INTEGRATED BUSINESS PROCESSES WITH ERP SYSTEMS

Dr. Lakshmi Prasanna Pagadala
Dr. Ranganathan Kumar

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CHAPTER 1

A STUDY ON CASE STUDY – ERP SAP IMPLEMENTATION

Dr. Lakshmi Prasanna Pagadala, Associate Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: lakshmi.prasanna@presidencyuniversity.in

ABSTRACT:

In a real-world organisational setting, this case study `1`investigates the deployment of an Enterprise Resource Planning (ERP) system utilising SAP software. The report examines the difficulties, solutions, and results of the ERP SAP installation project, offering insightful information for businesses contemplating or carrying out projects of a similar kind. The case study starts by outlining the organization's history and setting, including its size, sector, and the business difficulties that made the deployment of the ERP necessary. The selection process is then discussed, where the company considered a number of ERP options before settling on SAP owing to its comprehensive features, scalability, and reputation in the market. The planning, requirements collecting, system design, configuration, testing, and training stages are all included in a detailed breakdown of the implementation process. The case study addresses the difficulties that were faced throughout each stage, such as opposition to change, complicated data movement, and demands for customization.

KEYWORDS:

Change Management, ERP System, Strategic Enterprise Management, Project Management.

INTRODUCTION

Any organisation must undertake the challenging and important task of implementing an Enterprise Resource Planning (ERP) system. In this case study, we'll look at a fictional company's deployment of an ERP system utilising SAP, one of the top suppliers of ERP systems. Company X, the organisation in issue, realised they needed to increase productivity, decision-making efficiency, and organisation. They made the decision to deploy SAP's ERP system after giving it great thought and consideration. This case study will explore the difficulties Company X encountered throughout the implementation process, the methods used to overcome those difficulties, and the results and advantages of the SAP ERP deployment [1].

We will examine a number of implementation-related topics throughout the case study, such as project planning, stakeholder participation, system customization, data transfer, training, change management, and post-implementation support. These components are necessary to make sure that the ERP system is adopted and used effectively inside the organisation. This case study attempts to provide insightful information on the best practices, difficulties, and advantages of establishing an ERP system by analysing the experiences and lessons learnt from Company X's SAP ERP deployment. It will operate as a useful manual for businesses thinking about or starting a comparable ERP adoption path.

Through this case study, we will learn more about the elements that go into an ERP implementation's success as well as the crucial aspects to take into account for a seamless transition to the new system. We will also look at the concrete and intangible gains that Company X made as a consequence of implementing SAP ERP, including increased

operational effectiveness, greater data visibility, simplified procedures, and improved decision-making ability [2].

The case study on the deployment of SAP ERP by Company X offers a chance to delve into the complexity of an ERP implementation process. We may learn a lot about the best practices and factors to take into account for effectively deploying an ERP system by looking at the difficulties encountered, solutions used, and results obtained. This case study offers advice and lessons gained from a real-world situation, making it an invaluable resource for businesses starting their own ERP installation journeys.

DISCUSSION

SAP R/3 At Tata Steel

A steely decision was taken by Tata Iron and Steel Company Limited (TISCO) to transform into a customer-driven business in the Internet economy. In order to make their resolution successful, it adopted SAP R/3, an ERP, and is currently enjoying tremendous operational and financial gains, according to Bhavish Sood. "Since the ERP system was implemented, excellent results have been obtained. Ramesh C. Nadrajog, Vice President, Finance, said that Tisco invested close to '40 crores on its implementation and has saved '33 crores in only a few months. From over $200 per tonne two years ago to roughly $140 per tonne in 2000, the cost of labour has decreased.

By June 2000, the amount still owing had decreased from'5,170 millions in 1999 to'4,033 millions. The carrying cost of inventories has dropped significantly from $190 per tonne to $155 per tonne. Additionally, the deployment of SAP has resulted in considerable cost reductions through resource management. Doesn't it seem nearly utopian? But since TISCO's ERP system was finished in only eight months, it is precisely the outcome. India's biggest integrated steel business, TISCO, is the first in Asia. It can satisfy the most demanding requirements of its clients globally because to its cutting-edge 3.5 million tonne steel factory [3].

The firm implemented ERP technology to gain an edge in the cutthroat steel market, and through ongoing learning, innovation, and business process improvement, it has smoothly transitioned from a production-driven business to a customer-driven one. The technology at the time was only a copy of the manual system. Not only did it function as isolated information islands, but the technology itself was also severely out of date. The management and staff of TISCO had a difficult time communicating and locating information in the system. Furthermore, the consistency and duplication of data from other agencies put the credibility of the information acquired in doubt. Additionally, no built-in integrity check was available for different data sources. Additionally, it was often discovered that crucial pieces of information were missing [4].

A Prompt Answer

Beginning in 1991 with a cost competitiveness analysis and formal business strategy, the company began to adapt to changing client expectations. Next came ISO 9002 certification and benchmarking programmes. TISCO made the decision to choose a new, robust solution after seeing the need to further support the re-engineered core processes and swiftly align the business operations to significant changes in the marketplace.

Design

A small internal cross-functional team, IBM Global Services (BPR Consultants), Arthur D. Little (Strategy Consultants), and other consultants rebuilt the two key business processes in 1998–1999: order generation and fulfilment and marketing development. This was done to increase customer attention, enable better credit management, and encourage stock reduction.

Selecting The Technology and Platform

The management at TISCO wanted the software to be compatible with future deployments as well as smoothly connect with its current information system. SAP came out on top of the list of competitors after a thorough analysis of capability, cost, time, compatibility, esteem, operability, support, and future organisational needs.

Several strategic objectives were in mind when SAP was implemented. TISCO aimed to establish a culture of ongoing learning and development through this deployment. By doing this, TISCO would be able to elevate the calibre of its goods and services and solidify its position as the market leader. In addition, TISCO intended the software to promote rapid decision-making, data reliability, transparency, and enhanced customer response in all areas [5].

The Real Obstacle

The diminishing success rate of ERP installations globally makes it difficult for an organisation to adopt any ERP system, according to B Muthuraman, MD (Designate). However, at Tata Steel, the true issue was not in integrating SAP effectively or in quickly deploying it to all 46 of our facilities throughout the nation using a big-bang strategy. The true problem was creating a setting where SAP could become ingrained in the minds and emotions of TISCO's employees and clients.

Technology and Business Process Mapping

To attain the targeted levels of ERP success, a road map was developed. All branches that had a high volume of sophisticated transactions were classified as "hubs." The consignment agents and lesser branches were referred to as the "spokes" that were connected to the larger branches. Achieve Success via SAP Enabled Transformation, or TEAM ASSET, was established by TISCO in January 1999.

Two basic assumptions made up the TEAM ASSET:

1. Go-Live date: November 1st, 1999
2. The day is just 24 hours long.

Core business processes were mapped to SAP modules as part of preparatory task force efforts. Within the firm, 'Change Management' was started as a parallel effort. The main goal of "Change Management" was to inform those who were not directly engaged in the project of the changes that were occurring. Tata Steel intended to launch all of the modules simultaneously using a "big-bang" strategy. On November 1, 1999, Tata Steel completed a big-bang rollout of all SAP modules at 46 sites throughout the nation in only eight months. The objective was accomplished on time [6].

The Outcome

Tata Steel has improved customer service, decreased expenses, increased productivity, expedited transaction times, workflow management, and reduced the amount of credit management mistakes as a result of using SAP solutions. Additionally, there have been

considerable labour, inventory, and resource management savings. With regular updates and seamless services throughout the nation, TISCO can now better manage its clients. The accessibility of information online has made trend analysis for effective decision-making easier and more dependable. Additionally, the simplified business process lowers the amount of legacy systems and offers strong audit trails of all transactions as well as standard business practices across locations.

The outcomes have been fantastic since the SAP solution was introduced. According to Mr. Ramesh C. Nadrajog, Vice President (Finance), the firm invested about 40 crores on the SAP implementation and has already saved 33 crores. From more than $200 per tonne two years ago to roughly $140 per tonne in 2000, the cost of labour has decreased. By June 2000, the amount still owing had decreased from '5170 millions in 1999 to '4033 millions. The carrying cost of inventories has been decreased from '190 per tonne to '155 per tonne. Additionally, SAP deployment has resulted in considerable cost reductions via resource management [7].

Tata Steel can now give daily updates to consumers and seamless services throughout the nation thanks to SAP's solution, which also improves customer management. The accessibility of information online has made trend analysis for effective decision-making easier and more dependable. Along with providing standard business practises across locations and a strong audit record of all transactions, the simplified business process also minimises the levels of legacy systems. "Now, I cringe to consider how we managed for so many years without a famous ERP system. The advantages of the implementation's success came along with the challenges we faced, said Mr. K. V. Srinivasan, Member, Team ASSET at TISCO.

Using SAP to Achieve Business Agility

Moving forward, SAP R/3 will soon support the web. It seems that anybody would be able to access our SAP R/3 through the Internet. The ramifications, however, go far deeper since it would lead to information exchange with important clients and business accounts. The success in marketing and sales has caused the current system to be reviewed, and a comprehensive deployment is anticipated as follows.

1. Extending SAP in Works with FI, CO, MM, PP, and QM
2. In Phase II, SAP modules including Asset Management and Budget Management sub-modules of FICO, Plant Maintenance, Human Resources, and Production Optimizer (like SAP APO) will be implemented.

SEM (Strategic Enterprise Management) is the third phase. In order to improve its customer interactions now and ultimately realise its goal of being the most effective and competitive business in its industry, the firm also intends to use the my SAP Customer Relationship Management system [8].

Oracle at Qualcomm CDMA Technology

The Company

Code division multiple access (CDMA), the basis for third-generation (3G) communications devices, was invented by Qualcomm, Inc. in 1985. Qualcomm, Inc. also continues to create innovative voice, data, and wireless Internet products and solutions. In order to provide manufacturers hardware, software, tools, training, and technical support for CDMA wireless devices, the firm established Qualcomm CDMA Technologies (QCT) in 1995. The bulk of commercially available 3G devices are powered by Qualcomm CDMA Technologies' chipsets, which have been supplied to more than 50 clients and are the world's leading supplier of 3G chipsets and software technologies.

The issue or circumstance

The company's supply chain has become more complicated as more and more manufacturers across the globe use Qualcomm's CDMA standard. Chips are produced globally and then sent to consumers all around the globe thanks to QCT's production methodology. QCT made the decision to assess its supply chain applications to make sure they could still satisfy the demands of the organisation in the face of this complexity and expected expansion.

QCT need a low-cost method of communicating with its clients and partners. The systems QCT had been using had previously been substantially customised, and the method of client interaction was manual and much too sluggish to be effective. The system's tremendous customisation made scaling it prohibitively costly and updating it exceedingly challenging. Oracle was chosen by QCT after evaluating the alternatives to its outdated software in order to control complexity and improve customer and supplier interaction [9].

The Approach & Execution

Prior to looking for solutions to its outdated software, QCT first outlined its plan for enhancing its interactions with both consumers and suppliers. The business promised prompt answers to price inquiries, purchase commitments, and progress updates from customers. Additionally, QCT made the decision to increase supply chain visibility, increase flexibility, and shorten lead times. "We were solely concerned with finding the ideal match since the value proposition and the business case were so obvious. Lisa Henderson, director of QCT information technology, said that Oracle was the only genuine answer to our problems. The Oracle E-Business Suite apps are already integrated, so QCT didn't need to invest in time-consuming integration projects. This allowed for quick and inexpensive updates in the future and allowed QCT to add new applications as required [10].

The Advantages

The automation of procedures via QCT has improved productivity. For instance, Oracle Procurement has done away with manual procedures. Employing Oracle Warehouse Management's attribute-based picking criteria, the organisation has optimised its warehouse operations. The company's supply chain is now better understood and under its control. In addition to reducing inventory across the supply chain and improving its understanding of supply and demand, QCT has integrated Oracle applications. In addition, with its applications integrated, QCT models supply projections considerably more successfully today [11].

Oracle E-Business Suite Applications are in place, giving QCT's clients 24/7 access to online collaboration tools. QCT is now able to react to client quotation requests more swiftly because to improvements in internal process. Due to the integration of applications for many functional areas, QCT is able to make quicker, more precise judgements about customer problems like credits. QCT is now better equipped to manage its anticipated expansion. In conclusion, the Oracle solution gave QCT the capacity to:

1. Made forecast simulation simpler and more efficient.
2. Better chain supply control
3. Enhanced efficiency in warehousing and shipping management.

CONCLUSION

In conclusion, the case study of the ERP SAP deployment demonstrates the difficulties, advantages, and crucial factors involved in putting an Enterprise Resource Planning (ERP) system into place using SAP software. The case study highlights how critical meticulous

planning and project management are to the success of ERP adoption. It emphasises how important it is to analyse business processes thoroughly, set forth precise goals, and match the execution plan to overall organisational objectives. The case study highlights the need of good stakeholder participation, strong leadership, and communication throughout the implementation phase. The difficulties encountered during the ERP SAP deployment, such as complicated customizations, data transfer problems, and user resistance, highlight the need of taking proactive measures to address these aspects. To encourage user acceptance and reduce possible opposition to change, the case study emphasises the necessity for thorough training programmes, change management techniques, and continuing support.

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CHAPTER 2

A STUDY ON CASE STUDY – ERP APPLICATION ON SUPPLY CHAIN

Dr. Akhila Udupa, Associate Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: akhila.udupa@presidencyuniversity.in

ABSTRACT:

The case study starts off by looking at the difficulties the organisation encountered before putting the ERP solution into place. These difficulties include poor inventory control, fragmented stakeholder communication, and low supply chain visibility. The case study highlights the need for an integrated system that may increase communication, simplify operations, and boost supply chain efficiency in general. The processes required to guarantee effective integration with current systems and alignment with company goals are then discussed, along with the installation phase of the ERP application. Important aspects for a successful deployment are noted as being data transfer, system modification, and user training. The case study places a strong emphasis on the advantages of using ERP in a supply chain context. The company saw improvements in inventory control, better procurement procedures, improved demand forecasting, and simplified logistical operations. Real-time insight into inventory levels was made possible by the ERP programme, allowing for proactive decision-making and a decrease in stockouts and overstocks. The supply chain's integration of stakeholders has enhanced fluid communication, teamwork, and increased client satisfaction.

KEYWORDS:

Advanced Planning and Scheduling, BaanSCS, Enterprise Resource Planning, Materials Requirement Schedule, Material Requirements, Planning Capacity Requirements.

INTRODUCTION

The use of Enterprise Resource Planning (ERP) in the context of a supply chain is the main topic of the case study. It examines the difficulties, advantages, and important factors associated with using ERP technology to enhance supply chain operations. The management of the supply chain, which includes everything from locating raw materials to delivering the finished product to clients, is essential to organisations. In today's competitive corporate market, an efficient supply chain is crucial for satisfying consumer needs, cutting costs, and obtaining a competitive advantage.

The case study shows how ERP solutions may improve and streamline supply chain procedures. ERP systems provide a centralised platform for organising and controlling crucial supply chain operations including purchasing, inventory control, shipping, and demand forecasting. Organisations may increase visibility, coordination, and efficiency throughout their supply chain by using the features of ERP systems [1].

We will examine the installation process of the ERP application in the context of the supply chain via the case study. Analysing implementation difficulties such as system integration, data accuracy, and change management will be part of this. We'll also go through the advantages and results the company saw, such optimised inventory levels, shortened lead times, increased demand forecasting, and improved supplier cooperation. The case study will also highlight the

crucial factors that businesses should take into account before integrating an ERP solution into their supply chain. This involves things like setting clear goals, choosing the best ERP provider, running rigorous training programmes, and ensuring good stakeholder engagement and communication [2].

We will learn through looking at this case study how ERP solutions may change supply chain management, boost operational effectiveness, and promote overall corporate success. We will also comprehend the significance of thorough planning, stakeholder participation, and continuous support for an ERP deployment in the context of a supply chain. Overall, this case study is a useful tool for businesses looking to use ERP technology to streamline supply chain processes and gain an edge over rivals in the current fast-paced business environment.

