel costs	5470	4900	-570,00	-10%

Figure 3.33: Planning Control AFO Report

*	Mandatory Fields
a)	Multiple Selection

Table 3.6: Description of Indices from Figure 3.33

3.4.6.1. P&L Actuals vs. Budget

The projected Profit and Loss statement summarizes the revenues, costs, and expenses planned for the months of forecast and the budget year. These records provide information about the company's ability – or lack of – to generate profit by increasing revenue, reducing costs, or both. The projected Profit and Loss statement summarizes the revenues and costs planned, for the months of forecast and budget year. These records provide information about the company's ability – or lack of – to generate profit, by increasing revenue, reducing costs, or both.

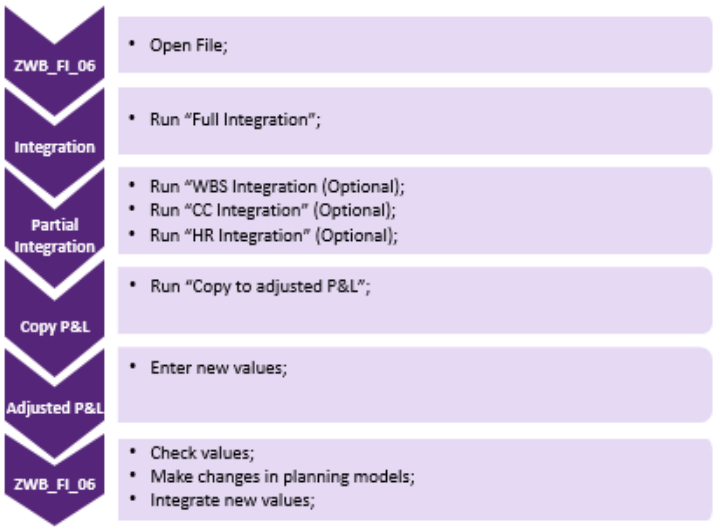


Figure 3.34: P&L Process Flow

On BPC Planning Role, P&L Input Template and P&L Report are presented for the use of key users.

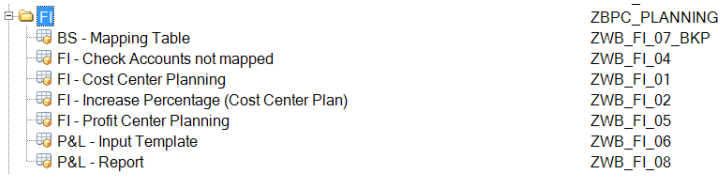


Figure 3.35: Report Tree for P&L

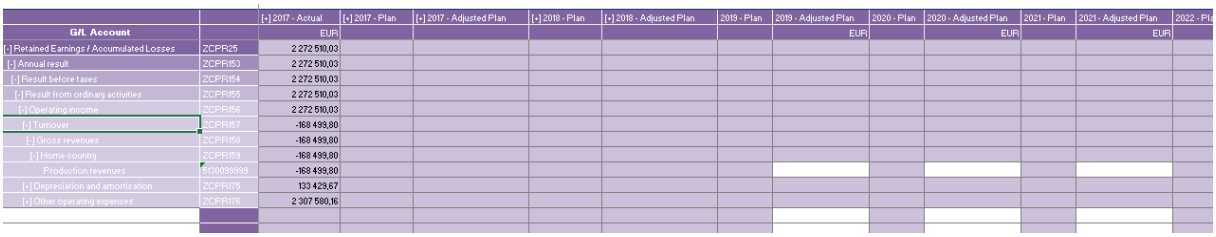
In these two reports, the input template is designed for the generation and adjustment purposes. The report is designed only for reporting purposes. To integrate the report, it will be necessary to integrate all planning model to P&L. To do this "Full Integration" sequence will be run according to the version.

Figure 3.36: P&L Planning Sequences Running Buttons on Report

It is also possible to integrate the models separately clicking and next buttons, according to the model that you want to load, where:

- WBS Integration – load data from OPEX planning ERP data presented in Figure 8.43;
- CC Integration – Load data from CAPEX cost and profit planning presented in Figure 8.44;
- HR Integration – Load data from HR-HCM planning presented in Figure 8.45.
- Full Integration – Load data from all entities presented in Figure 8.31.

These planning sequences are also presented in Figure 3.22 with their technical names and descriptions. SAP screenshots and FOX formula codes of these PS and PF can be found between at Annexes – Figure 8.31 to Figure 8.50 and Annexes – Table 8.8 to Annexes – Table 8.12.



G/L Account		[+] 2017 - Actual	[+] 2017 - Plan	[+] 2017 - Adjusted Plan	[+] 2018 - Plan	[+] 2018 - Adjusted Plan	2019 - Plan	2019 - Adjusted Plan	2020 - Plan	2020 - Adjusted Plan	2021 - Plan	2021 - Adjusted Plan	2022 - Pl
		EUR						EUR		EUR		EUR	
[-] Retained Earnings / Accumulated Losses	ZCPR25	2 272 510,03											
[-] Annual result	ZCPRI53	2 272 510,03											
[-] Result before taxes	ZCPRI54	2 272 510,03											
[-] Result from ordinary activities	ZCPRI55	2 272 510,03											
[-] Operating income	ZCPRI56	2 272 510,03											
[-] Turnover	ZCPRI57	-168 499,80											
[-] Gross revenues	ZCPRI58	-168 499,80											
[-] Home country	ZCPRI59	-168 499,80											
Production revenues	8130099999	-168 499,80											
[+] Depreciation and amortisation	ZCPRI75	133 429,67											
[+] Other operating expenses	ZCPRI76	2 307 580,16											

Figure 3.37: P&L Input Enabled AFO Report

In the adjusted P&L, it will be possible to change values for all years (by month to first two years and by year to the other years), without affect planning data.

This functionality will allow the planner to simulate a P&L without back to the other models but will not possible to retract values automatically. To have the value changes in the official P&L, planner will need to change the source data.

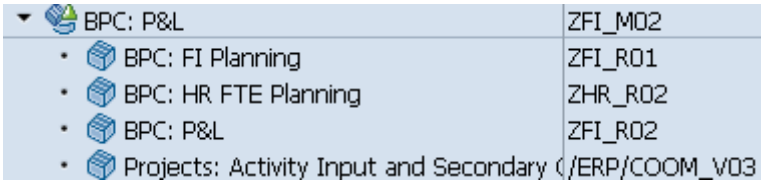


Figure 3.38: Profit and Loss Budgeting Info Providers

3.4.6.2. Cash Flow actuals vs. Budget

Projected Cash flow will be used to assess the quality of the company's income during forecast months and budget year, which means, how liquid it will be. It will be able to indicate whether the company is positioned to remain solvent. Projected Cash flow will be used to assess the quality of the company's income, during forecast months and budget year, which means, how liquid it will be. It will be able to indicate whether the company is positioned to remain solvent.

Cash flow, is the net amount of cash and cash-equivalents, moving into and out of business. Positive cash flow indicates that a company's liquid assets are increasing, enabling it to settle debts, return money to shareholders, pay expenses, reinvest in its business and provide a buffer against future financial challenges. Negative cash flow indicates that a company's liquid assets are decreasing.

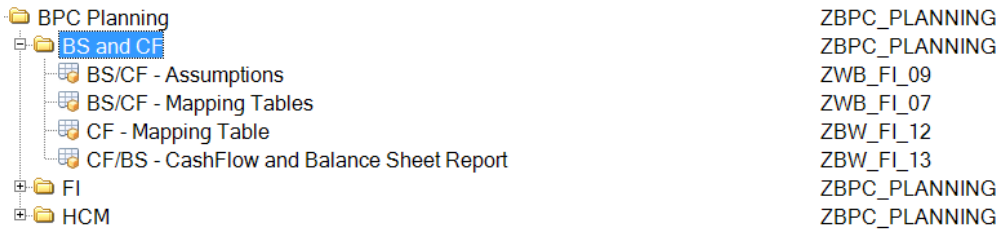


Figure 3.39: Report Tree for Cash Flow

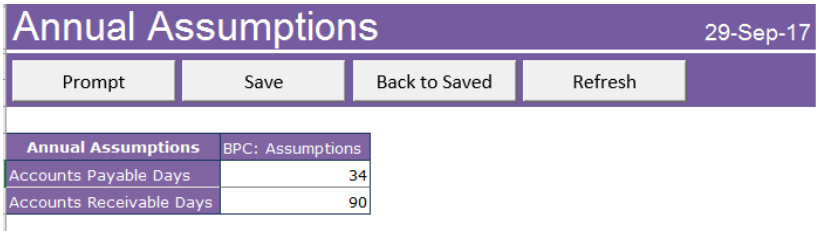


Figure 3.40: Cash Flow Annual Assumptions Input Enabled AFO Report

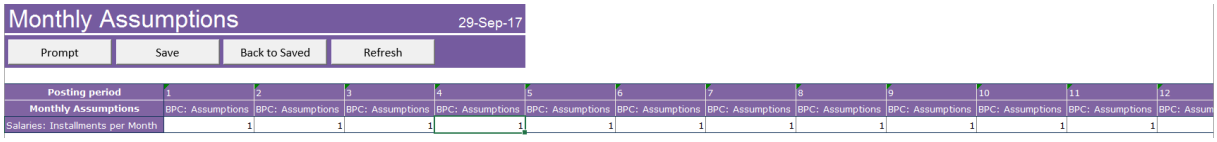


Figure 3.41: Cash Flow Monthly Assumptions Input Enabled AFO Report

BS/CF Assumptions: This report has two sheets to input assumptions for balance sheet and cash flow. The first sheet is designed to input Accounts payable days and accounts receivable days for the company which is fixed from Prompt. The second sheet is designed to input Salary Instalments per Month for the company which is fixed from Prompt.

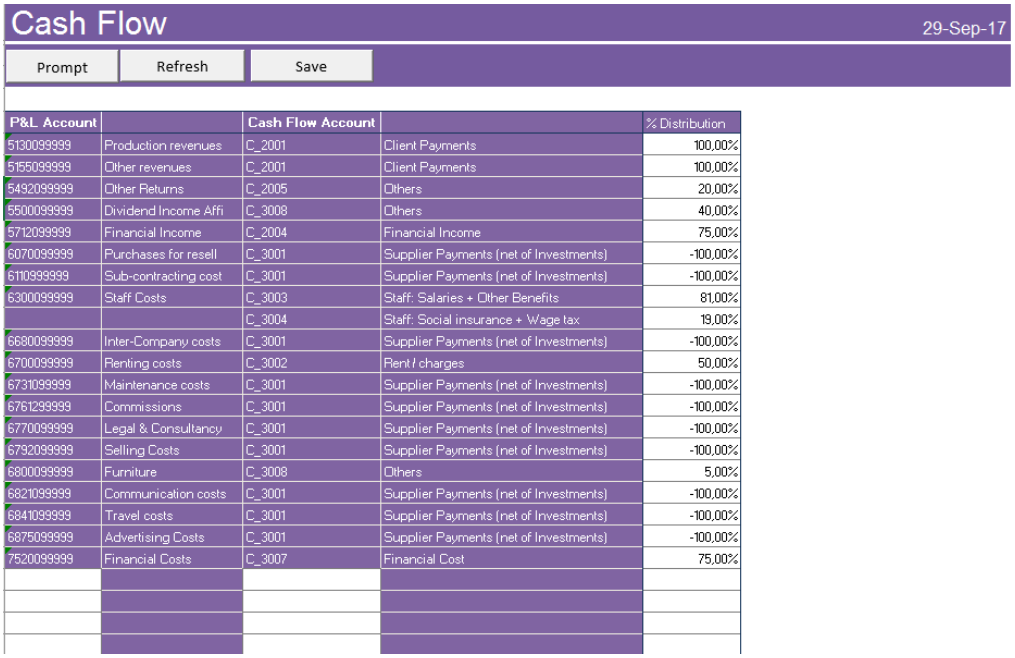


Figure 3.42: P&L to Cash Flow Transfer Assumptions Input Enabled AFO Report

Cash Flow Mapping Report: Cash Flow Mapping planning report is created to assign P&L accounts to Cash Flow accounts with their related percentages. It is a global assignment, so there is no company relation between these mappings.

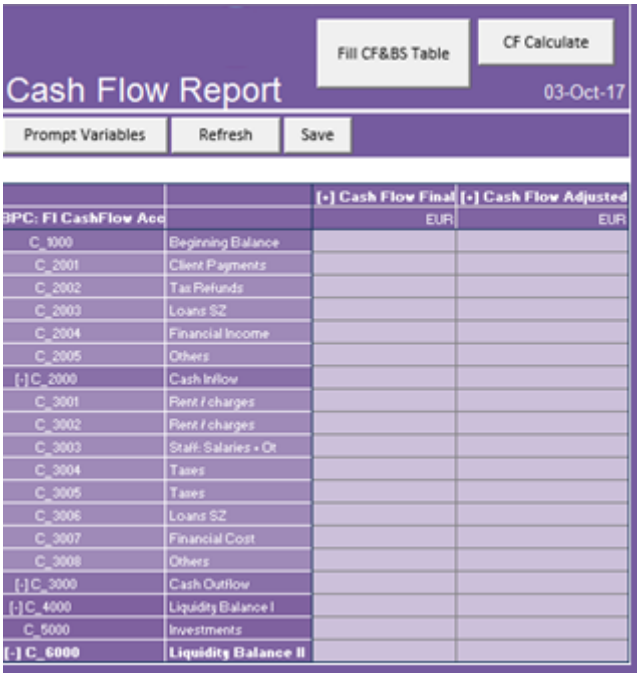


Figure 3.43: Cash Flow AFO Report

At the Cash Flow Report, the first prompt should be assigned decently. After that, filling the r eport with actual data should be executed from Fill CF&BS Table button. It will fill cash flow and balance sheet at the same time. Cash Flow Final is for the presentation of amounts which are derived from P&L. Adjusted is open for planning with the same amounts which are also derived from P&L. The user can change the amounts on the adjusted part and save. Also, users can click on CF Calculate button to execute all the accumulated calculation for that month and preceding months.

Analysis for Office Reports				
Analysis for Office Report ID	Analysis for Office Report Description	Report Element	Related Planning Sequence/Function ID	Related Planning Sequence/Function Description
ZWB_FI_09	BS/CF - Assumptions	Standard AFO Functions	N/A	N/A
ZWB_FI_07	BS/CF - Mapping Tables	Standard AFO Functions	N/A	N/A
ZWB_FI_12	CF - Mapping Tables	Standard AFO Functions	N/A	N/A
ZWB_FI_13	CF/BS - CashFlow and Balance Sheet Report	Fill CF&BS Table	ZPS_FI09_001	BPC: Cash Flow copy from PL
	CF/BS - CashFlow and Balance Sheet Report	CF Calculate	ZPS_FI09_002	BPC: Cash Flow Adjusted Calculation
ZWB_FI_04	FI - Check Accounts not mapped	Standard AFO Functions	N/A	N/A
ZWB_FI_01	FI - Cost Center Planning	Load Actual	ZPS_FI01_002	BPC: Copy Actual
		Calculate - Calculate Budget?	ZPF_FI01_001	Budget Calculation
		Calculate - Calculate Budget?	ZPF_FI01_002	BPC: Calculate Trend Years
		Forecast Distribution	ZPS_FI01_003	BPC: Monthly Distribution
		Forecast Year	ZPF_FI01_004	BPC: Year Aggregation
		Budget Distribution	ZPF_FI01_005	BPC: Monthly Distribution Year + 1
		Budget Year	ZPS_FI01_006	BPC: Year Aggregation Year+1
ZWB_FI_02	FI - Increase Percentage (Cost Center Plan)	Standard AFO Functions	N/A	N/A
ZWB_FI_05	FI - Profit Center Planning	Same as "ZWB_FI_01"	Same as "ZWB_FI_01"	Same as "ZWB_FI_01"
ZWB_FI_15	P&L - Actual and Plan	Standard AFO Functions	N/A	N/A
ZWB_FI_06	P&L - Input Template	Full Integration	ZPS_FI04_001	BPC: PL - Full Integration
		WBS Integration	ZPS_FI04_002	BPC: PL - WBS Integration
		CC Integration	ZPS_FI04_003	BPC: PL - Cost and Profit Integration
		HR Integration	ZPS_FI04_004	BPC: PL - HR Integration
		Copy to Adjusted P&L	ZPS_FI04_005	BPC: PL - Copy PL to Adjusted PL
ZWB_FI_08	P&L - Report	Standard AFO Functions	N/A	N/A
ZWB_HR_02	BPC: HR P&L Reports	Standard AFO Functions	N/A	N/A
ZWB_HR_01	BPC: HR Planning	FTE Check	ZPF_HR01_005	BPC: FTE Distribution 1
		Planning HR	ZPS_HR01_002	BPC: HR Planning Sequence
ZWB_HR_03	BPC: HR Planning(With Salary Increase)	Standard AFO Functions	N/A	N/A

Figure 3.44: AFO Reports and Planning Elements

SAP screenshots and FOX formula codes of these PS and PF can be found between at Annexes – Figure 8.68 to Figure 8.81 and Table 8.19 to Table 8.30.

3.4.6.3. Balance Sheet actuals vs. Budget

The projected Balance Sheet is meant to be the company's primary statement of financial position by summarizing a company's assets, liabilities and shareholders' equity at a specific point in time. The projected Balance Sheet is meant to be the company's primary statement of financial position by summarizing a company's assets, liabilities and shareholders' equity at a specific point in time. This financial statement will be projected along the four months of forecast and the budget year by reporting the members of the Balance Sheet known equation: **Assets = Liabilities + Shareholders' Equity**

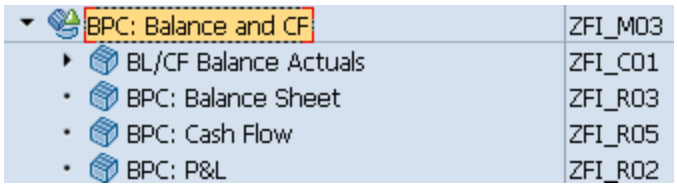


Figure 3.45: BPC Balance Sheet and Cash Flow Multi-Provider with Info Cubes

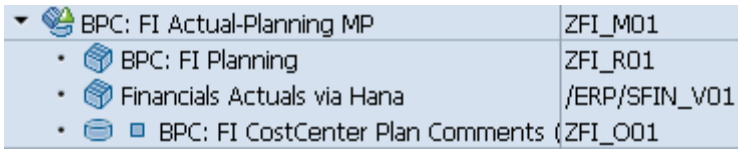


Figure 3.46: FI Actual Planning Multiprovider with Info Cubes

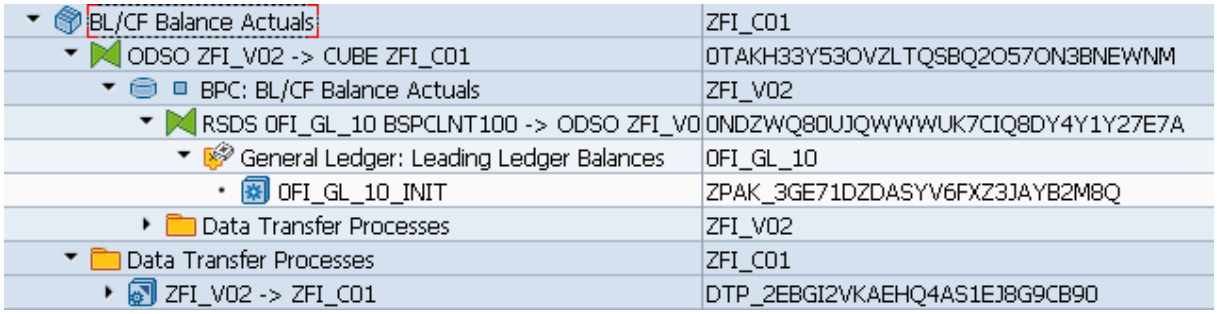


Figure 3.47: BL/CF Balance Actuals Info Providers

Some of the Planning Cubes are limited by characteristic relationships as well.

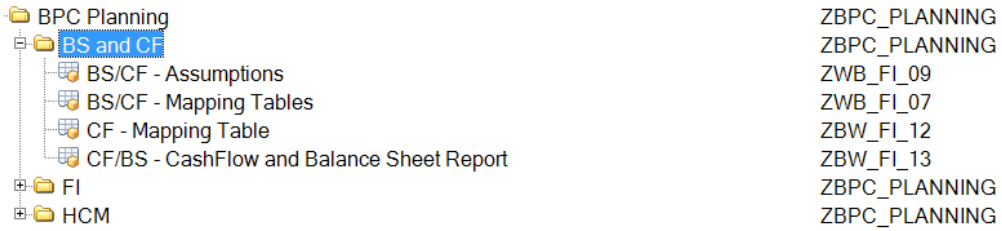


Figure 3.48: Report Tree for Balance Sheet

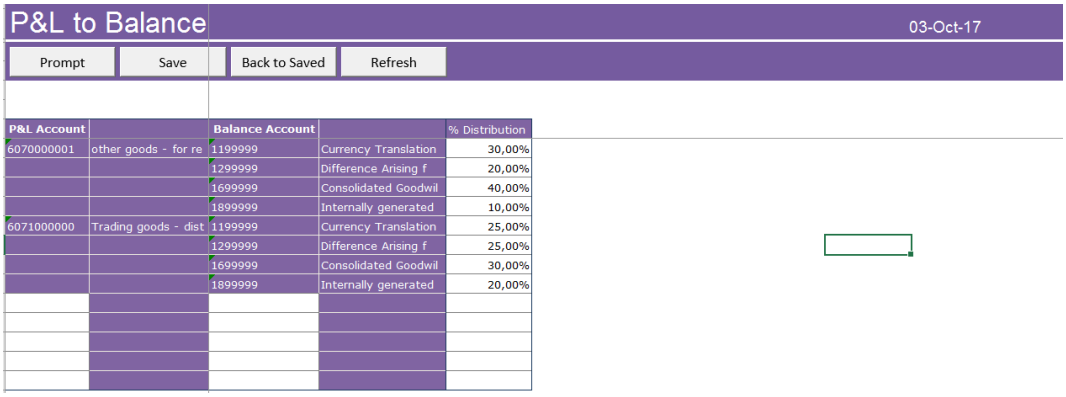


Figure 3.49: P&L to Balance Sheet Transfer Assumptions Input Enabled AFO Report

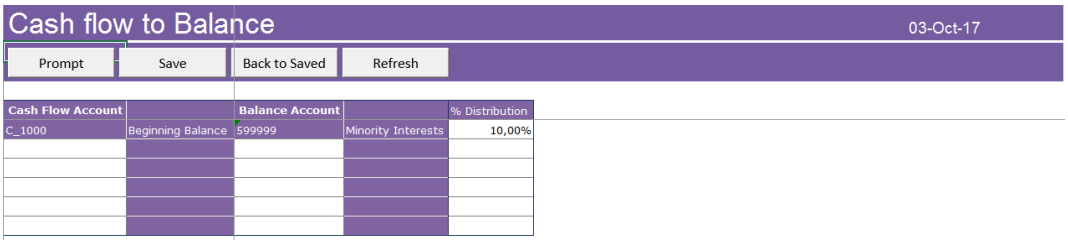


Figure 3.50: Cash Flow to Balance Sheet Transfer Assumptions Input Enabled AFO Report

On BS/CF Mapping tables, there are two sheets created to assign P&L to Balance Sheet percentages and Cash Flow to Balance Sheet percentages. These sheets are globally prompted, so they are company code free assignments. After the “Fill CF&BS Table button” execution Balance Sheet will be available. PS that collects Balance Sheet planning functions and runs with this command is presented in Table 8.19. At the prompt, there will be two company code options. The first company code is to execute Cash Flow(mandatory) and second company code is optional for Balance Sheet.

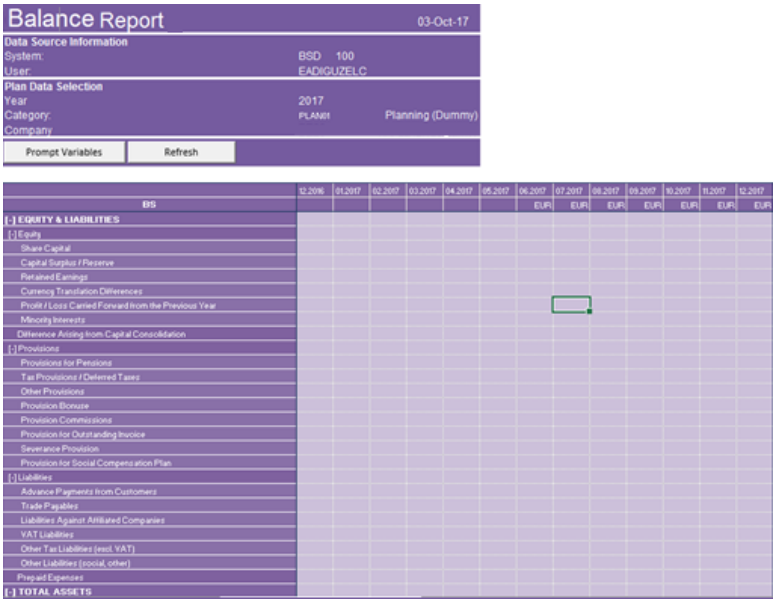


Figure 3.51: Balance Sheet AFO Report

4. RESULTS AND DISCUSSION

After the implementation, it is revealed that the total process time of planning and budgeting is much shorter compared to the old system. Easy and fast connection to the actual data is a big enhancement for the company. Real-time data integration from the HANA database is very useful for the actual reporting purposes but also can be very helpful for future developments such as consolidation reports and reporting. Before data integration was happening by excel with human effort and processing wrong values were very common. Because of that, there was a big approval chain to check financial reports. With the integration of Enterprise Performance Management tool, all the processes regarding with finance and business is automated in the SAP BPC Planning Application Kit platform. Processes are formulated with Planning Sequences and calculations are structured by planning functions with FOX formula. One of the remarkable aspects of the project is Improvement on the consistency of the data in the reports.

Through the development of the artefact, a lot of technical and business challenges has been solved. Technical challenges were generally related with the AFO reports performances and inconsistency of the timings. Mainly, processing times of Planning Sequences and Planning Functions on reports were not at the desired level in the beginning. Revealing and solving the process complexity with best practices and innovative enhancements was the big part of the unit tests and acceptance tests. Adjusting the actual FOX Formula codes to be leaner and more straight-forward, was the most successful method that is pursued on performance issues. The project has a tight schedule so, in some cases, project agenda was shifted to performance enhancements instead of visual enhancements of reports.

On the other hand, the artefact has brought a newly structured process flows to the Budget Planning and for future developments such as consolidation processes. It is inevitable that the company could not stay with the old process flow with 100% similarity because of technical and business limitations. There were many adjustments on the core of business flow which is considered and negotiated with the Group Company and business side. In the end, it has brought a lack of know-how from the business side even if the training were done with a big success. Adaptation of the Business Members took some time but, in the end, the artefact is being accepted by both business managerial level and end-user level without any resistance.

5. CONCLUSIONS

The goal of this project work was to develop a methodology for the building of embedded Enterprise Performance Management solution in ERP Embedded BI Platform which has a significant relationship with the new technology in-memory, column-oriented, relational database ERP system.

In the search of possibility for building a specific artefact to satisfy the needs of the group company, major problems are analyzed and collected accordingly. A new methodology proposed towards the evaluation of the implementation of an embedded enterprise performance management solution in ERP Embedded BI platform of a group company, thereby improving the orientation of business processes with the business strategy and enhancing the ability to measure financial performance by using the advantages of real-time data support.

Hence, this project work aimed to develop an embedded enterprise performance management solution in ERP embedded business intelligence platform to maintain foresight capacity and decision-making mechanism for the group company. During the project, the chosen embedded enterprise performance management solution is implemented to provide a clear understanding of improved financial reports with planning approach. In the meantime, the developed system is providing real-time data for the reporting as well as sustaining real-time planning for a different level of the group company.

Finally, this project has shown that towards the evaluation of the implementation of an embedded enterprise performance management solution by using ERP embedded BI platform, the orientation of business processes with the business strategy is slightly improved. On the other hand, the ability to measure financial performance is remarkably enhanced by using the advantages of real-time data support.

6. RECOMMENDATION FOR FUTURE DEVELOPMENTS

For the future development, implementation of consolidation function can be considered as the first milestone for the group company after the successful implementation of Embedded Planning and Budgeting solution. Since the ownership structure of the group company is very straightforward (All of the subsidiaries are fully owned), consolidation group report doesn't have significant issues and can be processed with standard approaches.

Considering the increasing complexity of the consolidation process of the Group Company, with acquisition of a diversity of companies in several geographic locations, it becomes more critical to have a system solution that would enable a more efficient control of the consolidation process execution, with the use of audit track functionalities and financial information validations. It is also essential to control process scheduled timings and quality of the information that are produced locally, in each geographic location.

The consolidation process of Group Company is planned to be executed monthly to provide consolidated information to stakeholders, based on general accounting information for legal consolidation by the company and analytical information for detailed analysis by business segment and geographic location. Annually for budgetary control, will also be integrated into the consolidation system the planning and budgetary data for the execution of the budgetary consolidation process.

The objective of the consolidation component should be to provide a solution that enables the presentation of the financial statements and notes, as well as the execution of the budgetary consolidation process. (This solution will be based on the SAP BPC system, using the Starter Kit for IFRS). This process will be related to the consolidation execution of financial reports and the necessary currency conversion.

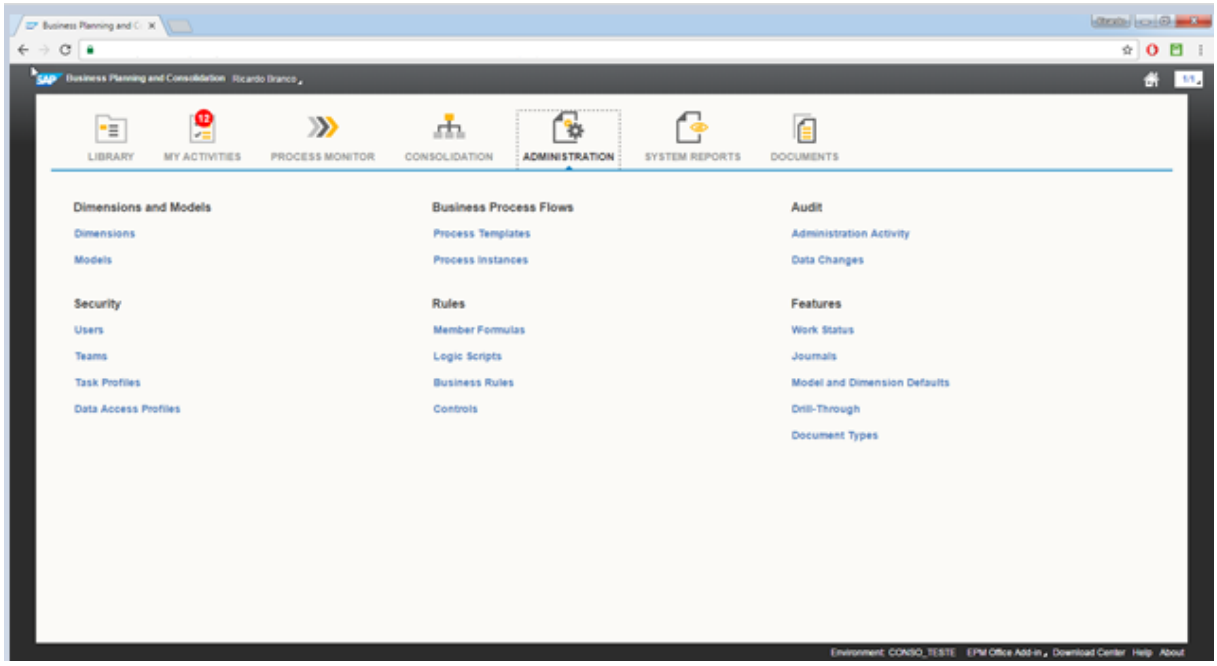


Figure 6.1: SAP BPC Web Interface

Regarding the consolidation function, some aspects which are already maintained by the implementation of SAP BPC structure by this project can be very helpful for the consolidation requirements of the company. It is always important to remember that “centralization of the processes” is the main goal of the group company since the beginning. According to that goal, one of the significant aspects of SAP BPC is the web interface. The web interface is a centralized way to access the SAP BPC system. It is characterized by a user-friendly environment, and it enables key-users to access BPF’s (Business Process Flows) and control the respective consolidation activities.

The web interface is a starting point for the SAP BPC process, and its core consists of models and their dimensions. Business Process Flow (BPF) is the term used in SAP BPC system to refer to a set of sequential tasks assigned to a restrict group of users to organize the process and distribute roles and responsibilities. It is a step-by-step web-based launch pad, with guided navigation through all the process flow which ensures consistency and coordination between team/individual’s tasks, providing task process status and completion. The access to the Excel interface is through the web interface is can be maintained by BPFs as well.