DISCUSSION

Supply Chain Optimisation from Baans' Perspective

Since there is potential for significant savings by making supply networks successful, this research seeks to emphasise the significance of planning in the process of supply chain management. Applications for ERP (Enterprise Resource Planning) are used for this to combine and simplify corporate operations. However, the majority of these applications include flaws such a sequential planning approach, a failure to identify constraints, a lack of visibility, static lead times, and the degree of information employed for capacity planning. These issues are addressed by a new type of planning software called APS (Advanced Planning and Scheduling), which utilises well-liked constraint-based methodologies [3].

The supply networks of today are astoundingly complicated. To compete in the global market, one must skillfully balance and integrate sales, supply, manufacturing, and distribution. These supply chains, however, are by no means effective; instead, they are holding back billions of dollars' worth of potential savings. The biggest chance for growing market share, cash flow, and profitability is intelligent supply chain management. You may use it to make well-informed choices at every stage of the supply chain, from purchasing raw materials to producing items to delivering them to customers.

Various strategies have been used by businesses looking to re-engineer their supply networks. ERP (enterprise resource planning) software are often used by businesses to address this issue. These programmes include features including inventory control, material scheduling, order processing, purchasing, shop floor management, and accounting. By enhancing information flow and velocity both internally inside a company's supply chain and externally with trade partners, ERP systems enable businesses to simplify and consolidate business operations [4].

Supply Chain Solutions Beyond ERP

The demand fulfilment process, which includes acquiring raw materials, processing them into completed goods, and delivering those goods to clients, is impacted in every way by planning, which is a key activity that happens along the whole supply chain. However, the planning environment for the majority of ERP systems has a number of drawbacks. Traditional ERP systems create a plan in a sequential manner. Prior to attempting to do capacity requirements planning (CRP), a master production schedule (MPS), which serves as the foundation for material requirements planning (MRP), is first prepared [5].

Unfortunately, this strategy treats resources and capability as independent factors at each level, which yields an impractical strategy. MRP's logic suggests repeatedly iterating this process to account for changes made at each phase to fix this. Due to the intricacy of the planning issue and the extent of the product-mix being planned, these activities quickly become quite

ambiguous. As a result, the planner begins his planning with greater leeway to ensure that his strategy is feasible. Traditional ERP Planning Framework is shown in Figure 1.

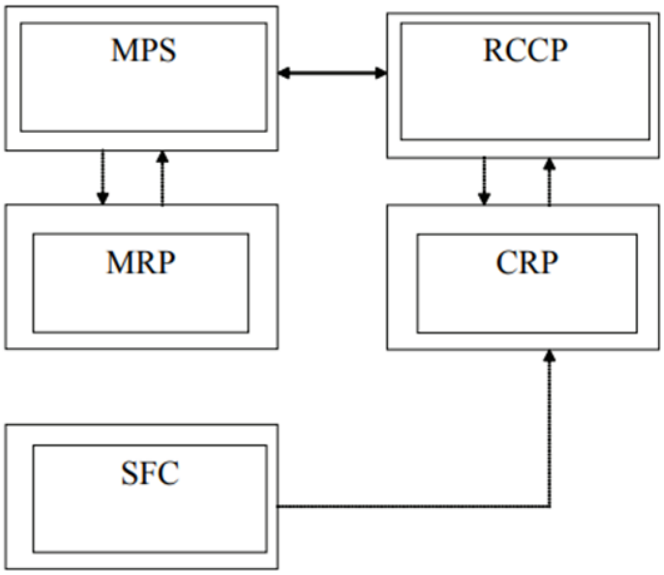

Figure 1: The Traditional ERP Planning Framework.

The primary drawbacks of traditional methods are:

1. **Inability to identify and optimise limitations:** The conventional method to planning makes no assumptions about material or capacity restrictions. The resultant strategy does not make the most of the important resources.
2. **Lack of visibility:** The planner is not given adequate insight into the effects of their decisions by the current systems. Final designs as a consequence are either not practical or do not make the best use of the essential resources in the production environment.
3. **Conceptual differences between distribution and production planning:** Despite the fact that the ideas of DRP and MRP are quite similar, they are often implemented as separate systems. In actuality, supply chains are often made up of interconnected distribution and production networks.
4. **Excess inventory or shortages:** Rather than being determined dynamically, lead times are often static and manually imposed. As a result, there are either shortages or surplus inventories, which makes the environment particularly reactive.
5. **Insufficient information:** The degree of detail employed in capacity planning is too basic to allow for sound decision-making.

The APS Competition

There is now a new kind of intelligent planning software that addresses the issues raised above. A set of applications known as APS stands for advanced planning and scheduling. APS systems tackle the aforementioned planning issues as well as manage complicated manufacturing processes involving many resources and operational phases in real time. To achieve manufacturing objectives like improving due-date performance, reducing lead times, improving throughout, and lowering inventory and operating costs, they use constraint technology to produce an intelligent and practical production plan that reflects real-world manufacturing conditions (and constraints). Contrary to the standard ERP system's iterative planning logic, APS solutions concurrently take into account all restrictions, including

material, capacity, operators, and tools, and provide a workable operational plan in a single pass. Plans that come from this are improved to satisfy the customer's delivery needs and company goals [6]. Up until recently, other suppliers than ERP providers offered APS solutions. The cost to adopt such systems ranges from a million dollars for a mid-sized manufacturing to upwards of tens of millions of dollars for a Fortune 500 corporation. To implement the plans generated by an APS system, such systems still need to be connected with the internal ERP systems. Up until now, the costs associated with acquiring, deploying, and integrating an APS system have been high.

Advanced Planning Solution by Baan

Baan has created its own APS system, which can be bought either as a stand-alone product to operate with another ERP system or completely integrated with the Baan ERP system. The popular constraint-based methodologies are used by Baan's APS solution, BaanSCS Planner and BaanSCS Scheduler, to give the same features as described above at a much cheaper cost of ownership. Users of Baan ERP benefit from pre-integrated APS functionality, which further reduces the cost of ownership [7].

The performance, constraints technology, and simulation capabilities of BaanSCS Planner are combined with the depth of the materials management concepts supported by the Baan ERP planning system to create a combined planning solution that offers a best-in-class planning environment. Therefore, it is now possible to use constraint-based planning and simulation ideas in mixed mode manufacturing settings such as Engineer-to-Order (ETO), Make-to-Order (MTO), Assemble-to-Order (ATO), or Make-to-Stock (MTS) at a low cost. Baan's Approach Creates a Rich – Planning Environment is shown in Figure 2.

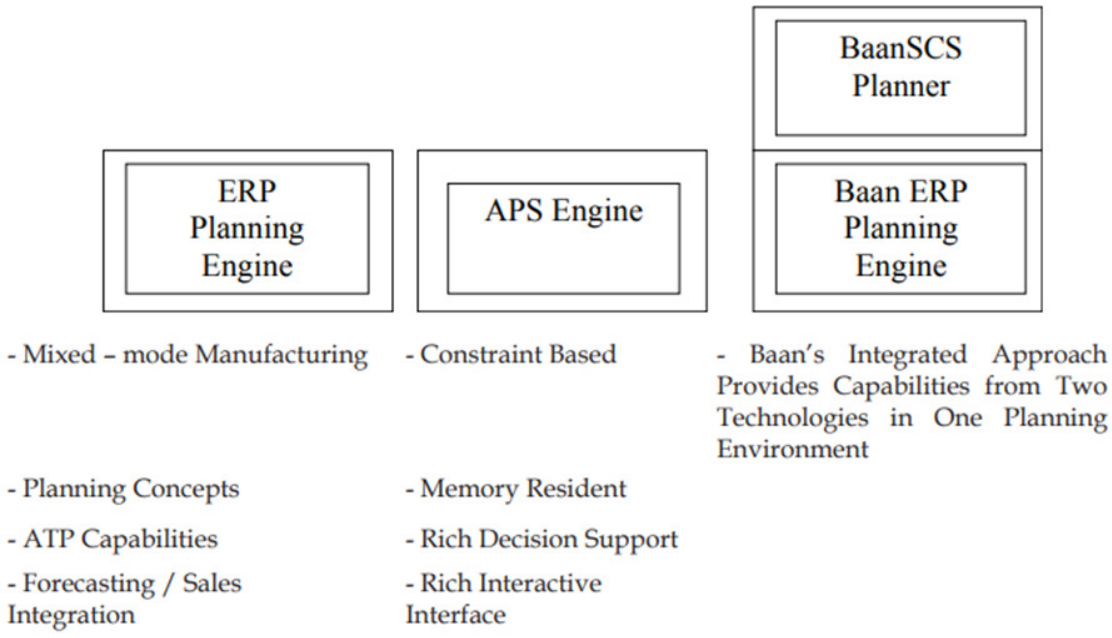

Figure 2: Baan's Approach Creates a Rich – Planning Environment.

Major Features of the BaanSCS Planner

The following functional depth of BaanSCS Planner supports BaanERP's planning abilities:

1. Bottleneck detection in constraint-based optimisation
2. Complete incorporation of BaanERP
3. Capabilities for High Performance Planning
4. Advanced Tools and User Interface for Analysis
5. Fifth-Generation Simulation Environment.

Optimisation under Constraints with Bottleneck Detection

Across the supply chain, BaanSCS Planner synchronises procurement, manufacturing, and distribution tasks in a way that maximises overall throughput and reduces inventory and cycle time. Planning under restrictions is intimately connected to optimisation. The planning engine considers restrictions and optimisation goals to create a supply plan that will maximise plant throughput and reduce manufacturing cycle times throughout the whole supply chain. It takes capacity and material limits into account at the same time in order to synchronise manufacturing processes and sub-assemblies [8].

One way to describe the BaanSCCS Planner Engine method is that it uses:

1. Memory resident (in-RAM) processing for speed
2. Optimisation of throughput under constraints in line with the Theory of Constraints
3. A sorting engine that converges on the best solution via repeated backward-leveling and forward-compression phases.
4. Simulation of resource allocation based on rules.

Operation predecessor/successor linkages, firm allocations, resource capacity, material availability, operation overlaps, set-up optimisation criteria, planning buffers, and order priority are among the parameters taken into consideration during a Planning Engine run. An overall supply chain operations strategy that has been optimised is the end outcome. In doing so, the Planning Engine chooses the specifics of the product's manufacturing process and location.

Net change engines are also a part of BaanSCS Planner. These Net Change Engines are specialised algorithms that, in accordance with organisational business principles, optimise certain performance parameters. They are event-driven engines that are used repeatedly throughout the day when certain events take place. The Order Insertion Engine, for instance, is the first of many net change engines to be implemented. Its goal is to swiftly incorporate fresh supply orders into the strategy in order to support order promises and cover fresh client demands [9].

Capabilities for High Performance Planning

A memory-resident planning engine in BaanSCS Planner is about 50–100 times quicker than the planning engines used in conventional database-driven ERP systems. As a result, in contrast to typical ERP systems, the response time to plan modifications may be measured in seconds or minutes. The planning environment becomes more rich because to memory-resident planning technology, which also makes simulation and dynamic order promising capabilities practical.

User Interface and Advanced Analysis Tools

The client-based decision support system for BaanSCS Planner offers the planner a highly comprehensive set of graphical visualisation and issue detection features. It features a performance monitoring monitor that evaluates a plan's quality and notifies the planner of issues that need to be fixed. It focuses on anticipated future performance and empowers the planner to take proactive measures to manage possible issues before they have a chance to materialise into actual issues. The monitor's primary analytical tools include:

Information about delivery performance is shown here.

1. Forecasted total customer demand and non-consumed demand
2. Customer Orders - Sales Amounts, Delivery Performance Percentage, Average and Maximum Lateness
3. End Supply Orders - Average and Maximum Lateness of Supply Orders
4. Reasons for Being Late is a list of the top 10 most significant obstacles.

Resource Utilisation Performance: Shows information on resource use.

1. Capacity Utilisation: total available capacity, capacity utilised (in hours and percentage), average, and maximum
2. Overload - average and maximum loads, overloaded times, and overloaded resources
3. Reasons for Lateness: A list of the top 10 resource limitations.

Performance of Inventory: Provides information about the performance of the inventory.

1. Inventory Value: Average, minimum and maximum values as well as fluctuation
2. Days Covered - Average, Minimum, Maximum
3. Issues - periods with forecast inventory balances that are negative and low on safety stock
4. Reasons for Lateness: A list of the top 10 raw material restrictions.

Financial Performance: Provides information about financial performance.

1. Profitability - income, costs, and overall profit
2. SYNC Indicators: Productivity, Throughput, Inventory, Operating Expenses, Turnover
3. Revenue - projected sales, overall
4. Operating, buying, and total expenses.

BaanSCS Planner also includes a variety of important graphics. The issue that occupies the majority of planners' work is "lateness": recognising it, figuring out what causes it, and attempting to avoid it proactively by improving plan visualisation. The Order's Delay The sub-system that supports these actions as a whole includes Graph. The goal is to reduce or completely stop the plant's expediting efforts while maintaining a high level of customer delivery service. A time-phased network of supply orders that are linked to a specific customer order or end-level supply order are represented as coloured blocks on the supply network analysis graph. Its goal is to pinpoint delays by using block colours to highlight factors like capacity or raw materials, or perhaps both [10].

One of the main duties of the planner is to manage the use of production resources effectively. The Resource Utilisation Graph shows the proportion of a resource's capacity that has been used over time. The planner might designate resources as entirely constrained, confined within a temporal boundary, or uncontrolled at all. The Planning Engine assumes limitless capacity if unrestricted. If limited, the Planning Engine level loads the resource according to the capacity that is available. The planner may examine crucial bottleneck resources in an unrestricted mode

at the beginning of the planning process to see whether there is sufficient overall capacity to satisfy the goals of the company's production plan. The planner may monitor in detail the orders loaded for a certain time period and control variances in capacity utilisation once the plan has been levelled [11], [12].

CONCLUSION

The case study of integrating an ERP application into the supply chain concludes by emphasising the revolutionary effects of such a system on supply chain operations. The case study places a strong emphasis on the difficulties encountered, advantages realised, and crucial factors for effective implementation. The case study illustrates the difficulties of integrating an ERP system into a convoluted supply chain. These difficulties include managing change inside the organisation, integrating data from diverse sources, and standardising processes across several locations. The case study emphasises how crucial it is to overcome these difficulties by careful preparation, stakeholder involvement, and good communication. The case study makes clear the advantages of installing an ERP programme in the supply chain. Throughout the supply chain, the organisation saw improvements in visibility, efficiency, and coordination. Better inventory management, shorter lead times, and higher customer satisfaction were made possible through real-time data access, simpler procedures, and automated workflows. The supply chain processes could be seen in detail thanks to the ERP programme, which also enabled proactive problem-solving and data-driven decision-making.

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CHAPTER 3

INTRODUCTION ABOUT THE BUSINESS PROCESSES

Dr. Nalin Chirakkara, Associate Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: nalinkumar@presidencyuniversity.in

ABSTRACT:

The fundamental ideas and significance of comprehending business processes in organisations are covered in this abstract, which offers an overview of the Introduction to Business Processes. It draws attention to the crucial role that business processes play in enhancing customer happiness, attaining operational efficiency, and fostering overall corporate success. The abstract emphasises the need of efficient process management and ongoing improvement while outlining the key elements of business processes. In highlighting the need of understanding business processes in the dynamic and cutthroat corporate world of today, it draws to a close.

KEYWORDS:

Business Processes, Continuous Improvement, Customer Satisfaction, Operational Efficiency, Process Management.

INTRODUCTION

Business procedures, which specify how work is done, resources are used, and objectives are attained, form the basis of organisations. For attaining operational efficiency, enhancing customer happiness, and promoting overall company success, it is essential to comprehend and manage business processes efficiently. A business process is a collection of related operations or activities that convert inputs into useful outputs. It includes the movement of information, materials, and resources across various organisational divisions and functions. Operational processes, managerial processes, and support processes are only a few categories into which business processes may be divided [1].

Delivering goods or services to clients involves operational procedures directly. They cover tasks including production, sales, order fulfilment, and customer service. Planning, organising, and regulating organisational resources and activities are the main goals of management processes. These procedures involve decision-making, performance management, budgeting, and strategic planning. Support processes provide the infrastructure and assistance required for the efficient execution of operational and managerial processes. Examples include procurement, quality control, IT support, and human resources.

It takes analysis, planning, implementation, and ongoing improvement to manage business processes effectively. It calls for defining roles and duties, mapping out the order of the activities, setting process goals, and developing performance indicators. Process improvement techniques like Lean Six Sigma and business process reengineering are often used to increase efficiency, simplify operations, and get rid of waste. Organisations can spot bottlenecks, inefficiencies, and places for development by understanding business processes. Organisations may save costs, cut lead times, boost quality, and increase customer satisfaction by optimising their operations. Additionally, it promotes a culture of continuous improvement where staff members are given the freedom to propose and carry out improvements that boost productivity and creativity [2].

Organisations must adapt and modify their processes to suit shifting consumer expectations and market demands in today's dynamic and competitive business climate. Process automation, data analytics, and real-time monitoring are all made possible by technology, allowing efficient and adaptable corporate operations. In the end, organisations that want to achieve operational excellence, provide value to consumers, and keep their competitive edge need to have a solid grasp of business processes. Organisations may promote efficiency, creativity, and commercial success in a business environment that is quickly changing by efficiently managing and continuously improving business processes [3].

DISCUSSION

The Functional Organizational Structure

You must first start to consider a company' operations holistically in order to properly understand the principles in this textbook. The functional structure is the kind of organisational structure you are most likely to run across. A functional structure divides an organisation into functions, or departments, each of which is in charge of a group of closely linked tasks. For instance, the warehouse receives and transports supplies, while the accounting department sends and receives payments. A contemporary organization's typical departments or functions include finance and accounting, human resources, sales and marketing, operations, buying, warehousing, operations, and research and development. The primary duties of a typical corporation are indicated by the vertical columns in Figure 1.

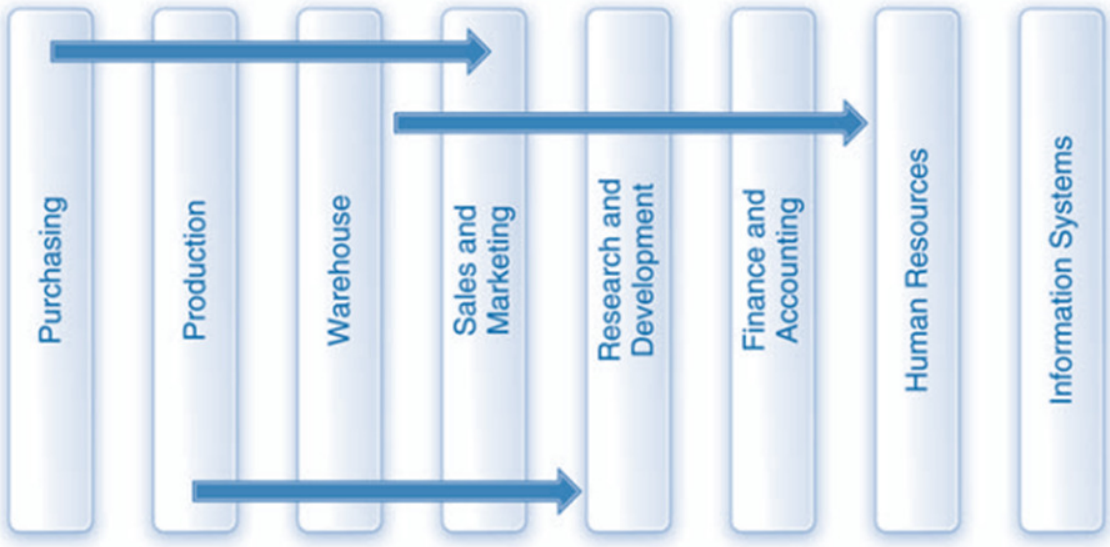

Figure 1: The functional structure.

Although most businesses have vertical (or functional) silos to divide up their operational divisions, these silos are horizontally crossed by the linked business processes that businesses utilise to carry out their job. Business processes, like the procurement and fulfilment procedures covered later in the chapter, are made up of actions that take place in many, at first seem unconnected departments or roles. In other words, these procedures are cross-functional, which denotes that no one team or department is in charge of carrying them out. Instead, it is a shared duty throughout several functional areas. Figure 1 also demonstrates how corporate operations are cross-functional. Therefore, for a process to be completed effectively, the business must

depend on each functional group to execute its own phases in a coordinated manner, which, as we will see, may not be a simple task to perform [4].

"THE SILO EFFECT"

For a period of years, the functional structure worked effectively for organisations since it helped them manage the difficulties brought on by their fast expansion. This method did, however, eventually become seriously flawed. Simply put, individuals from the various functional areas have a tendency to carry out their tasks independently without completely comprehending what comes before and behind them in the process. In essence, they finish their portion of the process, pass it along to the next person, and then move on to the subsequent assignment. They miss out on the "big picture" of the bigger process, whether it is procurement, fulfilment, or any number of other typical business operations, by concentrating so intently on their own job. Because employees do their jobs in their own functional "silos" without considering the effects on other process components, this tendency is sometimes referred to as the "silo effect."

The fact that the cross-functional character of processes and the silo nature of the functional organisational structure conflict is a major issue in this case. In other words, each business process incorporates employees from several functional areas, while each person focuses on their own role. The coordination of operations across the many functional domains is thus a significant problem for organisations. Employees must "think sideways" that is, observe the business across functional boundaries and concentrate on the end-to-end nature of the process and its desired outcomes in order to perceive a firm from a process viewpoint. Understanding how enterprise systems assist firms in managing their processes effectively requires learning to observe a process from beginning to conclusion. Therefore, it is not unexpected that businesses now consider this knowledge to be a crucial ability that workers must possess [5].

Enterprise Systems

Business processes cover all departments within an organisation, as you can see from the preceding section. In actuality, the many process phases are progressively being carried out by individuals in several places all over the globe in today's global economy. In other words, a business will produce its goods in several nations, get the components for those goods from various sources, sell those goods in numerous nations, and so on. For instance, a bicycle producer may import parts from Italy, construct the bicycles in Germany, and market them in the US. It is hard to handle business processes successfully without the assistance of contemporary information systems since the stages in them are carried out in geographically scattered places. Enterprise systems (ES) are systems that enable end-to-end business processes. They are crucial to the efficient and successful execution and administration of business operations [6].

Companies have spent vast amounts of money and effort over the last 40+ years planning, implementing, and continually improving enterprise systems because of the significant influence that these systems have on operational effectiveness (and, eventually, profitability). Numerous studies have shown that by removing obstacles to information sharing between functional areas and managing processes holistically, investments in information technology (IT), particularly enterprise systems, have significantly increased the profitability, productivity, and competitiveness of corporations. The capacity of contemporary enterprise systems to efficiently handle a company process from start to finish in an integrated, consistent, and highly efficient way is the fundamental factor driving this productivity and efficiency. Additionally, once a business process is controlled by an integrated enterprise system, it is extremely simple to monitor and enhance. Because of this, it is impossible to talk about modern business

processes without taking enterprise systems into account. In the next chapter, we will go into more detail about enterprise systems [7]. In this chapter, we start by listing the crucial procedures that are often included in organisations. Next, we talk about SAP, the firm that creates the most well-known corporate systems internationally. We also provide a brief introduction to Global Bike Incorporated, a business that will serve as a case study for many ideas in this book. The plan for the remaining chapters of the book comes next.

Processes in Business

Organisations are either created to fulfil a business need or to advance a social cause. According to their ownership or management structure, the objective or aim they are attempting to accomplish, and the regulatory framework in which they operate, they vary. To generate revenue, some businesses produce and provide goods or services to clients. A bicycle manufacturer, for instance, creates a range of bicycles and accessories. The company then sells these goods to a variety of shops, who in turn pass them along to the final customers. Other businesses provide services like bicycle maintenance. Others provide the company the components and supplies they need to construct the bicycles. The goals of the organisation must be accomplished via a variety of tasks. As an example, the manufacturer must design the bicycles, decide the components it will use to construct them, locate the locations where these components can be purchased, produce the bicycles, choose its target market, and promote and sell the bicycles to them. It must also decide how to handle its finances, a variety of buildings including factories and warehouses, and the many people it must hire, educate, and keep on staff. There are many procedures used to do this task [8].

Organisations serve a wide range of goals, vary widely in size and complexity, and work in a wide range of sectors, yet they always function in similar ways. Successful organisations and industries, regardless of their nature or scale, utilise processes and enterprise systems to carry out the work necessary to accomplish their objectives. Processes may vary somewhat based on the specific qualities of the sector or the structure of the organisation, but anybody who has formed a process perspective of business may recognise the fundamental activities. Similar to how organisations may use many enterprise systems to handle certain procedures. However, you may use the ideas, concepts, and methods covered in this book with the majority of the business systems you'll probably encounter [9].

A business process is a collection of processes or activities that result in desired results, as shown in Figure 2. Every process is started by a specific event, such getting a client order or realising you need more inventory. The columns in the diagram stand in for several organisational components, or functional sectors, including sales, warehousing, production, and accounting. As a result, the particular phases of the process are carried out in various functional domains. For instance, a manufacturer (seller) utilises a certain procedure when a store (customer) orders bicycles to make sure the right goods are supplied to the client in a timely way and that payment for the order is received. The order may be verified, the shipment prepared, the cargo sent, the invoice issued, and the receipt of payment recorded are some examples of these process processes. The warehouse prepares and sends the order after receiving and validating the customer's order from the sales department. The invoicing and payment processes are handled by the accounting department.

Figure 2: A generic business process.

This is a pretty basic illustration. However, it draws attention to the fact that processes are made up of interconnected phases that are carried out across the organisation. Since distinct functional areas or departments are responsible for carrying out the various process stages, good communication and coordination across the departments is crucial to the efficient execution of these processes. The procedure cannot be finished efficiently and successfully without this contact. For instance, the client order cannot be sent on time if it is not correctly transmitted to the warehouse. Similar to that, billing and payment cannot be handled properly and efficiently if the accounting department is not informed of the order and shipping information. It is obvious that effective process completion calls for more than just sharing information [10].

It is also critical that the parties concerned closely coordinate their efforts. For instance, the salesman must work with the warehouse to establish when the goods may be dispatched after accepting the transaction. Without it, the salesman could make commitments that the business cannot possibly keep. The items won't be available when promised if this happens. The salesperson must work with the accounting division to confirm the creditworthiness of the consumer. Accepting orders and delivering items to clients who have not paid for prior shipments might seriously affect the organization's finances.

PROCUREMENT-BUY

The steps required to get necessary supplies from a vendor on the outside are all included in the procurement process. Figure 3 depicts a very basic example of a procurement procedure. As shown in the illustration, procurement consists of five processes that are carried out in three distinct organisational functional domains.

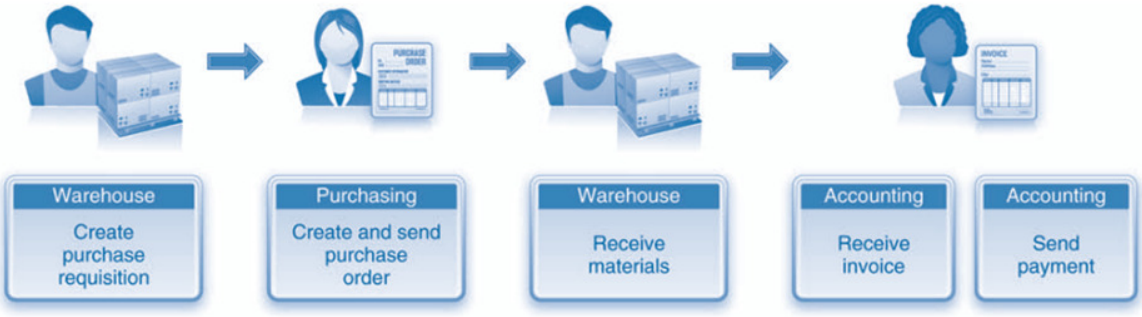

Figure 3: A procurement process.

The procedure starts when the warehouse realises that resources need to be acquired, maybe because inventory levels are low. The warehouse then submits a buy request to the purchasing division to formalise this necessity. The buying division then chooses an appropriate vendor, draughts a purchase order, and communicates with the supplier. The supplies are sent by the vendor and received at the warehouse. The accounting department subsequently receives an invoice from the vendor. The procedure is then finished when accounting pays the vendor [11].

Low material inventory was the catalyst for the procedure in the previous discussion. This talk demonstrates the relationship between inventory and warehouse management, as seen in Figure 4, and procurement. Figure 4 demonstrates, however, that activity in other processes may also cause procurement to occur. The figure offers at least three different possibilities:

1. The material planning procedure can reveal that the business needs to purchase materials in accordance with an anticipated demand for its goods.
2. The acquisition of a component required to fix a machine or a product that a consumer has already bought might be sparked by the asset management or customer care processes.
3. A client order's fulfilment procedure may need the purchase of anything, such as the raw materials or component components required for the product's production.

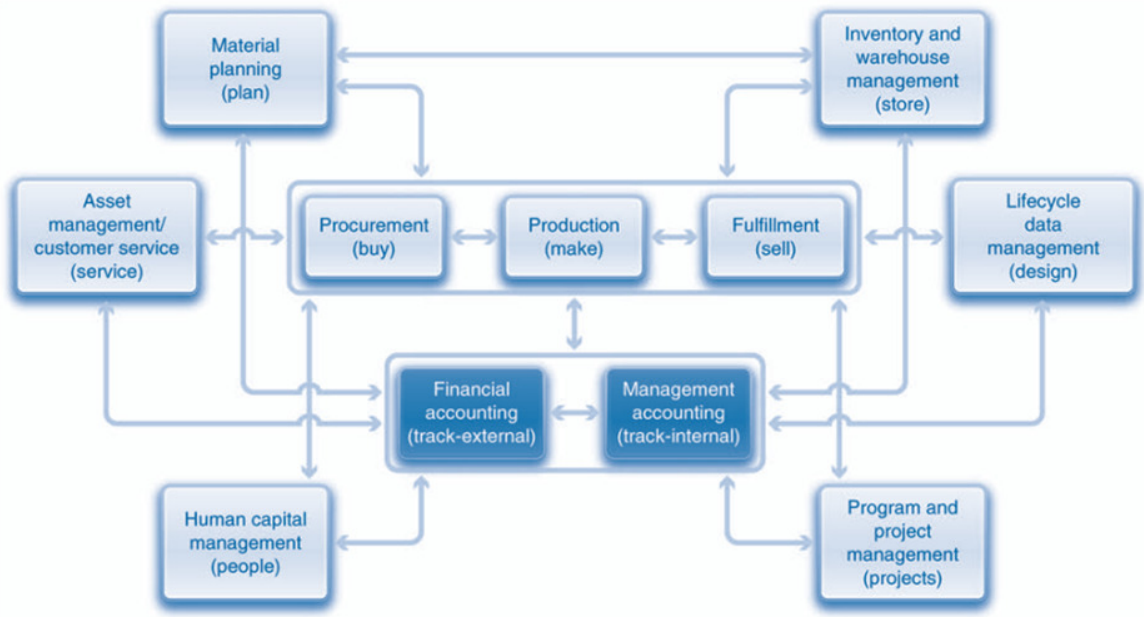

Figure 4: Illustrate the Key business processes.

PRODUCTION-MAKE

In the discussion that came before, the business used external procurement that is, it bought the necessary supplies from a vendor to satisfy the demand that initiated the process. However, a business may also utilise the manufacturing process to internally obtain the resources it need. A client order may start the manufacturing process, as we said in the previous sentence. As an alternative, the material planning stage might start internal manufacturing. The scenario when the warehouse realises that its product inventory is low is shown in Figure 5.

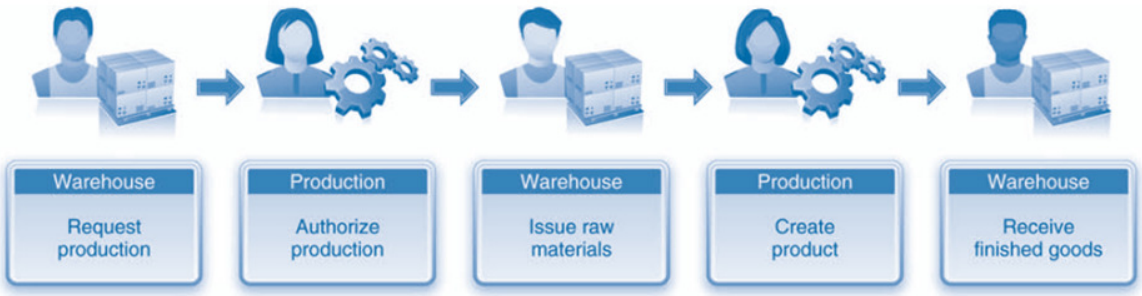

Figure 5: Illustrate the A production process.