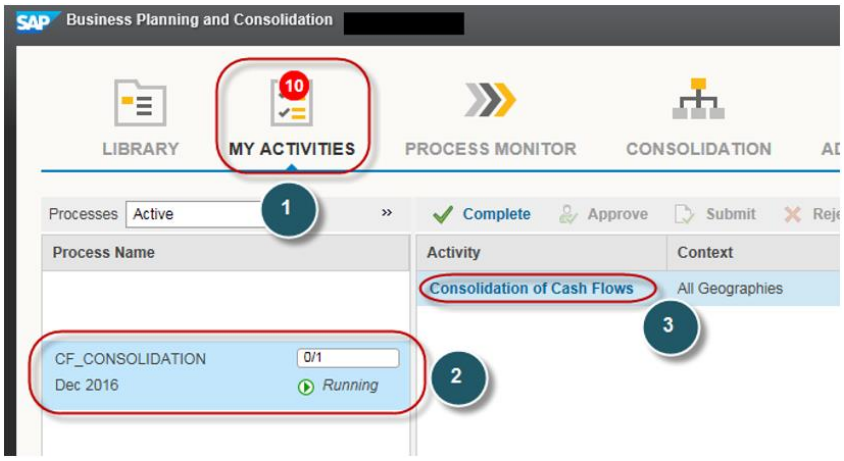


Figure 6.2: SAP BPC Web Console My Activities - BPF List

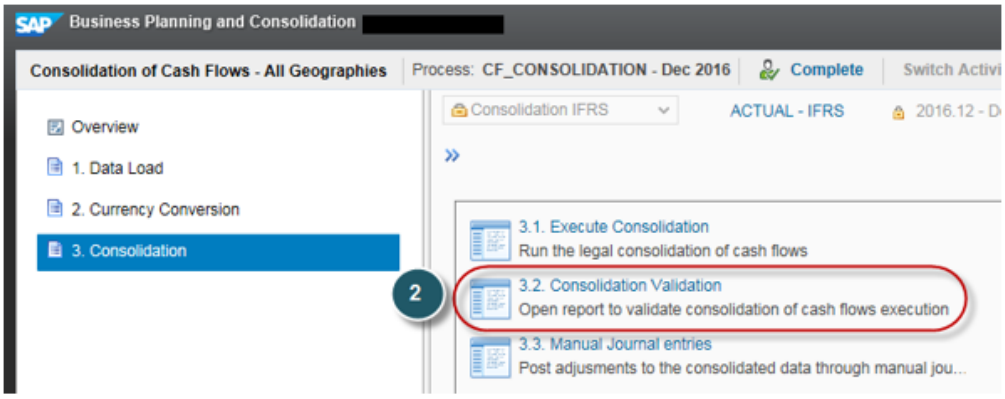


Figure 6.3: Consolidation Activities BPF on BPC Web Client

The legal consolidation for the period and scopes will be the main consolidation activities that are designed to be executed by BPF. For the consolidation processes, SAP BPC Classic is available to maintain all the aspects of consolidation with its complete IFRS kit. All these processes are available on SAP BPC Classic elements and SAP EPM Excel Add-on.

Ideally, Business Process Flows consist of Data Package and Report. Data package automatically executes the following operations:

- Aggregation of all companies' regarding financial reports within the selected consolidation perimeter
- Intercompany eliminations

The Data Manager is a module which enables the user to load data into SAP BPC system, through data manager Packages, as well as copy or move data within and between models. It is also where data mapping and conversion is maintained. In this case, data packages are not very different than the Planning Functions or Planning Sequences. The major difference is all the processes are standard in BPC. No customization is needed if the company's processes are IFRS standard. Consolidation structure is well designed in the system with related data packages, scripts and validation reports for IFRS so that the only challenge will be the implementation of the solution to the actual structure.

Through Data Manager it is possible to:

- Upload master data
- Upload transactional data
- Elimination of transactional data
- Move data between SAP BPC models
- Currency Translation
- Intercompany Recharge
- Consolidation

Validation Reports that are standard in SAP BPC and can be placed in BPF are the corresponding EPM reports which show the consolidated data in a financial format.

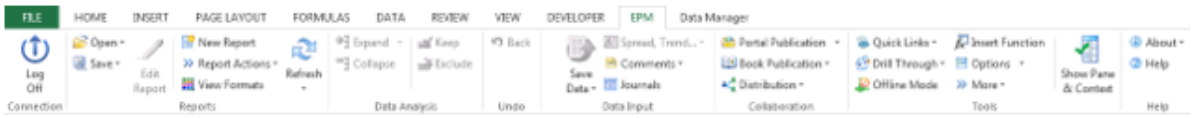


Figure 6.4: SAP EPM Interface

The EPM Microsoft Office Excel add-in enables the visualization of SAP BPC data, transforming them in real time, supporting the consolidation reports available. SAP EPM has pretty much the same purposes with SAP Analysis for Office regarding with reporting. But It is also working with the SAP BPC ABAP background on parallel as well.

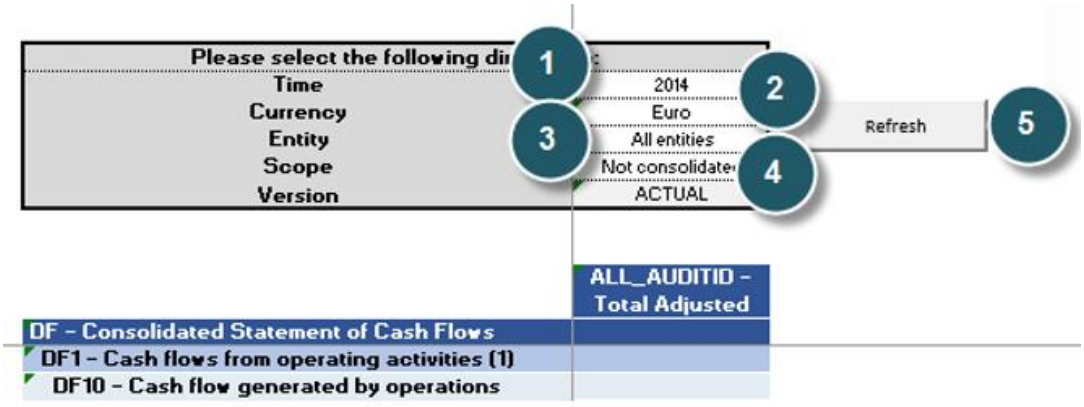


Figure 6.5: Validation Report of Consolidated Data in EPM Report

On EPM report user can also assign different parameters as they are presented below according to the Figure 6.5: Validation Report of Consolidated Data in EPM Report:

1. Time – Selection of the Currency Conversion period from a dropdown list
2. Currency – Selection of the group currency
3. Entity – Selection of the entity or group of entities displayed in the report
4. Scope – Selection of the consolidation scope displayed in the report. In this case, it should be "S_NONE" , since the user is validating input data instead of consolidated data.
5. Refresh – Refresh button. Refreshes the data displayed in the report after variables are defined.

As a summary, implementation of consolidation function can be considered as the next step for the group company after the successful implementation of Embedded Planning and Budgeting tool. BPC 10.1 that artefact is constructed on will provide all the technical requirements for this approach so there will be no new software implementation, adjustments of the existing features will be sufficient.

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8. ANNEXES

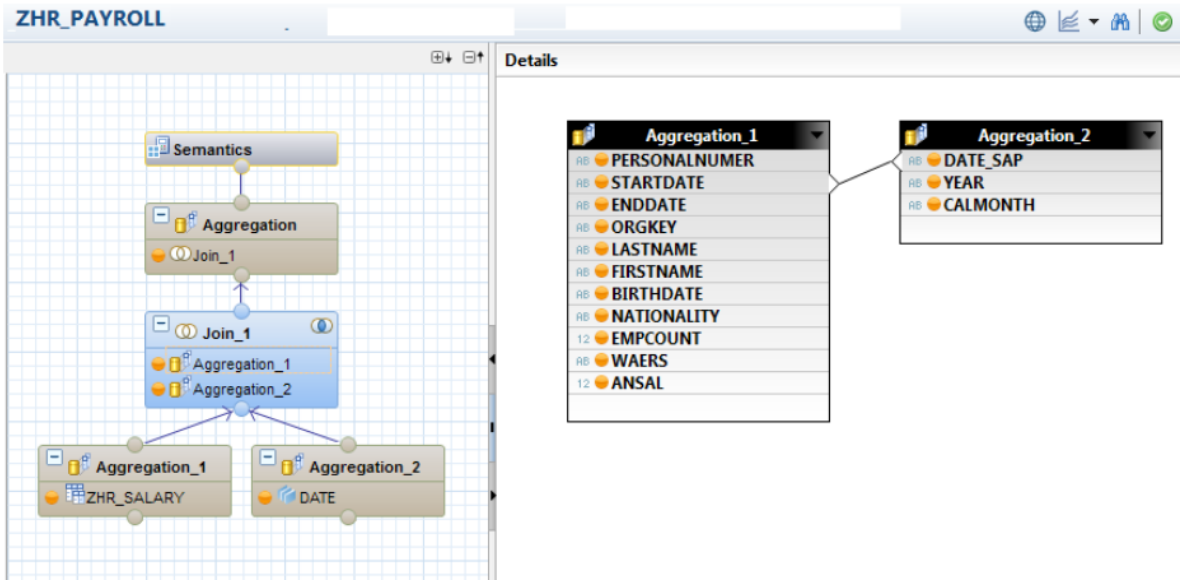


Figure 8.1: Hana View in Details

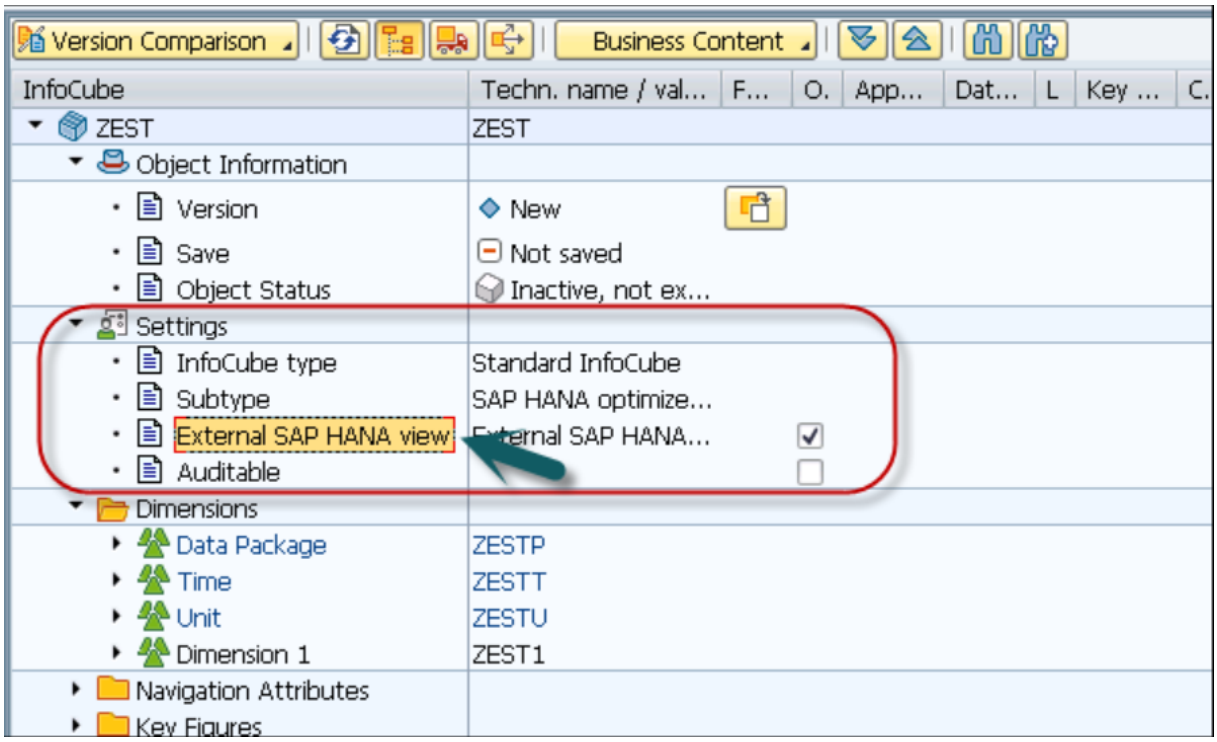


Figure 8.2: HANA View Connected BW Cube Settings

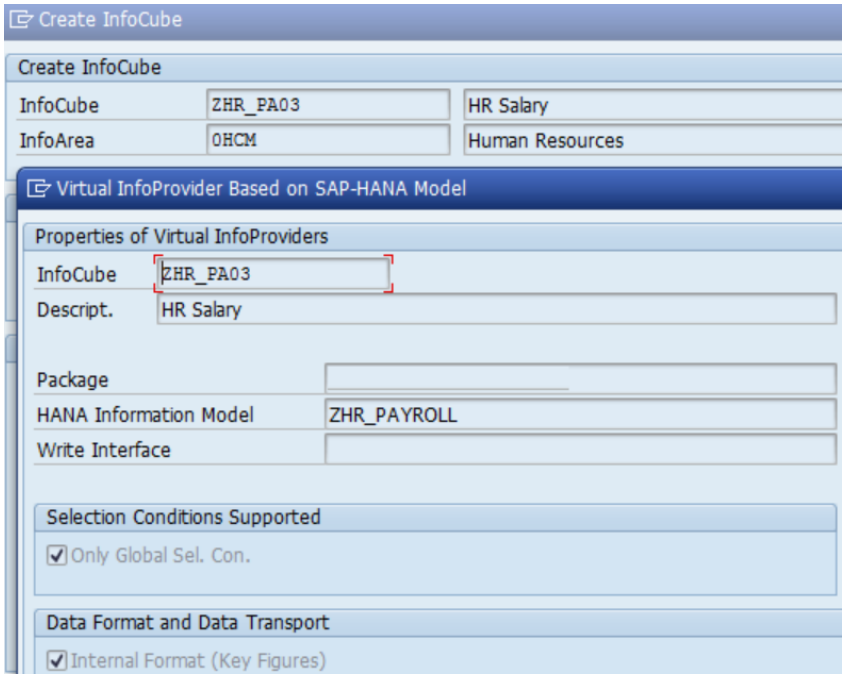


Figure 8.3: Virtual Infocube directly connected to Real-Time Hana View

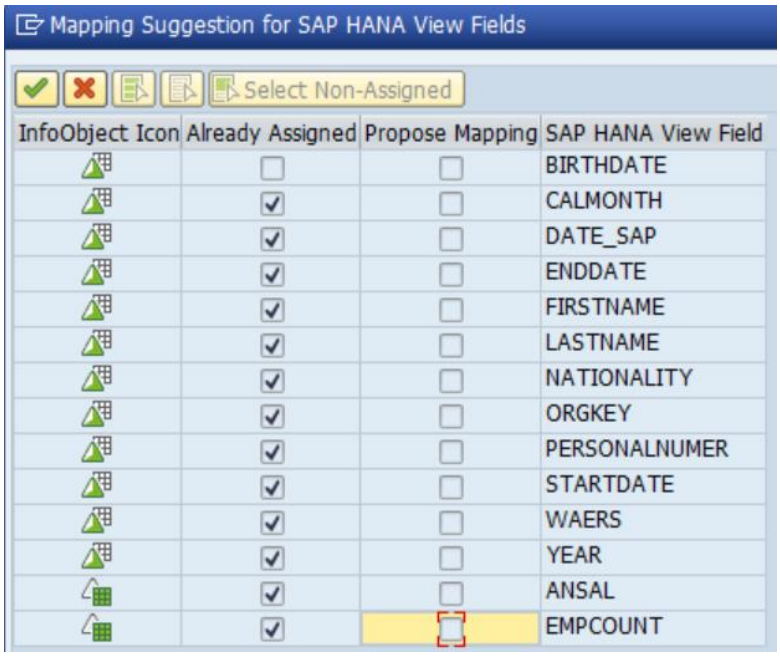


Figure 8.4: Mapping of Info Cube Fields (On the left) and Hana View Fields (On the Right)

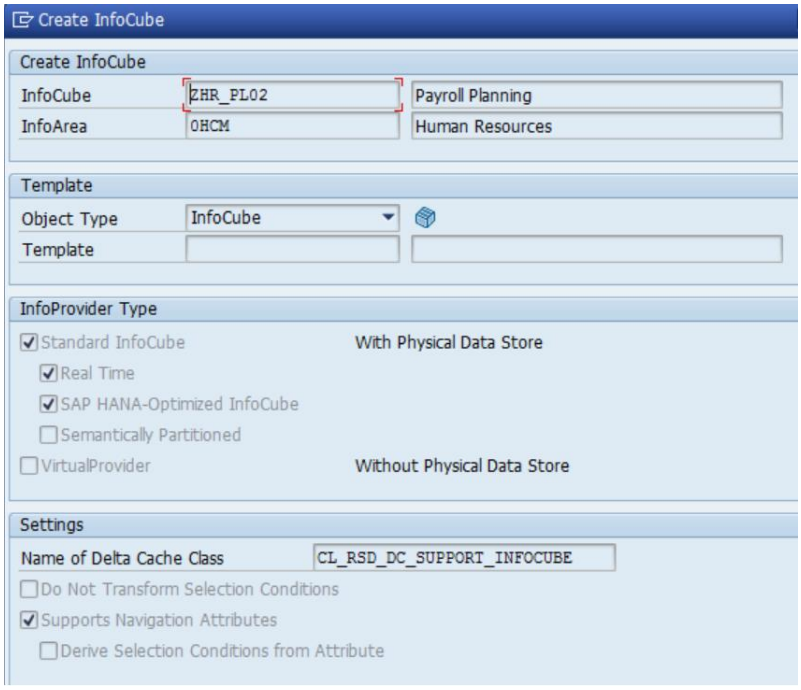


Figure 8.5: Real Time Infocube Designed for Planning Purposes

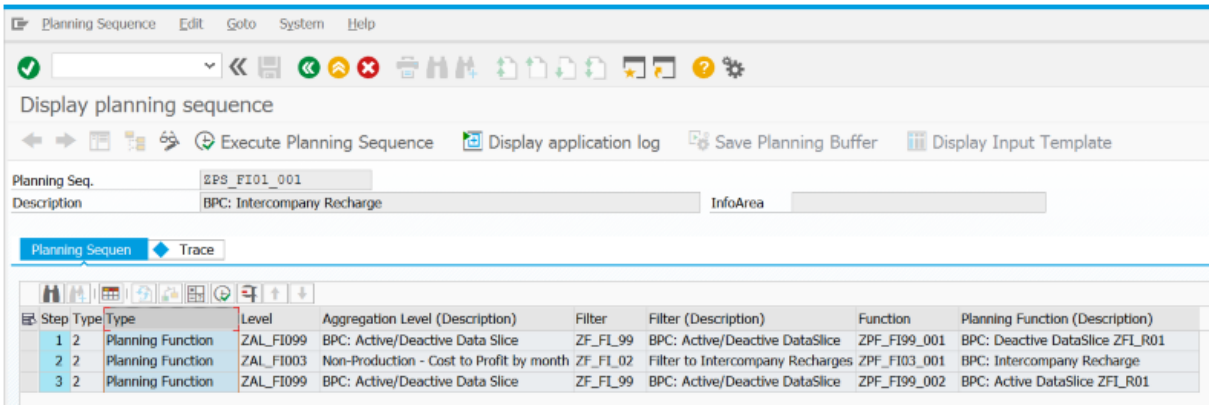


Figure 8.6: Activate Deactivate Data Slice Planning Functions in PS

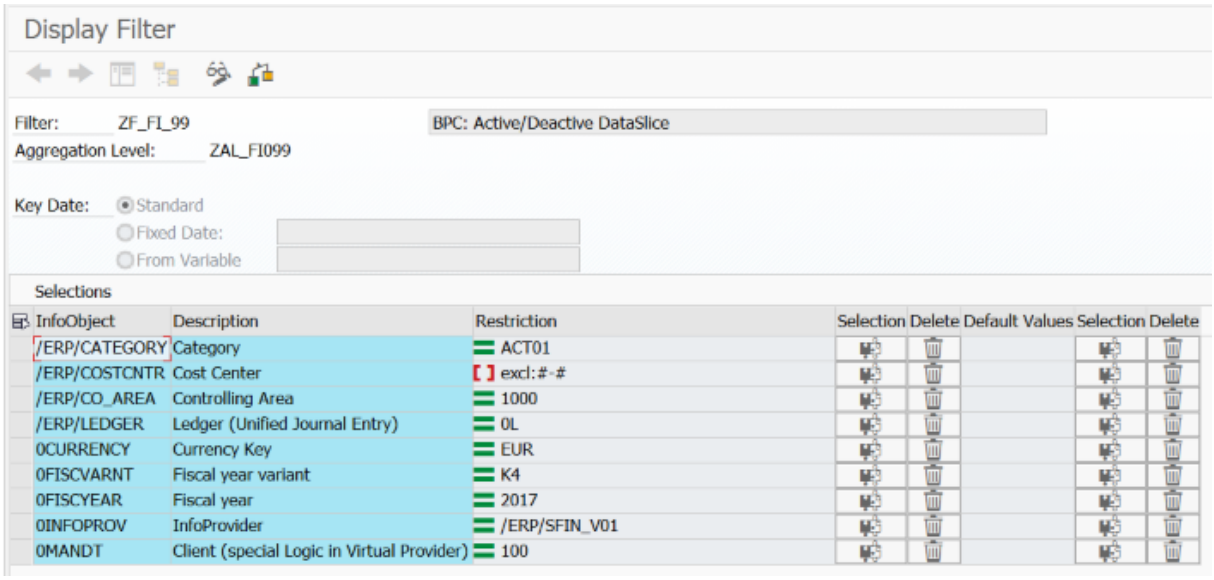


Figure 8.7: Activate/Deactivate Data Slice PF Filter

```
CALL FUNCTION Z_DSLICE_CHANGE_STATUS
  EXPORTING
    I_VAR = ZDS_FI_R01_STATUS
    I_STATUS = 2.
```

Table 8.1: Deactivate Data Slice PF Fox Formula Code

```
CALL FUNCTION Z_DSLICE_CHANGE_STATUS
  EXPORTING
    I_VAR = ZDS_FI_R01_STATUS
    I_STATUS = 1.
```

Table 8.2: Activate Data Slice PF Fox Formula Code

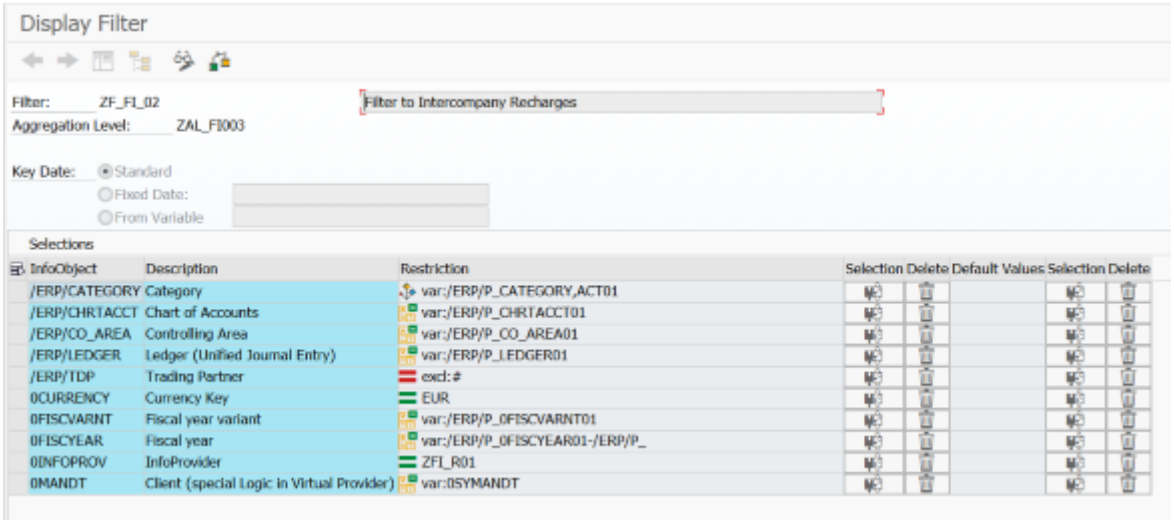


Figure 8.8: Intercompany Recharge PF Filter

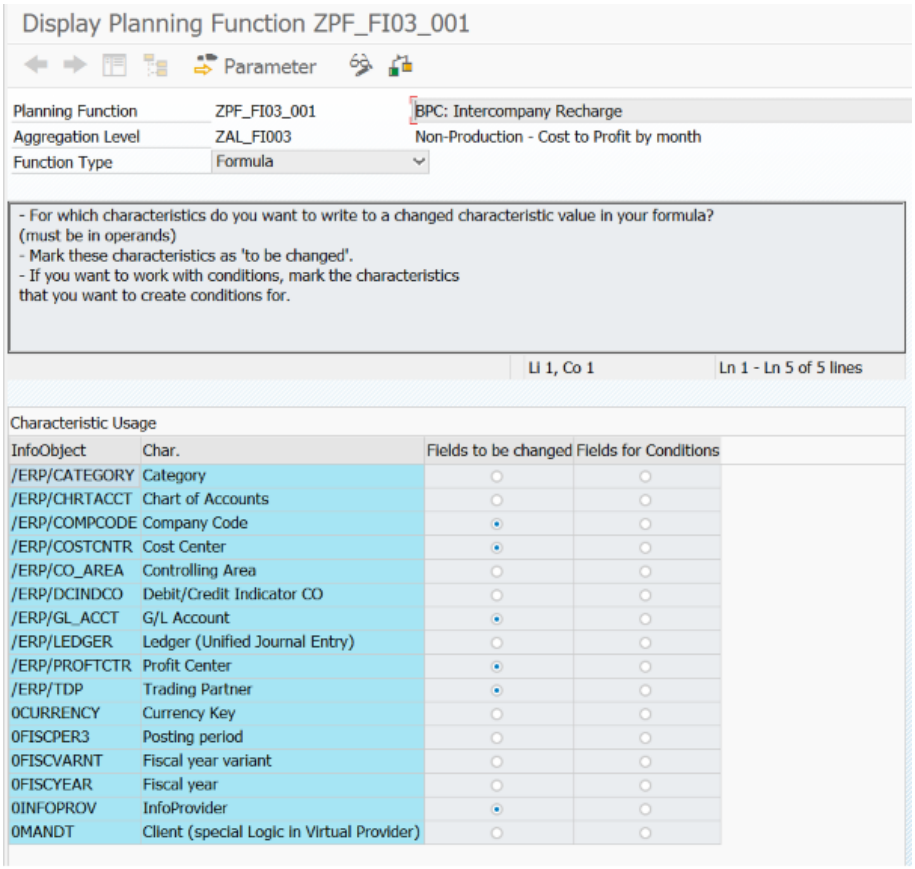


Figure 8.9: Intercompany Recharge PF Details

```
DATA YEAR TYPE 0FISCYEAR.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CC TYPE '/ERP/COSTCNTR'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA REVACC TYPE '/ERP/GL_ACCT'.
DATA PC  TYPE '/ERP/PROFTCTR'.
*DATA PC2  TYPE '/ERP/PROFTCTR'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA TRADEP  TYPE '/ERP/TDP'.
DATA TRADEP2 TYPE '/ERP/COMPCODE'.
DATA TRADEP3  TYPE '/ERP/TDP'.
DATA COMPCODE2  TYPE '/ERP/TDP'.
DATA COMPCODE3  TYPE '/ERP/COMPCODE'.
DATA COUNT TYPE I.

DATA TOTALACC TYPE F.

CATEGORY = OBJV().
****Run the calculation only to the selected CompanyCode
COUNT = VARC('ZVE_COMPCODE01').
IF COUNT <> 0.
  TRADEP3 = VARI('ZVS_TRADP01', COUNT).
  COMPCODE3 = VARI('ZVE_COMPCODE01', COUNT).
ENDIF.
```

```
****Clear value
  FOREACH COMPCODE, TRADEP,CC,ACC,PC.
*Check if trade is not null
*If a company code selected, just clear this company code otherwise clear all companies
    IF CC = # AND TRADEP <> # AND (COMPCODE = COMPCODE3 OR COMPCODE3 IS INITIAL).
       {'/ERP/AMOUNT', COMPCODE, #, ACC, PC, TRADEP, ZFI_R01 }=0.
    ENDIF.
  ENDFOR.

****Calculate trading Partner
  FOREACH  COMPCODE, TRADEP.
*If a company code selected, calculate only this company code otherwise calculate all companies
    IF TRADEP <> # AND (TRADEP = TRADEP3 OR TRADEP3 IS INITIAL).

*Switch company with trade partner
      TRADEP2 = TRADEP.
      COMPCODE2=COMPCODE.

      FOREACH CC.
        TOTALACC = 0.
        IF CC <> #.
          PC = ATRV('/ERP/PROFTCTR', CC).
          FOREACH ACC.
            REVACC = ATRV('ZGL_RACCT', ACC).
            IF REVACC IS INITIAL.
              REVACC = ATRV('/ERP/GL_ACCT', CATEGORY).
            ENDIF.
*Acumulate all accounts but revenue account
             IF ACC = RECACC.
             ELSE.
*Actual could have profit center, the other categories profit center is not assigned
               IF CATEGORY = 'ACT01'.
                 TOTALACC = TOTALACC + {'/ERP/AMOUNT',COMPCODE,CC,ACC,#,TRADEP,ZFI_R01}.
               ELSE.
                 TOTALACC = TOTALACC + {'/ERP/AMOUNT',COMPCODE,CC,ACC,#,TRADEP,ZFI_R01}.
               ENDIF.
             ENDIF.

          ENDFOR.
*Save the data of the company code switching trade with company code
          {'/ERP/AMOUNT', TRADEP2, #, REVACC, PC, COMPCODE2, ZFI_R01 } = {'/ERP/AMOUNT',
TRADEP2, #, REVACC, PC, COMPCODE2, ZFI_R01 }
          + TOTALACC .

        ENDIF.
      ENDFOR.
    ENDIF.
  ENDFOR.
```

Table 8.3: Intercompany Recharge PF Fox Formula Code

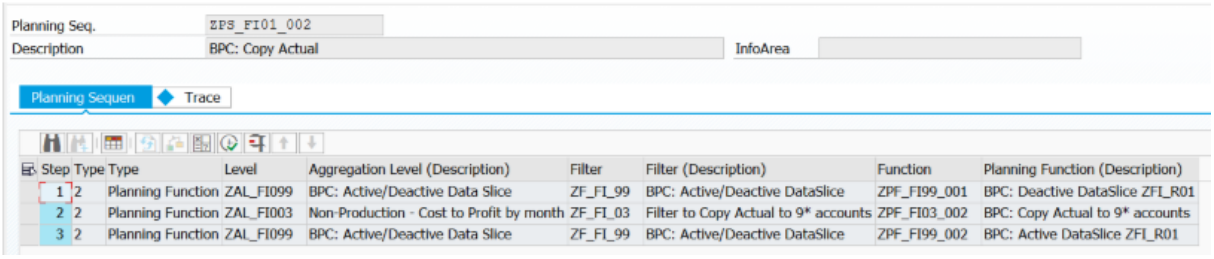


Figure 8.10: Copy Actual PS

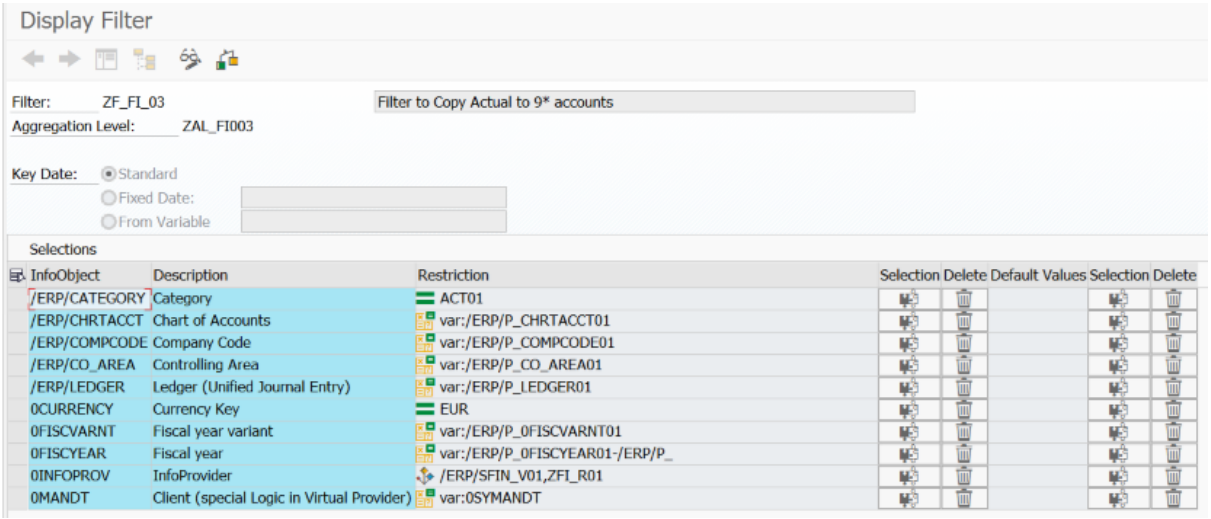


Figure 8.11: Copy Actual to 9* Accounts PF Filter

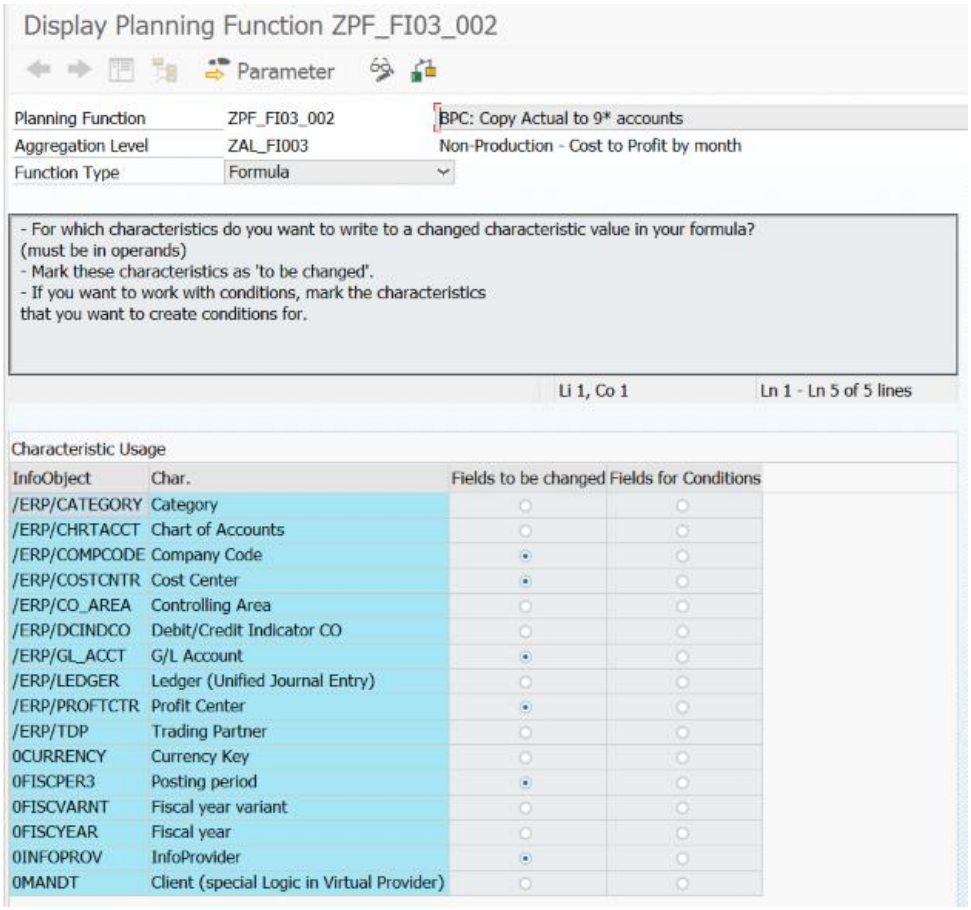


Figure 8.12: Copy Actual to 9* Accounts PF Details

```
DATA YEAR TYPE 0FISCYEAR.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC9 TYPE '/ERP/GL_ACCT'.
DATA PC TYPE '/ERP/PROFTCTR'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA CC TYPE '/ERP/COSTCNTR'.
DATA PP TYPE '0FISCPER3'.
DATA DC TYPE '/ERP/DCINDCO'.

FOREACH ACC, COMPCODE, CC, PC, PP.
*  ACC9 = ATRV( 'ZGL_ACCT', ACC ).
  IF NOT ACC IS INITIAL.
    IF NOT CC IS INITIAL.
*  IF CATEGORY = 'ACT01'.
      { '/ERP/AMOUNT', COMPCODE, CC, #, ACC, #, PP, ZFI_R01 } = 0.
      { '/ERP/AMOUNT', COMPCODE, CC, #, ACC, #, PP, ZFI_R01 } =
      { '/ERP/AMOUNT', COMPCODE, CC, #, ACC, #, PP, ZFI_R01 } + 0.

*  ENDIF.
    ELSE.
      IF NOT PC IS INITIAL.
        { '/ERP/AMOUNT', COMPCODE, #, #, ACC, PC, PP, ZFI_R01 } = 0.
        { '/ERP/AMOUNT', COMPCODE, #, #, ACC, PC, PP, ZFI_R01 } =
```

```
      { '/ERP/AMOUNT', COMPCODE, #, #, ACC, PC, PP, ZFI_R01 } + 0.
     ENDIF.
    ENDIF.
  ENDIF.
ENDFOR.

*BREAK-POINT.

FOREACH ACC, COMPCODE, CC, PC, PP, DC.
ACC9 = ATRV( 'ZGL_ACCT', ACC ).
*IF ACC9 = '6800099999'.
IF NOT ACC9 IS INITIAL.
  IF NOT DC IS INITIAL.
    IF NOT CC IS INITIAL.
*    IF CATEGORY = 'ACT01'.
      { '/ERP/AMOUNT', COMPCODE, CC, #, ACC9, #, PP, ZFI_R01 } =
      { '/ERP/AMOUNT', COMPCODE, CC, #, ACC9, #, PP, ZFI_R01 } +
      { '/ERP/AMOUNT', COMPCODE, CC, DC, ACC, PC, PP, '/ERP/SFIN_V01' }.
*    ENDIF.
    ELSE.
     IF NOT PC IS INITIAL.
      { '/ERP/AMOUNT', COMPCODE, #, #, ACC9, PC, PP, ZFI_R01 } =
      { '/ERP/AMOUNT', COMPCODE, #, #, ACC9, PC, PP, ZFI_R01 } +
      { '/ERP/AMOUNT', COMPCODE, CC, DC, ACC, PC, PP, '/ERP/SFIN_V01' }.
     ENDIF.
    ENDIF.
  ENDIF.
     ENDIF.
ENDFOR.
```