Then, it will ask for production. In turn, the request will be granted by the production division. The warehouse is permitted by the permission to release the supplies required to finish the manufacturing. The warehouse stores the finished items once the producing department has finished its work. Be aware that this last stage of manufacturing, which deals with storing the finished items, can start IWM procedures.

Financial Accounting-Track for External Reporting

To satisfy legal and regulatory reporting obligations, financial accounting focuses on monitoring the financial effects of business operations. It is therefore outwardly directed. The balance sheet and the income statement, often known as a profit and loss (P&L) statement, are common reports. The income statement shows the company's financial situation throughout a certain time period. It lists the period's receipts, outlays, and net profit (or loss). In contrast, a balance sheet shows an organization's financial situation at a certain period. It lists stockholders' equity, assets, and liabilities. All of these reports must adhere to established standards, such as the Handelsgesetzbuch (HGB) in Germany and generally accepted accounting principles (GAAP) in the United States. These reports must be sent to regulatory organisations at certain intervals, such yearly or quarterly. These reports are also country-specific. Therefore, a company that works in numerous nations must monitor financial data individually for each one, utilising the criteria that particular country has established.

An organization's financial state is affected by a number of the previously in this chapter discussed procedures. Four crucial financial accounting-based processes general ledger, accounts receivable, accounts payable, and asset accounting are used by organisations to analyse this effect. The general ledger process keeps track of how numerous process phases affect the financial status of an organisation. The general ledger accounts that reflect an organization's revenue, spending, assets, and liabilities are where the effects are recorded. These accounts are used to keep track of process-related accounting data. The procurement process is linked to accounts payable, which is used to keep track of money owing to suppliers. Accounts receivable is used to keep track of money that customers owe. The general ledger entries related to the procurement and fulfilment operations are automated by accounts receivable and accounts payable, ensuring that the financial effect of these activities is reflected automatically. Finally, asset accounting is involved with maintaining financial records for items like vehicles and machines [12].

CONCLUSION

In conclusion, business processes serve as the foundation of organisations, guiding their productivity, success, and general functioning. For operational efficiency, satisfying customer expectations, and being competitive in today's changing business environment, it is crucial to comprehend and manage business processes efficiently. Business processes are a collection of related actions that convert inputs into useful outputs. They provide businesses a well-structured framework to carry out their fundamental operations, such as manufacturing, sales, customer support, and financial administration. Organisations may spot bottlenecks, reorganise workflows, and boost overall effectiveness by analysing and optimising these processes. Customer happiness is directly impacted by effective company operations. Organisations may develop solid client connections, brand loyalty, and favourable brand perception by delivering goods or services on schedule, adhering to quality standards, and offering great customer service. Clear goals, process documentation, responsibility distribution, and performance evaluation are all necessary components of effective process management. In order to react to changing market circumstances, customer wants, and developing technology, organisations must continually evaluate and improve their processes. This calls for a culture of continuous improvement.

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CHAPTER 4

INTRODUCTION ABOUT THE ENTERPRISE SYSTEMS

Dr. Pramod Pandey, Associate Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: pramodkumar@presidencyuniversity.in

ABSTRACT:

The Introduction to Enterprise Systems is summarised in this summary, emphasising the importance of these integrated software solutions in contemporary businesses. It places a strong emphasis on how enterprise technologies may improve data visibility, streamline corporate processes, and facilitate wise decision-making. The essential elements and advantages of enterprise systems, including as resource management, supply chain optimisation, and customer relationship management, are also described in the abstract. The necessity of comprehending and using business systems to promote operational efficiency and competitive advantage is emphasised as it draws to a close.

KEYWORDS:

Data Visibility, Enterprise Systems, Integrated Software Solutions, Supply Chain Optimization.

INTRODUCTION

Enterprise systems, commonly referred to as Enterprise Resource Planning (ERP) systems, are integrated software solutions that let businesses manage their key business processes, data, and resources effectively and uniformly. These systems provide an organisation a centralised platform for simplifying and integrating numerous functions across many divisions and locations. Business activities such as finance, human resources, supply chain management, manufacturing, customer relationship management (CRM), and others are covered by enterprise systems. They allow real-time collaboration and decision-making across several functional domains and improve the flow of information. The standardisation and integration of data and processes is one of the main benefits of business systems. Organisations may get rid of data silos and get a comprehensive perspective of their operations by combining data from numerous sources into a single database. Better decision-making, increased operational effectiveness, and greater departmental cooperation are all made possible as a result [1].

Enterprise systems also provide process management and automation. They provide resources for automating repetitive operations, minimising manual labour, and streamlining procedures. Organisations may establish and enforce standardised processes with the help of workflow management tools, guaranteeing uniformity and compliance across the board. Enterprise systems also provide businesses the ability to simplify their supply chain operations. They provide effective order fulfilment, inventory management, and procurement, enabling businesses to optimise their supply chains and raise customer satisfaction. Enterprise systems have changed recently to include cutting-edge technology like analytics, cloud computing, machine learning, and artificial intelligence (AI). By offering automated processes, comprehensive data analysis, and predictive insights, these technologies expand the functionality of enterprise systems, enabling businesses to make data-driven choices and maintain their competitiveness in a market that is undergoing fast change [2].

An enterprise system must be implemented, however, and this requires careful planning, resource allocation, and change management. Organisations must evaluate their unique needs, choose the appropriate solution, and guarantee efficient user uptake and training. An enterprise system's successful deployment and use may have a big impact on productivity, customer satisfaction, data correctness, and agility, among other things. By integrating and controlling key business processes and data, enterprise systems play a critical role in contemporary organisations. They provide businesses a single platform to enhance decision-making, simplify processes, and achieve operational excellence. Enterprise systems are anticipated to improve further with the ongoing development of technology, providing organisations with more options for creativity, efficiency, and success in the future [3].

DISCUSSION

Business Systems

One of the most sophisticated and potent information systems in use today is the enterprise system. This book will go into great detail on the most well-known ERP system in the world, SAP, as we described in previous Chapter. Although you may have studied business systems in a prior course, we provide a brief recap of the main ideas to brush up on your understanding and set these ideas in the proper perspective for the remainder of the course. The SAP® Business Suite, SAP ERP, and the technological platform SAP® Netweaver that serves as the basis for these applications are all briefly discussed in this section.

Architecture of Enterprise Systems

The technical layout of software, user interface design, and physical management of software on computer hardware are collectively referred to as the architecture of an enterprise system. The majority of contemporary ES either feature a service-oriented design or a three-tier client-server architecture. In these two designs, ES may be deployed in a wide variety of ways. each methods have flaws, but they each have significant technological and financial advantages. However, these two models have essentially the same effects on the management of business operations. Below, we look at two kind of architecture [4].

Server-Client Architecture

Consider a desktop programme you use often, such word processing, a spreadsheet, or presentation software. These programmes are made up of three layers: the user interface (menus, typing, and selection); the functions offered by the programme (creating formulas or charts; writing essays); and the storage location of your work (on your hard drive or flash drive). These levels are, in order, the presentation layer, the application layer, and the data layer. All three levels are present in a single system in the desktop apps previously stated. The three-tier client-server design, in contrast, divides these levels into three distinct systems, as shown in Figure 1.

A three-tier architecture is used in a lot of your online work. The layer of display is your browser. You connect to several systems (websites) that provide a range of functionalities (e-mail, shopping, information sharing) via your browser. These websites house the programmes that carry out the HTTP requests you submit from your browser and retrieve and save data from a linked database. The transition to a three-tier client-server architecture significantly increased the scalability of the systems while significantly reducing the expenses of purchasing, deploying, and utilising an ES. The term "scalability" describes a system's capacity to handle an increasing number of users with ease over time, often with a declining cost per user. These

two advantages turned ES from a feature that only a select few big businesses could afford into a technology that tens of thousands of businesses today use [5].

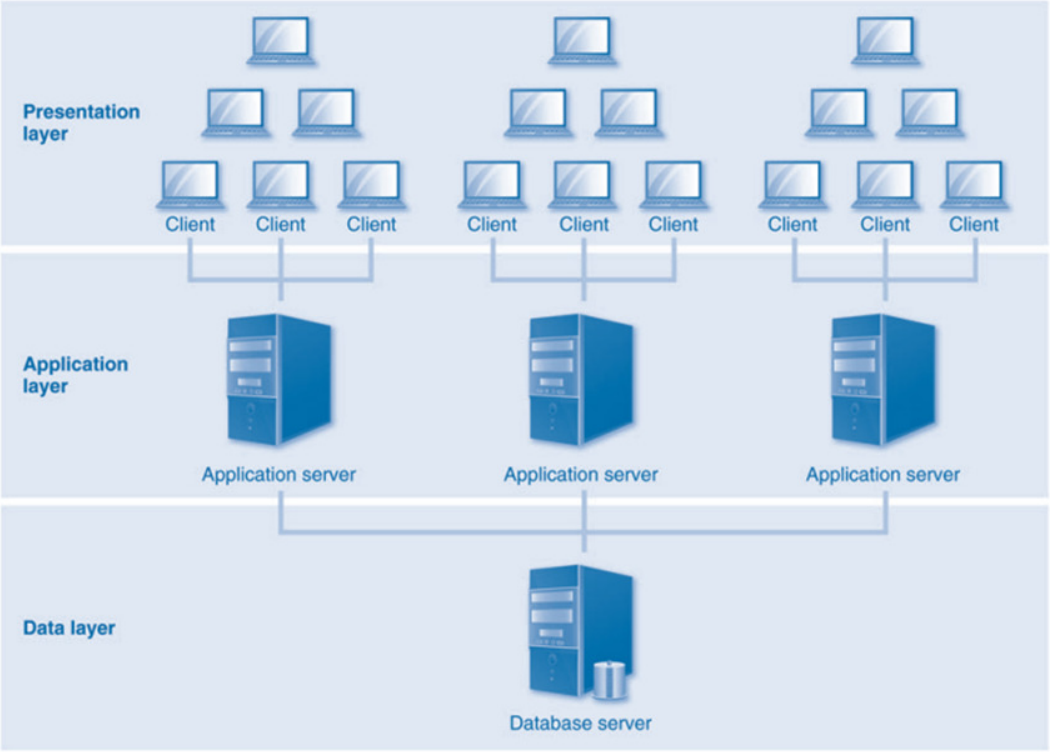

Figure 1: Illustrate the Three layers of the client-server architecture.

Service-Oriented Architecture

Companies started web-enabling their three-tier programmes in the early 2000s so that users could access the systems using a Web browser. Companies also benefited from emerging technology at this time, which made it possible to connect and combine several client-server systems in novel and beneficial ways. The term "service-oriented architecture," or SOA, is used to refer to all of these new technologies. The underlying idea of SOA is concerned with the technological capabilities that enable systems to communicate with one another through standardised interfaces known as Web services. Businesses may now combine several client-server apps and build corporate mash-ups, or composite applications, by employing Web services. Web services are used by composite applications and mash-ups to transmit and receive data between and among ES in a standardised manner, which greatly reduces the cost and complexity of integration projects. Additionally, they carry out more advanced and specialised procedures than are normally seen in the conventional ES [6].

Companies like SAP have spent billions of dollars to service-enable their software so that it may be linked to a large number of composite applications and exposed, or have its capability made apparent to consumers. Using SOA to connect and expose the business processes and data within an ES, businesses may now rapidly and affordably develop new composite applications. Essentially, SOA gives businesses the ability to create composite applications on top of their three-tier client-server systems they already have in place without modifying the underlying applications. With such minimal expense, this capacity offers businesses a whole new level of flexibility.

Enterprise Resource Planning (ERP) Systems

Systems for enterprise resource planning (ERP) are the biggest and most complex ES in existence. ERP systems combine both functional and cross-functional business processes, focusing largely on intra-company processes, or the activities carried out inside an organisation. Finance & Accounting, Sales & Distribution, Human Resources, Operations (Production), and Procurement are often supported by typical ERP systems. As we saw in the last chapter, SAP was the first firm to develop a fully integrated and international ERP system, SAP® R/3, which could handle end-to-end business operations for businesses that operated in a variety of nations with various languages and currencies. Figure 2 displays the solution map for the most recent version of the SAP ERP system [7].

Figure 2: Illustrate the SAP ERP solution map.

The system's supported capabilities and procedures are identified by the solution map. You'll see that many of the solution map's functional capabilities are analogous to the business processes described in the previous chapter. Additionally, a number of SAP ERP's functional categories and domains overlap. Due to ERP's close integration with the operations it controls, there are overlaps between these processes. The ES and functional worlds have started to converge as businesses have embraced more and more ERP capabilities and started to perceive their organisations more from a process viewpoint. We shall concentrate on the primary ERP functional modules in this book due to the breadth and scale of the SAP ERP system [8].

The functional approach is still prevalent in many organisations, despite the fact that businesses are shifting towards a process view of organisations and that our book adopts a process view of business operations. When describing an ERP system's capabilities, modules or specific capabilities are often used, and it is still typical to read or hear references to SAP ERP in job postings or industry talks using module acronyms. The main popular SAP ERP modules are shown in Figure 3 along with the acronyms that are often used to refer to them.

Figure 3: Illustrate the SAP ERP modules.

For instance, based on the acronyms of the two modules, a person having experience in the financial accounting and management accounting modules of SAP ERP is commonly referred to as a FICO specialist. The next stage in the growth of ES, as more businesses purchased ERP systems, was to link these systems together so that they could support inter-company operations, or procedures that happen inside and between businesses. Supply chain management (SCM) and supplier relationship management (SRM) systems, which link an organization's ERP system to those of its suppliers, are examples of inter-company systems. SCM links a business to other businesses that provide the raw resources it needs to produce its goods. Standard SCM systems assist businesses in forecasting their production needs and streamlining complicated material transportation and logistics. Typically, SRM systems oversee all interactions with the material suppliers. The procedures for managing quotes and contracts are managed by SRM systems [9].

These solutions function as add-ons to the ERP systems' procurement and material planning procedures. Customer relationship management (CRM) solutions link a company's ERP system to those of its customers on the other side of the production and sales processes. Companies may manage marketing, sales, and customer service with the help of CRM systems. These systems are an expansion of ERP systems' fulfilment processes. Product lifecycle management (PLM) solutions assist businesses in managing the activities of product management, design, and research. PLM solutions enable businesses to move new product concepts from the virtual drawing board to the production plant. An application suite is a grouping of these inter-company systems and the underlying intra-company ERP system. Suite providers, like SAP and Oracle, provide comparatively thorough sets of apps with a tonne of capability that cover the majority of common business operations.

Platforms for Applications

Application platforms are a crucial part of ES. Application platforms provide as a kind of "enterprise operating system" for a business's ES environment by enabling all of the different systems to interact easily with one another as well as with systems outside the firm, much like the function of the operating system for your own computer. In 2003, SAP unveiled its application platform, SAP NetWeaver. The SAP Business Suite and SAP ERP now both include SAP NetWeaver. The SOA capabilities required to link SAP systems with non-SAP systems are present in it. Additionally, it gives businesses a toolkit to create fresh composite apps or integrate ISV applications on top of their primary ERP and suite applications. The relationship between SAP NetWeaver and the SAP Business Suite of apps is shown in Figure 4 [10].

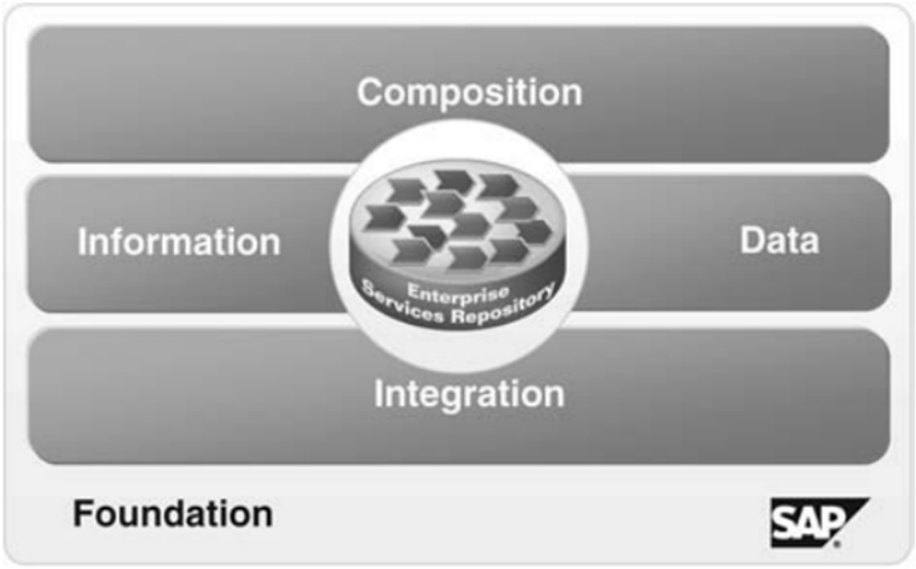

Figure 4: Illustrate the SAP NetWeaver.

Data in an Enterprise System

As we previously covered, the essential element of every ERP system is the shared database that houses information about all the operations. Integration of the many processes would be challenging, if not impossible, without this function. Understanding how data are organised in an ERP system is thus crucial. In the part that follows, we talk about this subject. After introducing the various data types kept in an ERP system, we list the fundamental data components that are present in most operations. In following chapters that address particular processes, we will expand on these themes and include new data items. We shall limit our examination of the procurement and fulfilment procedures established in the previous chapter for the sake of this chapter. The physical mechanism in which process stages like generating a purchase order and receiving items are carried out is represented by data in an ERP system. These processes provide data that shows the results of the processes. Organisational data, master data, and transaction data are the three different forms of data that may be found in an ERP system [11].

CONCLUSION

In conclusion, by integrating and automating numerous business processes and tasks, enterprise systems play a crucial role in contemporary organisations. Enterprise resource planning (ERP), customer relationship management (CRM), and supply chain management (SCM) are a few of the systems that provide a centralised platform for effective data management, faster operations, and improved decision-making. Organisations may eliminate information silos and promote seamless communication and cooperation across departments and functional areas by using enterprise systems. Organisations may acquire a comprehensive understanding of their operations and improve visibility, coordination, and control by integrating data from many business areas. Enterprise systems have several advantages. By automating repetitive processes, decreasing manual mistakes, and streamlining workflows, they increase operational efficiency. By streamlining operations, reducing duplication, and removing bottlenecks, these solutions help businesses enhance production and save costs. Access to reliable, real-time data

provided by enterprise systems aids in improved decision-making as well. These tools help organisations make educated choices, spot trends, and react swiftly to changing market circumstances by offering thorough insights into numerous business activities.

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CHAPTER 5
A BRIEF DISCUSSION ON ACCOUNTING

Mr. Ram Srinivas, Assistant Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: ramsrinivas@presidencyuniversity.in

ABSTRACT:

This paper is a summary of the Introduction to Accounting course, including its core ideas, guiding principles, and importance to business. It emphasises the function of accounting in gathering, interpreting, and disseminating financial data to stakeholders. The key elements of accounting, such as financial statements, assets, liabilities, equity, income, and costs are outlined in the abstract. In making decisions, organising finances, and guaranteeing accountability and transparency in organisations, accounting is emphasised. The conclusion of the abstract emphasises the importance of learning accounting for those interested in professions in business and finance.

KEYWORDS:

Asset Accounting, General Ledger Accounting, Master Data, Cost Accounting.

INTRODUCTION

A crucial component of financial and commercial management is accounting. It entails documenting, condensing, analysing, and reporting on an organization's financial transactions and operations. A framework for assessing and analysing a company's financial condition, performance, and health is provided by accounting. The goal of accounting is to provide accurate and trustworthy financial data so that diverse stakeholders, including as creditors, managers, investors, and governmental regulatory authorities, may utilise it to make knowledgeable choices. It serves as the official language of business and offers a standardised method for exchanging financial data [1].

We will examine the major tenets, ideas, and methods that provide the groundwork for accounting in this introduction. Assets, liabilities, equity, income, and costs are some of the fundamental components of financial statements that will be examined in order to comprehend how they are recorded and presented in line with either generally accepted accounting principles (GAAP) or international financial reporting standards (IFRS).

We will also explore the many disciplines of accounting, such as cost accounting, management accounting, and financial accounting, each of which has a particular function within an organisation. While management accounting offers internal data for decision-making and performance assessment, financial accounting focuses on the creation of financial statements for external stakeholders. In contrast, the emphasis of cost accounting is on the measurement and analysis of expenses for efficient cost management. We will also look at crucial accounting ideas including the accrual foundation of accounting, the matching principle, and the need of having an organised, precise record-keeping system. We'll talk about how technology improvements and accounting software can automate accounting procedures, boost productivity, and guarantee data correctness [2].

Finally, we'll discuss the moral values and professional expectations that guide the accounting industry, including things like impartiality, professionalism, secrecy, and honesty. Individuals

and organisations may efficiently manage their financial affairs, make informed choices, and maintain regulatory compliance by developing a fundamental grasp of accounting concepts and practises. Accounting is an essential instrument for evaluating corporate performance, promoting financial openness, and fostering responsibility in the financial sector.

DISCUSSION

Financial accounting is considered to be the "heart" of an ERP since it must correctly reflect the company's financial situation at all times. Understanding the financial implications of these processes is crucial as you learn about them in following chapters. This is why we've positioned the accounting chapter towards the beginning of the book. However, management accounting and financial accounting are interwoven in many ways. As a result, in this chapter we present some fundamental management accounting ideas [3].

The main financial accounting procedures are:

1. General ledger accounting
2. Accounts receivable accounting
3. Accounts payable accounting
4. Asset accounting
5. Bank ledger accounting

The general ledger (GL), which holds most of the information required for financial reporting, is used to track the financial effects of business process processes. Accounting for accounts receivables is related to the fulfilment process and is used to keep track of money that customers owe for products and services that were provided to them. Accounts Payable Accounting, on the other hand, is related to the purchase procedure. Accounting for accounts payable helps businesses track and manage money owing to suppliers for the acquisition of goods and services. Asset accounting is used to keep track of information on the acquisition, usage, and disposal of assets including homes, machines, and vehicles. Last but not least, bank ledger accounting is concerned with logging information related to financial transactions [4].

The financial information recorded in the general ledger is utilised, as previously mentioned, to produce the financial statements required for external reporting. The balance sheet, income statement, and statement of cash flow are examples of common financial statements. A balance sheet is a momentary picture of the organisation. Assets, liabilities, and equity are identified. An income statement, sometimes referred to as a profit and loss statement, on the other hand, shows the changes in a company's financial situation over time. It lists the expenditures, profits, and losses. Last but not least, a statement of cash flow shows all cash collections and payments during a certain time period. The organisational data and master data pertinent to financial accounting are examined at the beginning of this chapter.

Organizational Data

Client, company code, and business area are the organisational data related to financial accounting. In the preceding chapter, we covered both client and business code. Remember that a client represents a business made up of numerous firms and is the highest organisational level in the system. As a result, even the biggest company can only have one customer. A company code identifies each firm inside an organisation. Applying this situation to GBI, the two firms, GBI US and GBI Germany, are represented by company codes US00 and DE00, respectively, while the worldwide GBI enterprise is represented by a client. Financial statements are often created at the level of the business code. To satisfy the regulatory

requirements of each nation, GBI US and GBI Germany will produce separate financial statements [5].

Business areas are internal organisational divisions used to define areas of responsibility or to fulfil a business segment's need for external reporting. A segment is a business division for which management tracks performance (sales, expenses, profitability, etc.) independently of other segments. Each business unit within the company generates financial statements. Across company codes, a business region is often based on the product line or geographic division of the corporation. Figure 1 depicts two fictitious business sectors for GBI. Three firms that are part of the GBI enterprise are identified in the top section of the figure: GBI US, GBI Germany, and GBI Australia.

	GBI US	GBI Germany	GBI Australia
Bicycles	X	X	X
Accessories	X	X	X

	GBI US	GBI Canada	GBI Mexico	GBI Germany	GBI UK
GBI North America	X	X	X		
GBI Europe				X	X

Figure 1: Illustrate the Business areas.

Additionally, it describes two industry sectors based on product categories: bicycles and accessories. For all three firms, GBI prepares financial statements for both business divisions. In contrast, the business regions in the bottom portion of the picture are described in terms of the locations of the individual enterprises. Financial statements are created as a result for every business in North America and Europe.

Master Data

The objective of financial accounting is to document the financial effect of corporate actions, as was already said. The general ledger of the business contains this information. Particularly, the general ledger has a number of accounts that businesses utilise to record financial information. Each account keeps track of many kinds of financial information. For instance, some accounts track sales income, whilst others track the expenses related to manufacturing and distributing goods. A chart of accounts is a list of accounts that may be used in a general ledger. We go further into general ledger accounts and charts of accounts in this part [6].

Chart of Accounts

An organised list of the accounts that make up a company's general ledger is called a chart of accounts (COA). Charts of accounts come in three varieties: operational COA, country-specific COA, and group COA. The operational accounts used to record the financial effect of a company's daily operations are included in the operative COA, also known as the operational COA. It is the major COA that an organisation maintains.

In country-specific charts of accounts, the accounts in the operational COA are mapped to alternative accounts. These alternate accounts are set up by businesses to satisfy certain country-specific reporting requirements. Figure 2 depicts a situation in which GBI US and GBI Germany employ the INT COA together with their respective GKR (German COA) and COA-CANA (North America COA) country-specific COAs [7].

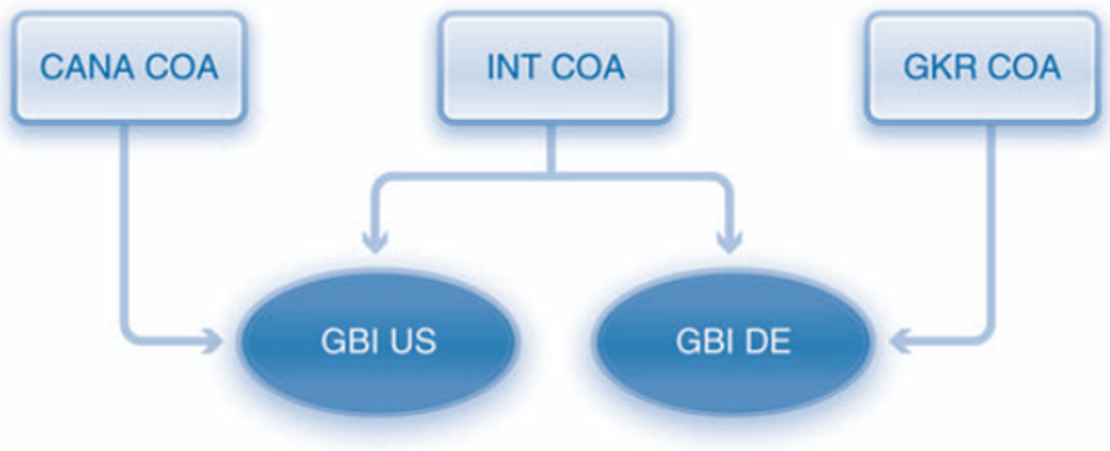

Figure 2: Charts of accounts and company codes.

A group chart of accounts, in addition, has group accounts that are used by many firms within an organisation to unify their financial reporting. When a business has many companies, it must also generate financial statements for the enterprise as a whole in addition to those for each company (company code). The business, which is a distinct legal entity unto itself (for example, a parent or holding company), has reporting responsibilities, necessitating this consolidation. Consolidated financial statements are simple to produce when using a group chart of accounts. If not, the company will need to use more complicated consolidation techniques. In order to record financial data, all businesses must have an active COA. Group- and country-specific COAs, however, are optional.

General Ledger Accounts

Based on the chosen COA, the accounts in the general ledger are defined. The general ledger, which might comprise any or all of the accounts in the COA, is an instance of the COA for a specific firm. The information in general ledger accounts is divided up by organisational level, like the majority of master data (Figure 3). A COA or customer segment as well as a corporate code segment are included in COA account data.

An account number, short and long text, an account group, and a statement of whether the account is a balance sheet or profit and loss account are all commonly included in the COA section. To differentiate each account from other accounts in the COA, each is given a unique account number. A long text (description) and a short text (brief description) are also included for each account. It has an impact on how the balances in the accounts are handled at the end of the year whether the account is designated as a balance sheet account or a profit and loss account. Balances in profit and loss accounts are specifically carried forward into various, designated accounts, while balances in balance sheet accounts are specifically carried forward into the same account [8].

Subsidiary Ledgers and Reconciliation Accounts

Some financial information is not kept in the general ledger directly. For instance, individual customer accounts are kept for each client, which keep track of the sums clients owe and the payments they have made. Each client account does not need to be included in the general ledger, even if it is required to monitor sales and payments individually for each customer. Similar information is kept in different accounts for each vendor and item, such as a car. Vendor accounts keep track of payments paid to and purchases made from them. Asset accounts are used to keep track of the asset's purchase price as well as any value changes over time. These accounts are not kept in the general ledger; instead, they are kept in subsidiary ledgers or subledgers.

The information in customer and vendor accounts must be reflected in the general ledger even though these accounts are not a component of the general ledger. Companies do this activity by entering data from subledger accounts into certain general ledger accounts referred to as reconciliation accounts. Reconciliation accounts are general ledger accounts that combine data from a collection of connected subledger accounts, such as clients and suppliers [9]. Accounts receivable serves as the reconciliation account for customers, while Accounts Payable serves as the reconciliation account for suppliers. It is vital to specify which subledger each reconciliation account belongs to since the general ledger might include several reconciliation accounts. This data may be found in the general ledger account master data's reconciliation account for account type field. These ideas are connected to the chapter's introduction of the accounts payable and receivable accounting procedures. A more in-depth explanation of these procedures will be provided later in this chapter.

The inability to immediately upload data into reconciliation accounts is one of their unique features. As opposed to this, information must be uploaded to subledger accounts before being automatically posted to the associated reconciliation account. As a result, when a business provides goods or services to a customer on credit, the outstanding balance is recorded in the client's subledger account and posted to the appropriate reconciliation account (accounts receivable). Similar to this, when the business owes a vendor money for purchases they made on credit, the debt is recorded in the vendor's subledger account and deposited at the same time to the relevant reconciliation account (accounts payable). The posts in the corresponding subledger accounts (such as customers and suppliers, respectively) add up to the amount in the reconciliation account (such as accounts receivable and payable). We now focus on the fundamental ideas in financial accounting, starting with accounting records. Some financial information is not kept in the general ledger directly. For instance, individual customer accounts are kept for each client, which keep track of the sums clients owe and the payments they have made [10].

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Management Accounting Concepts

Financial accounting and management accounting, or controlling (CO), are tightly linked, as we discussed at the beginning of the chapter. In actuality, financial accounting is where the majority of the data utilised in management accounting comes from. Therefore, we take a moment to present a few crucial management accounting principles. As the name indicates, managing and allocating expenses is a crucial part of management accounting. These expenses are incurred by businesses as a result of different company operations. For instance, the production process includes expenses linked to producing things, while the fulfilment process comprises costs related to selling goods and services. Supplies, maintenance, and equipment used by different procedures are also expenses. The company is broken up into cost centres in order to distribute resources and keep track of expenses. An area where expenses are incurred is connected to a cost centre.

Cost centres may be connected to divisions, like marketing and finance, to physical places, like factories, and to people. In its simplest form, a cost centre is anything that takes on expenses produced when businesses carry out procedures. For instance, when a corporation buys goods, the expenses of the transaction are allocated to a cost centre. The corporation will thus allocate or charge the cost of the goods to the marketing cost centre if the marketing department purchases office supplies. The business examines and redistributes these accrued expenses on a regular basis. Consider a cost centre as a container or bucket where expenses are gathered.

Several procedures were briefly discussed in the preceding chapter. The need to "authorise" the execution of various procedures is one of the recurring motifs in most processes. This authorisation often appears as "orders." For instance, while presenting the procurement procedure, we said that a buy order is often used to authorise the acquisition of supplies. A production order is used to authorise the manufacture of something, much as a sales order is used to authorise the fulfilment of a client purchase. Similar to cost centres, these orders may be used to assign or pay for process-related expenses. Cost objects are the collective name for these orders and cost centres [12].