Table 8.4: Copy Actual to 9* Accounts PF Fox Formula Code

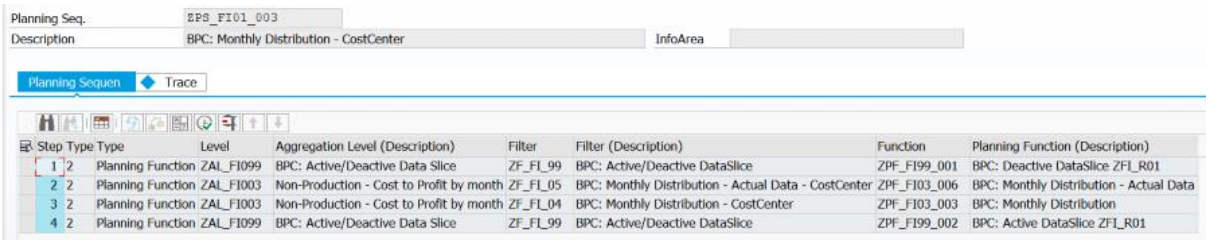


Figure 8.13: Monthly Distribution – Cost Center PS

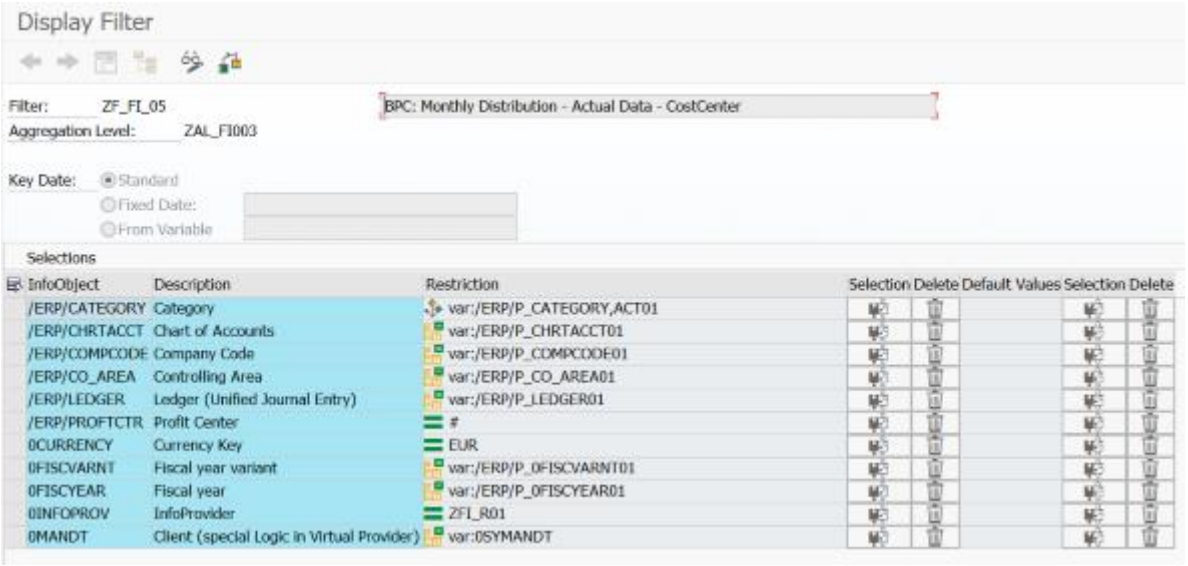


Figure 8.14: Actual Data Monthly Distribution by Cost Center PF Filter

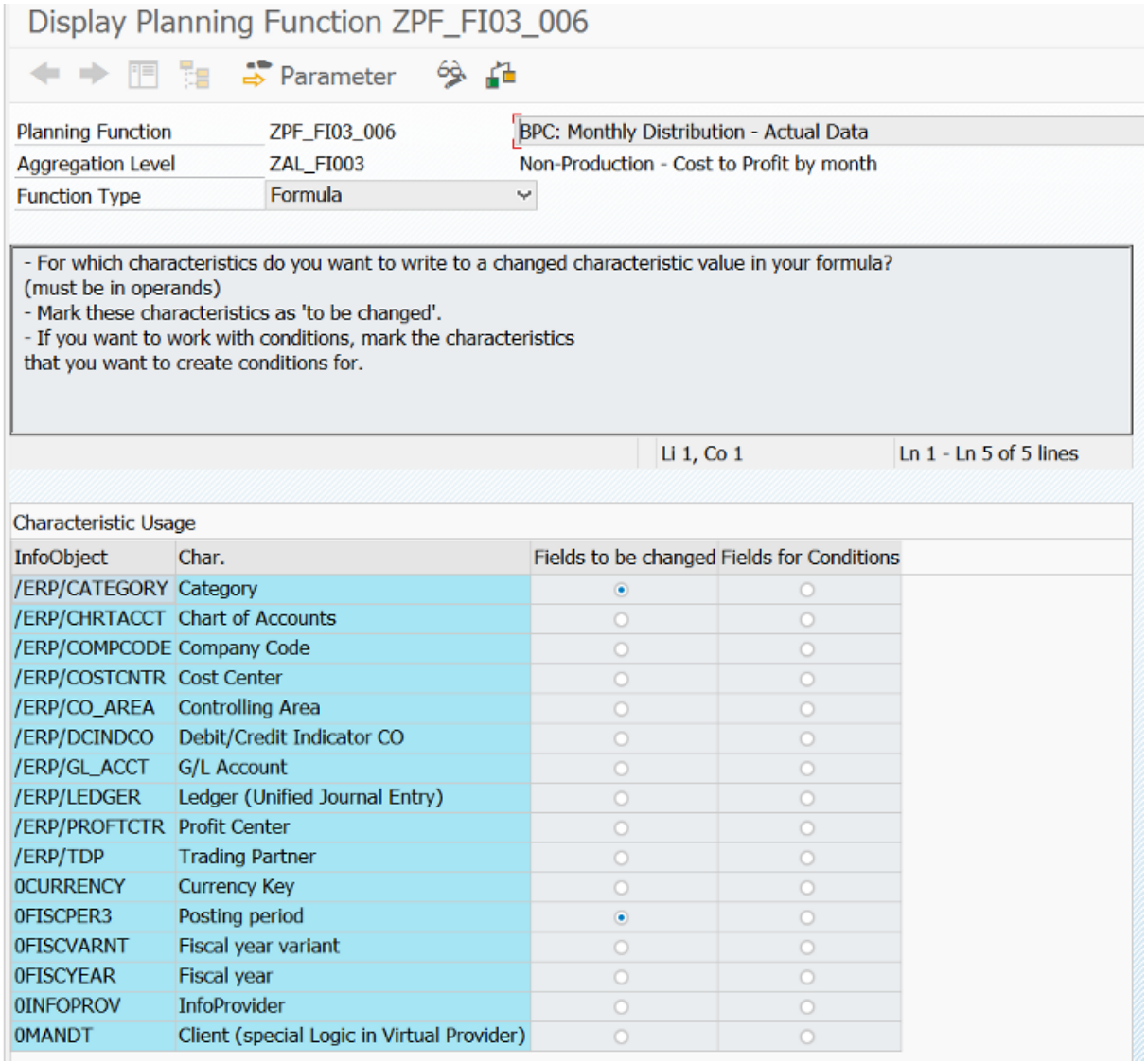


Figure 8.15: Actual Data Monthly Distribution by Cost Center PF Details

```
DATA YEAR TYPE 0FISCYEAR.
DATA YEAR2 TYPE 0FISCYEAR.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CATEGORY_M TYPE '/ERP/CATEGORY'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA M_VAL TYPE I.
DATA DIV_VAL TYPE I.

CATEGORY_M = VARV( '/ERP/P_CATEGORY' ).
M_FCST = ATRV( '0FISCPER3', CATEGORY_M ).
*M_VAL = ATRV( '0FISCPER3', CATEGORY_M ).
YEAR = OBJV( ).
YEAR2 = ATRV( '0FISCYEAR', CATEGORY_M ).

M_COUNT = 000.
FOREACH CATEGORY.
 IF CATEGORY = 'ACT01'.
  DO.
   IF M_COUNT >= 012.
    EXIT.
   ELSE.
    M_COUNT = TMVL( M_COUNT, 1 ).
    MONTH = M_COUNT.

    IF YEAR = YEAR2.
     IF M_COUNT <= M_FCST.
      { '/ERP/AMOUNT', CATEGORY_M, MONTH} = { '/ERP/AMOUNT', 'ACT01', MONTH }.
     ENDIF.
    ENDIF.

   ENDIF.
  ENDDO.
 ENDIF.
ENDFOR.
```

Table 8.5: Actual Data Monthly Distribution by Cost Center PF Fox Formula Code

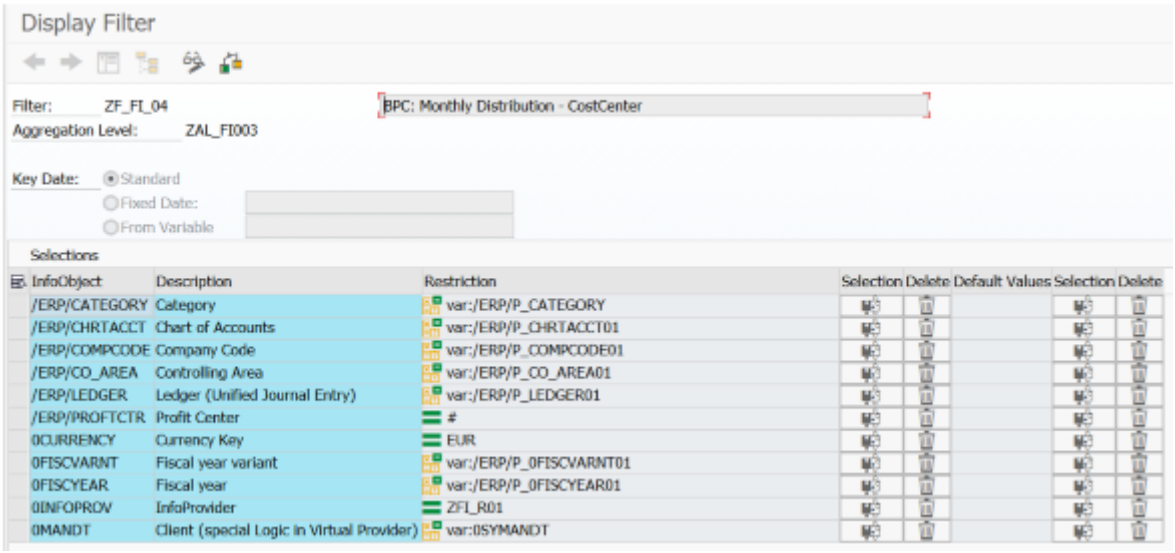


Figure 8.16: Planning Data Monthly Distribution by Cost Center PF Filter

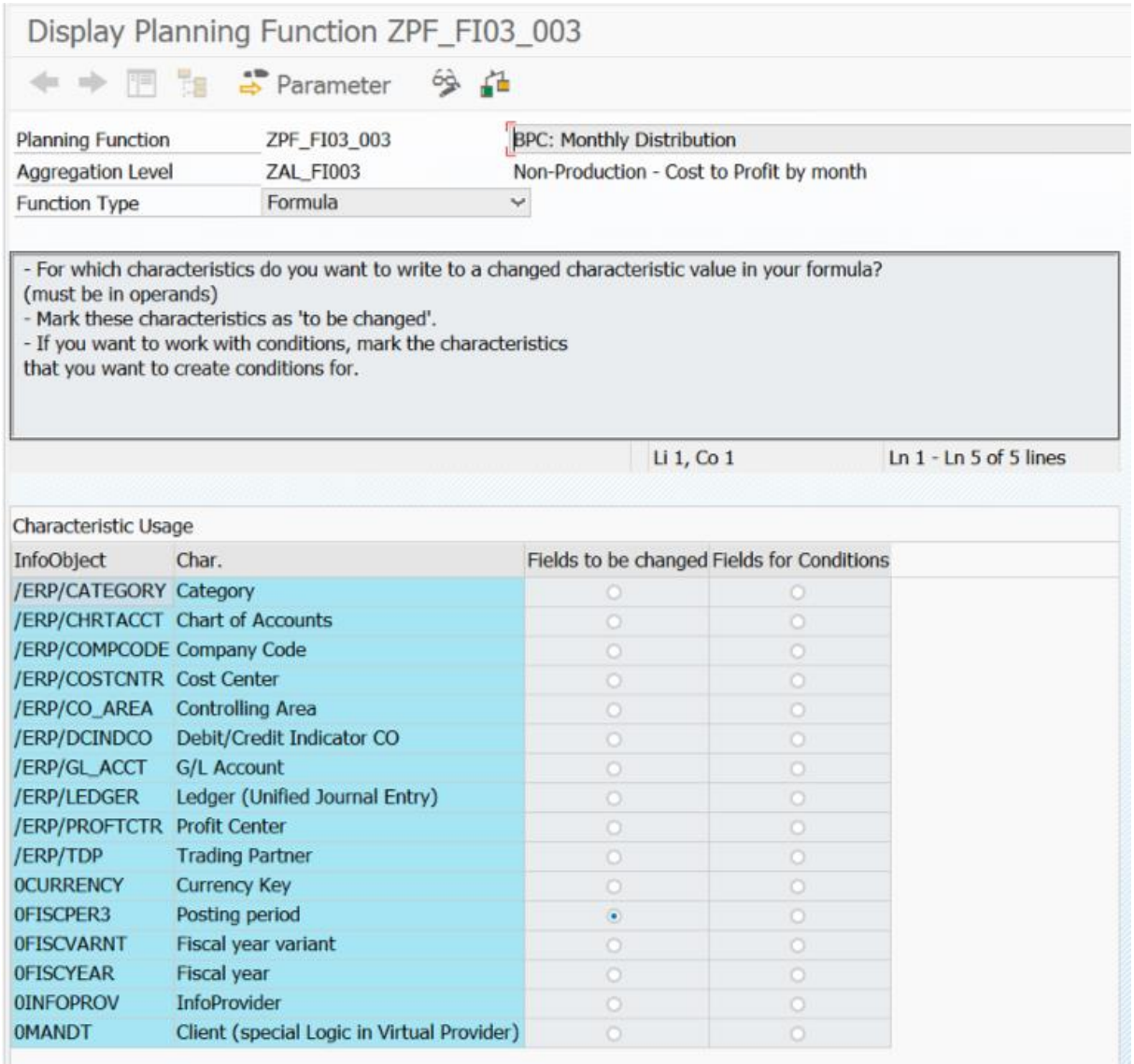


Figure 8.17: Planning Data Monthly Distribution by Cost Center PF Details

```
DATA YEAR TYPE 0FISCYEAR.
DATA YEAR2 TYPE 0FISCYEAR.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CATEGORY_M TYPE '/ERP/CATEGORY'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA M_VAL TYPE I.
DATA DIV_VAL TYPE I.

CATEGORY_M = VARV('/ERP/P_CATEGORY').
CATEGORY = OBJV().

M_FCST = ATRV( '0FISCPER3', CATEGORY_M ).
M_VAL = ATRV( '0FISCPER3', CATEGORY_M ).
YEAR = OBJV( ).
YEAR2 = ATRV( '0FISCYEAR', CATEGORY_M ).

M_COUNT = 000.
DO.

 IF M_COUNT >= 012.
  EXIT.
 ELSE.
  M_COUNT = TMVL( M_COUNT, 1 ).
  MONTH = M_COUNT.

  IF CATEGORY <> 'ACT01'.
   IF YEAR = YEAR2.
    IF M_COUNT > M_FCST.
     DIV_VAL = 12 - M_VAL.
     { '/ERP/AMOUNT', MONTH } = { '/ERP/AMOUNT', # } / DIV_VAL.
    ENDIF.
   ELSE.
     { '/ERP/AMOUNT', MONTH } = { '/ERP/AMOUNT', # } / 12.
   ENDIF.
  ELSE.
  ENDIF.

 ENDIF.
ENDDO.
```

Table 8.6: Planning Data Monthly Distribution by Cost Center PF Fox Formula Code

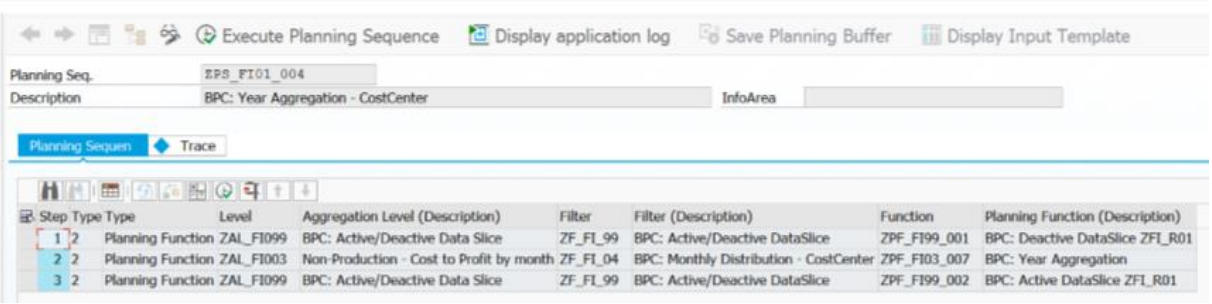


Figure 8.18: Year Aggregation – Cost Center PS

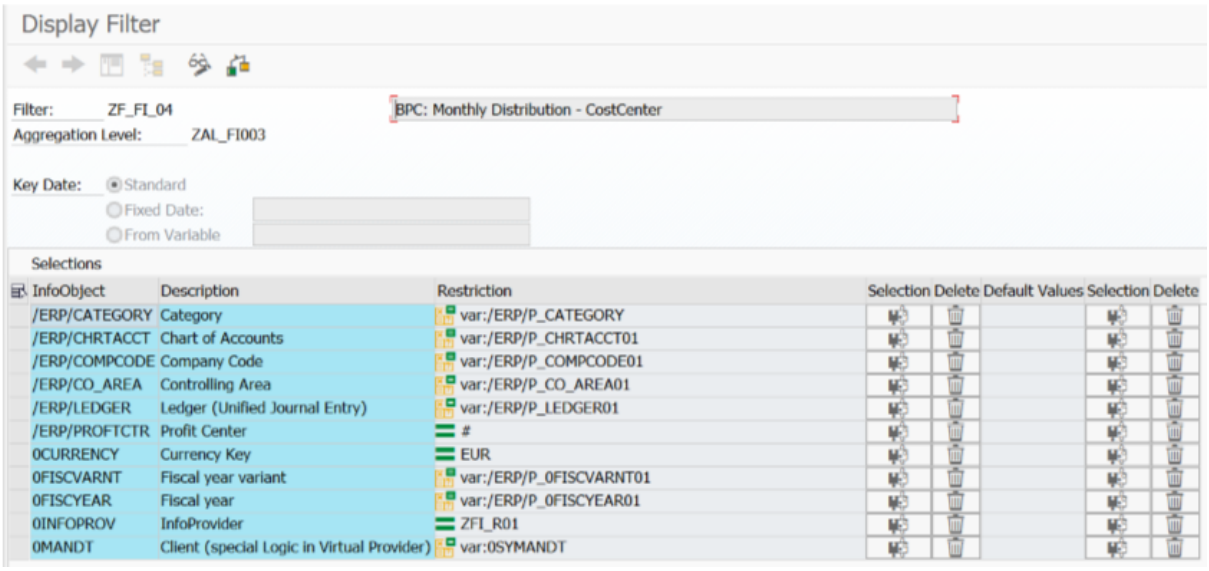


Figure 8.19: Year Aggregation by Cost Center PF Filter

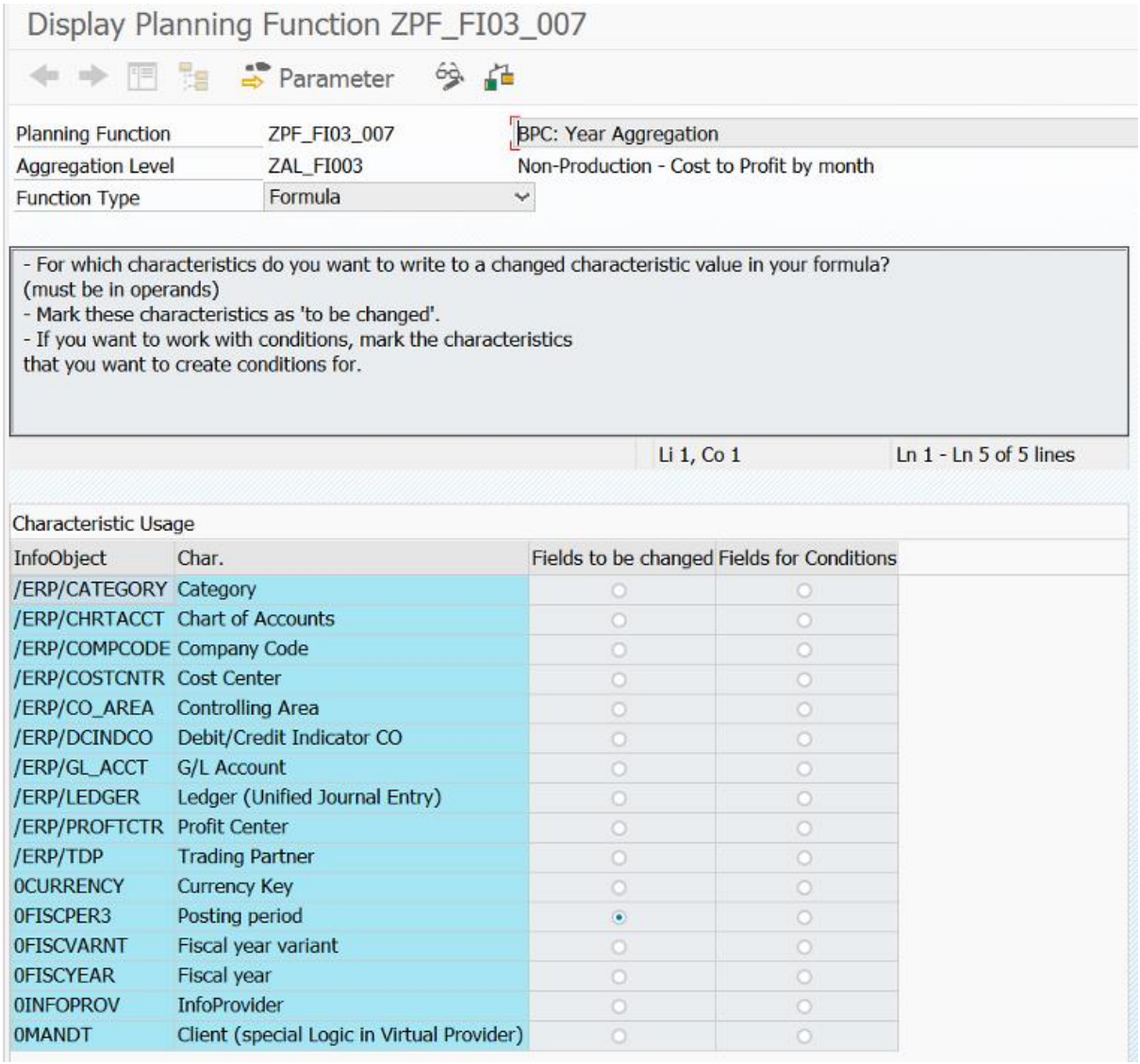


Figure 8.20: Year Aggregation PF Details

```
DATA YEAR TYPE 0FISCYEAR.
DATA YEAR2 TYPE 0FISCYEAR.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CATEGORY_M TYPE '/ERP/CATEGORY'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA M_VAL TYPE I.
DATA DIV_VAL TYPE I.
DATA TOTALYEAR TYPE F.

CATEGORY_M = VARV( '/ERP/P_CATEGORY' ).
M_FCST = ATRV( '0FISCPER3', CATEGORY_M ).
*M_VAL = ATRV( '0FISCPER3', CATEGORY_M ).
YEAR = OBJV( ).
YEAR2 = ATRV( '0FISCYEAR', CATEGORY_M ).
TOTALYEAR = 0.
M_COUNT = 000.
```

```
DO.
 IF M_COUNT >= 012.
  EXIT.
 ELSE.
  M_COUNT = TMVL( M_COUNT, 1 ).
  MONTH = M_COUNT.
  IF YEAR = YEAR2.
   IF M_COUNT > M_FCST.
    TOTALYEAR = TOTALYEAR + { '/ERP/AMOUNT', MONTH }.
   ENDIF.
  ELSE.
   TOTALYEAR = TOTALYEAR + { '/ERP/AMOUNT', MONTH }.
  ENDIF.
 ENDIF.
ENDDO.
{ '/ERP/AMOUNT', # } = TOTALYEAR.
```

Table 8.7: Year Aggregation PF Fox Formula Code

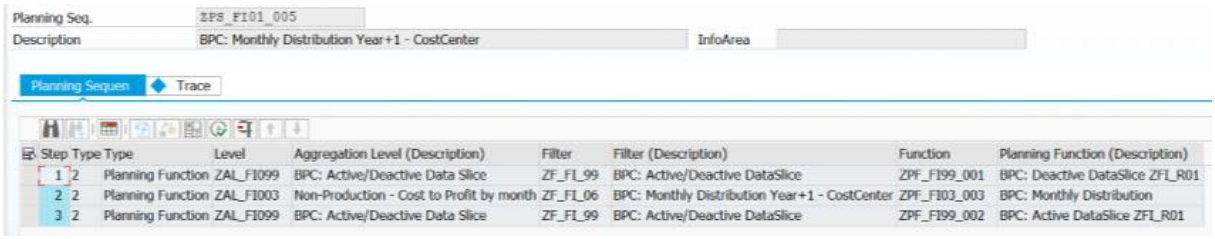


Figure 8.21: Monthly Distribution Year+1 by Cost Center PS

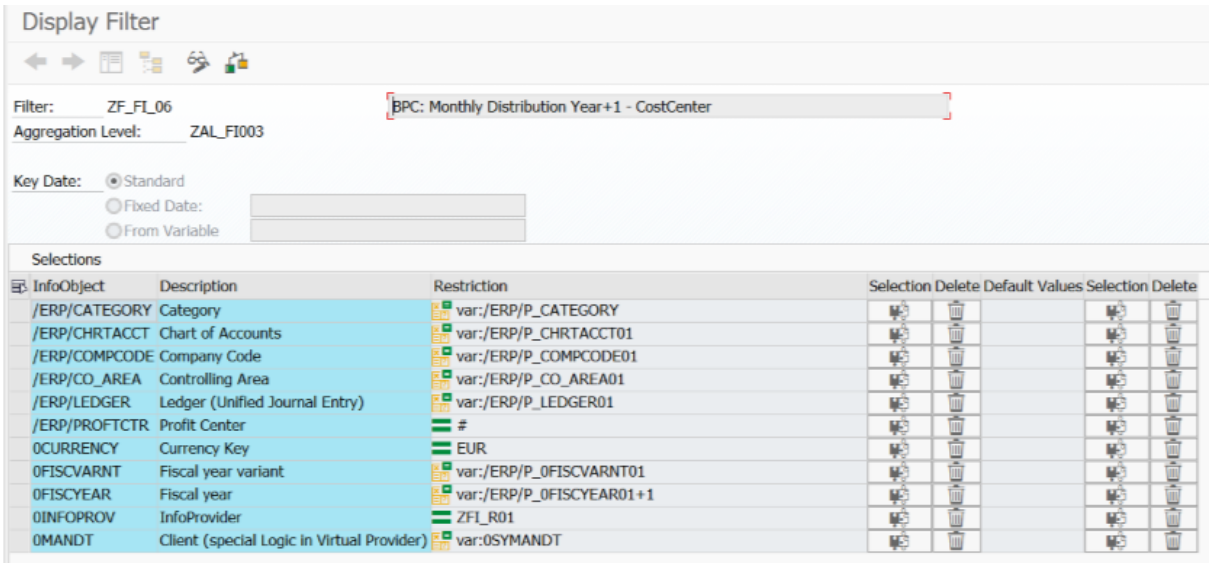


Figure 8.22: Monthly Distribution Year+1 by Cost Center PF Filter

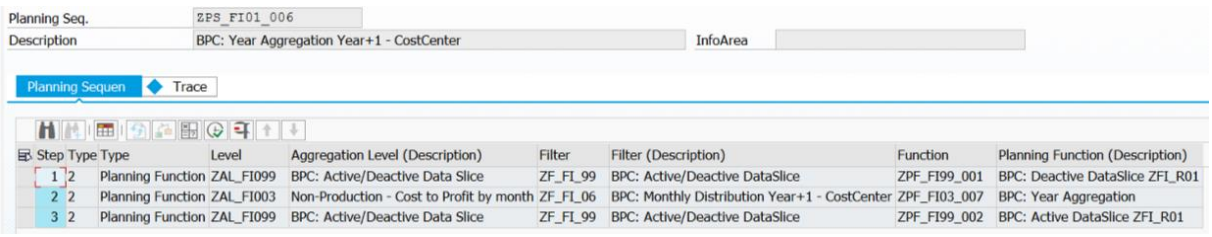
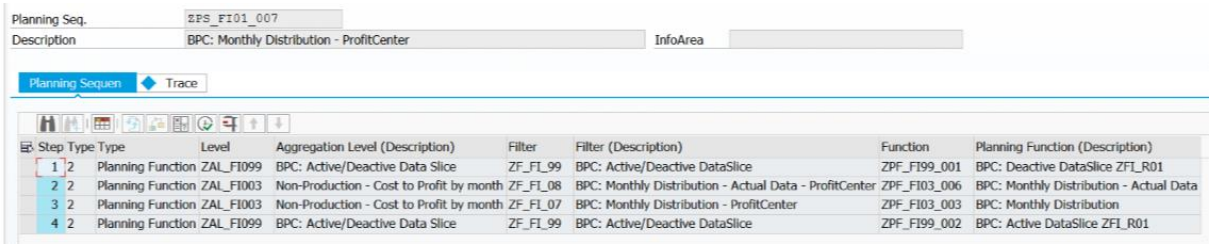