CONCLUSION

In conclusion, accounting is a crucial subject that is essential to the corporate and financial worlds. It covers the gathering, compiling, evaluating, and reporting of financial data and offers insightful information for decision-making, performance assessment, and financial transparency. Accounting serves as the official language of company, offering a standardised method for informing stakeholders about financial facts. By gathering and organising data on financial transactions and activities, it enables firms to track and assess their financial health, profitability, and liquidity. A foundation for uniform and trustworthy financial reporting is provided by the principles and ideas of accounting, such as IFRS or GAAP. These guidelines guarantee that a company's financial condition, performance, and cash flows are appropriately reflected in its financial statements, allowing creditors, investors, and other stakeholders to make wise choices. Financial accounting, management accounting, and cost accounting are just a few of the areas of accounting that each have a distinct function within an organisation. Cost accounting focuses on cost measurement and analysis, whereas management accounting offers internal information for decision-making. Financial accounting places a strong emphasis on outward reporting.

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CHAPTER 6

ACCOUNTS IN THE GL00 CHART OF ACCOUNTS

Dr. Srinivasan Palamalai, Associate Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: srinivasanp@presidencyuniversity.in

ABSTRACT:

This paper gives a general overview of the procurement process, emphasising its importance in organisations and outlining the important processes. The paper highlights the value of efficient procurement management in reducing costs, guaranteeing the quality and dependability of products and services, and cultivating strong supplier relationships. The significance of technology and strategic sourcing in expediting the procurement process is also covered. In attaining organisational efficiency, risk mitigation, and strategic goals, the abstract highlights the need of a well-defined procurement process.

KEYWORDS:

Budgeting, Chart of Accounts, Financial Management, Financial Reporting, Procurement Process, Procurement Management, Strategic Sourcing.

INTRODUCTION

The acquisition of products, services, or works from outside suppliers or vendors includes the procurement process, which is an essential part of company operations. This procedure makes ensuring that businesses have the resources they need to satisfy their operating requirements and provide clients with goods or services. There are normally numerous important milestones in the procurement process. Organisations first evaluate the demands for products or services to determine their procurement requirements. This involves figuring out the amount, quality, requirements, and deadlines for delivery. Organisations then go through a supplier selection and assessment process. This entails locating possible suppliers, requesting proposals or bids, and assessing the qualifications, dependability, and cost of each. Evaluation of the supplier may take into account elements like prior performance, financial stability, quality control procedures, and adherence to ethical and sustainable norms [1].

Organisations discuss and create contractual agreements after choosing suppliers. Pricing, terms and conditions, delivery dates, and any unique needs or performance expectations are all part of this process. Contractual agreements provide a structure for the continuous relationship between the company and its suppliers, guaranteeing responsibility and transparency. Organisations move on to the procurement execution phase after the contracts are in place. To do this, purchase orders or contracts with specifics about the needed products or services must be sent to the chosen providers. The orders are subsequently filled by suppliers, who supply the needed goods in a timely manner and to the required quality standards.

Organisations conduct inspections, quality checks, and verifications after receiving products or services to make sure they adhere to the needed standards. To verify the supplied goods, this phase may include testing samples, reviewing records, or paying site visits. By maintaining supplier connections and taking care of payment and invoice processing, organisations finally finish the procurement process. Verifying invoices, comparing them to the original purchase

orders or contracts, and guaranteeing prompt and proper payment to suppliers are all included in this [2].

Supply chain optimisation, quality assurance, and effective cost management are all influenced by efficient procurement procedures. Organisations may acquire dependable and high-quality products and services, bargain advantageous price arrangements, and reduce supply chain risks by developing strategic supplier partnerships. In the end, the procurement process plays a crucial role in ensuring that businesses are able to acquire the materials they need to run effectively. Organisations may manage supplier relationships, save costs, and guarantee that resources are available to fulfil operational demands by adopting a systematic strategy. The entire performance and competitiveness of organisations in today's business environment are influenced by efficient procurement procedures.

DISCUSSION

The procurement process, often known as the buying or requisition-to-pay process, is covered in this chapter. The organisational and master data pertinent to this procedure are covered first. The procurement process's fundamental ideas are then examined. Options for reporting are discussed as we wrap up the chapter. We will use the following scenario throughout the chapter to show the different ideas and processes in the process. T-shirt (SHRT1000) stock at GBI's Miami distribution centre is low, the company has found. As a result, the business has to buy additional shirts before it runs out and starts to lose revenue (and maybe customers). All of GBI's t-shirts are purchased from a business named Spy Gear. Furthermore, it buys 500 of them at a time [3].

Organizational Data

The execution of the procurement process takes place within certain organisational levels. The organisational layers of customer, business code, and plant are all important to the procurement process. These levels were covered in Chapter 2. Recall from that talk that a client represents a business made up of several subsidiaries or firms, each of which is denoted by a company code. The majority of procurement process actions take place inside a corporate code. Keep in mind that a plant performs several tasks for a business. A plant is the site where the materials are obtained in the context of procurement. As contrast to, instance, a manufacturing plant, where items are really manufactured, we refer to it as a receiving plant as a result. Storage sites, buying organisations, and purchasing groups are three more organisational details that are pertinent to purchasing. Next, we take each into account [4].

Storage Facility

Materials are maintained in storage sites inside a facility until they are required. A factory may have many storage areas, each of which is used for a distinct function (such as a staging area or an inspection area) or houses a particular kind of material (such as semifinished items). Shelves, boxes, cabinets, and trays are some more specialised storage options. Depending on the amount of the things being housed, locations might be anything from tiny bins to enormous skyscrapers.

For instance, a tiny container will be used to store nuts and bolts, but a hanger would be used to store an aeroplane. Companies that have advanced inventory management systems are able to control their supplies more precisely. In the chapter on inventory and warehouse management, we discuss these systems [5].

However, if a factory has to monitor the number and worth of items in its inventory, it must maintain at least one storage facility regardless of the type of the business. A facility that produces or stores items, for instance, is required to keep precise records of the amount and cost of raw materials, semi-finished goods, and finished goods. Without storage spaces, the plant is unable to carry out its duty. However, in other circumstances, this function is not required. For instance, a company normally does not keep track of the amount or cost of the goods it buys for a corporate office (a plant). Consequently, a storage space is not required. Significantly, even though a plant may have many storage spaces, only one plant may be the owner of each space [6].

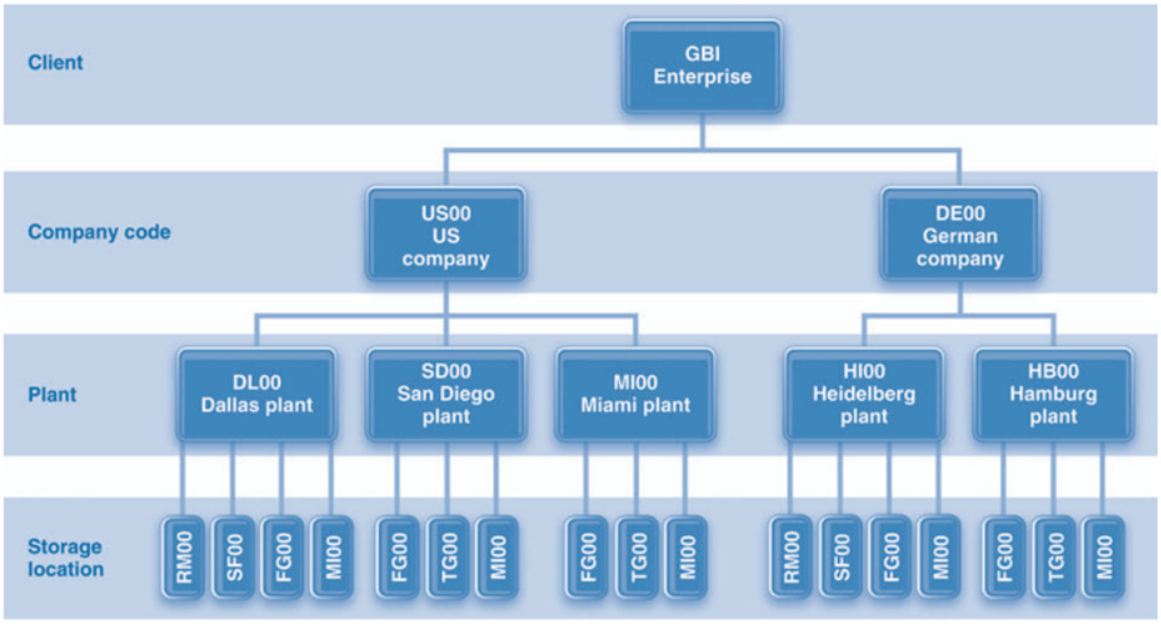

Figure 1: GBI Storage locations.

The five GBI facilities' storage sites are shown above in Figure 1. There are four storage facilities in the Dallas facility. It houses unfinished items (FG00), finished goods (FG00), semi-finished goods (SF00), and other materials (MI00). The distribution centres (DCs) in Miami and San Diego each include three storage areas for finished products (FG00), trading goods (TG00), and other materials (MI00). The German company's storage facilities are organised similarly to those in the United States. The Hamburg factory is built similarly to the factories in Miami and San Diego, whereas the production facility in Heidelberg is built like the one in Dallas. Although the storage locations' names are the same across all plants for instance, location FG00 appears in all five plants it should be noted that they have various organisational levels. The plant and storage facility must be an original combination. Therefore, it's possible that the Dallas facility doesn't have another storage space with the designation FG00. If they reflect the same sort of storage, such as raw materials and finished items, it is typical to use the same labels across facilities and company codes [7].

Bought by Organisation

The department within an organisation responsible for strategic buying for one or more plants is known as the purchasing organisation. It assesses and identifies suppliers, negotiates conditions of contracts and agreements, including price, etc. One or more buying organisations may be present in a company. There are typically three types of buying organisations: plant-level, company-level, and enterprise-level. From extremely centralised to very decentralised, these models span both extremes. Below, we go through each of these models in more depth.

Organisation for Enterprise-Level Purchasing

The most centralised approach is the enterprise-level buying organisation, sometimes called the cross-company code purchasing organisation. The whole firm, including all of its factories, is served by a single buying organisation. The enterprise-level model is used to represent the GBI organisational structure in Figure 2. The buying for all five factories under both company codes (US00 and DE00) is handled by a single corporate purchasing organisation, GL00. In this paradigm, each plant is given the buying organisation, but not the business code.

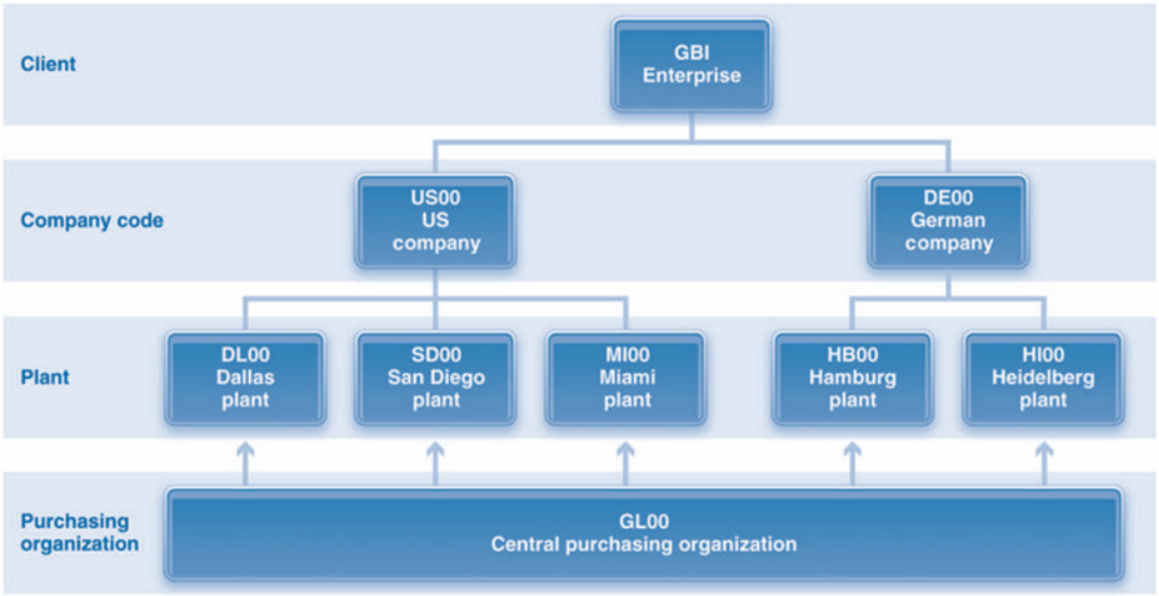

Figure 2: Enterprise-level purchasing organization.

Organisation for Company-Level Purchasing

A single buying organisation is in charge of many plants under one company code with the company-level purchasing organisation, sometimes referred to as the crossplant model. Figure 3 depicts a model of this kind for GBI. There are two buying organisations in the figure: US00 and DE00. The three American factories are all under the control of US00, while the two German plants are under the control of DE00. In comparison to the enterprise-level paradigm, this strategy is less centralised. In this paradigm, the business code and the plant are both given to the buying organisation. A buying organisation, however, may only be given to one business code [8].

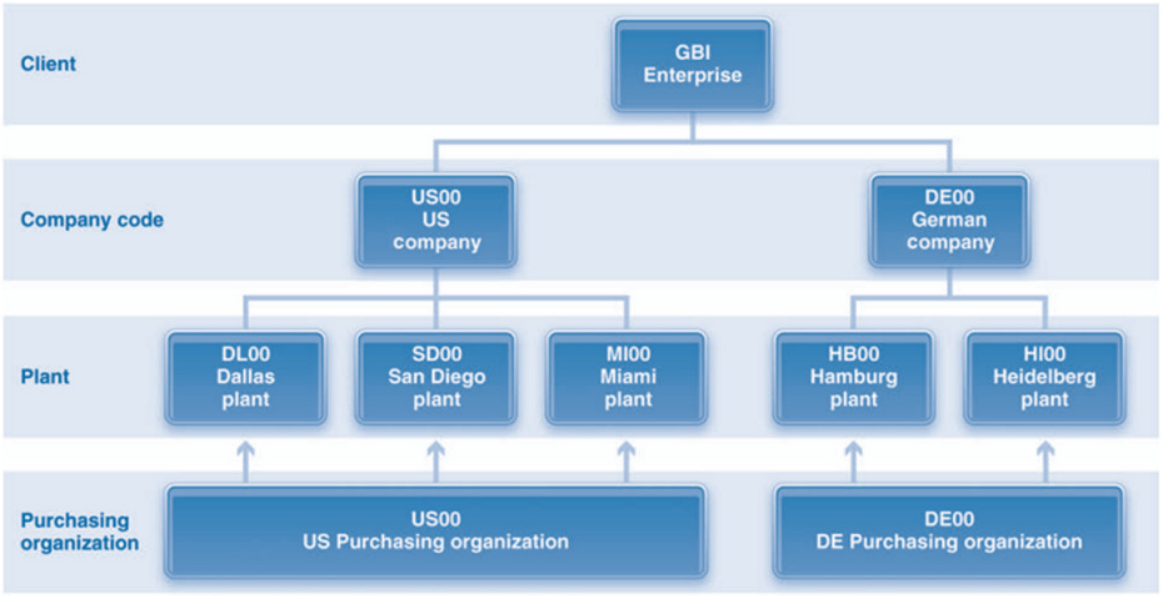

Figure 3: Company-level purchasing organization.

GBI operates a business in Germany and the United States, both of which have their own buying organisations. Each nation might have its own buying organisation if GBI developed other businesses in other European nations. An alternative would be for one buying organisation to oversee purchases across many nations. In order to cope with the unique mix of regulations, taxes, and commercial practices that each country has, it is really rather normal to establish a separate buying organisation for each nation [9].

Referring Purchasing Company

Each kind of buying organisation has benefits and drawbacks. An organisation may negotiate advantageous deals thanks to a highly centralised model since it acquires materials in bulk. The business may not be able to benefit from regional customs and connections that it is unfamiliar with. It could also be unable to respond swiftly to changes in the environment. In contrast, a highly decentralised approach is recommended when suppliers are mainly focused on a certain region and the firm can reach advantageous deals thanks to its understanding of regional customs and requirements. In the end, businesses usually choose a hybrid approach that entails a single centralised buying organisation that can assess possibilities and requirements for the whole business and negotiate international contracts, which purchasing organisations then utilise across the business. A reference purchasing organisation is one that makes such purchases. GBI has established a hybrid approach that consists of various company-code-specific buying organisations, as well as a single global reference purchasing organisation (GL00), as seen in the figure above. The buying organisation (DE00) is physically based in Heidelberg, Germany, whereas the purchasing organisation (US00) is physically located in Miami, United States [10].