Figure 8.23: Year Aggregation Year+1 – Cost Center PS

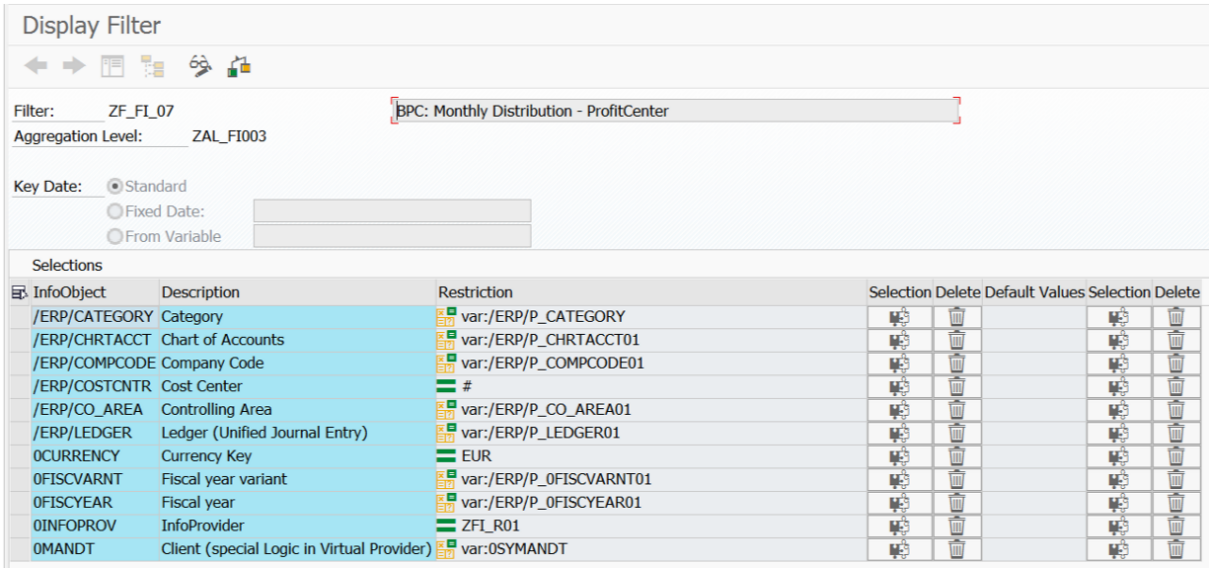


Planning Seq.	ZPS_FI01_007		
Description	BPC: Monthly Distribution - ProfitCenter	InfoArea	

Planning Sequen | Trace

Step	Type	Type	Level	Aggregation Level (Description)	Filter	Filter (Description)	Function	Planning Function (Description)
1	2	Planning Function	ZAL_FI099	BPC: Active/Deactive Data Slice	ZF_FI_99	BPC: Active/Deactive DataSlice	ZPF_FI99_001	BPC: Deactive DataSlice ZFI_R01
2	2	Planning Function	ZAL_FI003	Non-Production - Cost to Profit by month	ZF_FI_08	BPC: Monthly Distribution - Actual Data - ProfitCenter	ZPF_FI03_006	BPC: Monthly Distribution - Actual Data
3	2	Planning Function	ZAL_FI003	Non-Production - Cost to Profit by month	ZF_FI_07	BPC: Monthly Distribution - ProfitCenter	ZPF_FI03_003	BPC: Monthly Distribution
4	2	Planning Function	ZAL_FI099	BPC: Active/Deactive Data Slice	ZF_FI_99	BPC: Active/Deactive DataSlice	ZPF_FI99_002	BPC: Active DataSlice ZFI_R01

Figure 8.24: Monthly Distribution – Profit Center PS



Display Filter

Filter: ZF_FI_07 BPC: Monthly Distribution - ProfitCenter

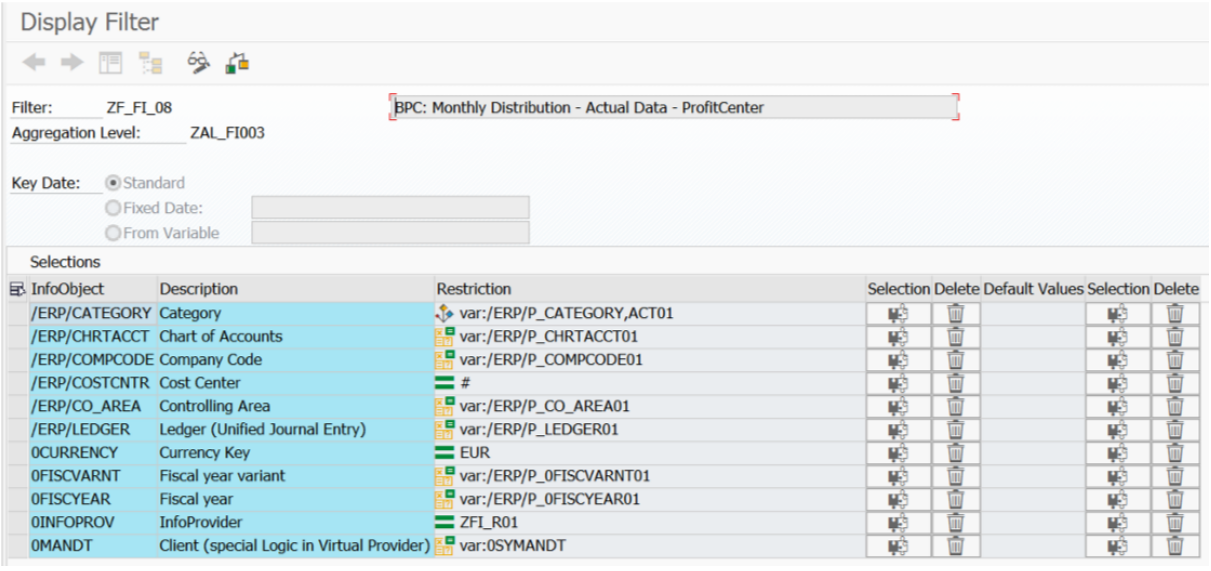
Aggregation Level: ZAL_FI003

Key Date: Standard / Fixed Date: / From Variable

Selections

InfoObject	Description	Restriction	Selection	Delete	Default Values	Selection	Delete
/ERP/CATEGORY	Category	var:/ERP/P_CATEGORY					
/ERP/CHRTACCT	Chart of Accounts	var:/ERP/P_CHRTACCT01					
/ERP/COMPCODE	Company Code	var:/ERP/P_COMPCODE01					
/ERP/COSTCNTR	Cost Center	#					
/ERP/CO_AREA	Controlling Area	var:/ERP/P_CO_AREA01					
/ERP/LEDGER	Ledger (Unified Journal Entry)	var:/ERP/P_LEDGER01					
0CURRENCY	Currency Key	EUR					
0FISCVARNT	Fiscal year variant	var:/ERP/P_0FISCVARNT01					
0FISCYEAR	Fiscal year	var:/ERP/P_0FISCYEAR01					
0INFOPROV	InfoProvider	ZFI_R01					
0MANDT	Client (special Logic in Virtual Provider)	var:0SYMANDT					

Figure 8.25: Monthly Distribution – Profit Center PF Filter



Display Filter

Filter: ZF_FI_08 BPC: Monthly Distribution - Actual Data - ProfitCenter

Aggregation Level: ZAL_FI003

Key Date: Standard / Fixed Date: / From Variable

Selections

InfoObject	Description	Restriction	Selection	Delete	Default Values	Selection	Delete
/ERP/CATEGORY	Category	var:/ERP/P_CATEGORY,ACT01					
/ERP/CHRTACCT	Chart of Accounts	var:/ERP/P_CHRTACCT01					
/ERP/COMPCODE	Company Code	var:/ERP/P_COMPCODE01					
/ERP/COSTCNTR	Cost Center	#					
/ERP/CO_AREA	Controlling Area	var:/ERP/P_CO_AREA01					
/ERP/LEDGER	Ledger (Unified Journal Entry)	var:/ERP/P_LEDGER01					
0CURRENCY	Currency Key	EUR					
0FISCVARNT	Fiscal year variant	var:/ERP/P_0FISCVARNT01					
0FISCYEAR	Fiscal year	var:/ERP/P_0FISCYEAR01					
0INFOPROV	InfoProvider	ZFI_R01					
0MANDT	Client (special Logic in Virtual Provider)	var:0SYMANDT					

Figure 8.26: Monthly Distribution Actual Data by Profit Center PF Filter

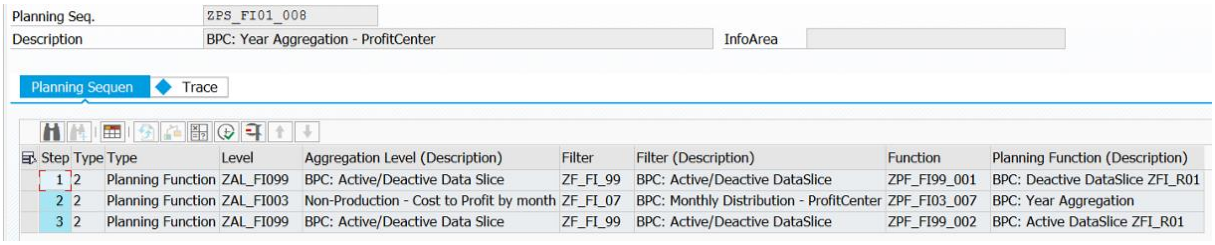


Figure 8.27: Year Aggregation by Profit Center PS

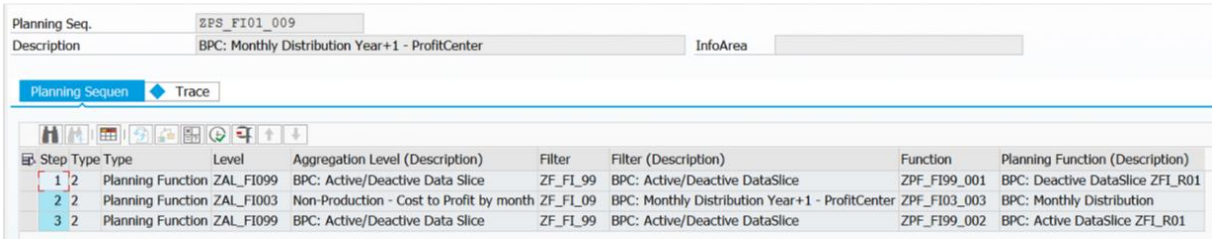


Figure 8.28: Monthly Distribution Year+1 by Profit Center PS

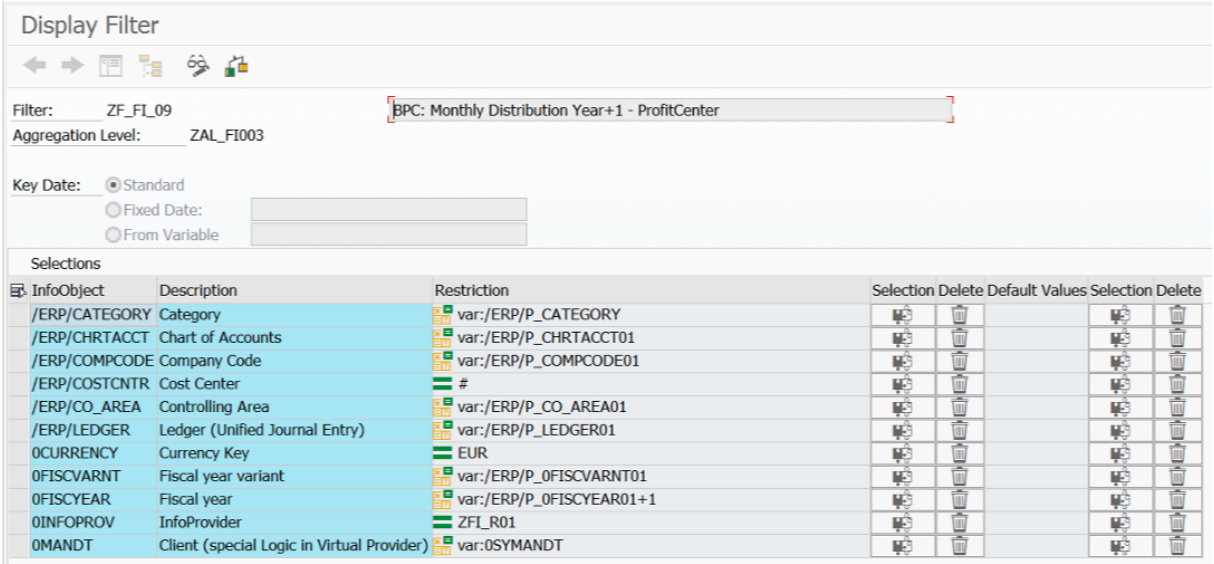


Figure 8.29: Monthly Distribution Year+1 by Profit Center PF Filter

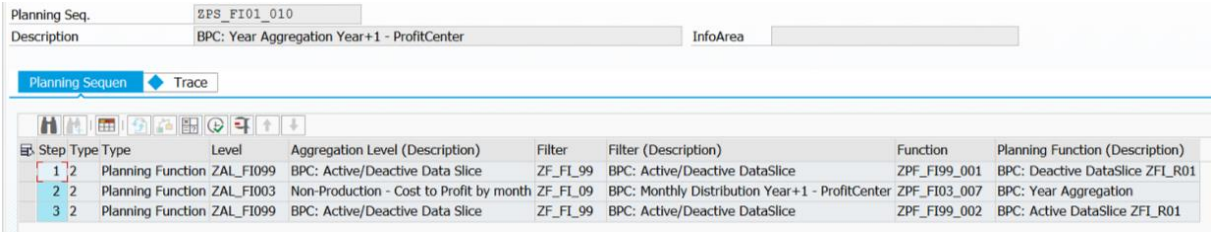
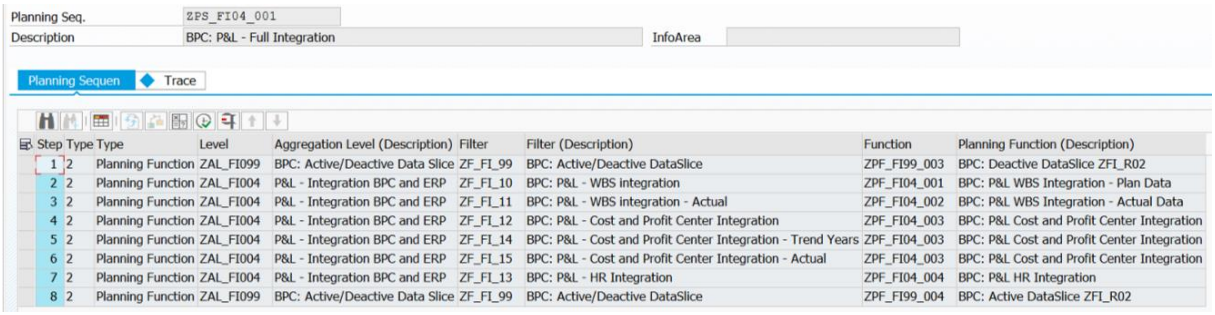


Figure 8.30: Year Aggregation Year+1 by Profit Center PS

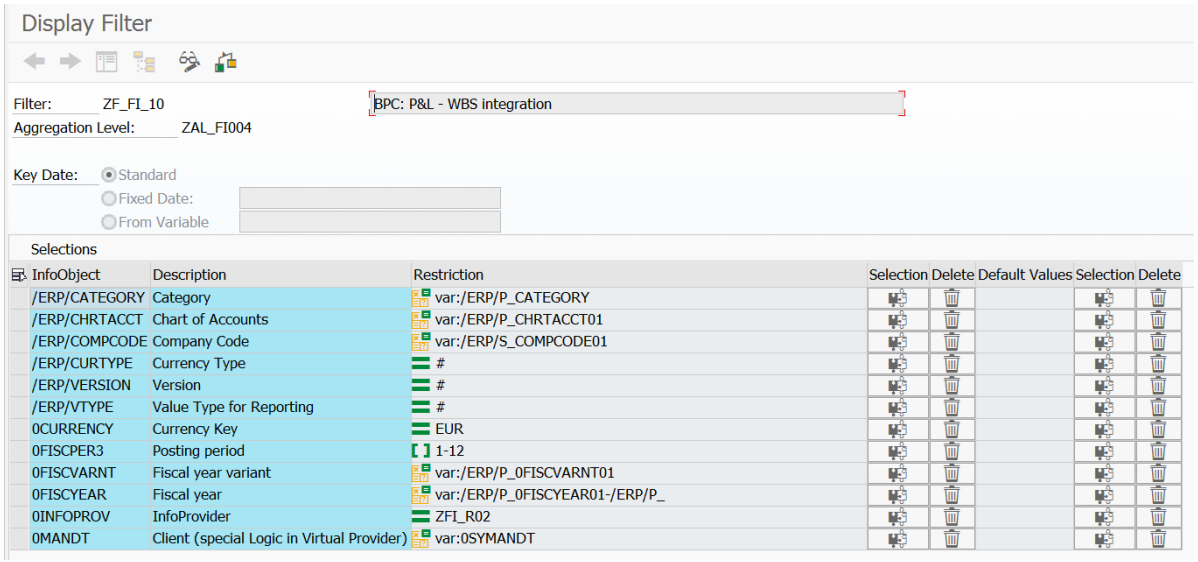


Planning Seq. ZPS_FI04_001
Description BPC: P&L - Full Integration InfoArea

Planning Sequen | Trace

Step	Type	Type	Level	Aggregation Level (Description)	Filter	Filter (Description)	Function	Planning Function (Description)
1	2	Planning Function	ZAL_FI099	BPC: Active/Deactive Data Slice	ZF_FI_99	BPC: Active/Deactive DataSlice	ZPF_FI99_003	BPC: Deactive DataSlice ZFI_R02
2	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_10	BPC: P&L - WBS integration	ZPF_FI04_001	BPC: P&L WBS Integration - Plan Data
3	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_11	BPC: P&L - WBS integration - Actual	ZPF_FI04_002	BPC: P&L WBS Integration - Actual Data
4	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_12	BPC: P&L - Cost and Profit Center Integration	ZPF_FI04_003	BPC: P&L Cost and Profit Center Integration
5	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_14	BPC: P&L - Cost and Profit Center Integration - Trend Years	ZPF_FI04_003	BPC: P&L Cost and Profit Center Integration
6	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_15	BPC: P&L - Cost and Profit Center Integration - Actual	ZPF_FI04_003	BPC: P&L Cost and Profit Center Integration
7	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_13	BPC: P&L - HR Integration	ZPF_FI04_004	BPC: P&L HR Integration
8	2	Planning Function	ZAL_FI099	BPC: Active/Deactive Data Slice	ZF_FI_99	BPC: Active/Deactive DataSlice	ZPF_FI99_004	BPC: Active DataSlice ZFI_R02

Figure 8.31: P&L - Full Integration PS



Display Filter

Filter: ZF_FI_10 BPC: P&L - WBS integration
Aggregation Level: ZAL_FI004

Key Date: Standard
Fixed Date:
From Variable

Selections

InfoObject	Description	Restriction	Selection	Delete	Default Values	Selection	Delete
/ERP/CATEGORY	Category	var:/ERP/P_CATEGORY					
/ERP/CHRTACCT	Chart of Accounts	var:/ERP/P_CHRTACCT01					
/ERP/COMPCODE	Company Code	var:/ERP/S_COMPCODE01					
/ERP/CURTYPE	Currency Type	#					
/ERP/VERSION	Version	#					
/ERP/VTYPE	Value Type for Reporting	#					
0CURRENCY	Currency Key	EUR					
0FISCPER3	Posting period	1-12					
0FISCVARNT	Fiscal year variant	var:/ERP/P_0FISCVARNT01					
0FISCYEAR	Fiscal year	var:/ERP/P_0FISCYEAR01-/ERP/P_					
0INFOPROV	InfoProvider	ZFI_R02					
0MANDT	Client (special Logic in Virtual Provider)	var:0SYMANDT					

Figure 8.32: P&L and WBS integration PF Filter

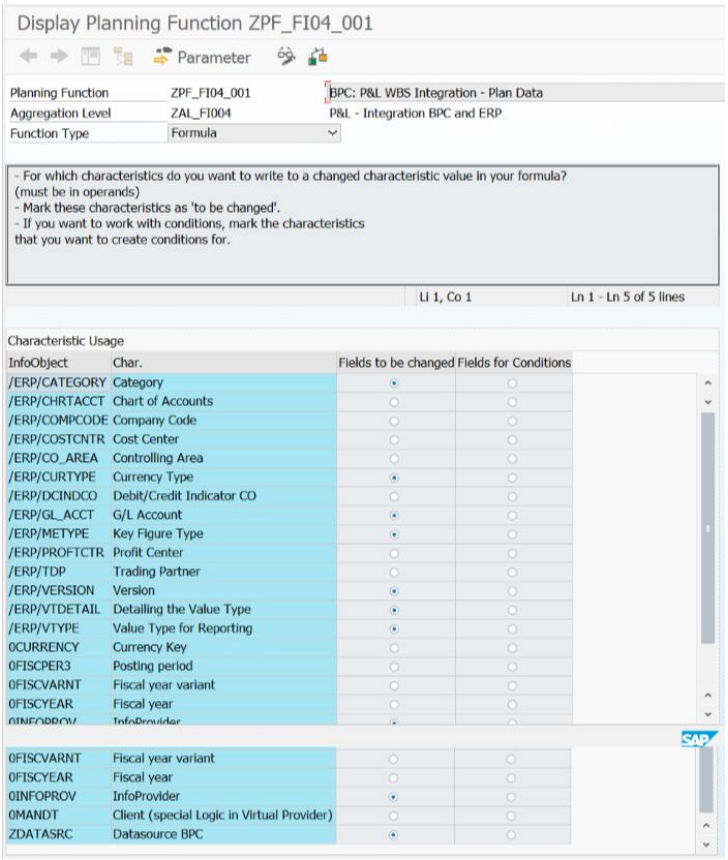


Figure 8.33: P&L WBS Integration by Plan Data PF Details

```
DATA CATEGORY   TYPE '/ERP/CATEGORY'.
DATA VERSION    TYPE '/ERP/VERSION'.
DATA CURTYPE    TYPE '/ERP/CURTYPE'.
DATA METYPE     TYPE '/ERP/METYPE'.
DATA VTYPE      TYPE '/ERP/VTYPE'.
DATA VTDETAIL   TYPE '/ERP/VTDETAIL'.
DATA BUSAREA    TYPE '/ERP/BUSAREA'.
DATA INFOPROV   TYPE 0INFOPROV.
DATA WBS_ELEMENT TYPE /ERP/WBSELMT.
DATA LEDGER TYPE /ERP/LEDGER.
DATA GLACCT TYPE /ERP/GL_ACCT.
DATA GLACCT9 TYPE /ERP/GL_ACCT.

*IF NOT INFOPROV = '/ERP/COOM_V03'.
* EXIT.
*ENDIF.

VERSION = VARV('/ERP/P_VERSION01').
*CO_AREA = VARV('/ERP/P_CO_AREA01').
*FISCYEAR = OBJV().

  FOREACH CATEGORY IN SELECTION.
    FOREACH GLACCT9.
      {'/ERP/AMOUNT',CATEGORY,#,GLACCT9,#,#,#,#,'ZFI_R02','WBS_PLAN'} = 0.
    ENDFOR.
```

```
FOREACH GLACCT, METYPE, VTDETAIL IN REFDATA.

  {'/ERP/AMOUNT',CATEGORY,#,GLACCT,#,#,#,#,'ZFI_R02','WBS_PLAN'}
  = {'/ERP/AMOUNT',CATEGORY,#,GLACCT,#,#,#,#,'ZFI_R02','WBS_PLAN'}
    + {'/ERP/AMOUNT',#,20,GLACCT,METYPE,VERSION,VTDETAIL,020,'/ERP/COOM_V03', #}.

ENDFOR.

ENDFOR.
```

Table 8.8: P&L WBS Integration by Plan Data PF Fox Formula Code

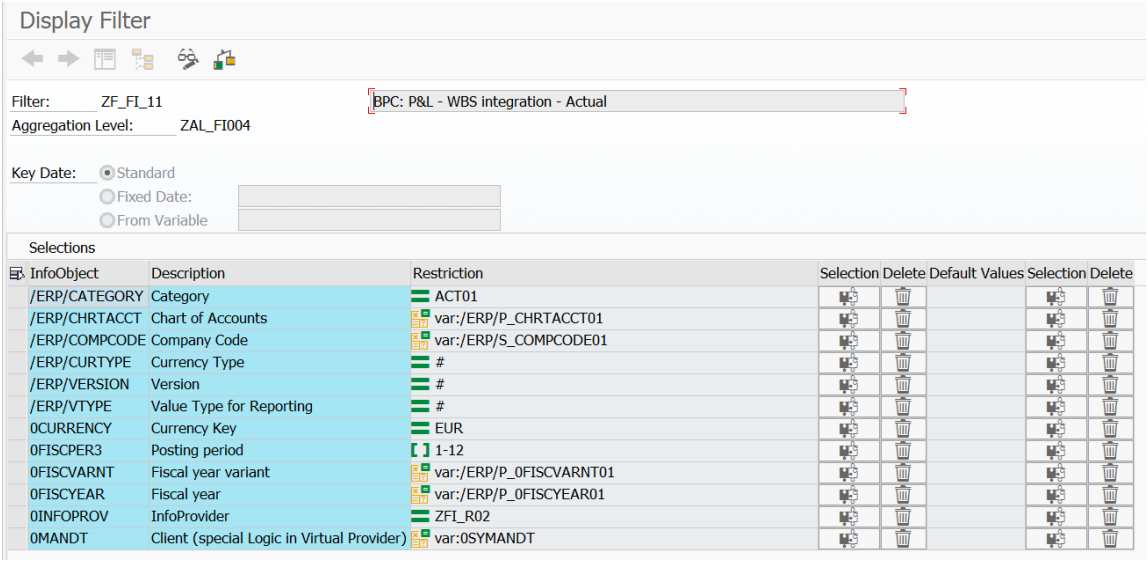


Figure 8.34: P&L - WBS integration – Actual PF Filter

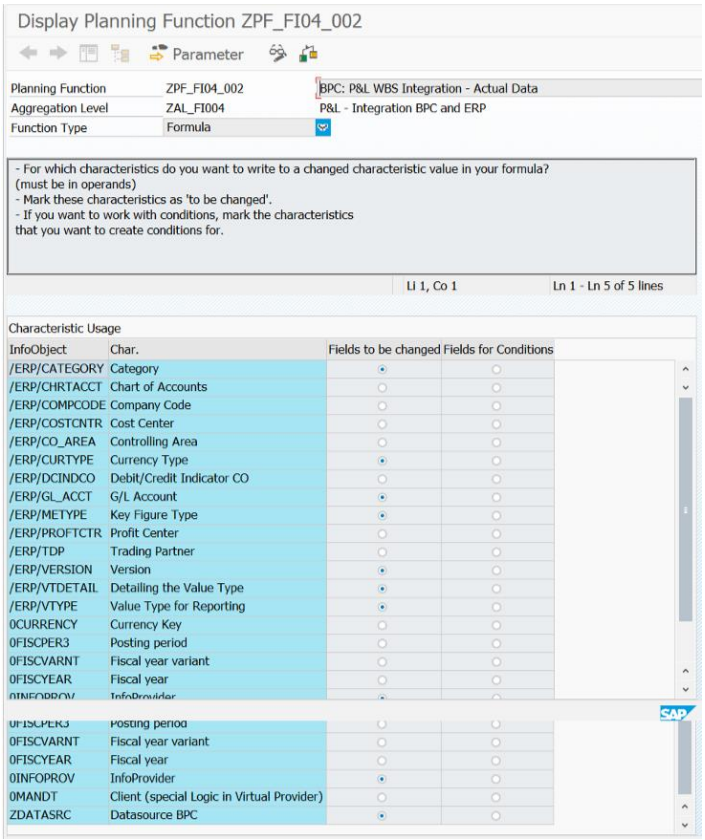


Figure 8.35: P&L and WBS Integration by Actual Data PF Details

```
DATA CATEGORY   TYPE '/ERP/CATEGORY'.
DATA VERSION    TYPE '/ERP/VERSION'.
DATA CURTYPE    TYPE '/ERP/CURTYPE'.
DATA METYPE     TYPE '/ERP/METYPE'.
DATA VTYPE      TYPE '/ERP/VTYPE'.
DATA VTDETAIL   TYPE '/ERP/VTDETAIL'.
DATA BUSAREA    TYPE '/ERP/BUSAREA'.
DATA INFOPROV   TYPE 0INFOPROV.
DATA WBS_ELEMENT TYPE /ERP/WBSELMT.
DATA LEDGER TYPE /ERP/LEDGER.
DATA GLACCT TYPE /ERP/GL_ACCT.
DATA GLACCT9 TYPE /ERP/GL_ACCT.

*BREAK-POINT.
*VERSION = VARV('/ERP/P_VERSION01').
*CO_AREA = VARV('/ERP/P_CO_AREA01').
*FISCYEAR = OBJV().

*  FOREACH CATEGORY IN SELECTION.
  FOREACH CATEGORY IN REFDATA.
    FOREACH GLACCT9.
      {'/ERP/AMOUNT','ACT01', #,GLACCT9,#,#,#,#,'ZFI_R02','WBS_ACTUAL'} = 0.
    ENDFOR.
    FOREACH GLACCT, METYPE, VTDETAIL IN REFDATA.
      GLACCT9 = ATRV(ZGL_ACCT, GLACCT).
      IF NOT GLACCT9 IS INITIAL.
```

```
      {'/ERP/AMOUNT', 'ACT01',#,GLACCT9,#,#,#,#,'ZFI_R02','WBS_ACTUAL'}
      = {'/ERP/AMOUNT', 'ACT01',#,GLACCT9,#,#,#,#,'ZFI_R02','WBS_ACTUAL'}
        + {'/ERP/AMOUNT',#,20,GLACCT,METYPE,000,VTDETAIL,010,'/ERP/COOM_V03',#}.
    ENDIF.
  ENDFOR.
ENDFOR.
```

Table 8.9: P&L and WBS Integration by Actual Data PF Fox Formula Code

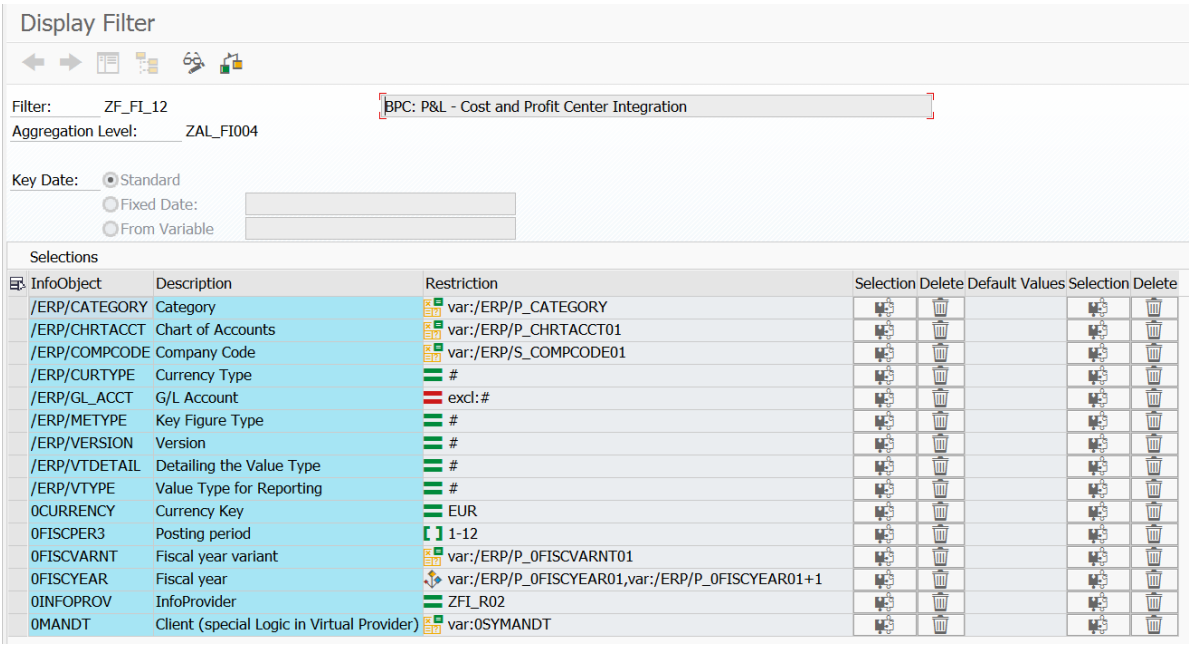


Figure 8.36: P&L - Cost and Profit Center Integration PF Filter

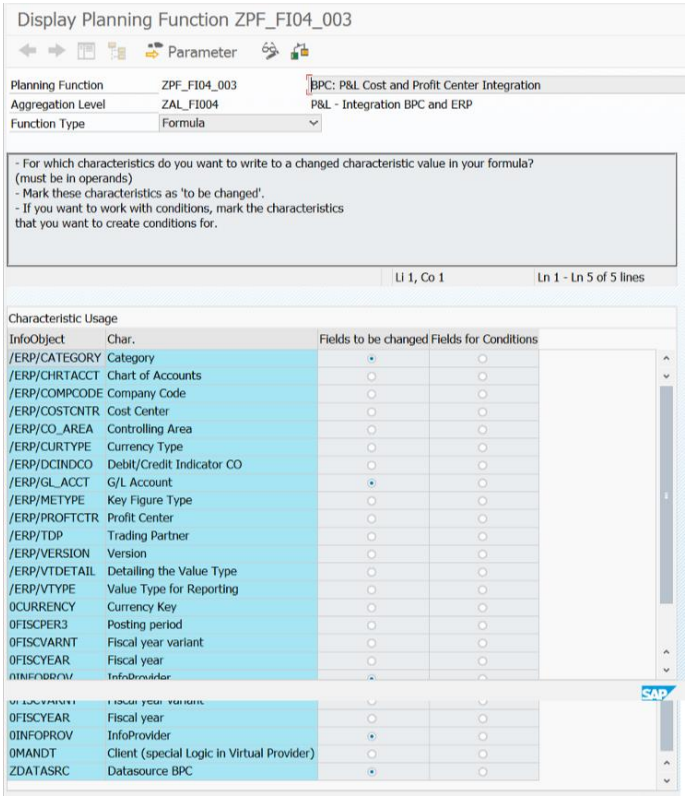


Figure 8.37: P&L Cost and Profit Center Integration PF Details

```
DATA CATEGORY   TYPE '/ERP/CATEGORY'.
DATA VERSION    TYPE '/ERP/VERSION'.
DATA CURTYPE    TYPE '/ERP/CURTYPE'.
DATA METYPE     TYPE '/ERP/METYPE'.
DATA VTYPE      TYPE '/ERP/VTYPE'.
DATA VTDETAIL   TYPE '/ERP/VTDETAIL'.
DATA BUSAREA    TYPE '/ERP/BUSAREA'.
DATA INFOPROV   TYPE 0INFOPROV.
DATA WBS_ELEMENT TYPE /ERP/WBSELMT.
DATA LEDGER TYPE /ERP/LEDGER.
DATA GLACCT TYPE /ERP/GL_ACCT.
DATA GLACCT9 TYPE /ERP/GL_ACCT.

*BREAK-POINT.
*  FOREACH CATEGORY.
 FOREACH CATEGORY IN SELECTION.
   FOREACH GLACCT.
    {'/ERP/AMOUNT',CATEGORY,GLACCT,'ZFI_R02','CC_PC'} = 0.
   ENDFOR.
   FOREACH GLACCT IN REFDATA.
      {'/ERP/AMOUNT',CATEGORY,GLACCT,'ZFI_R02','CC_PC'}
      = {'/ERP/AMOUNT',CATEGORY,GLACCT,'ZFI_R02','CC_PC'}
       + {'/ERP/AMOUNT',CATEGORY,GLACCT,'ZFI_R01',#}.
   ENDFOR.

 ENDFOR.
```

Table 8.10: P&L Cost and Profit Center Integration PF Fox Formula Code

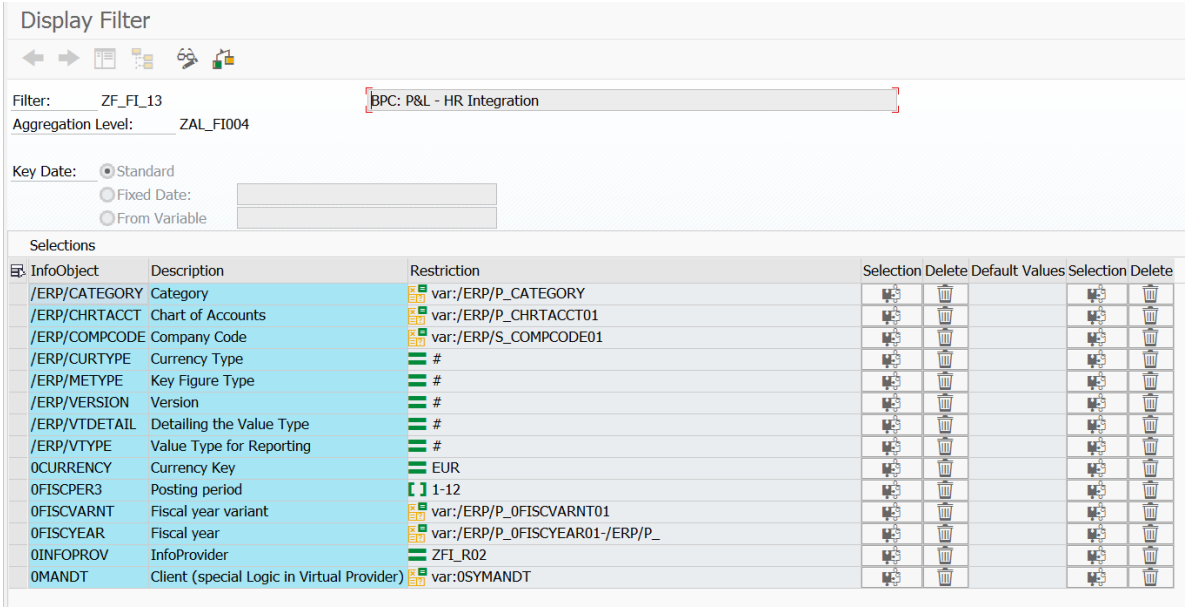


Figure 8.38 : P&L - HR Integration PF Filter

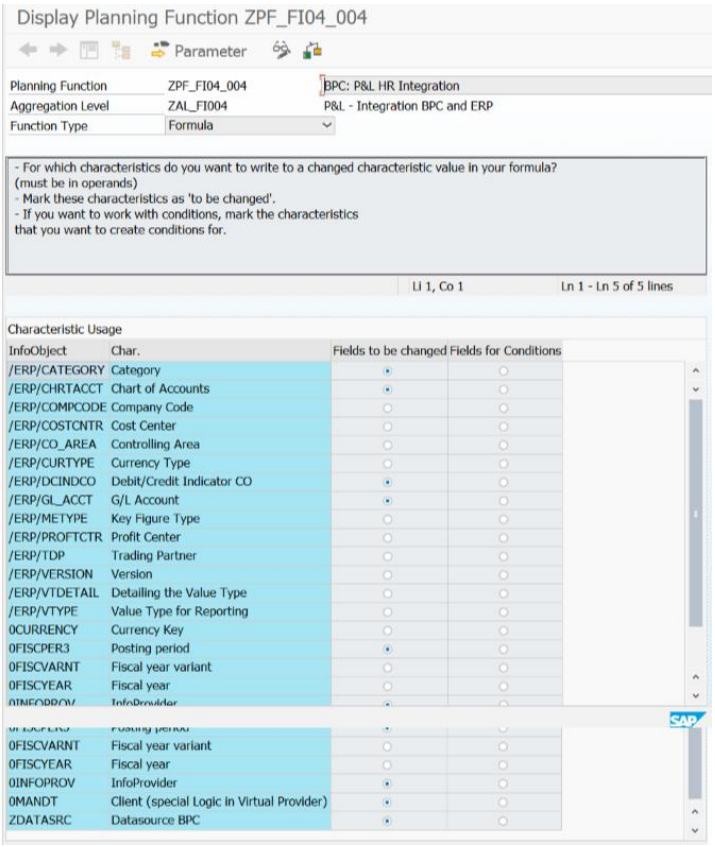


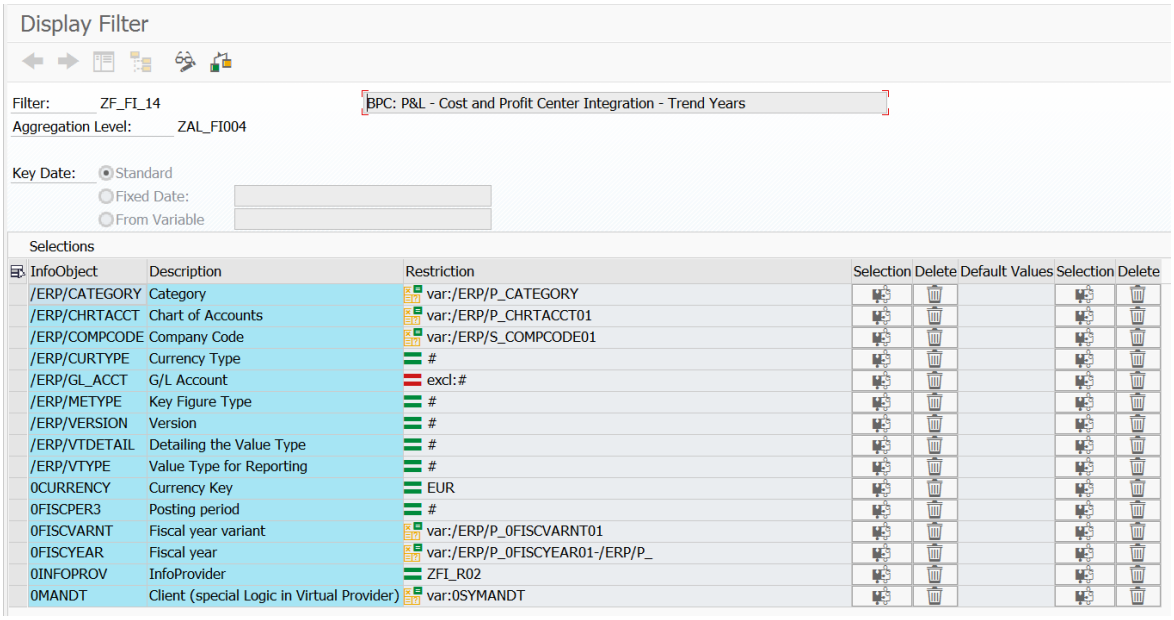
Figure 8.39: P&L HR Integration PF Details

```
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CATEGORY_M TYPE '/ERP/CATEGORY'.
DATA VERSION TYPE '/ERP/VERSION'.
DATA CURTYPE TYPE '/ERP/CURTYPE'.
DATA METYPE TYPE '/ERP/METYPE'.
DATA VTYPE TYPE '/ERP/VTYPE'.
DATA VTDETAIL TYPE '/ERP/VTDETAIL'.
DATA BUSAREA TYPE '/ERP/BUSAREA'.
DATA PERIOD TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA CHARTACC TYPE '/ERP/CHRTACCT'.
DATA YEAR TYPE '0FISCYEAR'.
DATA YEAR2 TYPE '0FISCYEAR'.
DATA MANDT TYPE 0MANDT.
DATA INFOPROV TYPE 0INFOPROV.
DATA WBS_ELEMENT TYPE / ERP / WBSELMT.
DATA LEDGER TYPE / ERP / LEDGER.
DATA GLACCT TYPE / ERP / GL_ACCT.
DATA GLACCT1 TYPE / ERP / GL_ACCT.
DATA GLACCT2 TYPE / ERP / GL_ACCT.
*DATA GLACCT9 TYPE /ERP/GL_ACCT.

*Change(25.09.2017).....
CATEGORY_M = VARV( '/ERP/P_CATEGORY' ).
M_FCST = ATRV( '0FISCPER3', CATEGORY_M ).
```

```
*M_VAL = ATRV( '0FISCPER3', CATEGORY_M ).
YEAR = OBJV( ).
YEAR2 = ATRV( '0FISCYEAR', CATEGORY_M ).
*Change.....

*Staff Cost
GLACCT = '6300099999'.

******ADDED FOR CHANGE REQUEST 04.10.2017*******
GLACCT1 = '6300099999'.
GLACCT2 = '6332099999'.
**********************************************

*BREAK-POINT.
FOREACH CATEGORY, MANDT, CHARTACC IN SELECTION.

  FOREACH PERIOD.
    { '/ERP/AMOUNT', CATEGORY, CHARTACC, GLACCT, PERIOD, 'ZFI_R02', MANDT, 'HR_PLAN' } = 0.
    { '/ERP/AMOUNT', CATEGORY, CHARTACC, GLACCT2, PERIOD, 'ZFI_R02', MANDT, 'HR_PLAN' } =
0.
  ENDFOR.
*      {'/ERP/AMOUNT',CATEGORY,GLACCT,'ZFI_R02','CC_PC'} = 0.

  FOREACH PERIOD IN REFDATA.
    IF PERIOD > M_FCST.

**************.....COMMENTED FOR THE CHANGE REQUEST
BELOW.....*************************
*       {'/ERP/AMOUNT',CATEGORY,CHARTACC,GLACCT, PERIOD, 'ZFI_R02',MANDT,'HR_PLAN'}
*       = {'/ERP/AMOUNT',CATEGORY,CHARTACC,GLACCT, PERIOD, 'ZFI_R02',MANDT,'HR_PLAN' }
*         + {'ZEMPCOST',CATEGORY,#,#, PERIOD, 'ZHR_R02',#,#}.
************************************04.10.2017**********************************
********

*****************************ACCOUNT CHANGE REQUEST
04.10.2017************************
     { '/ERP/AMOUNT', CATEGORY, CHARTACC, GLACCT, PERIOD, 'ZFI_R02', MANDT, 'HR_PLAN' }
       = { '/ERP/AMOUNT', CATEGORY, CHARTACC, GLACCT, PERIOD, 'ZFI_R02', MANDT, 'HR_PLAN' }
       + ( { 'ZEMPCOST', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # }
       - { 'ZLNCHVOU', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # }
       - { 'ZHLTHINS', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # }
       - { 'ZMEALALL', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # }
       - { 'ZKMINDEM', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # } ).

        { '/ERP/AMOUNT', CATEGORY, CHARTACC, GLACCT2, PERIOD, 'ZFI_R02', MANDT, 'HR_PLAN' }
=
        { '/ERP/AMOUNT', CATEGORY, CHARTACC, GLACCT2, PERIOD, 'ZFI_R02', MANDT, 'HR_PLAN' }
+
        { 'ZLNCHVOU', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # } +
        { 'ZHLTHINS', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # } +
        { 'ZMEALALL', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # } +
        { 'ZKMINDEM', CATEGORY, #, #, PERIOD, 'ZHR_R02', #, # }.
```

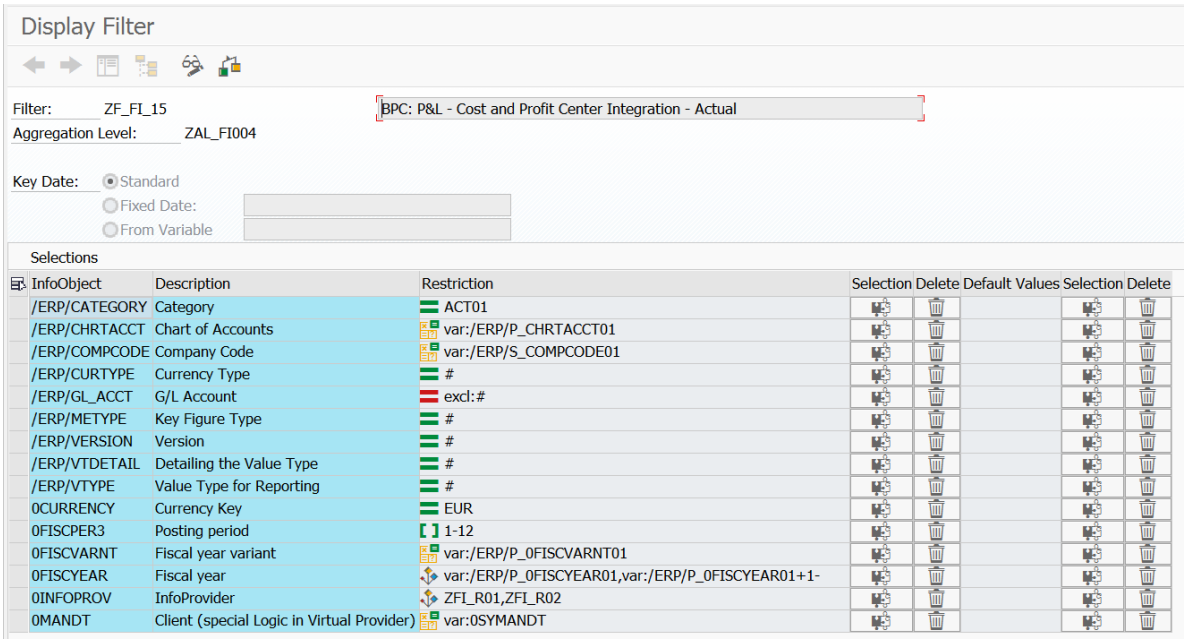
```
*****************************ACCOUNT CHANGE REQUEST
04.10.2017************************
        ELSE.
  ENDIF.
 ENDFOR.

ENDFOR.
```

Table 8.11: P&L HR Integration PF Fox Formula Code



InfoObject	Description	Restriction	Selection	Delete	Default Values	Selection	Delete
/ERP/CATEGORY	Category	var:/ERP/P_CATEGORY					
/ERP/CHRTACCT	Chart of Accounts	var:/ERP/P_CHRTACCT01					
/ERP/COMPCODE	Company Code	var:/ERP/S_COMPCODE01					
/ERP/CURTYPE	Currency Type	#					
/ERP/GL_ACCT	G/L Account	excl:#					
/ERP/METYPE	Key Figure Type	#					
/ERP/VERSION	Version	#					
/ERP/VTDETAIL	Detailing the Value Type	#					
/ERP/VTYPE	Value Type for Reporting	#					
0CURRENCY	Currency Key	EUR					
0FISCPER3	Posting period	#					
0FISCVARNT	Fiscal year variant	var:/ERP/P_0FISCVARNT01					
0FISCYEAR	Fiscal year	var:/ERP/P_0FISCYEAR01-/ERP/P_					
0INFOPROV	InfoProvider	ZFI_R02					
0MANDT	Client (special Logic in Virtual Provider)	var:0SYMANDT					

Figure 8.40: P&L - Cost and Profit Center Integration - Trend Years PF Filter



InfoObject	Description	Restriction	Selection	Delete	Default Values	Selection	Delete
/ERP/CATEGORY	Category	ACT01					
/ERP/CHRTACCT	Chart of Accounts	var:/ERP/P_CHRTACCT01					
/ERP/COMPCODE	Company Code	var:/ERP/S_COMPCODE01					
/ERP/CURTYPE	Currency Type	#					
/ERP/GL_ACCT	G/L Account	excl:#					
/ERP/METYPE	Key Figure Type	#					
/ERP/VERSION	Version	#					
/ERP/VTDETAIL	Detailing the Value Type	#					
/ERP/VTYPE	Value Type for Reporting	#					
0CURRENCY	Currency Key	EUR					
0FISCPER3	Posting period	1-12					
0FISCVARNT	Fiscal year variant	var:/ERP/P_0FISCVARNT01					
0FISCYEAR	Fiscal year	var:/ERP/P_0FISCYEAR01,var:/ERP/P_0FISCYEAR01+1-					
0INFOPROV	InfoProvider	ZFI_R01,ZFI_R02					
0MANDT	Client (special Logic in Virtual Provider)	var:0SYMANDT					

Figure 8.41: P&L - Cost and Profit Center Integration – Actual PF Filter

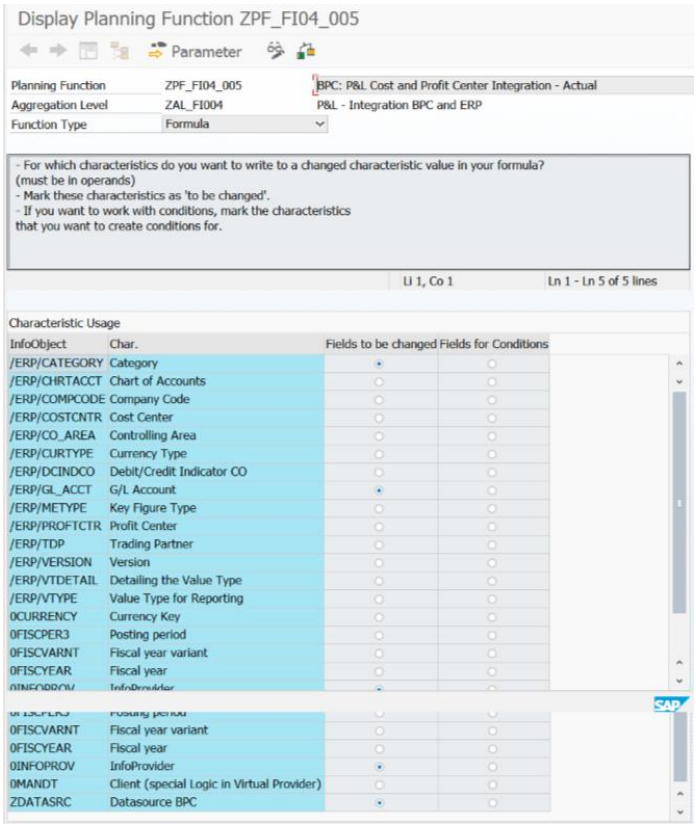


Figure 8.42: P&L Cost and Profit Center Integration by Actual PF Details

```
DATA CATEGORY   TYPE '/ERP/CATEGORY'.
DATA VERSION    TYPE '/ERP/VERSION'.
DATA CURTYPE    TYPE '/ERP/CURTYPE'.
DATA METYPE     TYPE '/ERP/METYPE'.
DATA VTYPE      TYPE '/ERP/VTYPE'.
DATA VTDETAIL   TYPE '/ERP/VTDETAIL'.
DATA BUSAREA    TYPE '/ERP/BUSAREA'.
DATA INFOPROV   TYPE 0INFOPROV.
DATA WBS_ELEMENT TYPE /ERP/WBSELMT.
DATA LEDGER TYPE /ERP/LEDGER.
DATA GLACCT TYPE /ERP/GL_ACCT.
DATA GLACCT9 TYPE /ERP/GL_ACCT.

BREAK-POINT.
  FOREACH GLACCT.
   {'/ERP/AMOUNT','ACT01', GLACCT,'ZFI_R02','CC_PC'} = 0.
  ENDFOR.
  FOREACH GLACCT IN REFDATA.
    {'/ERP/AMOUNT','ACT01',GLACCT,'ZFI_R02','CC_PC'}
    = {'/ERP/AMOUNT','ACT01',GLACCT,'ZFI_R02','CC_PC'}
      + {'/ERP/AMOUNT','ACT01',GLACCT,'ZFI_R01',#}.
  ENDFOR.
```

Table 8.12: P&L Cost and Profit Center Integration by Actual PF Fox Formula Code

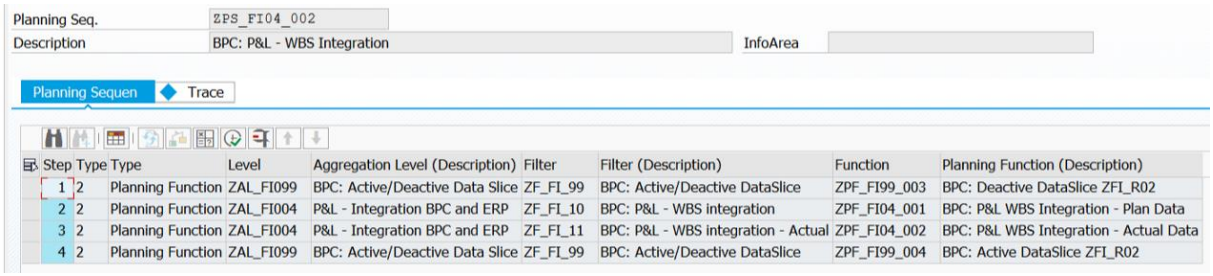


Figure 8.43: P&L - WBS Integration PS

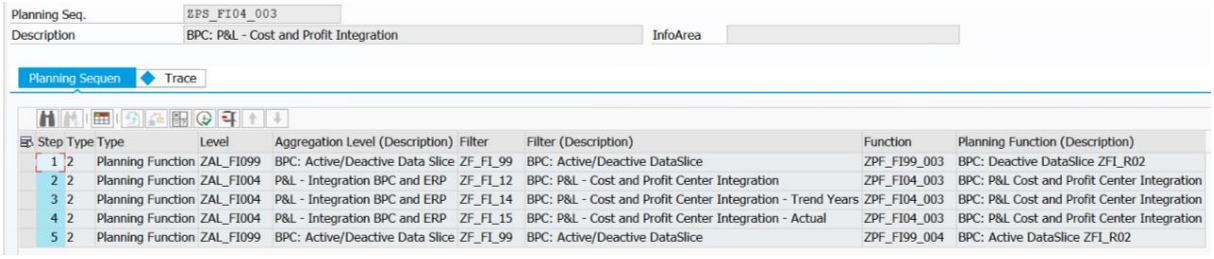


Figure 8.44: P&L by Cost and Profit Integration PS

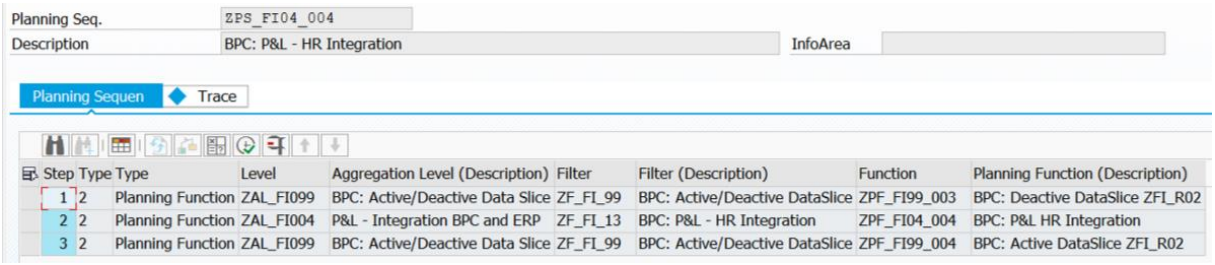


Figure 8.45: P&L by HR Integration PS

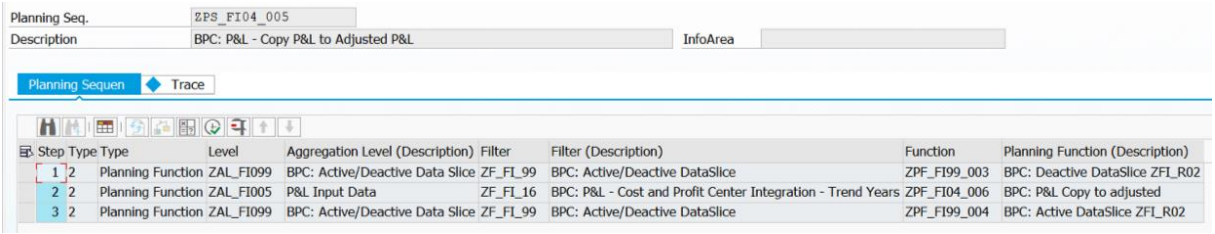


Figure 8.46: P&L - Copy P&L to Adjusted P&L PS

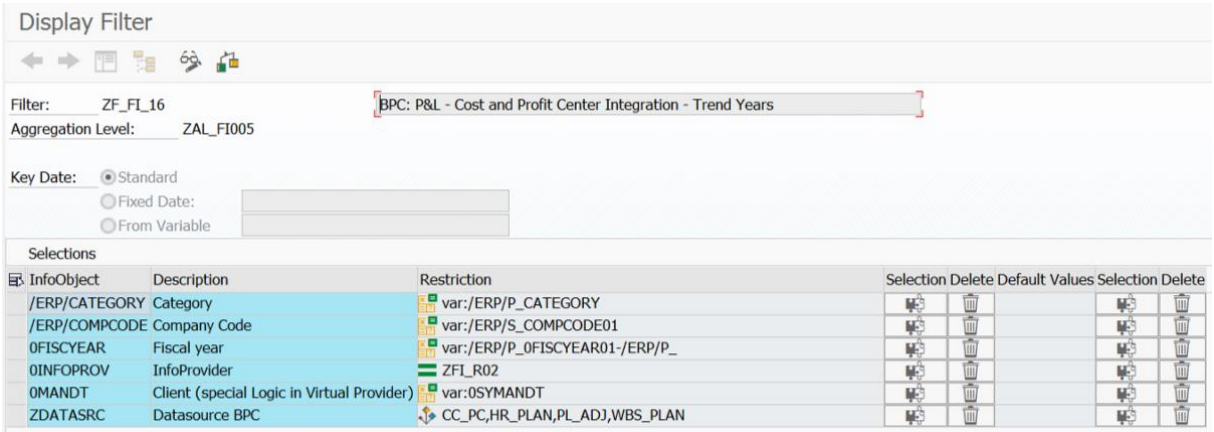


Figure 8.47: P&L by Cost and Profit Center Integration - Trend Years PF Filter

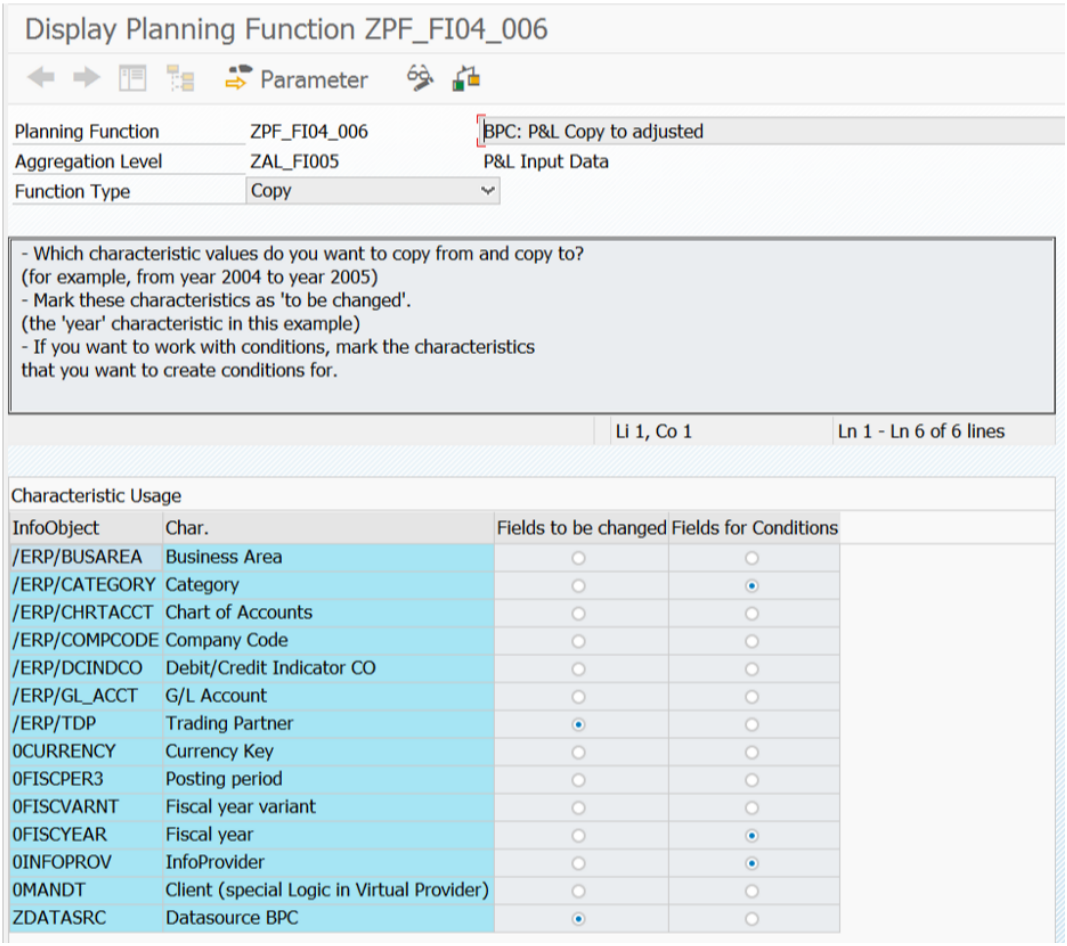


Figure 8.48: P&L Copy to adjusted PF Details

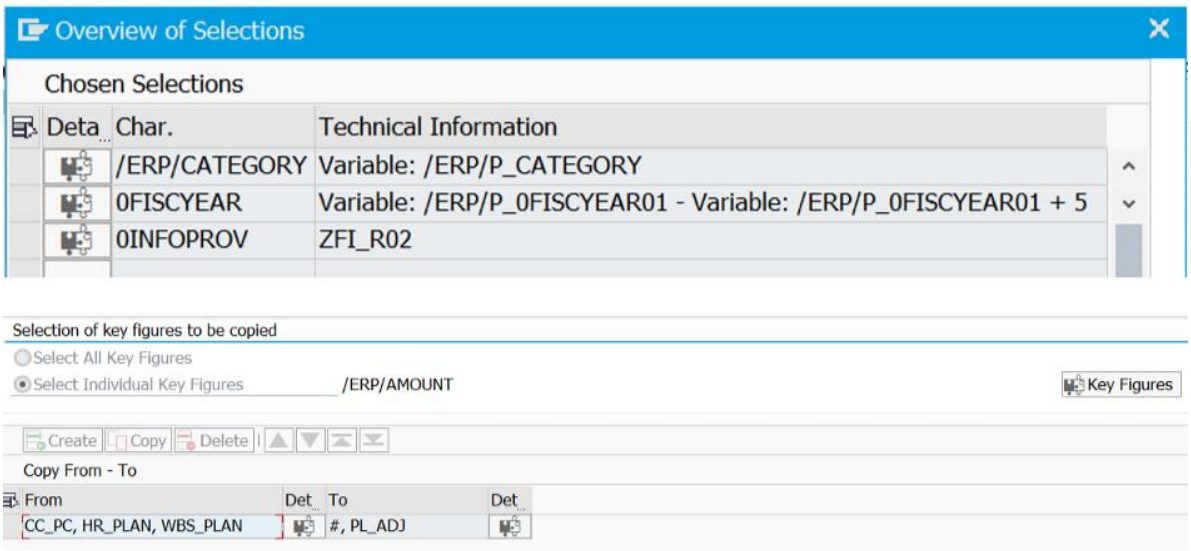
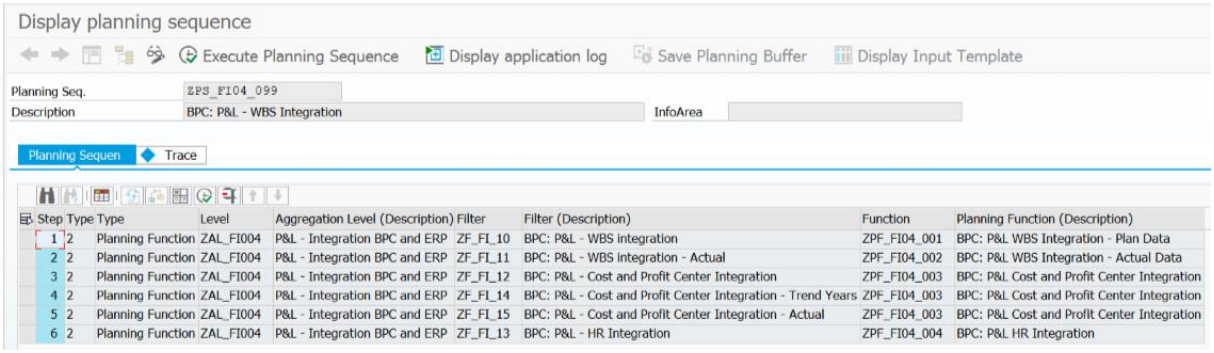
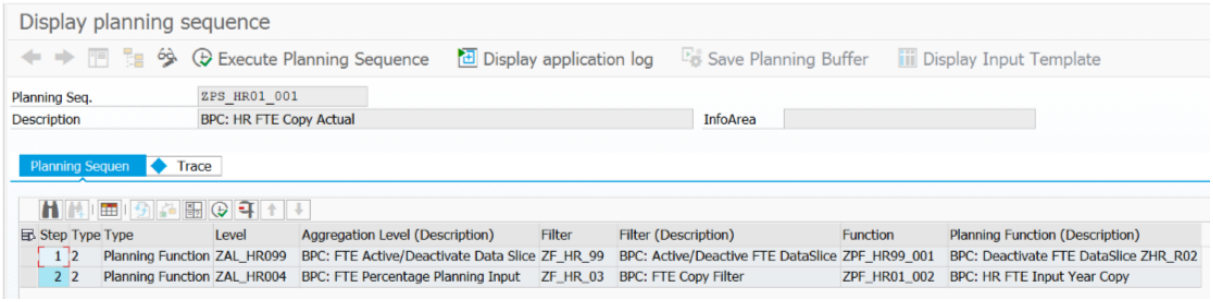