Purchasing Group

Buying groups handle the daily buying tasks, whereas purchasing organisations are in charge of the strategic elements of purchasing, such as negotiating contracts with suppliers. A buying group is a person or group of people who are in charge of carrying out the purchase tasks for a material or collection of commodities. Planning, drafting purchase requisitions, seeking vendor quotes, issuing and tracking purchase orders are some of these processes. A purchase order

(PO), which is a formal letter to a seller, expresses a commitment to buy the specified goods under the given conditions. The primary point of contact for the company with suppliers is the buying division.

A buying group is not usually a corporate organisation. Some companies contract out the group's operations. Think of a scenario where a business has to purchase land or a structure. The business would probably use a realtor to choose the home that best meets their requirements. In this instance, the buying group is the real estate agent. Similarly, since buyer agents are better acquainted with the suppliers, many businesses employ their services to find acceptable vendors and purchase products from them. GBI has two buying groups: one for Europe (E00) and one for North America (N00) [11].

Accounts In the GL00 Chart of Accounts

The precise groups or classifications used to arrange and keep track of financial transactions inside an organisation are referred to as accounts in the GL00 Chart of Accounts. A standardised framework that offers a methodical basis for collecting and reporting financial data is the GL00 Chart of Accounts. A full list of accounts, each of which represents a distinct financial category, is often included in the GL00 Chart of Accounts. For simple identification and categorization, these accounts are given specific codes or numbers. The organization's financial reporting and analysis are built on top of them. The GL00 Chart of Accounts is designed to make it easier to accurately record, classify, and report financial transactions. In order to provide uniformity and comparability across various business units and reporting periods, it helps organisations to record and organise financial data in a consistent and standardised way.

Assets, liabilities, equity, revenues, costs, and different subcategories within these major groupings are only a few examples of the financial activities that are covered by the accounts in the GL00 Chart of Accounts. The financial status and performance of the organisation are each represented by a different account. The GL00 Chart of Accounts is made to accommodate each organization's particular demands and specifications. It may be tailored depending on the organization's internal management and financial analysis requirements, the nature of the company, and industry-specific reporting standards.

Organisations may produce accurate financial statements, carry out useful financial research, and make informed choices by using a well-structured and organised GL00 Chart of Accounts. It offers a thorough structure for financial management, assuring efficient resource allocation, monitoring of financial performance, and adherence to legal requirements. The GL00 Chart of Accounts, in short, is a crucial part of a company's financial management system. Organisations can efficiently monitor, analyse, and report their financial operations thanks to the standardised framework it offers for organising and reporting financial transactions [12].

Finally, it should be noted that the GL00 Chart of Accounts is essential for classifying and organising financial transactions inside an organisation. In order to ensure uniformity and accuracy in financial reporting, it offers a standardised framework for documenting and categorising financial operations. A company's financial activities are represented by a variety of account codes and categories in the GL00 Chart of Accounts. It usually consists of major categories including assets, liabilities, equity, income, and costs, with each of these further broken down into subcategories for different kinds of transactions. Businesses may efficiently monitor and analyse financial data by utilising the GL00 Chart of Accounts. The systematic recording of transactions is made possible by this, giving a clear and thorough picture of the organization's financial situation and performance.

CONCLUSION

In conclusion, the procurement process ensures the prompt and effective purchase of the products and services required for operations, which plays a crucial role in organisations. It entails a number of tasks, including as determining the need for procurement and locating suppliers, as well as contract negotiations, order placement, and supplier relationship management. The procurement process seeks to get the most value for the money while upholding organisational laws and regulations, maintaining quality standards, and sustaining standards of performance. Between procurement teams, stakeholders, and suppliers, good communication, cooperation, and coordination are necessary. Conducting market research to find possible suppliers, assessing and choosing suppliers based on factors including price, quality, and delivery capabilities, negotiating contract terms and conditions, and tracking supplier performance are important elements in the procurement process.

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CHAPTER 7

MASTER DATA AND KEY CONCEPTS OF PROCUREMENT

Dr. Ranganathan Kumar, Associate Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: drsenthilkumar@presidencyuniversity.in

ABSTRACT:

This summary gives a general overview of master data and important procurement concepts while stressing the role they play in efficient supply chain management. It places a focus on the part that master data plays in procurement procedures such contract management, item catalogue management, and supplier management. Additionally covered in the paper are important procurement topics including strategic sourcing, supplier assessment, and supplier relationship management. For successful procurement operations, it emphasises the significance of master data accuracy, process effectiveness, and supplier participation.

KEYWORDS:

Account Assignment Object, Consumable Materials, Invoice Verification, Material Document.

INTRODUCTION

Effective supply chain management depends heavily on master data and core procurement ideas. Organisations recognise the need of effectively managing master data management and comprehending important ideas in procurement to optimise their sourcing and procurement operations in today's complicated business environment. The review of master data and important procurement ideas in this introduction emphasises their importance and relevance for attaining operational effectiveness, cost savings, and supplier relationship management [1].Master data is the vital, non-transactional information that characterises important organisational components including suppliers, products, materials, and clients. The administration of suppliers, item catalogues, and contracts are just a few of the procurement-related procedures that heavily rely on master data. Smooth procurement processes are guaranteed by accurate and current master data, which also helps to cut down on mistakes and promotes good decision-making.

Understanding core procurement principles is crucial for organisations to undertake strategic sourcing practices and forge solid supplier relationships, in addition to master data management. Strategic sourcing is using a methodical process to find, assess, and choose suppliers based on factors including price, quality, delivery, and innovation. It strives to reduce costs and optimise procurement processes while maintaining access to high-quality products and services [2]. Critical elements of procurement include supplier assessment and performance management. To make sure that suppliers adhere to the necessary standards, organisations must evaluate the skills of their suppliers, monitor performance indicators, and set up clear communication routes. The main goals of supplier relationship management are to establish long-lasting relationships with suppliers that are based on mutual trust. Development, innovation, and ongoing improvement of suppliers are encouraged by effective supplier relationship management.

One of the most important components of contemporary procurement practises is supplier collaboration. In areas like demand forecasting, product design, and inventory management, organisations are becoming more and more aware of the advantages of supplier cooperation. Organisations may take advantage of suppliers' knowledge, shorten lead times, and improve supply chain performance by incorporating them in the early phases of the procurement process [3]. In order for organisations to optimise their sourcing and procurement operations, knowing the administration of master data and comprehending fundamental concepts in procurement are crucial. Effective procurement operations are ensured by accurate and current master data, and strategic sourcing techniques, supplier assessment, and supplier relationship management all help to reduce costs, boost supplier performance, and maintain long-term competitiveness. Organisations may improve their procurement skills and add value throughout the supply chain by adopting these principles and managing master data efficiently.

DISCUSSION

Material master, vendor master, buying information records, and conditions are the four master data types that are pertinent to the purchase process. Throughout the procurement process, all four categories are combined in different ways.

Data in Financial Accounting

The valuation currency, the valuation class, and the price control are all included in financial accounting data. The materials will be priced in valuation currency, which might be either U.S. dollars or euros. The accounts in the general ledger that are connected to the material are identified by the valuation class. The general ledger accounts, which are updated when materials are bought, sold, or utilised in production, are used to maintain the value of the inventory that is on hand. Because it enables the system to automatically record transactions to the relevant stock or inventory accounts in the general ledger, valuation class serves as a crucial point of integration between buying and financial accounting. All materials with comparable properties are generally allocated to the same value class [4].

As a result, the same general ledger account is used for all financial transactions related to these items. Off-road bicycles and touring bicycles, for instance, are both completed products, therefore their transactions may be recorded in the same finished goods inventory account. However, there are instances when materials with comparable qualities are given to several valuation classes, and as a result, various general ledger accounts. Using the prior case as an example, the bikes may be allocated to the inventory accounts for off-road bikes and touring bikes, respectively. When a business has distinct general ledger accounts for various materials, it is reasonable to assign materials with comparable characteristics to different value classes. The last and most straightforward alternative is to put materials with various properties in the same value class, and therefore, the same inventory account. When the business does not need to monitor the worth of the materials individually, as is the case, for instance, with office supplies, this technique is suitable. The process for valuing the materials is identified by price control. Standard price and moving average price are the two choices for price regulation. Both choices specify the cost per unit of goods that are already in stock, such helmets [5].

In the moving average pricing option, the average price per unit is calculated by dividing the total cost of the materials by the amount on hand. As an example, if a company has 1000 helmets in stock and paid $34,000 for them, the moving price is $34 (34,000/1,000). This price, which reflects the average cost of the materials in stock, is referred to as "moving" since it is updated each time a process step has an impact on the price. As a result, if the company spends $3,500 more to buy 100 more helmets, the new moving price will climb to $34.09 (($34,000 + $3,500)/(1,000 + 100)).

Standard pricing, on the other hand, is fixed for a certain amount of time and does not alter regardless of what happens to the materials' value. The standard price is adjusted on a regular basis for instance, weekly or quarterly to reflect changes in the value of the materials. As a result, in our previous example, if the company's practise is to update the standard pricing at the end of every month, it does not alter the price when it buys extra helmets. The regular pricing is instead updated at the end of each month.

Purchasing Data

The purchase data or perspective is yet another essential part of the material master. The buying group, the processing time for goods reception, and the delivery tolerances are the three main pieces of information in the purchasing perspective. The supplies are purchased by the buying group, which we previously covered as one of the organisational components in procurement. It takes some time for a business to accept and store items when they are delivered to them from a vendor. For instance, it must physically carry the items to the proper storage site, count the supplies, check their quality, and unpack the boxes. This is the processing time for the products reception. The material master has a time estimate for this process. This estimate is used by the ERP system in planning operations, such as deciding when to place an order so that the supplies are available when they are required.

It happens often that a seller will provide you either more or less material than you really bought. Depending on its rules and agreements with its suppliers, the receiving organisation may or may not recognise receipt when this happens. The ordering party's tolerance for over- and under-delivery is specified in the material master's delivery tolerances. Ordering party accepts delivery if amount provided is within specified limitations. It rejects the cargo and sends it back to the vendor if the amount is more than the tolerances. Each appropriate organisational level may need a different set of information from the material master. The plant is the appropriate organisational level for buying. If a business operates many factories, the material has to be specified for each one where it is kept. For instance, processing times for goods receipts and buying groups might differ depending on the facility [6].

Plant Data / Storage

The majority of commodities generated internally or acquired from a vendor eventually end up in inventory. The plant data / storage view has to be a part of the material master for this step to take place. The data required for appropriate material storage are included in the plant data/storage view. Some instances of this data are:

1. Environmental conditions including humidity and temperature
2. Unique storage containers that are necessary
3. Shelf life, which is the amount of time an item may be kept before becoming bad or becoming useless (common in the pharmaceutical and food services sectors);
4. Directions for particular handling, such as if the substance is brittle or dangerous.

VENDOR MASTER

The information required to interact with a vendor and complete activities connected to the buying process is included in vendor master data. The three components of data in the vendor master are general data, accounting data, and buying data. Figure 1 shows the connections between the three segments and the two departments in charge of data accounting and buying.

The particular statistics that are presented in each section are highlighted in Figure 2.

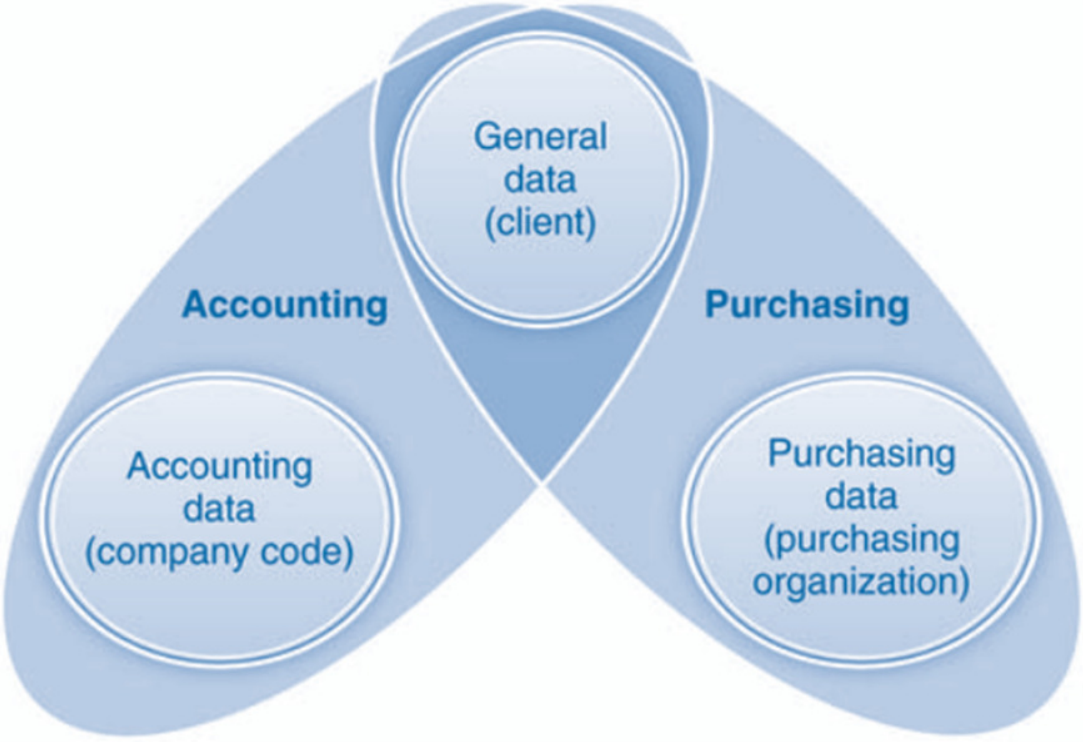

Figure 1: Segments of vendor master data.

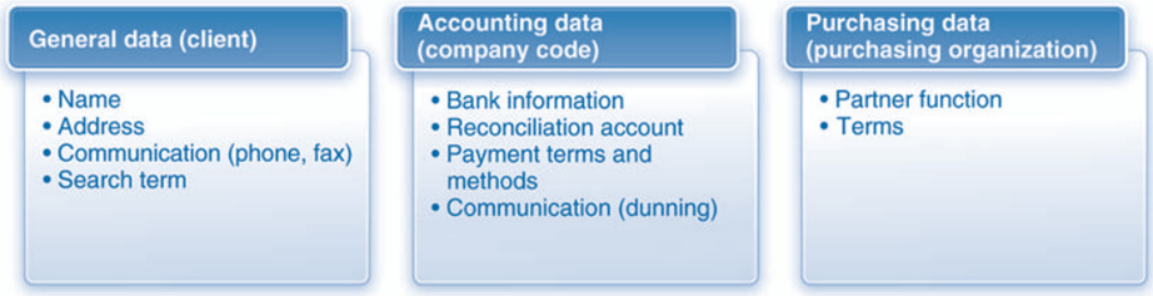

Figure 2: Examples of vendor master data.

The vendor's name, address, and contact details like their phone and fax numbers are considered general data. These data are defined at the client level and are the same for all enterprise (client) company codes and buying organisations. Both the buying and accounting departments share general data, which may be managed by any department. Tax-related data, bank data, and payment terms and procedures are all examples of accounting data. All buying transactions in the company code are affected by these data, which are specified at the level of the company code. This section of the vendor master will normally be completed by the accounting department [7].

Accounting information must additionally identify the general ledger reconciliation account. In the previous chapter, we learned that a vendor account is a subledger account and that the reconciliation account identifies the general ledger account for the vendor's accounts payable. The data will almost certainly differ for each business if the vendor provides the firm with several companies (company codes). If the general ledger accounts and chart of accounts used by each firm vary, then the reconciliation account will also differ. Payment conditions and bank details may differ as well. As a result, accounting information is kept individually for each company code that the vendor did business with.

Last but not least, the phrases connected to price negotiation, drafting and sending buy orders, examining invoices, and other activities involved in carrying out purchases with the vendor are included in the purchasing data. Usually, the buying division will finish this section. The buying organisational level defines purchasing data, which is thus exclusively relevant to that organisation. If an organisation deals with a vendor via different buying organisations, it must keep separate data for each of them. For instance, various buying organisations may have varying delivery and payment periods. There are 12 suppliers that provide raw materials and trade items for GBI US and GBI DE. Table 1 includes a list of these suppliers. Additional information about these suppliers may be found. It should be noted from the appendix that each vendor provides GBI with particular resources [8].