Figure 8.49: P&L Copy to adjusted Standard PF



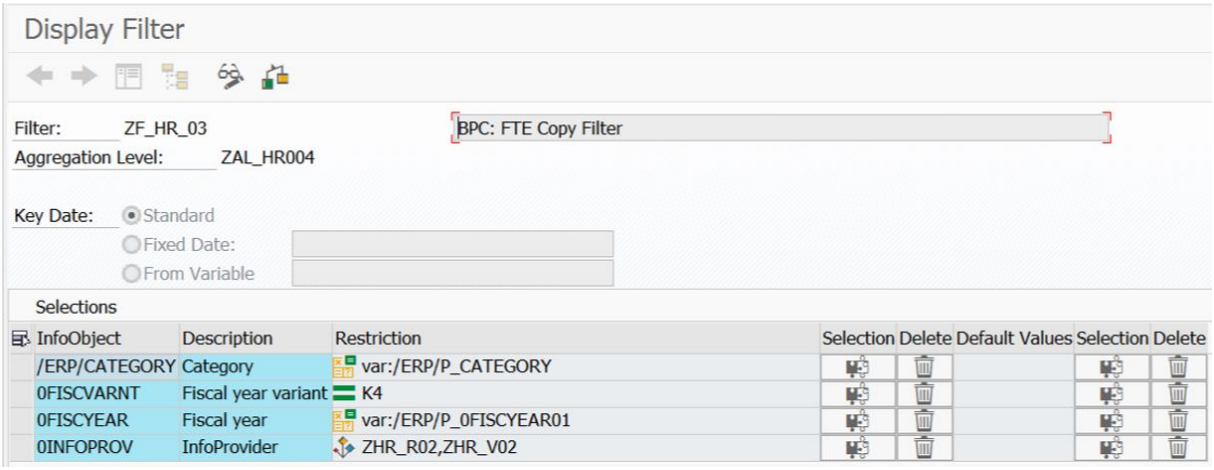
Step	Type	Type	Level	Aggregation Level (Description)	Filter	Filter (Description)	Function	Planning Function (Description)
1	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_10	BPC: P&L - WBS integration	ZPF_FI04_001	BPC: P&L WBS Integration - Plan Data
2	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_11	BPC: P&L - WBS integration - Actual	ZPF_FI04_002	BPC: P&L WBS Integration - Actual Data
3	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_12	BPC: P&L - Cost and Profit Center Integration	ZPF_FI04_003	BPC: P&L Cost and Profit Center Integration
4	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_14	BPC: P&L - Cost and Profit Center Integration - Trend Years	ZPF_FI04_003	BPC: P&L Cost and Profit Center Integration
5	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_15	BPC: P&L - Cost and Profit Center Integration - Actual	ZPF_FI04_003	BPC: P&L Cost and Profit Center Integration
6	2	Planning Function	ZAL_FI004	P&L - Integration BPC and ERP	ZF_FI_13	BPC: P&L - HR Integration	ZPF_FI04_004	BPC: P&L HR Integration

Figure 8.50: P&L - WBS Integration PS



Step	Type	Type	Level	Aggregation Level (Description)	Filter	Filter (Description)	Function	Planning Function (Description)
1	2	Planning Function	ZAL_HR099	BPC: FTE Active/Deactivate Data Slice	ZF_HR_99	BPC: Active/Deactive FTE DataSlice	ZPF_HR99_001	BPC: Deactivate FTE DataSlice ZHR_R02
2	2	Planning Function	ZAL_HR004	BPC: FTE Percentage Planning Input	ZF_HR_03	BPC: FTE Copy Filter	ZPF_HR01_002	BPC: HR FTE Input Year Copy

Figure 8.51: HR FTE Copy Actual PS



InfoObject	Description	Restriction	Selection	Delete	Default Values	Selection	Delete
/ERP/CATEGORY	Category	var:/ERP/P_CATEGORY					
0FISCVARNT	Fiscal year variant	K4					
0FISCYEAR	Fiscal year	var:/ERP/P_0FISCYEAR01					
0INFOPROV	InfoProvider	ZHR_R02,ZHR_V02					

Figure 8.52: FTE Copy Filter PF Filter

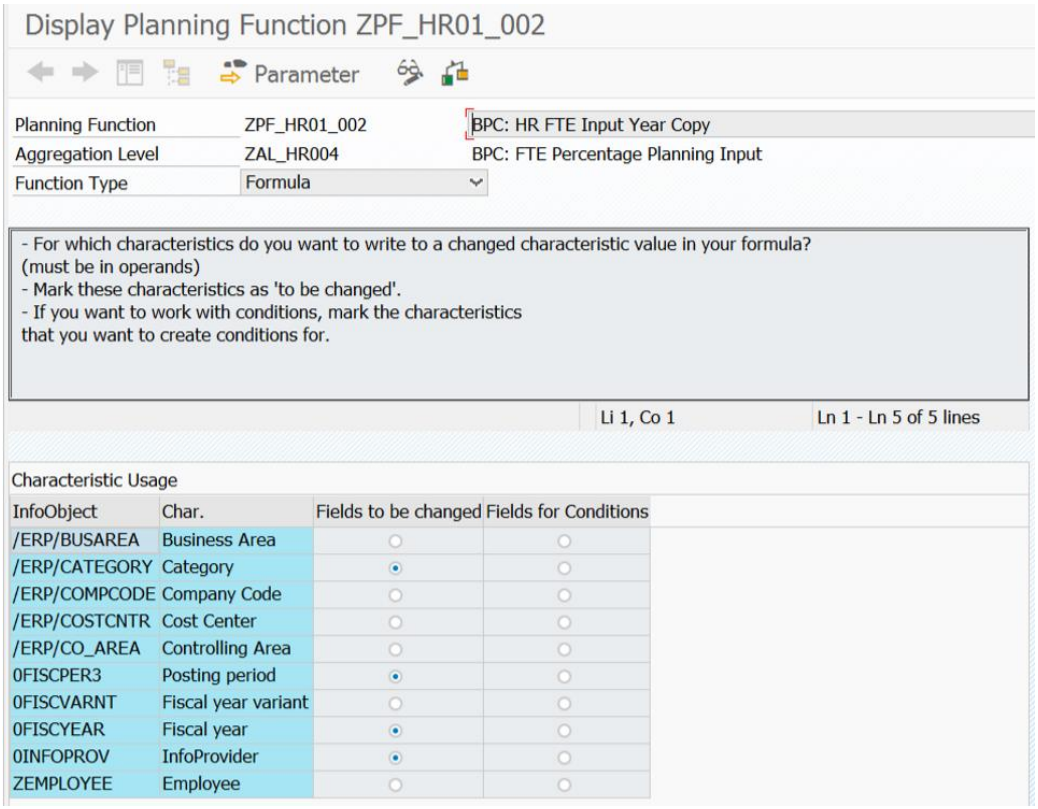


Figure 8.53: HR FTE Input Year Copy PF Details

```
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CATEGORY1 TYPE '/ERP/CATEGORY'.
DATA CATEGORY2 TYPE '/ERP/CATEGORY'.
DATA CURRENCY TYPE '0CURRENCY'.
DATA EMPLOYEE TYPE 'ZEMPLOYEE'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA YEAR TYPE '0FISCYEAR'.
DATA INFOPROD1 TYPE '0INFOPROV'.
DATA INFOPROD2 TYPE '0INFOPROV'.

*BREAK-POINT.
CATEGORY2 = VARV( '/ERP/P_CATEGORY' ).
YEAR = VARV( '/ERP/P_0FISCYEAR01' ).
CATEGORY1= 'ACT01' .
M_FCST = ATRV( '0FISCPER3', CATEGORY2 ).

FOREACH MONTH IN REFDATA.
  IF  {ZPERCFTE,CATEGORY1,MONTH,YEAR,ZHR_V02} <> 0 AND MONTH <= M_FCST.
    {ZPERCFTE,CATEGORY2,MONTH,YEAR,ZHR_R02} =
{ZPERCFTE,CATEGORY1,MONTH,YEAR,ZHR_V02}.
  ENDIF.
  ENDFOR.
```

Table 8.13: HR FTE Input Year Copy PF Fox Formula Code

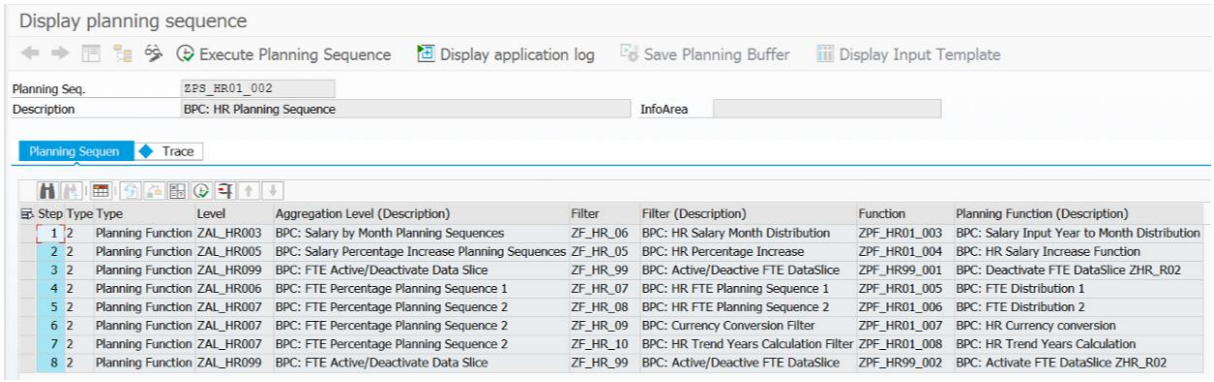


Figure 8.54: HR Planning PS

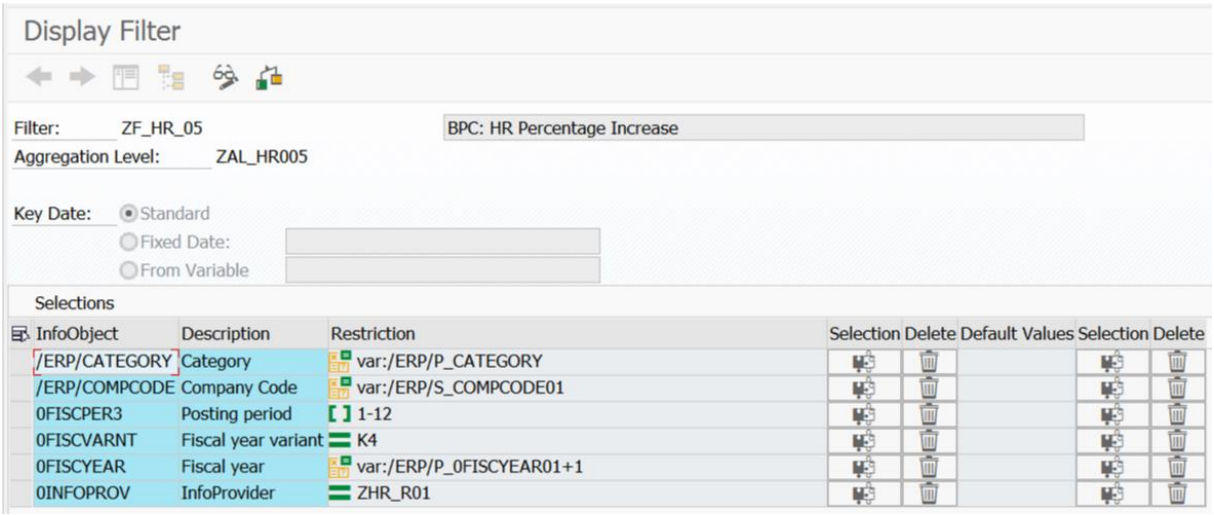


Figure 8.55: HR Percentage Increase PF Filter

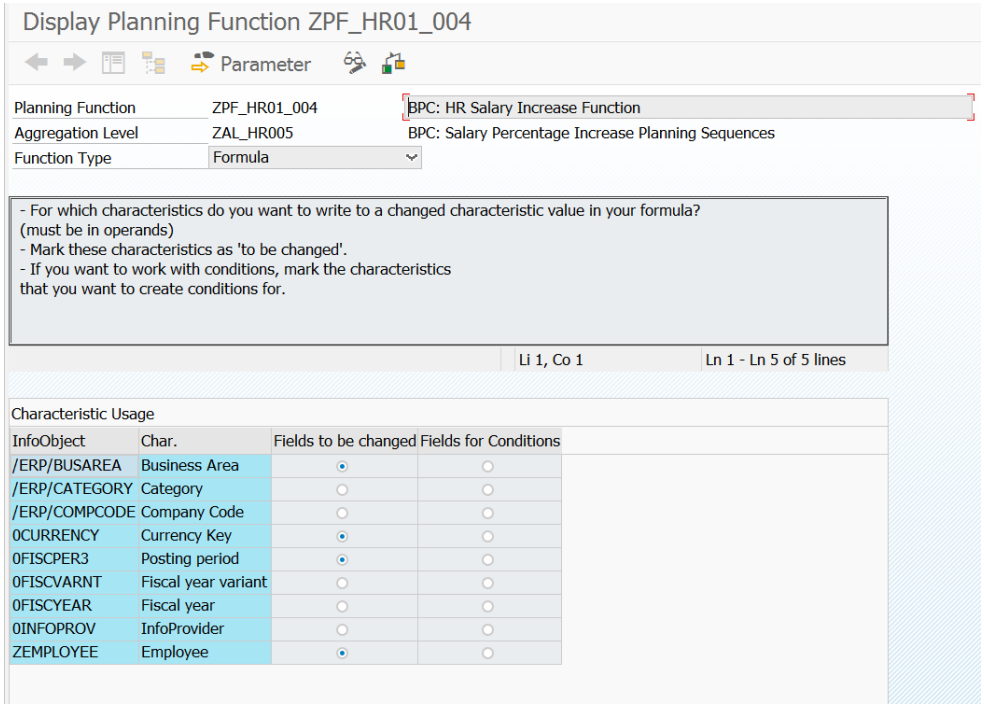


Figure 8.56: HR Salary Increase Function PF Details

```
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA BUSAREA TYPE '/ERP/BUSAREA'.
DATA CURRENCY TYPE '0CURRENCY'.
DATA EMPLOYEE TYPE 'ZEMPLOYEE'.
DATA YEAR TYPE '0FISCYEAR'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA PERCENTAGE TYPE F.
DATA PERC_AUX TYPE F.
DATA KF TYPE KEYFIGURE_NAME.
DATA MONTH TYPE '0FISCPER3'.
DATA AMOUNT TYPE F.
DATA BP TYPE I.
DATA CHECK TYPE I.
BP = 0.
M_COUNT = 000.
PERCENTAGE = 1.
DO.

IF M_COUNT >= 012.
EXIT.
ELSE.
M_COUNT = TMVL( M_COUNT, 1 ).

PERCENTAGE = PERCENTAGE * ( 1 + ( { 'ZPERCSLRY', #, #, M_COUNT, # } / 100 ) ).
IF PERCENTAGE <> 0.
FOREACH EMPLOYEE, KF, BUSAREA, CURRENCY.
IF KF <> 'ZPERCSLRY' AND NOT EMPLOYEE IS INITIAL.
{ KF, BUSAREA, CURRENCY, M_COUNT, EMPLOYEE } = { KF, BUSAREA, CURRENCY, M_COUNT, EMPL
OYEE } * PERCENTAGE.
ENDIF.
ENDFOR.
ENDIF.

ENDIF.
ENDDO.
```

Table 8.14: HR Salary Increase Function PF Fox Formula Code

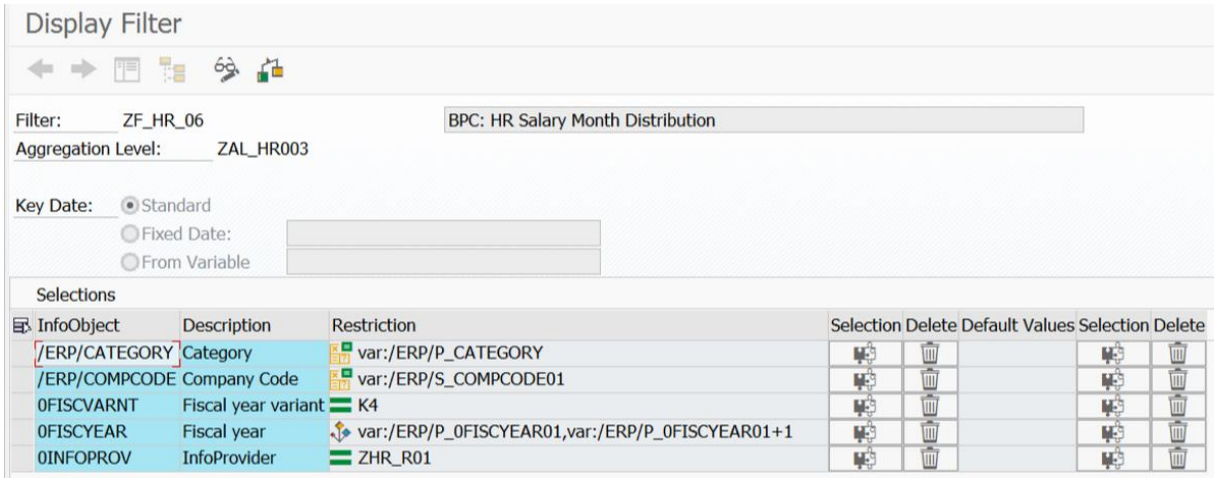


Figure 8.57: HR Salary Month Distribution PF Filter

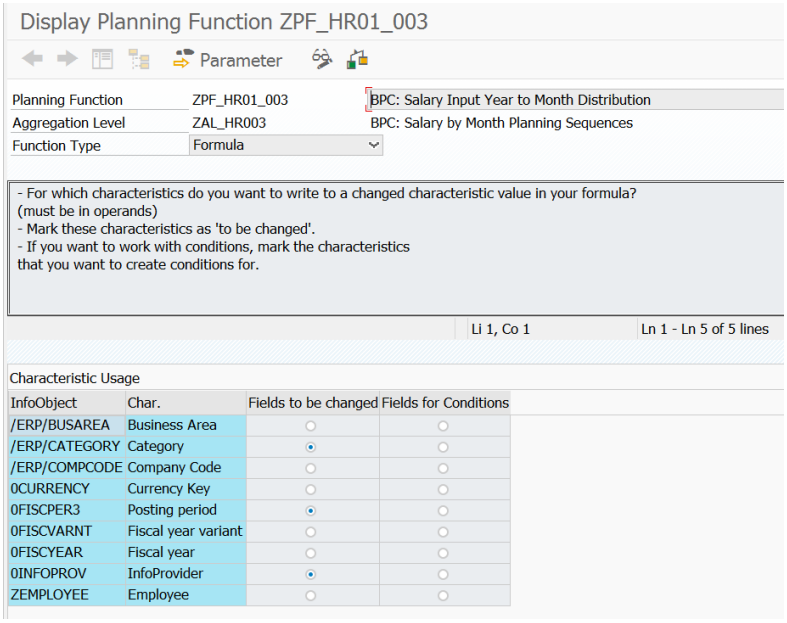


Figure 8.58: Salary Input Year to Month Distribution PF Details

```
DATA YEAR TYPE 0FISCYEAR.
DATA EMPLOYEE TYPE ZEMPLOYEE.
DATA YEAR2 TYPE 0FISCYEAR.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA CATEGORY_M TYPE '/ERP/CATEGORY'.
DATA MONTH TYPE '0FISCPER3'.
DATA MONTH2 TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA KEYFIGURE TYPE KEYFIGURE_NAME.
DATA M_VAL TYPE I.
DATA DIV_VAL TYPE I.
DATA TOTALMONTH TYPE F.
DATA BP TYPE I.
DATA X TYPE KEYFIGURE_NAME.
DATA EMPCONT TYPE F.

TOTALMONTH = 12.
*MONTH2 = '00'.
BP = 0.

*DO.
*  IF BP = 1.
*    EXIT.
*  ENDIF.
*ENDDO.

CATEGORY = VARV( '/ERP/P_CATEGORY' ).
EMPLOYEE = OBJV( ).
*CATEGORY = OBJV( ).
```

```
EMPCONT = ATRV( 'ZEMPCONT', EMPLOYEE).
*M_VAL = ATRV( '0FISCPER3', CATEGORY_M ).
*YEAR = OBJV( ).
*YEAR2 = ATRV( '0FISCYEAR', CATEGORY_M ).

M_COUNT = 000.
MONTH = M_COUNT.

{ ZEMPTOTAL, CATEGORY, #, ZHR_R01 } = { ZANNAMO, CATEGORY, #, ZHR_R01 } * ( 1 + ( EMPCONT
 / 100 ) ).
{ ZTTLAVS, CATEGORY, #, ZHR_R01 } = { ZEMPTOTAL, CATEGORY, #, ZHR_R01 } + ( { ZTARGET, CATE
GORY, #, ZHR_R01 } * ( 1 + ( EMPCONT / 100 ) ) ).
{ ZEMPCOST, CATEGORY, #, ZHR_R01 } = { ZSEVCOST, CATEGORY, #, ZHR_R01 } + { ZLIVALL, CATEGO
RY, #, ZHR_R01 } + { ZINSPEN, CATEGORY, #, ZHR_R01 } + { ZCASHALL, CATEGORY, #, ZHR_R01 } + {
ZHLTHINS, CATEGORY, #, ZHR_R01 } + { ZVEHICLE, CATEGORY, #,
ZHR_R01 } + { ZTRPALL, CATEGORY, #, ZHR_R01 } + { ZWAINS, CATEGORY, #, ZHR_R01 } + { ZOTHBO
N, CATEGORY,
 #, ZHR_R01 } + { ZMEALALL, CATEGORY, #, ZHR_R01 } + { ZKMINDEM, CATEGORY, #, ZHR_R01 } + {
ZINTERNET, CATEGORY, #, ZHR_R01 } + { ZLNCHVOU, CATEGORY, #, ZHR_R01 } + { ZTTLAVS, CATEG
ORY, #, ZHR_R01 }  + { ZOTHERALL, CATEGORY, #, ZHR_R01 }.
DO.
  IF M_COUNT >= 012.
    EXIT.
  ELSE.
    M_COUNT = TMVL( M_COUNT, 1 ).
    IF CATEGORY <> 'ACT01'.
     { ZSEVCOST, CATEGORY, M_COUNT, ZHR_R01 } = { ZSEVCOST, CATEGORY, #, ZHR_R01 } / TOTAL
MONTH.
     { ZLIVALL, CATEGORY, M_COUNT, ZHR_R01 } = { ZLIVALL, CATEGORY, #, ZHR_R01 } / TOTALMON
TH.
     { ZEMPCOST, CATEGORY, M_COUNT, ZHR_R01 } = { ZEMPCOST, CATEGORY, #, ZHR_R01 } / TOT
ALMONTH.
     { ZINSPEN, CATEGORY, M_COUNT, ZHR_R01 } = { ZINSPEN, CATEGORY, #, ZHR_R01 } / TOTALM
ONTH.
     { ZCASHALL, CATEGORY, M_COUNT, ZHR_R01 } = { ZCASHALL, CATEGORY, #, ZHR_R01 } / TOTAL
MONTH.
     { ZHLTHINS, CATEGORY, M_COUNT, ZHR_R01 } = { ZHLTHINS, CATEGORY, #, ZHR_R01 } / TOTAL
MONTH.
     { ZVEHICLE, CATEGORY, M_COUNT, ZHR_R01 } = { ZVEHICLE, CATEGORY, #, ZHR_R01 } / TOTAL
MONTH.
     { ZTRPALL, CATEGORY, M_COUNT, ZHR_R01 } = { ZTRPALL, CATEGORY, #, ZHR_R01 } / TOTALMO
NTH.
     { ZWAINS, CATEGORY, M_COUNT, ZHR_R01 } = { ZWAINS, CATEGORY, #, ZHR_R01 } / TOTALMO
NTH.
     { ZOTHBON, CATEGORY, M_COUNT, ZHR_R01 } = { ZOTHBON, CATEGORY, #, ZHR_R01 } / TOTAL
MONTH.
     { ZMEALALL, CATEGORY, M_COUNT, ZHR_R01 } = { ZMEALALL, CATEGORY, #, ZHR_R01 } / TOTA
LMONTH.
     { ZKMINDEM, CATEGORY, M_COUNT, ZHR_R01 } = { ZKMINDEM, CATEGORY, #, ZHR_R01 } / TOT
ALMONTH.
```

```
    { ZINTERNET, CATEGORY, M_COUNT, ZHR_R01 } = { ZINTERNET, CATEGORY, #, ZHR_R01 } / TOT
ALMONTH.
    { ZLNCHVOU, CATEGORY, M_COUNT, ZHR_R01 } = { ZLNCHVOU, CATEGORY, #, ZHR_R01 } / TOT
ALMONTH.
    { ZTARGET, CATEGORY, M_COUNT, ZHR_R01 } = { ZTARGET, CATEGORY, #, ZHR_R01 } / TOTALM
ONTH.
    { ZEMPTOTAL, CATEGORY, M_COUNT, ZHR_R01 } = { ZEMPTOTAL, CATEGORY, #, ZHR_R01 } / TO
TALMONTH.
    { ZBASPAY, CATEGORY, M_COUNT, ZHR_R01 } = { ZBASPAY, CATEGORY, #, ZHR_R01 } / TOTALM
ONTH.
    { ZANNAMO, CATEGORY, M_COUNT, ZHR_R01 } = { ZANNAMO, CATEGORY, #, ZHR_R01 } / TOTA
LMONTH.
    { ZTTLAVS, CATEGORY, M_COUNT, ZHR_R01 } = { ZTTLAVS, CATEGORY, #, ZHR_R01 } / TOTALM
ONTH.
    { ZOTHERALL, CATEGORY, M_COUNT, ZHR_R01 } = { ZOTHERALL, CATEGORY, #, ZHR_R01 } / TOT
ALMONTH.
   ENDIF.
  ENDIF.
ENDDO.
```

Table 8.15: Salary Input Year to Month Distribution PF Fox Formula

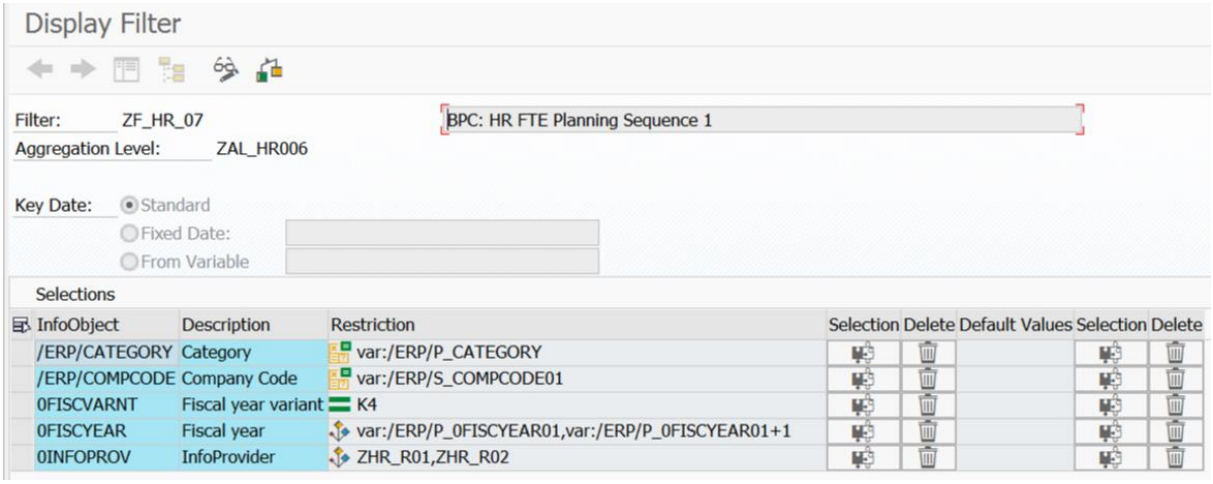


Figure 8.59: HR FTE Planning Sequence 1 PF Filter

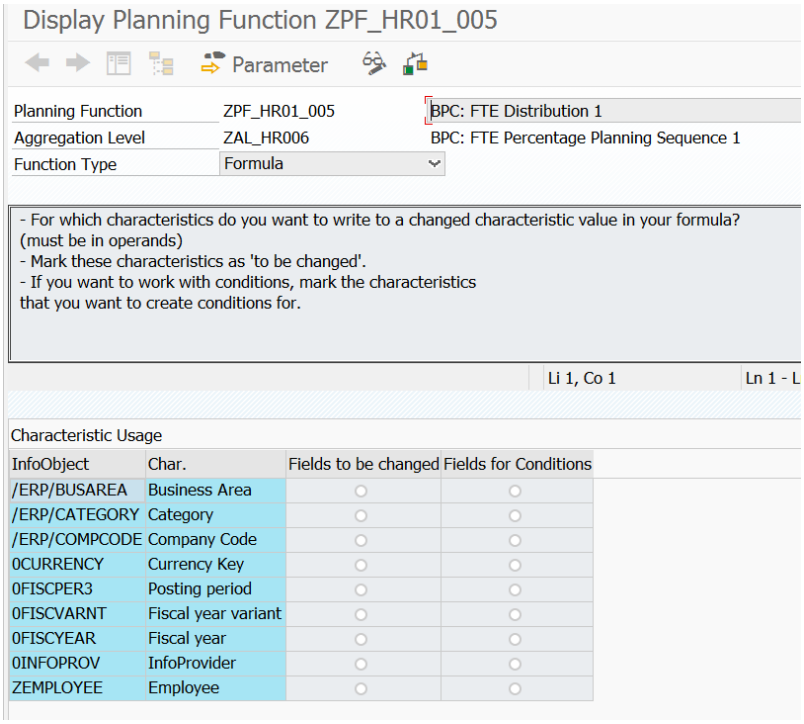


Figure 8.60: FTE Distribution 1 PF Details

```
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA BUSAREA TYPE '/ERP/BUSAREA'.
DATA CURRENCY TYPE '0CURRENCY'.
DATA EMPLOYEE TYPE 'ZEMPLOYEE'.
DATA MONTH TYPE '0FISCPER3'.
DATA KF TYPE KEYFIGURE_NAME.
DATA PERCENTAGE TYPE F.
DATA TOTAL TYPE F.
*BREAK-POINT.
EMPLOYEE = OBJV().
MONTH=OBJV().

PERCENTAGE = { 'ZPERCFTE' }.
IF PERCENTAGE <> 0.
 { 'ZTOTLFTE' } = PERCENTAGE.
 IF { 'ZTOTLFTE' } > 100.
   MESSAGE E000(ZBPC) WITH EMPLOYEE MONTH .
   EXIT.
 ELSE.
 ENDIF.
ENDIF.
```

Table 8.16: FTE Distribution 1 PF Fox Formula

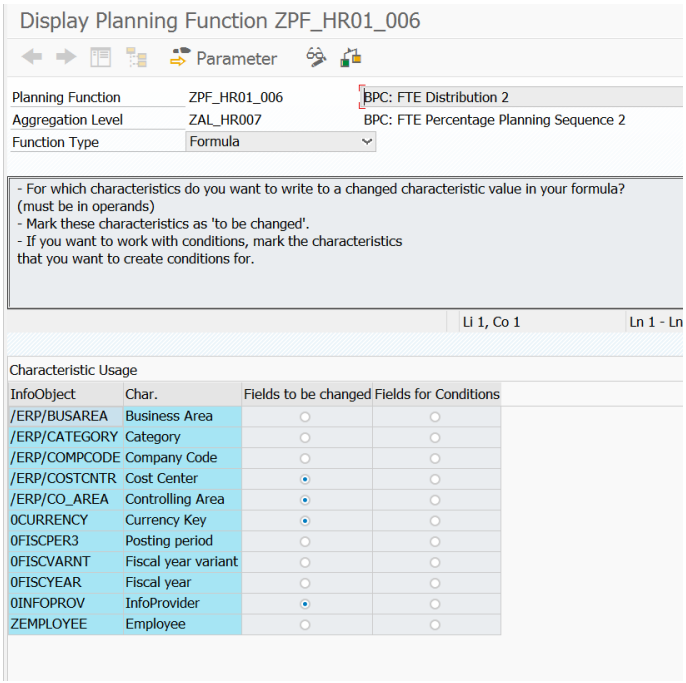


Figure 8.61: FTE Distribution 2 PF Details

```
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA BUSAREA TYPE '/ERP/BUSAREA'.
DATA CURRENCY TYPE '0CURRENCY'.
DATA EMPLOYEE TYPE 'ZEMPLOYEE'.
DATA YEAR TYPE '0FISCYEAR'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA COAREA TYPE '/ERP/CO_AREA'.
DATA COSTCENTER TYPE '/ERP/COSTCNTR'.
DATA TOTALPERCENTAGE TYPE F.
DATA PERCENTAGE TYPE F.
DATA INFOPROD TYPE '0INFOPROV'.
DATA KF TYPE KEYFIGURE_NAME.
DATA AMOUNT TYPE F.
DATA BP TYPE I.
BP = 0.

*DO.
*  IF BP = 1.
*    EXIT.
*  ENDIF.
*ENDDO.

*BREAK-POINT.
INFOPROD = 'ZHR_R02'.

FOREACH COSTCENTER, COAREA.
  IF NOT COSTCENTER IS INITIAL.
    TOTALPERCENTAGE = { 'ZTOTLFTE', #, #, #, ZHR_R02 }.
    PERCENTAGE = { 'ZPERCFTE', COSTCENTER, COAREA, #, ZHR_R02 }.
```

```
   FOREACH KF, CURRENCY IN REFDATA.
    IF NOT CURRENCY IS INITIAL.
     IF KF <> 'ZTOTLFTE'.
      { KF, COSTCENTER, COAREA, CURRENCY, ZHR_R02 } = { KF, #, #, CURRENCY, ZHR_R01 } * ( PER
CENTAGE / TOTALPERCENTAGE ).
     ENDIF.
    ENDIF.
   ENDFOR.
  ENDIF.
ENDFOR.
```

Table 8.17: FTE Distribution 2 PF Fox Formula

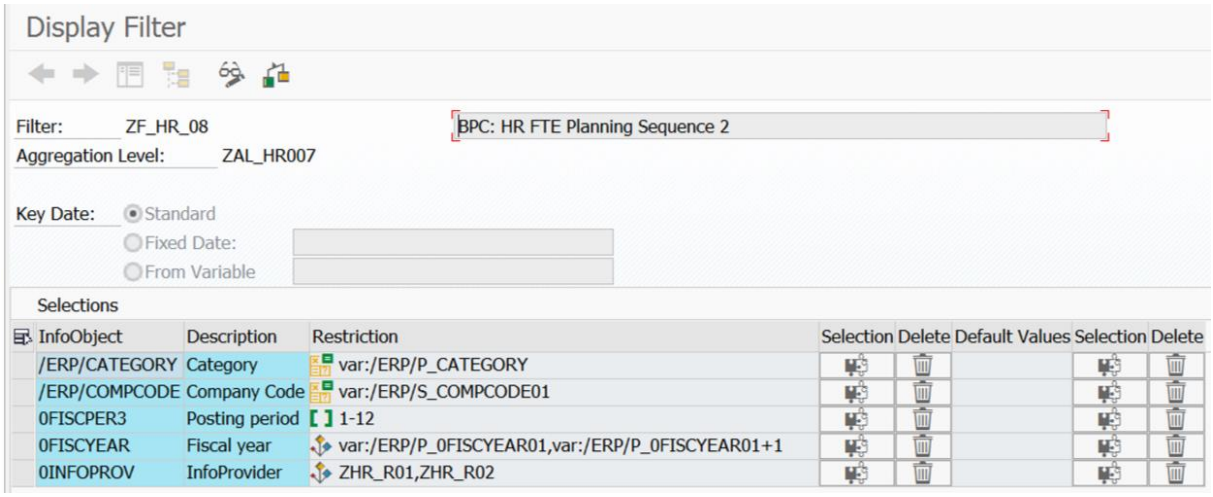


Figure 8.62: HR FTE Planning Sequence 2 PF Filter

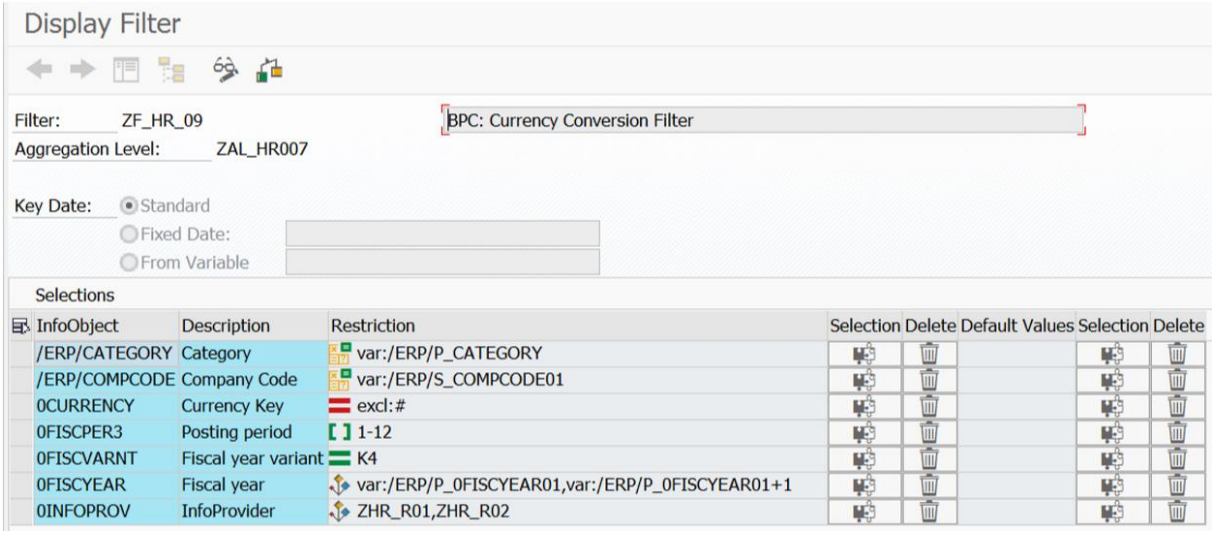


Figure 8.63: Currency Conversion PF Filter

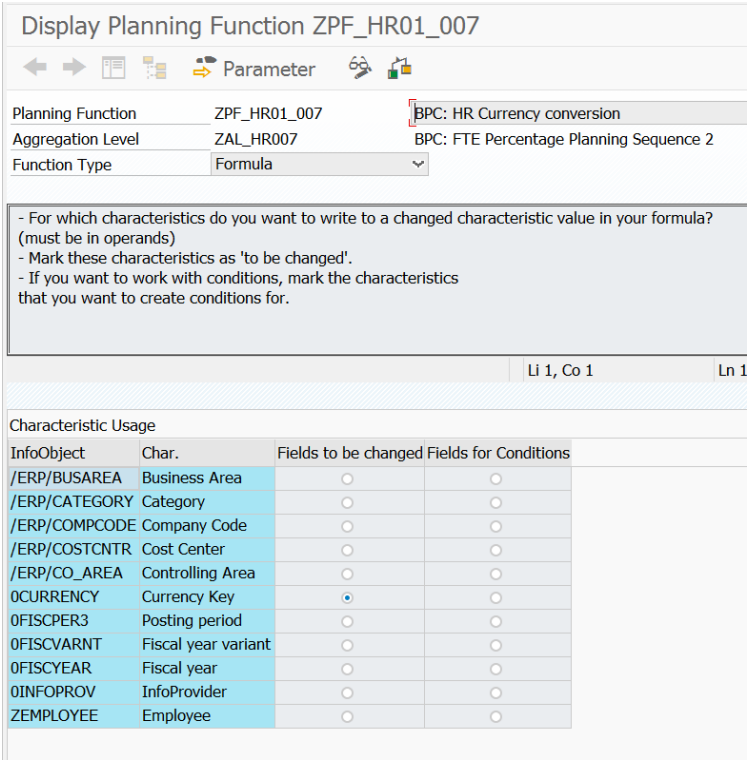


Figure 8.64: HR Currency Conversion PF Details

```
DATA LCUR TYPE 0CURRENCY.
DATA ECUR TYPE 0CURRENCY.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA AMOUNT TYPE F.
DATA DATE TYPE D.
DATA KF TYPE KEYFIGURE_NAME.
DATA YEAR TYPE 0FISCYEAR.
*BREAK-POINT.

ECUR = EUR.
YEAR = OBJV( ).
CALL FUNCTION ZCURR_CONV_BPC
  EXPORTING
    I_YEAR = YEAR
    I_EX_TYPE = 'ZB'
  IMPORTING
    E_DATE = DATE.
*    E_EX_TYPE = EX_TYPE.

FOREACH KF, LCUR.
  IF LCUR <> 'EUR' OR NOT LCUR IS INITIAL.
    AMOUNT = { KF, LCUR }.
    AMOUNT = CURC( AMOUNT, DATE, ZB, LCUR, EUR ).
    { KF, EUR } = AMOUNT.

  ENDIF.
ENDFOR.
```

Table 8.18: HR Currency Conversion PF Fox Formula

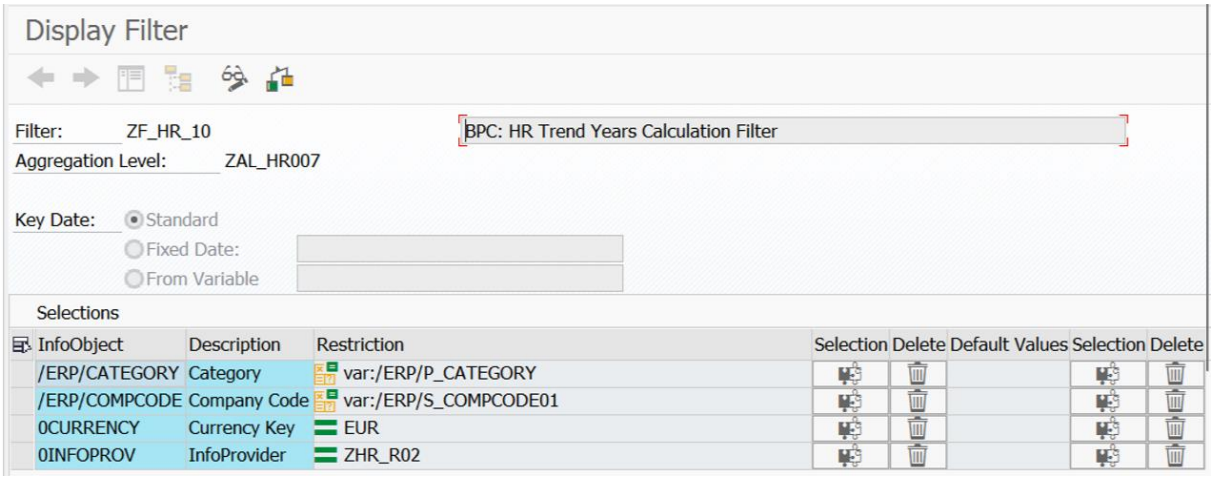


Figure 8.65: HR Trend Years Calculation PF Filter

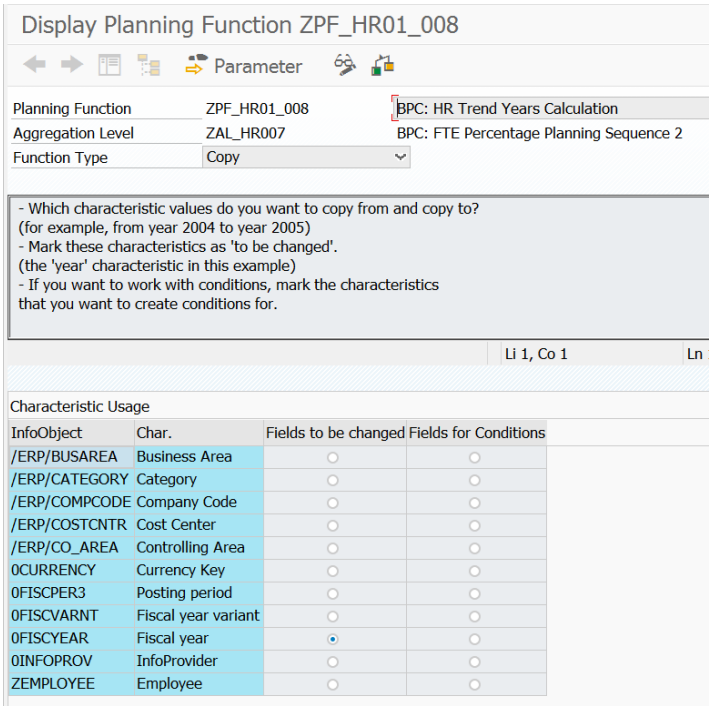


Figure 8.66: HR Trend Years Calculation PF Details

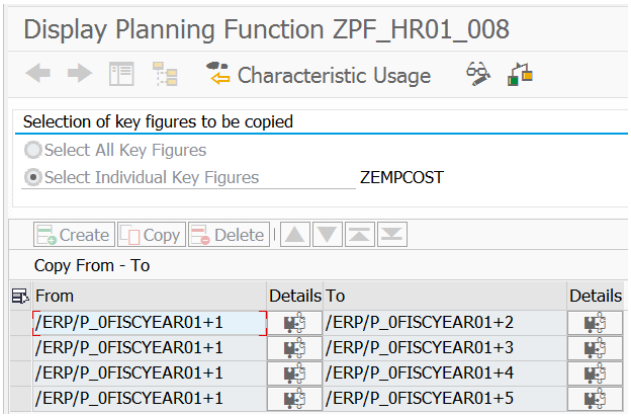


Figure 8.67: HR Trend Years Calculation PF Standard Copy Formula

ZPS_FI09_001	BPC: Cash Flow copy from P&L	ZAL_FI009	CF Report	ZF_FI_25	BPC: Cashflow Actuals Transformation Filter TEST	ZPF_FI09_002	BPC: P&L to CashFlow Actual Months Accumulated
		ZAL_FI009	CF Report	ZF_FI_18	BPC: Cashflow Tranformation Filter	ZPF_FI09_001	BPC: P&L to CashFlow Planned
		ZAL_FI013	Cashflow - Accumulated	ZF_FI_19	BPC: Cashflow Accumulation Filter	ZPF_FI09_005	BPC: CashFlow Accumulated Balance
		ZAL_FI013	Cashflow - Accumulated	ZF_FI_19	BPC: Cashflow Accumulation Filter	ZPF_FI09_006	BPC: CashFlow Actual Months Accumulated Balance
		ZAL_FI015	Cashfow - Calculation Assumptions	ZF_FI_22	BPC: Cashflow Assumption Calculations	ZPF_FI15_003	BPC: Installments Summation
		ZAL_FI014	Cashflow - Final	ZF_FI_21	BPC: Cashflow Final Calculations	ZPF_FI14_002	BPC: Cashflow Final Calculations
		ZAL_FI014	Cashflow - Final	ZF_FI_27	BPC: CF Copy Final to Adjust	ZPF_FI09_007	BPC: CashFlow Copy Final to Adjusted Balance
		ZAL_FI011	Balance - PL->BS	ZF_BS_01	BPC: PL->Balance	ZPF_FI11_001	BPC: PL->BS
		ZAL_FI009	CF Report	ZF_FI_30	BPC: Balance SheetTransformation Filter	ZPF_FI09_004	BPC: CF->BS
		ZAL_FI012	Balance - Accumulated	ZF_BS_02	BPC: BS Accumulated	ZPF_FI12_001	BPC: Accumulated Balance

Table 8.19: Cash Flow copy from P&L PS

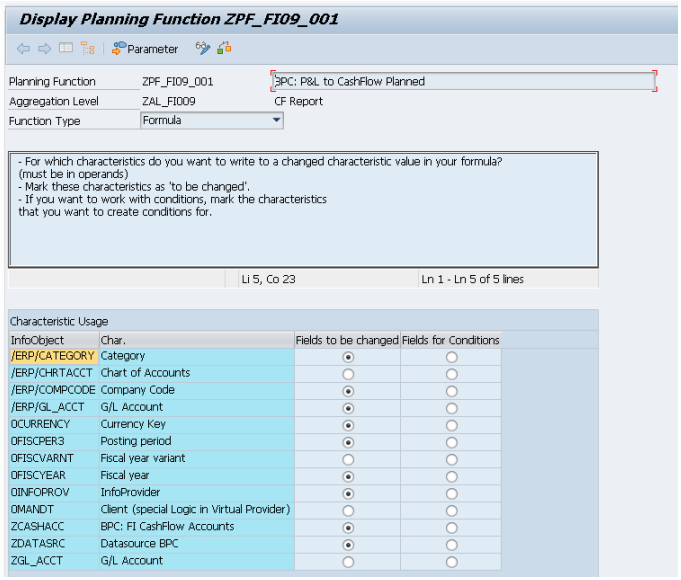


Figure 8.68: P&L to CashFlow Planned PF Details

```
*************************************************************************************
*************
*DATA PRESENTATIONS
*************************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC9 TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA INFOPROV1 TYPE '0INFOPROV'.
DATA INFOPROV2 TYPE '0INFOPROV'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA YEAR TYPE '0FISCYEAR'.
DATA YEAR_AA TYPE '0FISCYEAR'.
DATA YEAR_FCST TYPE '0FISCYEAR'.
DATA CF_VL TYPE F.
DATA OFFSET TYPE I.
DATA GLACCOUNT TYPE '/ERP/GL_ACCT'.
DATA MONTH TYPE '0FISCPER3'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA KF TYPE KEYFIGURE_NAME.
```

```
DATA PERCENTAGE TYPE F.
*BREAK-POINT.
********************************************************************************
*************



********************************************************************************
*************
*CLEARING TARGET SOURCE TO AVOID DUPLICATION.
********************************************************************************
*************
FOREACH COMPCODE, GLACCOUNT, CASHFLOWACC, MONTH, YEAR, CATEGORY IN REFDATA.
  IF NOT GLACCOUNT IS INITIAL AND NOT CASHFLOWACC IS INITIAL AND NOT COMPCODE IS INITIAL
AND NOT MONTH IS INITIAL AND NOT YEAR IS INITIAL.
   { 'ZCASHTTL', CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05,
CASHFLOWACC, CF_PLAN } = 0.
  ENDIF.
ENDFOR.
********************************************************************************
*************



********************************************************************************
*************
*CALCULATION FOR PLAN MONTHS>MONTH FORECAST(NOT ACCUMULATED) AMOUNTS FROM
P&L CUBE.
********************************************************************************
*************
FOREACH COMPCODE, MONTH, GLACCOUNT, CATEGORY, YEAR IN REFDATA.
  IF NOT GLACCOUNT IS INITIAL.
   FOREACH DATASRC IN REFDATA.
    IF DATASRC <> 'CF_PLAN'.
     FOREACH CASHFLOWACC IN REFDATA.
      IF NOT CASHFLOWACC IS INITIAL.
       { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05,
CASHFLOWACC, CF_PLAN } =
       { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05,
CASHFLOWACC, CF_PLAN } +
       ( { / ERP / AMOUNT, CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R02, #,
DATASRC } *
       { ZPERCCF, CATEGORY, PT10, GLACCOUNT, #, #, YEAR, ZFI_R05, CASHFLOWACC, PL_CF } ).
      ENDIF.
     ENDFOR.
    ENDIF.
   ENDFOR.
  ENDIF.
ENDFOR.
********************************************************************************
*************
```

Table 8.20: P&L to CashFlow Planned PF Fox Formula

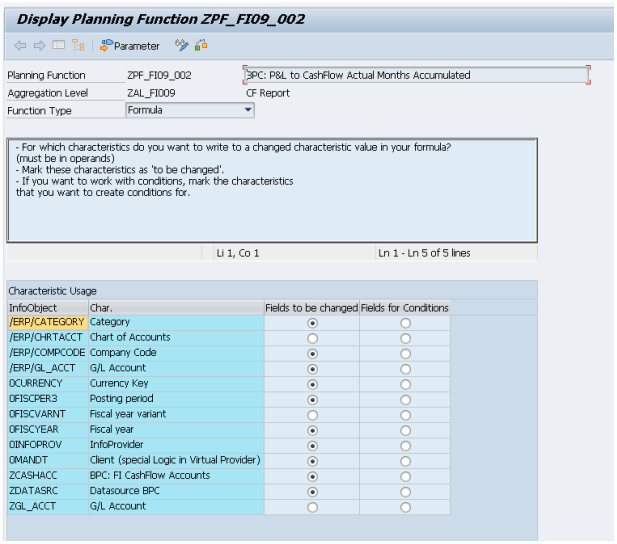


Figure 8.69: P&L to CashFlow Actual Months Accumulated PF Details

```
**********************************************************************************
*************
*DATA PRESENTATIONS
**********************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC9 TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA INFOPROV1 TYPE '0INFOPROV'.
DATA INFOPROV2 TYPE '0INFOPROV'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA YEAR TYPE '0FISCYEAR'.
DATA YEAR_AA TYPE '0FISCYEAR'.
DATA YEAR_FCST TYPE '0FISCYEAR'.
DATA CF_VL TYPE F.
DATA OFFSET TYPE I.
DATA GLACCOUNT TYPE '/ERP/GL_ACCT'.
DATA ZGLACCOUNT TYPE 'ZGL_ACCT'.
DATA MONTH TYPE '0FISCPER3'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA KF TYPE KEYFIGURE_NAME.
DATA PERCENTAGE TYPE F.
*BREAK-POINT.
**********************************************************************************
*************



**********************************************************************************
*************
```

```
*CLEARING TARGET SOURCE TO AVOID DUPLICATION.
*********************************************************************************************
FOREACH COMPCODE, GLACCOUNT, CASHFLOWACC, MONTH, YEAR, CATEGORY IN REFDATA.
 IF NOT GLACCOUNT IS INITIAL AND NOT CASHFLOWACC IS INITIAL AND NOT COMPCODE IS INITIAL
AND NOT MONTH IS INITIAL AND NOT YEAR IS INITIAL.
  { 'ZCASHTTL', CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ACTUAL } = 0.
 ENDIF.
ENDFOR.
*********************************************************************************************



*********************************************************************************************
*CALCULATION FOR ACTUAL MONTHS<MONTH FORECAST(ALREADY ACCUMULATED IN THE
ACTUAL CUBE) AMOUNTS
*FROM ACTUAL CUBE.
*********************************************************************************************
FOREACH CATEGORY, YEAR IN REFDATA.
 IF NOT CATEGORY IS INITIAL AND NOT YEAR IS INITIAL.
  M_FCST = ATRV( '0FISCPER3', CATEGORY ).
  YEAR_FCST = ATRV( '0FISCYEAR', CATEGORY ).
  FOREACH GLACCOUNT, CASHFLOWACC IN REFDATA.
   IF NOT GLACCOUNT IS INITIAL AND NOT CASHFLOWACC IS INITIAL.
    FOREACH COMPCODE IN REFDATA.
     IF NOT COMPCODE IS INITIAL.
      FOREACH MONTH IN REFDATA.
       IF YEAR = YEAR_FCST.
        IF MONTH < M_FCST OR MONTH = M_FCST OR MONTH = 000.
         { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ACTUAL }
          = ( { '/ERP/AMOUNT', #, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_C01, #, #, # }
*
          { ZPERCCF, CATEGORY, PT10, GLACCOUNT, #, #, YEAR, ZFI_R05, 100, CASHFLOWACC,
PL_CF } ).
        ENDIF.
       ENDIF.
      ENDFOR.
     ENDIF.
    ENDFOR.
   ENDIF.
  ENDFOR.
 ENDIF.
ENDFOR.
*********************************************************************************************
*************
```

```
*********************************************************************************
*************
*NORMALLY THERE IS NO C_1000 in MAPPING. THIS IS THE  CALCULATION FOR ACTUAL MONTH =
"0" or " "
*(ALREADY ACCUMULATED IN THE ACTUAL CUBE) AMOUNTS FROM ACTUAL CUBE.
*********************************************************************************
*************
FOREACH CATEGORY, YEAR IN REFDATA.
 IF NOT CATEGORY IS INITIAL AND NOT YEAR IS INITIAL.
  M_FCST = ATRV( '0FISCPER3', CATEGORY ).
  YEAR_FCST = ATRV( '0FISCYEAR', CATEGORY ).
  FOREACH GLACCOUNT, CASHFLOWACC IN REFDATA.
   IF NOT GLACCOUNT IS INITIAL AND NOT CASHFLOWACC IS INITIAL.
    FOREACH COMPCODE IN REFDATA.
     IF NOT COMPCODE IS INITIAL.
      FOREACH MONTH IN REFDATA.
       IF YEAR = YEAR_FCST.
        IF MONTH IS INITIAL OR MONTH = 000.
         { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05, 100,
C_1000, CF_ACTUAL }
          = ( { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ACTUAL } ).
        ENDIF.
       ENDIF.
      ENDFOR.
     ENDIF.
    ENDFOR.
   ENDIF.
  ENDFOR.
 ENDIF.
ENDFOR.
*********************************************************************************
*************
```

Table 8.21: P&L to CashFlow Actual Months Accumulated PF Fox Formula

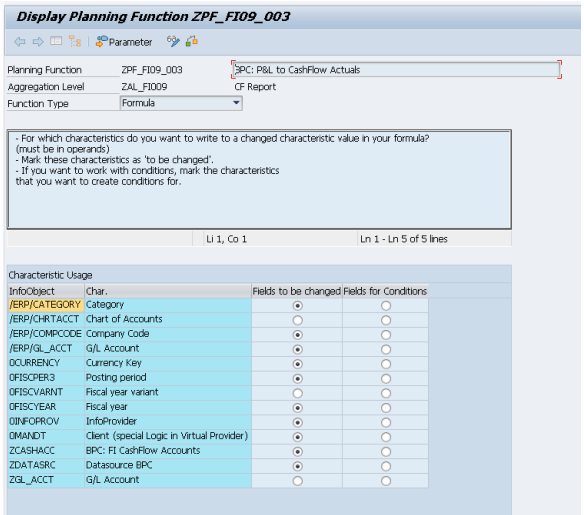


Figure 8.70: P&L to CashFlow Actuals PF Details

```
************************************************************************************************
*DATA PRESENTATIONS
************************************************************************************************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC9 TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA INFOPROV1 TYPE '0INFOPROV'.
DATA INFOPROV2 TYPE '0INFOPROV'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA YEAR TYPE '0FISCYEAR'.
DATA YEAR_AA TYPE '0FISCYEAR'.
DATA YEAR_FCST TYPE '0FISCYEAR'.
DATA CF_VL TYPE F.
DATA OFFSET TYPE I.
DATA GLACCOUNT TYPE '/ERP/GL_ACCT'.
DATA ZGLACCOUNT TYPE 'ZGL_ACCT'.
DATA MONTH TYPE '0FISCPER3'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA KF TYPE KEYFIGURE_NAME.
DATA PERCENTAGE TYPE F.
************************************************************************************************



************************************************************************************************
*CLEARING TARGET SOURCE
************************************************************************************************
FOREACH COMPCODE, GLACCOUNT, CASHFLOWACC, MONTH IN REFDATA.
*  IF NOT GLACCOUNT IS INITIAL AND NOT CASHFLOWACC IS INITIAL AND NOT COMPCODE IS INITIAL
AND NOT MONTH IS INITIAL.
*       { 'ZCASHTTL', CATEGORY, COMPCODE, GLACCOUNT, EUR, MONTH, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ACTUAL } = 0.
*  ENDIF.
ENDFOR.
************************************************************************************************



************************************************************************************************
*CALCULATION FOR ACTUAL AMOUNTS FROM ACTUAL CUBE
```

```
*************************************************************************************
*************
*FOREACH CATEGORY, YEAR IN REFDATA.
*  IF NOT CATEGORY IS INITIAL AND NOT YEAR IS INITIAL.
*    M_FCST = ATRV( '0FISCPER3', CATEGORY ).
*    YEAR_FCST = ATRV( '0FISCYEAR', CATEGORY ).
*    FOREACH GLACCOUNT, CASHFLOWACC IN REFDATA.
*     IF NOT GLACCOUNT IS INITIAL AND NOT CASHFLOWACC IS INITIAL.
*       FOREACH COMPCODE IN REFDATA.
*        IF NOT COMPCODE IS INITIAL.
*          IF YEAR = YEAR_FCST.
*            IF M_FCST IS INITIAL OR M_FCST = 000.
*                    { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, #, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ACTUAL }
*             = ({ '/ERP/AMOUNT', #, COMPCODE, GLACCOUNT, EUR, #, YEAR, ZFI_C01, #, #, # } *
*               { ZPERCCF, CATEGORY, PT10, GLACCOUNT, #, #, YEAR, ZFI_R05, 100, CASHFLOWACC,
PL_CF } ).
*           ELSE.
**             { ZCASHTTL, CATEGORY, COMPCODE, GLACCOUNT, EUR, M_FCST, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ACTUAL }
**              = { '/ERP/AMOUNT', #, COMPCODE, GLACCOUNT, EUR, M_FCST, YEAR, ZFI_C01, #, #, #
} *
**            ( 1 + { ZPERCCF, CATEGORY, PT10, GLACCOUNT, #, #, YEAR, ZFI_R05, 100, CASHFLOWACC,
PL_CF } ).
*           ENDIF.
*          ELSE.
*          ENDIF.
*         ENDIF.
*       ENDFOR.
*     ENDIF.
*   ENDFOR.
*  ENDIF.
*ENDFOR.
*************************************************************************************
*************
```

Table 8.22: P&L to CashFlow Actuals PF Fox Formula

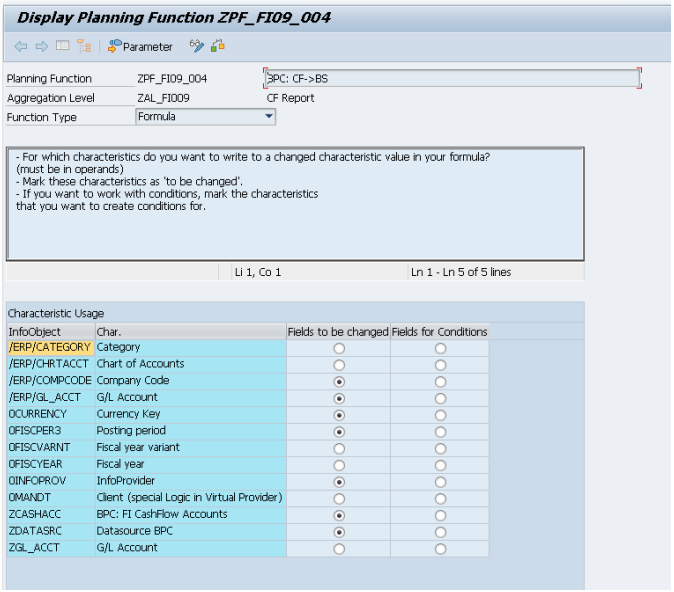


Figure 8.71: CF->BS PF Details

```
DATA MONTH TYPE '0FISCPER3'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC_AUX TYPE '/ERP/GL_ACCT'.
DATA CF_ACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CURR TYPE '0CURRENCY'.

*BREAK-POINT.
FOREACH COMPCODE, ACC, MONTH.
 { '/ERP/AMOUNT', COMPCODE, ACC, EUR, MONTH, ZFI_R03, #, BSCF_PLAN} = 0.
ENDFOR.

FOREACH COMPCODE, ACC, MONTH, CURR IN REFDATA.
*  IF DATASRC <> 'BS_PLAN'.
  IF NOT CURR IS INITIAL.
*       {'/ERP/AMOUNT', COMPCODE, ACC ,CURR,MONTH,ZFI_R03,BS_PLAN,#} = 0.
   FOREACH CF_ACC IN REFDATA.
    IF NOT CF_ACC IS INITIAL.
*       ACC_AUX = BS_ACC.
     { '/ERP/AMOUNT', COMPCODE, ACC_AUX, CURR, MONTH, ZFI_R03, #, BSCF_PLAN} =
         { '/ERP/AMOUNT', COMPCODE, ACC_AUX, CURR, MONTH, ZFI_R03, #, BSCF_PLAN} +
        ( { '/ERP/AMOUNT', COMPCODE, ACC, CURR, MONTH, ZFI_R05, #, CF_FINAL} *
         { ZPERCCF, #, ACC, #, #, ZFI_R05, CF_ACC, CF_BS} ).
    ENDIF.
   ENDFOR.
*  ENDIF.
  ENDIF.
ENDFOR.
```

Table 8.23: CF->BS PF Fox Formula

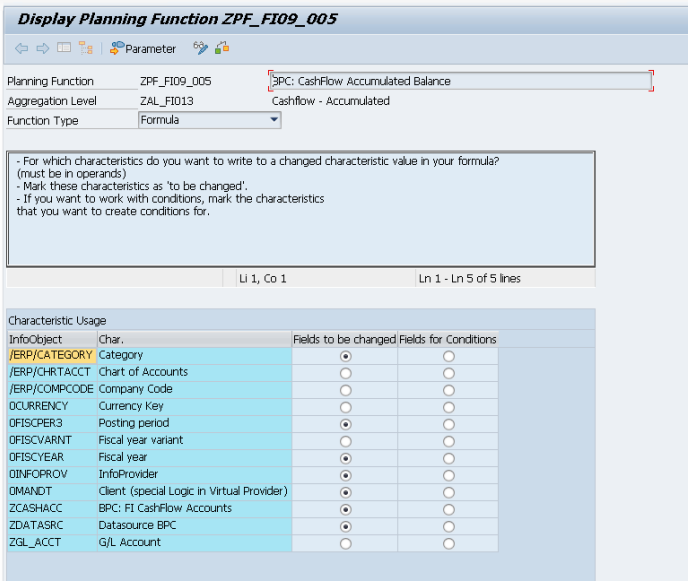


Figure 8.72: CashFlow Accumulated Balance PF Details

```
**********************************************************************************
*************
*DATA PRESENTATIONS
**********************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC9 TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA YEAR TYPE '0FISCYEAR'.
DATA YEAR_AA TYPE '0FISCYEAR'.
DATA YEAR_FCST TYPE '0FISCYEAR'.
DATA KF TYPE KEYFIGURE_NAME.
DATA CF_VL TYPE F.
DATA OFFSET TYPE I.
OFFSET = 1 - 2.
*BREAK-POINT.
**********************************************************************************
*************



**********************************************************************************
*************
*CLEARING TARGET SOURCE TO AVOID DUPLICATION.
**********************************************************************************
*************
```

```
FOREACH CATEGORY, YEAR, MONTH, CASHFLOWACC IN REFDATA.
  { 'ZCASHTTL', CATEGORY, MONTH, YEAR, ZFI_R05, 100, CASHFLOWACC, CF_ACC } = 0.
  { 'ZCASHTTL', CATEGORY, MONTH, YEAR, ZFI_R05, 100, CASHFLOWACC, CF_FINAL } = 0.
ENDFOR.
*****************************************************************************
*************



*****************************************************************************
*************
*CALCULATION FOR PLAN MONTHS OVER ACCUMULATED ACTUAL MONTHS IN CF CUBE.
*****************************************************************************
*************
FOREACH CATEGORY, YEAR IN REFDATA.
  IF NOT CATEGORY IS INITIAL AND NOT YEAR IS INITIAL.
    M_FCST = ATRV( '0FISCPER3', CATEGORY ).
    YEAR_FCST = ATRV( '0FISCYEAR', CATEGORY ).
    FOREACH CASHFLOWACC IN REFDATA.
      IF NOT CASHFLOWACC IS INITIAL.
        IF YEAR = YEAR_FCST.
          IF M_FCST IS INITIAL OR M_FCST = 000.
            CF_VL = { 'ZCASHTTL', CATEGORY, 000, YEAR, ZFI_R05, 100, CASHFLOWACC, CF_ACTUAL }.
          ELSE.
            CF_VL = { 'ZCASHTTL', CATEGORY, M_FCST, YEAR, ZFI_R05, 100, CASHFLOWACC, CF_ACTUAL
}.
          ENDIF.
        ELSE.
        ENDIF.
        M_COUNT = 000.
        DO.
          IF M_COUNT >= 012.
            EXIT.
          ELSE.
            M_COUNT = TMVL( M_COUNT, 1 ).
            MONTH = M_COUNT.
            IF M_COUNT > M_FCST.
              { 'ZCASHTTL', CATEGORY, M_COUNT, YEAR, ZFI_R05, 100, CASHFLOWACC, CF_ACC } =
              CF_VL + { 'ZCASHTTL', CATEGORY, M_COUNT, YEAR, ZFI_R05, 100, CASHFLOWACC,
CF_PLAN }.
              CF_VL = { 'ZCASHTTL', CATEGORY, M_COUNT, YEAR, ZFI_R05, 100, CASHFLOWACC, CF_ACC
}.
            ENDIF.
          ENDIF.
        ENDDO.
      ENDIF.
    ENDFOR.
  ENDIF.
ENDFOR.
*****************************************************************************
*************
```

Table 8.24: CashFlow Accumulated Balance PF Fox Formula

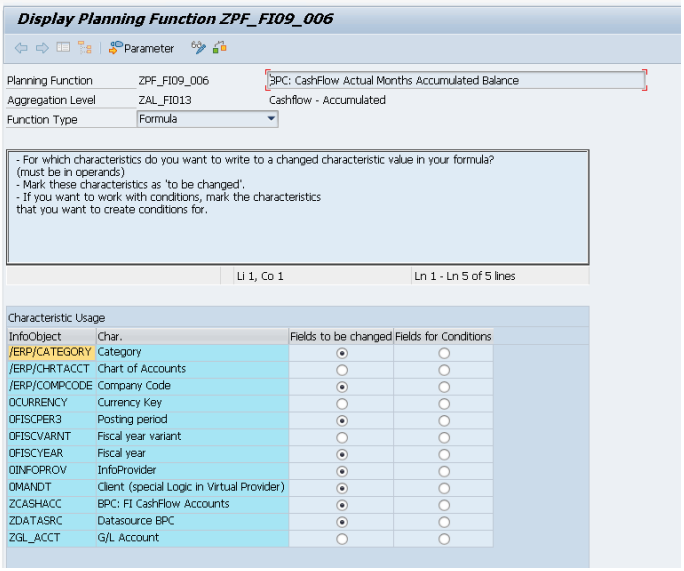


Figure 8.73: CashFlow Actual Months Accumulated Balance PF Details

```
**********************************************************************************
*************
*DATA PRESENTATIONS
**********************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC9 TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA M_FCST TYPE '0FISCPER3'.
DATA YEAR TYPE '0FISCYEAR'.
DATA YEAR_AA TYPE '0FISCYEAR'.
DATA YEAR_FCST TYPE '0FISCYEAR'.
DATA KF TYPE KEYFIGURE_NAME.
DATA CF_VL TYPE F.
DATA OFFSET TYPE I.
*BREAK-POINT.
**********************************************************************************
*************



**********************************************************************************
*************
*TRANSPORTATION FROM CF_ACTUAL FOR ACTUAL MONTHS TO CF_ACC IN CashFlow Cube.
```

```
*************************************************************************************
*************
OFFSET = 1 - 2.
M_COUNT = 000.
FOREACH CATEGORY, YEAR IN REFDATA.
  IF NOT CATEGORY IS INITIAL AND NOT YEAR IS INITIAL.
    M_FCST = ATRV( '0FISCPER3', CATEGORY ).
    YEAR_FCST = ATRV( '0FISCYEAR', CATEGORY ).
    FOREACH CASHFLOWACC IN REFDATA.
     IF NOT CASHFLOWACC IS INITIAL.
       FOREACH COMPCODE IN REFDATA.
       FOREACH M_COUNT IN REFDATA.
        IF M_COUNT > M_FCST.
          EXIT.
        ELSE.
          MONTH = M_COUNT.
          { 'ZCASHTTL', CATEGORY, COMPCODE, M_COUNT, YEAR, ZFI_R05, 100, CASHFLOWACC,
CF_ACC } =
          { 'ZCASHTTL', CATEGORY, COMPCODE, M_COUNT, YEAR, ZFI_R05, 100, CASHFLOWACC,
CF_ACC } +
          { 'ZCASHTTL', CATEGORY, COMPCODE, M_COUNT, YEAR, ZFI_R05, 100, CASHFLOWACC,
CF_ACTUAL }.
          M_COUNT = TMVL( M_COUNT, 1 ).
        ENDIF.
       ENDFOR.
       ENDFOR.
     ENDIF.
    ENDFOR.
  ENDIF.
ENDFOR.
*************************************************************************************
*************
```

Table 8.25: CashFlow Actual Months Accumulated Balance PF Fox Formula

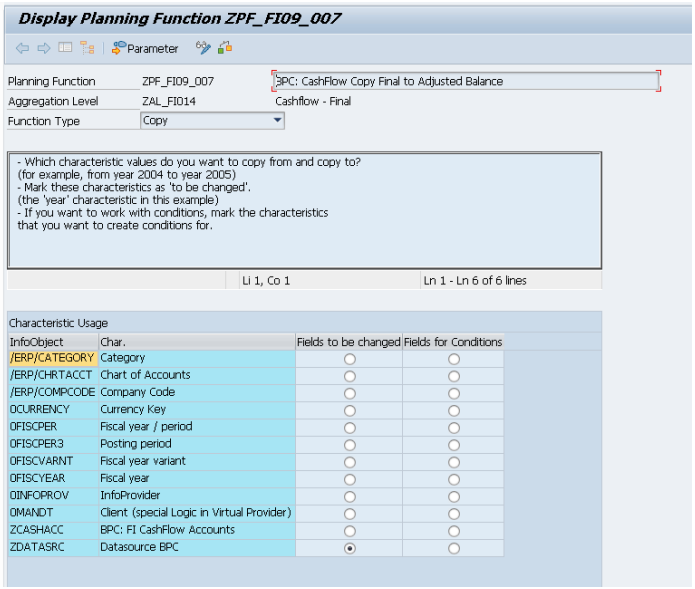


Figure 8.74: CashFlow Copy Final to Adjusted Balance PF Details

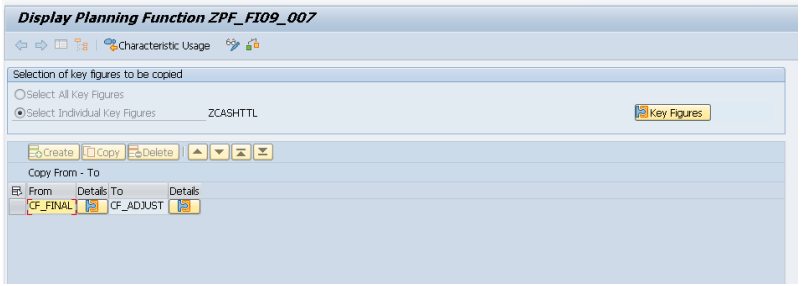


Figure 8.75: CashFlow Copy Final to Adjusted Balance PF Standard Copy Fox Formula

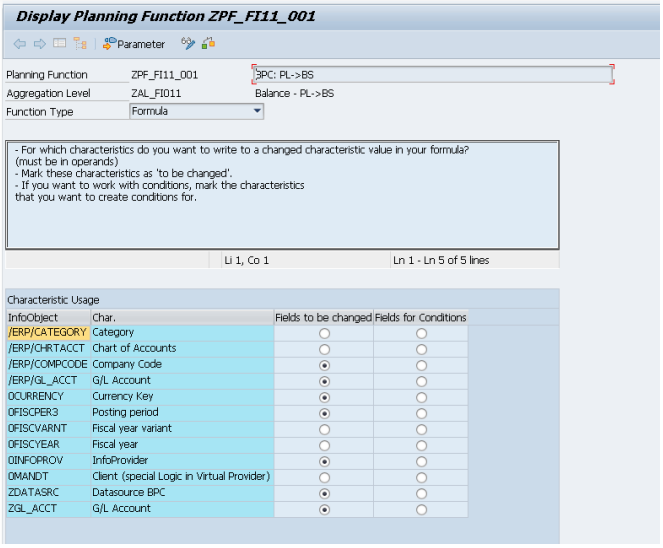


Figure 8.76: PL->BS PF Details

```
DATA MONTH TYPE '0FISCPER3'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA ACC_AUX TYPE '/ERP/GL_ACCT'.
DATA BS_ACC TYPE 'ZGL_ACCT'.
```

```
DATA DATASRC TYPE 'ZDATASRC'.
DATA CURR TYPE '0CURRENCY'.



*BREAK-POINT.
FOREACH COMPCODE, ACC, MONTH.
 { '/ERP/AMOUNT', COMPCODE, ACC, EUR, MONTH, ZFI_R03, BS_PLAN, # } = 0.
ENDFOR.

FOREACH COMPCODE, ACC, MONTH, DATASRC, CURR IN REFDATA.
 IF DATASRC <> 'BS_PLAN'.
 IF NOT CURR IS INITIAL.
*       {'/ERP/AMOUNT', COMPCODE, ACC ,CURR,MONTH,ZFI_R03,BS_PLAN,#} = 0.
   FOREACH BS_ACC IN REFDATA.
    IF NOT BS_ACC IS INITIAL.
     ACC_AUX = BS_ACC.
     { '/ERP/AMOUNT', COMPCODE, ACC_AUX, CURR, MONTH, ZFI_R03, BS_PLAN, # } =
         { '/ERP/AMOUNT', COMPCODE, ACC_AUX, CURR, MONTH, ZFI_R03, BS_PLAN, # } +
        ( { '/ERP/AMOUNT', COMPCODE, ACC, CURR, MONTH, ZFI_R02, DATASRC, # } *
         { ZPERCBS, #, ACC, #, #, ZFI_R03, PL_BS, BS_ACC } ).
    ENDIF.
   ENDFOR.
 ENDIF.
 ENDIF.
ENDFOR.
```

Table 8.26: PL->BS PF Fox Formula

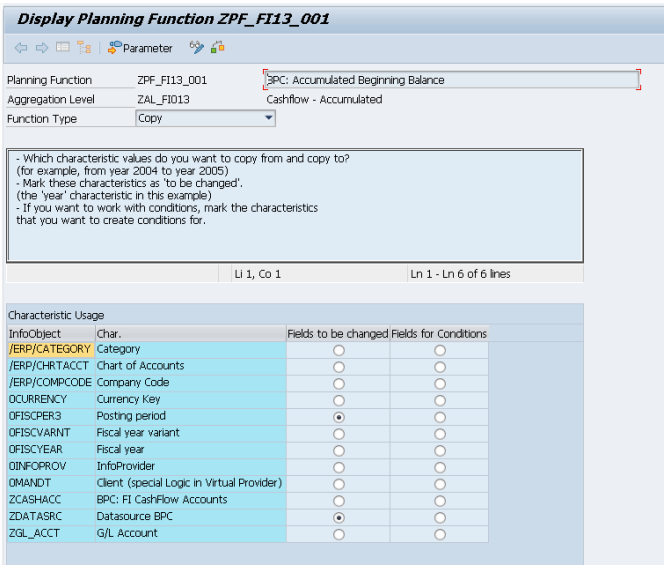


Figure 8.77: Accumulated Beginning Balance PF Details

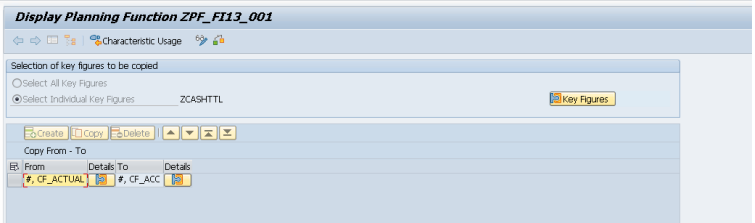


Figure 8.78: Accumulated Beginning Balance PF Standard Copy Fox Formula

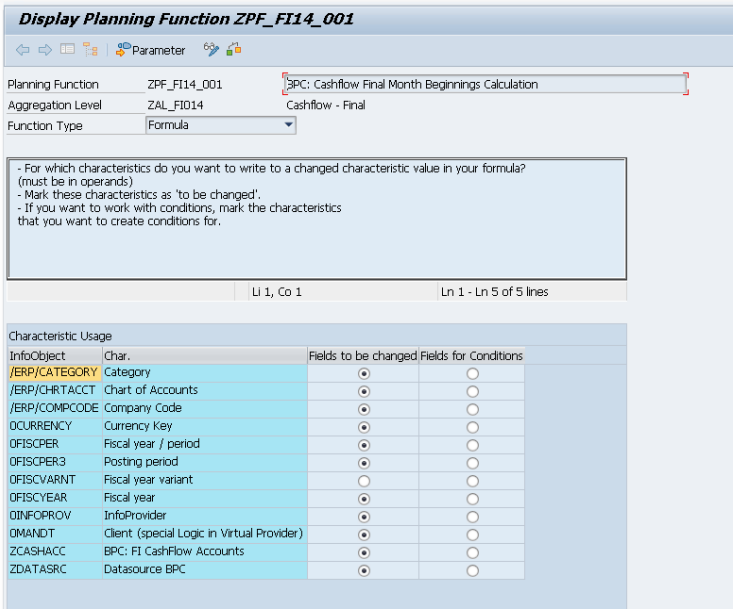


Figure 8.79: CashFlow Final Month Beginnings Calculation PF Details

```
**********************************************************************************
*************
*DATA PRESENTATIONS
**********************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA FISCPER_COUNT TYPE '0FISCPER'.
DATA FISCPER_MONTH TYPE '0FISCPER'.
DATA YEAR TYPE '0FISCYEAR'.
DATA CLIENT TYPE '0MANDT'.
DATA CHART TYPE '/ERP/CHRTACCT'.
DATA KF TYPE KEYFIGURE_NAME.
DATA CF1000F TYPE F.
DATA CF6000F TYPE F.
BREAK-POINT.
```

```
*********************************************************************************
*************


*********************************************************************************
*************
*CLEARING TARGET SOURCE TO AVOID DUPLICATION.
*********************************************************************************
*************
FOREACH CATEGORY, COMPCODE, CASHFLOWACC, MONTH, FISCPER_MONTH, YEAR IN REFDATA.
 { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_MONTH, MONTH, YEAR, ZFI_R05,
100, C_1000, CF_FINAL } = 0.
ENDFOR.
*********************************************************************************
*************


*********************************************************************************
*************
*TRANSPORTATION FROM CF_ACTUAL FOR ACTUAL MONTHS TO CF_ACC IN CashFlow Cube.
*********************************************************************************
*************
FOREACH CATEGORY, COMPCODE, YEAR IN REFDATA.
 IF NOT YEAR IS INITIAL AND NOT COMPCODE IS INITIAL.
  FOREACH M_COUNT, FISCPER_COUNT IN REFDATA.
*    FOREACH MONTH, FISCPER_MONTH IN REFDATA.
*   FOREACH M_COUNT IN REFDATA.
*    CF1000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_1000, CF_FINAL }.
*    CF6000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, M_COUNT, YEAR,
ZFI_R05, 100, C_6000, CF_FINAL }.

*************************************CALCULATIONS*****************************
************************
*      M_COUNT = 000.
*      DO.
       IF M_COUNT >= 011.
        EXIT.
       ELSE.
        MONTH = TMVL( M_COUNT, 1 ).
        FISCPER_MONTH = TMVL( FISCPER_COUNT, 1 ).
        { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_MONTH, MONTH, YEAR,
ZFI_R05, 100, C_1000, CF_FINAL } =
       { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_COUNT, M_COUNT, YEAR,
ZFI_R05, 100, C_6000, CF_FINAL }.
        M_COUNT = TMVL( M_COUNT, 1 ).
       ENDIF.
*      ENDDO.
*    ENDFOR.

*************************************CALCULATIONS*****************************
************************
```

```
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_1000, CF_FINAL } = CF1000F.
*     ENDFOR.
   ENDFOR.
 ENDIF.
ENDFOR.
*********************************************************************************
*************
```

Table 8.27: CashFlow Final Month Beginnings Calculation PF Fox Formula

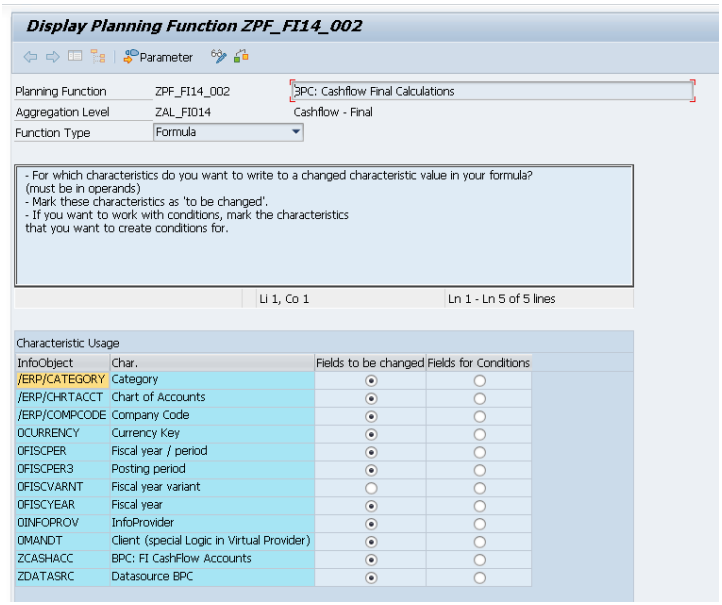


Figure 8.80: CashFlow Final Calculations PF Details

```
*********************************************************************************
*************
*DATA PRESENTATIONS
*********************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA MONTHPLUS TYPE '0FISCPER3'.
DATA FISCPER_COUNT TYPE '0FISCPER'.
DATA FISCPER_PLUS TYPE '0FISCPER'.
DATA FISCPER TYPE '0FISCPER'.
```

```
DATA YEAR TYPE '0FISCYEAR'.
DATA CLIENT TYPE '0MANDT'.
DATA CHART TYPE '/ERP/CHRTACCT'.
DATA KF TYPE KEYFIGURE_NAME.
DATA CF2001A TYPE F.
DATA CF2002A TYPE F.
DATA CF2003A TYPE F.
DATA CF2004A TYPE F.
DATA CF2005A TYPE F.
DATA CF3000A TYPE F.
DATA CF3001A TYPE F.
DATA CF3002A TYPE F.
DATA CF3003A TYPE F.
DATA CF3004A TYPE F.
DATA CF3005A TYPE F.
DATA CF3006A TYPE F.
DATA CF3007A TYPE F.
DATA CF3008A TYPE F.
DATA CF4000A TYPE F.
DATA CF1000F TYPE F.
DATA CF2001F TYPE F.
DATA CF2002F TYPE F.
DATA CF2003F TYPE F.
DATA CF2004F TYPE F.
DATA CF2005F TYPE F.
DATA CF3000F TYPE F.
DATA CF3001F TYPE F.
DATA CF3002F TYPE F.
DATA CF3003F TYPE F.
DATA CF3004F TYPE F.
DATA CF3005F TYPE F.
DATA CF3006F TYPE F.
DATA CF3007F TYPE F.
DATA CF3008F TYPE F.
DATA CF4000F TYPE F.
DATA CF5000F TYPE F.
DATA CF6000F TYPE F.
DATA ACCPDAYS TYPE F.
DATA ACCRDAYS TYPE F.
DATA ASMONTHS TYPE F.
DATA ASMONTHSTOTAL TYPE F.
*BREAK-POINT.
**********************************************************************
*************



**********************************************************************
*************
*CLEARING TARGET SOURCE TO AVOID DUPLICATION.
**********************************************************************
*************
```

```
FOREACH CATEGORY, COMPCODE, CURRENCY, CASHFLOWACC, FISCPER, MONTH , YEAR,
INFOPROV, DATASRC, CLIENT IN REFDATA.
 { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, CURRENCY, FISCPER, MONTH, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_FINAL } = 0.
ENDFOR.
**************************************************************************
************


**************************************************************************
************
*TRANSPORTATION FROM CF_ACTUAL FOR ACTUAL MONTHS TO CF_ACC IN CashFlow Cube.
**************************************************************************
************
FOREACH CATEGORY, COMPCODE, MONTH, FISCPER, YEAR IN REFDATA.
 IF NOT YEAR IS INITIAL AND NOT MONTH IS INITIAL AND NOT COMPCODE IS INITIAL.
  FOREACH M_COUNT, FISCPER_COUNT IN REFDATA.
   CF1000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_1000, CF_FINAL }.
   CF2001A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2001, CF_ACC }.
   CF2002A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2002, CF_ACC }.
   CF2003A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2003, CF_ACC }.
   CF2004A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2004, CF_ACC }.
   CF2005A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2005, CF_ACC }.
   CF3001A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3001, CF_ACC }.
   CF3002A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3002, CF_ACC }.
   CF3003A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3003, CF_ACC }.
   CF3004A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3004, CF_ACC }.
   CF3005A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3005, CF_ACC }.
   CF3006A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3006, CF_ACC }.
   CF3007A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3007, CF_ACC }.
   CF4000A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_4000, CF_ACC }.
   CF2001F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2001, CF_FINAL }.
   CF2002F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2002, CF_FINAL }.
   CF2003F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2003, CF_FINAL }.
```

```
    CF2004F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2004, CF_FINAL }.
    CF2005F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2005, CF_FINAL }.
    CF3001F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3001, CF_FINAL }.
    CF3002F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3002, CF_FINAL }.
    CF3003F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3003, CF_FINAL }.
    CF3004F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3004, CF_FINAL }.
    CF3005F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3005, CF_FINAL }.
    CF3006F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3006, CF_FINAL }.
    CF3007F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3007, CF_FINAL }.
    CF4000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_4000, CF_FINAL }.
    CF5000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_5000, CF_FINAL }.
    CF6000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_6000, CF_FINAL }.
    ACCPDAYS = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, #, #, YEAR, ZFI_R03, 100, #,
ACC_P_DAYS }.
    ACCRDAYS = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, #, #, YEAR, ZFI_R03, 100, #,
ACC_R_DAYS }.
    ASMONTHS = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, FISCPER, MONTH, YEAR, ZFI_R03, 100,
#, SAL_INSTAL }.
    ASMONTHSTOTAL = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, #, #, YEAR, ZFI_R03, 100, #,
SAL_INSTAL }.

************************************CALCULATIONS*****************************
************************
    CF2001F = ( CF2001A / ( ACCRDAYS * 30 ) ).
    CF2002F = CF2002A.
    CF2003F = CF2003A.
    CF2004F = CF2004A.
    CF2005F = CF2005A.
    CF3001F = ( CF3001A / ( ACCRDAYS * 30 ) ).
    CF3002F = CF3002A.
    CF3003F = ( CF3003A / ( ASMONTHS * ASMONTHSTOTAL ) ).
    CF3004F = ( CF3004A / ( ASMONTHS * ASMONTHSTOTAL ) ).
    CF3005F = CF3005A.
    CF3006F = CF3006A.
    CF3007F = CF3007A.
    CF4000F = ( CF1000F + CF2001F + CF2002F + CF2003F + CF2004F + CF2005F +
          CF3001F + CF3002F + CF3003F + CF3004F + CF3005F + CF3006F + CF3007F ).
    CF6000F = CF4000F + CF5000F.

    IF M_COUNT > 011.
```

```
    ELSE.
      MONTHPLUS = TMVL( M_COUNT, 1 ).
      FISCPER_PLUS = TMVL( FISCPER_COUNT, 1 ).
      { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_PLUS, MONTHPLUS, YEAR,
ZFI_R05, 100, C_1000, CF_FINAL } =
        { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_COUNT, M_COUNT, YEAR,
ZFI_R05, 100, C_6000, CF_FINAL }.
      M_COUNT = TMVL( M_COUNT, 1 ).
    ENDIF.

************************************CALCULATIONS*****************************
************************

    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2001, CF_FINAL } = CF2001F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2002, CF_FINAL } = CF2002F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2003, CF_FINAL } = CF2003F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2004, CF_FINAL } = CF2004F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2005, CF_FINAL } = CF2005F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3001, CF_FINAL } = CF3001F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3002, CF_FINAL } = CF3002F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3003, CF_FINAL } = CF3003F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3004, CF_FINAL } = CF3004F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3005, CF_FINAL } = CF3005F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3006, CF_FINAL } = CF3006F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3007, CF_FINAL } = CF3007F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_4000, CF_FINAL } = CF4000F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_5000, CF_FINAL } = CF5000F.
    { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_6000, CF_FINAL } = CF6000F.
   ENDFOR.
  ENDIF.
ENDFOR.
*******************************************************************************
*************
```

Table 8.28: CashFlow Final Calculations PF Fox Formula

ZPS_FI09_002	BPC: Cash Flow Adjusted Calculations	ZAL_FI014	Cashflow - Final	ZF_FI_29	BPC: Cashflow Adjusted Final Calculations	ZPF_FI14_003	BPC: Cashflow Adjusted Final Calculations

Table 8.29: Cash Flow Adjusted Calculations PS

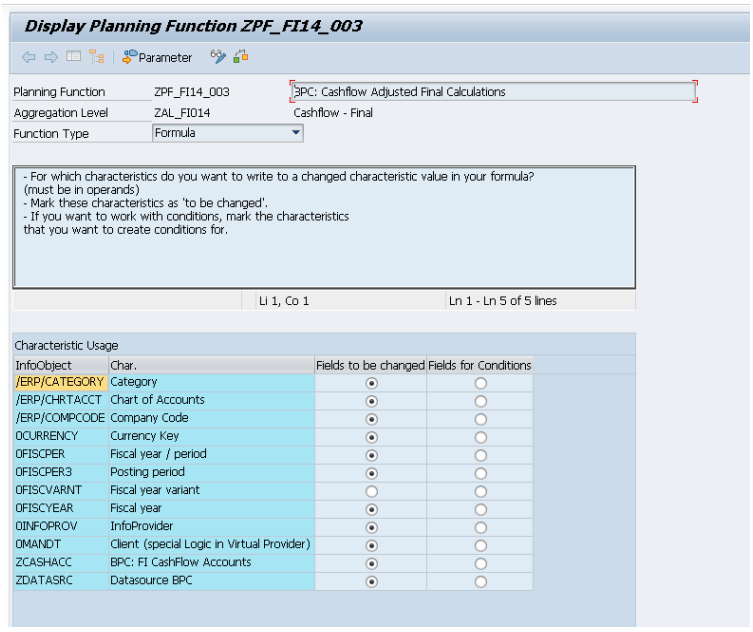


Figure 8.81: CashFlow Adjusted Calculations PF Details

```
**********************************************************************************
*************
*DATA PRESENTATIONS
**********************************************************************************
*************
DATA CURRENCY TYPE '0CURRENCY'.
DATA ACC TYPE '/ERP/GL_ACCT'.
DATA CASHFLOWACC TYPE 'ZCASHACC'.
DATA DATASRC TYPE 'ZDATASRC'.
DATA CATEGORY TYPE '/ERP/CATEGORY'.
DATA INFOPROV TYPE '0INFOPROV'.
DATA COMPCODE TYPE '/ERP/COMPCODE'.
DATA MONTH TYPE '0FISCPER3'.
DATA M_COUNT TYPE '0FISCPER3'.
DATA MONTHPLUS TYPE '0FISCPER3'.
DATA FISCPER_COUNT TYPE '0FISCPER'.
DATA FISCPER_PLUS TYPE '0FISCPER'.
DATA FISCPER TYPE '0FISCPER'.
DATA YEAR TYPE '0FISCYEAR'.
DATA CLIENT TYPE '0MANDT'.
DATA CHART TYPE '/ERP/CHRTACCT'.
DATA KF TYPE KEYFIGURE_NAME.
DATA CF2001A TYPE F.
DATA CF2002A TYPE F.
DATA CF2003A TYPE F.
DATA CF2004A TYPE F.
DATA CF2005A TYPE F.
```

```
DATA CF3000A TYPE F.
DATA CF3001A TYPE F.
DATA CF3002A TYPE F.
DATA CF3003A TYPE F.
DATA CF3004A TYPE F.
DATA CF3005A TYPE F.
DATA CF3006A TYPE F.
DATA CF3007A TYPE F.
DATA CF3008A TYPE F.
DATA CF4000A TYPE F.
DATA CF1000F TYPE F.
DATA CF2001F TYPE F.
DATA CF2002F TYPE F.
DATA CF2003F TYPE F.
DATA CF2004F TYPE F.
DATA CF2005F TYPE F.
DATA CF3000F TYPE F.
DATA CF3001F TYPE F.
DATA CF3002F TYPE F.
DATA CF3003F TYPE F.
DATA CF3004F TYPE F.
DATA CF3005F TYPE F.
DATA CF3006F TYPE F.
DATA CF3007F TYPE F.
DATA CF3008F TYPE F.
DATA CF4000F TYPE F.
DATA CF5000F TYPE F.
DATA CF6000F TYPE F.
DATA ACCPDAYS TYPE F.
DATA ACCRDAYS TYPE F.
DATA ASMONTHS TYPE F.
DATA ASMONTHSTOTAL TYPE F.
*BREAK-POINT.
********************************************************************************
**********



********************************************************************************
**********
*CLEARING TARGET SOURCE TO AVOID DUPLICATION.
********************************************************************************
**********
*FOREACH CATEGORY, COMPCODE, CURRENCY, CASHFLOWACC, FISCPER, MONTH , YEAR,
INFOPROV, DATASRC, CLIENT IN REFDATA.
*  { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, CURRENCY, FISCPER, MONTH, YEAR, ZFI_R05, 100,
CASHFLOWACC, CF_ADJUST } = 0.
*ENDFOR.
********************************************************************************
**********
```

```
**********************************************************************************
*************
*TRANSPORTATION FROM CF_ACTUAL FOR ACTUAL MONTHS TO CF_ACC IN CashFlow Cube.
**********************************************************************************
*************
FOREACH CATEGORY, COMPCODE, MONTH, FISCPER, YEAR, DATASRC.
*  IN REFDATA.
  IF NOT YEAR IS INITIAL AND NOT MONTH IS INITIAL AND NOT COMPCODE IS INITIAL.
    FOREACH M_COUNT, FISCPER_COUNT IN REFDATA.
     CF1000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_1000, DATASRC }.
*     CF2001A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_2001, CF_ACC }.
*     CF2002A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_2002, CF_ACC }.
*     CF2003A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_2003, CF_ACC }.
*     CF2004A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_2004, CF_ACC }.
*     CF2005A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_2005, CF_ACC }.
*     CF3001A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3001, CF_ACC }.
*     CF3002A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3002, CF_ACC }.
*     CF3003A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3003, CF_ACC }.
*     CF3004A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3004, CF_ACC }.
*     CF3005A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3005, CF_ACC }.
*     CF3006A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3006, CF_ACC }.
*     CF3007A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_3007, CF_ACC }.
*     CF4000A = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR,
ZFI_R05, 100, C_4000, CF_ACC }.
     CF2001F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2001, CF_ADJUST }.
     CF2002F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2002, CF_ADJUST }.
     CF2003F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2003, CF_ADJUST }.
     CF2004F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2004, CF_ADJUST }.
     CF2005F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_2005, CF_ADJUST }.
     CF3001F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3001, CF_ADJUST }.
     CF3002F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3002, CF_ADJUST }.
```

```
    CF3003F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3003, CF_ADJUST }.
    CF3004F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3004, CF_ADJUST }.
    CF3005F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3005, CF_ADJUST }.
    CF3006F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3006, CF_ADJUST }.
    CF3007F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_3007, CF_ADJUST }.
    CF4000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_4000, CF_ADJUST }.
    CF5000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_5000, CF_ADJUST }.
    CF6000F = { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05,
100, C_6000, CF_ADJUST }.
*     ACCPDAYS = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, #, #, YEAR, ZFI_R03, 100, #,
ACC_P_DAYS }.
*     ACCRDAYS = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, #, #, YEAR, ZFI_R03, 100, #,
ACC_R_DAYS }.
*     ASMONTHS = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, FISCPER, MONTH, YEAR, ZFI_R03,
100, #, SAL_INSTAL }.
*     ASMONTHSTOTAL = { 'ZASSUMP', CATEGORY, #, COMPCODE, #, #, #, YEAR, ZFI_R03, 100, #,
SAL_INSTAL }.

************************************CALCULATIONS*****************************
************************
*     CF2001F = ( CF2001A / ( ACCRDAYS * 30 ) ).
*     CF2002F = CF2002A.
*     CF2003F = CF2003A.
*     CF2004F = CF2004A.
*     CF2005F = CF2005A.
*     CF3001F = ( CF3001A / ( ACCRDAYS * 30 ) ).
*     CF3002F = CF3002A.
*     CF3003F = ( CF3003A / ( ASMONTHS * ASMONTHSTOTAL ) ).
*     CF3004F = ( CF3004A / ( ASMONTHS * ASMONTHSTOTAL ) ).
*     CF3005F = CF3005A.
*     CF3006F = CF3006A.
*     CF3007F = CF3007A.
    CF4000F = ( CF1000F + CF2001F + CF2002F + CF2003F + CF2004F + CF2005F +
          CF3001F + CF3002F + CF3003F + CF3004F + CF3005F + CF3006F + CF3007F ).
    CF6000F = CF4000F + CF5000F.

    IF M_COUNT > 011.
    ELSE.
      MONTHPLUS = TMVL( M_COUNT, 1 ).
      FISCPER_PLUS = TMVL( FISCPER_COUNT, 1 ).
      { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_PLUS, MONTHPLUS, YEAR,
ZFI_R05, 100, C_1000, CF_ADJUST } =
        { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER_COUNT, M_COUNT, YEAR,
ZFI_R05, 100, C_6000, CF_ADJUST }.
      M_COUNT = TMVL( M_COUNT, 1 ).
```

```
    ENDIF.

************************************CALCULATIONS*****************************
************************

*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2001, CF_ADJUST } = CF2001F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2002, CF_ADJUST } = CF2002F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2003, CF_ADJUST } = CF2003F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2004, CF_ADJUST } = CF2004F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_2005, CF_ADJUST } = CF2005F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3001, CF_ADJUST } = CF3001F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3002, CF_ADJUST } = CF3002F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3003, CF_ADJUST } = CF3003F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3004, CF_ADJUST } = CF3004F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3005, CF_ADJUST } = CF3005F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3006, CF_ADJUST } = CF3006F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_3007, CF_ADJUST } = CF3007F.
     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_4000, CF_ADJUST } = CF4000F.
*     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_5000, CF_ADJUST } = CF5000F.
     { 'ZCASHTTL', CATEGORY, CCOA, COMPCODE, EUR, FISCPER, MONTH, YEAR, ZFI_R05, 100,
C_6000, CF_ADJUST } = CF6000F.
   ENDFOR.
  ENDIF.
ENDFOR.
*******************************************************************************
*************
```

Table 8.30: CashFlow Adjusted Calculations PF Fox Formula