Table 1: Illustrate the GBI vendor list.

GBI US Vendors	GBI DE Vendors
• Olympic Protective Gear • Boomtown Tire & Wheel • Dallas Bike Basics • Lightbulb Accessory Kits • Space Bike Composites • Night Rider Aluminum Products • Spy Gear • Rapids Nuts n Bolts • Green Blazers Seats • Fun n the Sun Seats n Bars • Sunny Side Up Tire • Redwood Kits	• Burgmeister Zubehör OHG • Pyramid Biking • ABS Brakes GmbH • Flat Tire and More • Gummi Schultze • Lohse Schraube • Thick Spoke • Main Carbon • Shell Gear • Cologne Bike Supplies • Sachsen Stahl AG • Run & Fun

Purchasing Info Records

As shown in Figure 3, a buying info record is the intersection or fusion of vendor and material data. It includes information that is unique to one seller and one kind of item or set of materials. Records for purchasing information include information that is valid for the particular combination of vendor and material as well as information that is contained in the vendor master and the material master. General statistics and data about buying organisations make up this collection of information.

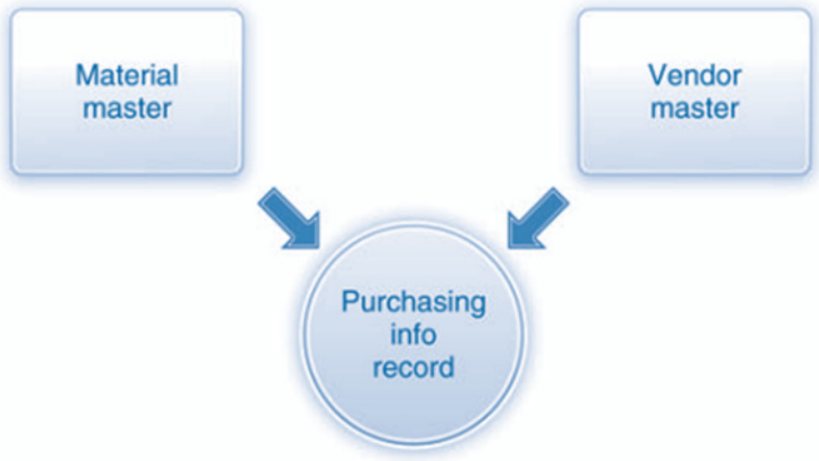

Figure 3: Illustrate the Purchasing info record.

The vendor number, material number (or group), and other data needed for communication (such as contact details, phone numbers, and reminders) are examples of general data that apply to all buying groups. buying information, on the other hand, is unique to one buying organisation and is based on agreements with the vendor specifying delivery dates, delivery tolerances, quantities, and price terms. To calculate the price of buying the material from that source, businesses employ pricing conditions. Various condition kinds, such as gross price, discounts and surcharges, taxes, and goods, are often defined in the info record. It also maintains track of the most recent purchase order for the particular material-vendor combination and contains text data that is used for remarks and instructions that go along with purchase orders. When the organisation prepares a buy order for a given combination of material and seller, it takes information from the purchasing info record as default settings.

KEY CONCEPTS

We take a moment to talk about a few basic ideas that are crucial to comprehending the procurement process before going into further depth. These ideas have to do with the way in which materials are acquired (item categories), how their effects on finances are documented (account determination), how useful the resources are (stock type), and how the materials are moved when they are received, stored, and delivered to clients (goods motions).

Item Categories

When a business acquires goods or services, the process stages and data required are determined by the item categories. Standard, consignment, subcontracting, third-party, stock transfer, and services are typical item types. Standard products and the method for obtaining them are the most prevalent of these categories. Making a requisition is the first stage, after which a purchase order is created and delivered to a vendor. The materials are sent by the vendor in response to receipt of the purchase order, and the ordering party gets them via the goods reception step. Additionally, the ordering party gets an invoice, and it pays the seller [9].

Contrarily, when a business buys things on consignment, it doesn't pay the seller until it actually utilises or sells the products. Therefore, there is no stage involving the receiving of invoices for this type of items. Items that the seller sends directly to a consumer are referred to as third-party orders. For trading items like helmets that they buy and subsequently resell to clients

without conducting any activities themselves, businesses use third-party orders. There is no goods receipt for the business since the consumer gets the items straight from the seller.

Account Determination

Typically, businesses utilise the procurement process to buy the items they keep in stock until they are needed. For instance, companies buy raw materials to utilise in manufacturing later on and trade items for consumer sales later on. Stock materials are the name given to such materials. Remember that the general ledger comprises several inventory accounts, such as raw materials, trade products, and finished goods from the subject of financial accounting in the previous chapter. Which of these inventory accounts has to be updated when supplies are received? How does an ERP system recognise this? Account determination is an automated procedure that uses information from the material master, notably the valuation class, to decide which general ledger accounts to utilise for stock materials, for which a material master must be specified [10].

Consumable materials are also purchased by businesses via the procurement process. As the name implies, they are items that are purchased for internal use or consumption by the organisation. Office supplies like pencils and paper that employees use on a daily basis as part of their job are an example of consumable materials. When a business buys materials for consumption, the transaction must specify the general ledger accounts that will be debited and credited as well as the account assignment object that will be charged for the purchase. The entity for which the items were bought is identified by an account assignment object, which also serves as the bearer of the cost of the transaction. For instance, when a business buys office supplies for the marketing division, it debits a consumption account for the transaction, such as the supply expenditure account in the general ledger, and charges the cost centre for the marketing division. Remember that a cost centre is an expense item that is used to collect expenses for a department. The cost centre serves as the account assignment object in the example above. Additionally, businesses utilise the buying process to purchase assets like automobiles as well as the materials required to support operations like manufacturing, fulfilment, and enterprise asset management as well as initiatives like building a new factory. The account assignment category determines the precise accounting information required [11].

Type of Stock or Status

Materials are categorised into several stock kinds or stock statuses that impact their usability, or how well they may be used by the firm in its various activities. Unrestricted usage, stock undergoing quality control, blocked stock, and stock in transit are the four main categories of stock. As the name indicates, materials with an unrestricted use classification may be utilised whatever management deems best for the business. For example, they may be used internally to create additional goods or outside to satisfy client demand. Materials that are designated as being under quality inspection or blocked stock, on the other hand, may only be removed for sample or for scrap. When a vendor's products must be inspected before being issued for consumption, a corporation utilises the in quality inspection status. Supplies that are damaged or unsuitable for whatever reason, such as when the vendor provides the incorrect supplies, are often kept in blocked stock. Finally, items are classified as stock in transit while they are being transported from one factory to another.

CONCLUSION

In the context of procurement, master data refers to the fundamental knowledge required for effectively managing and carrying out procurement operations. Data on suppliers, supplies, prices, contracts, and other pertinent information are often included. The handling of master

data effectively is essential for precise and efficient procurement operations. It allows businesses to manage supplier relationships, negotiate better deals, uphold transparency, make educated choices, and optimise their entire procurement procedures.

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CHAPTER 8

A BRIEF DISCUSSION ON FULFILLMENT PROCESS

Dr. Muralidhar Sunil, Assistant Professor
Masters In Business Administration (General Management), Presidency University, Bangalore, India
Email Id: sunilrashinkar@presidencyuniversity.in

ABSTRACT:

The supply chain management process known as fulfilment ensures that consumers get their orders in a timely and precise manner. This abstract gives a quick rundown of the fulfilment process' essential components. From the moment an order is received until it is delivered, the fulfilment process is divided into many steps. It includes tasks including order processing, inventory control, picking, packaging, and shipping, as well as customer service. In order to guarantee customer happiness and operational effectiveness, each step is crucial. Order processing include confirming and validating consumer orders, determining if a product is in stock, and gathering data required for fulfilment. Order processing that is accurate and effective lays the groundwork for the efficient execution of following fulfilment operations. Inventory control is essential to the fulfilment process in order to maintain ideal stock levels, reduce stockouts, and avoid having too much inventory. It entails keeping an eye on inventory levels, restocking goods as required, and using inventory management tools to keep precise records.

KEYWORDS:

Credit Control Area, Distribution Chain, Outline Agreements, Scheduling Agreement.

INTRODUCTION

The delivery of a product or service to a client after the placement of an order is included in the fulfilment process, sometimes referred to as order fulfilment. From order reception through product delivery to customer satisfaction, there are many processes involved. Order processing is the first step in the fulfilment process. This entails obtaining consumer orders through a variety of channels, including websites, phone calls, and in-person sales. After being input into the system and being checked for correctness, the order data is then ready to be processed further. The inventory management stage begins as soon as an order is received. When a product's availability is compared to an order, the available stock is held for fulfilment. If any products are out of stock, the consumer may be given alternate options or backorders placed [1], [2].

Finding and collecting the products from the inventory to complete an order is known as order picking. The warehouse employees may do this manually or automatically using robots or barcode scanners. Zone picking and other effective picking techniques assist increase productivity and decrease mistakes. After the products are selected, they are packaged and made ready for shipping. This entails making certain that the packaging, labelling, and paperwork are appropriate. Depending on the kind of product being sent, different packaging may be used to safeguard the goods during transportation.

After the order has been packaged, the shipping and logistics team receives it. They arrange for the package's transportation and delivery to the customer's designated location. Choosing the best shipment method, finding carriers or shipping partners, creating mailing labels, and tracking data are all part of this step. The shipment is delivered and delivered to the consumer.

Customers may have access to tracking data to follow the status of their cargo at any time throughout the delivery process. Notifications and updates in real-time may increase customer satisfaction and promote transparency.

Following delivery, customer support is essential in resolving any questions, difficulties, or concerns that clients may have. This includes dealing with exchanges, refunds, and any issues that arise throughout the fulfilment process. Providing top-notch customer service may increase client loyalty and satisfaction. Feedback and Continuous Improvement: To pinpoint opportunities for improvement, the fulfilment process has to be watched and assessed. Customers', warehouse employees', and other stakeholders' feedback may be used to spot operational bottlenecks, inefficiencies, or chances for improvement. Initiatives for continuous improvement seek to improve the fulfilment process and provide great customer service. For companies to exceed consumer expectations, maintain inventory accuracy, and guarantee timely delivery, effective fulfilment systems are crucial. Organisations may boost operational effectiveness, save costs, and boost customer happiness by optimising each step of the fulfilment process [3].

DISCUSSION

Currently, GBI fills client orders using a relatively straightforward procedure. Figure 1 shows a replica of this procedure. The procedure starts when GBI gets a purchase order from a client, which it then verifies and authorises using a sales order. After the warehouse has finished packing and shipping the package, accounting issues an invoice. When the consumer pays GBI, the transaction is complete.

Figure 1: Illustrate the a basic fulfillment process.

Up till now, GBI has had good success with this straightforward procedure. GBI has expanded quickly, however, so the business wants to use the new ERP system it bought to improve the way it fills client orders. In particular, it seeks to improve the process's effectiveness, customer-friendliness, and transparency by tracking each order's progress throughout every stage of the procedure. It also seeks to include into the new procedure additional sales-related operations like lead generation and customer service [4].

We go into great depth about the fulfilment process in this chapter, paying particular attention to how an ERP system helps the process. We start by identifying the important organisational layers and the process-related master data. The process phases are then thoroughly examined, and the integration of fulfilment with other processes is explained. We wrap off by talking about the numerous reports about fulfilment. This chapter does not include a distinct section on essential topics like the prior chapter did. This is because the fundamental ideas related to fulfilment, including the flow of products, have already been covered in earlier chapters [5].

We will use the following scenario throughout the chapter to show the different ideas and processes in the process. Located in Denver, Colorado, Rocky Mountain cycles (RMB), a client of GBI, has placed an order for 40 silver deluxe touring cycles and 100 t-shirts that will be sold at two racing events in Colorado Springs, one on May 15 and the other on June 20. Just a few days before each race, RMB wants GBI to transport the motorcycles immediately to the racing venue since they represent a large inventory and storage charge. In addition, RMB believes the May event will draw a bigger audience, so it anticipates selling more bikes and t-shirts there. As a result, it has asked GBI to deliver 30 motorcycles on May 10 and the remaining 10 on June 10. However, it requests that GBI provide every one of the 100 t-shirts in May so that it may sell the most of them during the first event and the remaining ones at the second. T-shirts, as opposed to bikes, are less costly and simpler to keep in between races.

To complete the fulfilment process, many organisational components are necessary. Client, Company Code, Sales Area, Plant, Storage Location, Shipping Point, and Credit Control Area are a few of them. Three of these the delivery point, the credit control area, and the sales section are exclusive to fulfilment. The three additional organisational components sales organisation, distribution channel, and division that are particular to fulfilment are combined to form a sales area. In this part, we go through each of these organisational components. Client, business code, plant, and storage location are a few components that are pertinent to other operations and have been covered in earlier chapters. A review of plant and storage sites primarily related to fulfilment is given in this section. There is no need to go into more detail about client and corporate code [6].

Sales Organization

Each sales organisation inside a corporation (company code) is in charge of handling the sale and distribution of products and services within a certain geographic area, such as a national or regional market. A sales organisation is specifically:

1. In charge of negotiating the sales terms and conditions for that market.
2. Accountable to consumers in terms of legal responsibility and available legal channels for complaints.
3. The greatest degree of aggregate for reporting on sales. In other words, sales information may be condensed to the level of the sales organisation.

A business code may have numerous sales organisations, but it must have at least one. The second structure is suitable if the sales procedures in the various sales organisations varies significantly, for instance to accommodate regional variations in practises and traditions. In other situations, a business could employ many sales organisations just to maintain a tolerable regional coverage. A sales organisation may be a part of more than one business, but only one company code may be the home of that sales organisation.

Figure 2 shows the sales organisations for GBI. According to the figure, GBI US has two sales organisations, one for the Eastern and one for the Western US. Additionally, GBI Germany has two sales organisations, one for the Northern and one for the Southern regions [7].

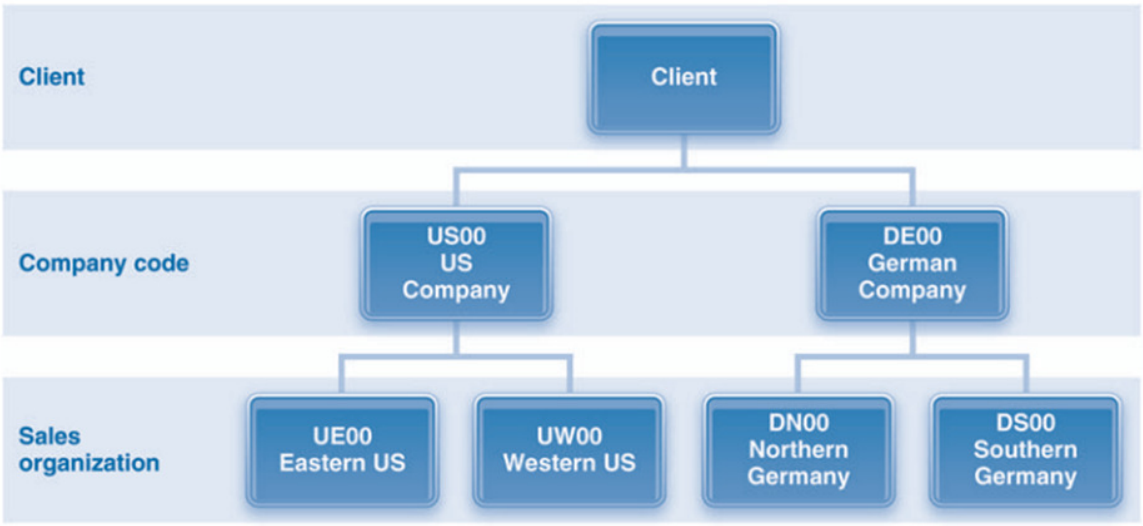

Figure 2: Illustrate the GBI sales organizations.

The Distribution Channel

The method through which a business distributes its products and services to its clients is known as a distribution channel (DC). Wholesale, retail, and online (Internet sales) are examples of typical channels. A firm might have several DCs, just as it can have numerous sales organisations. Every channel has its own ideas, tactics, and limitations for delivering products and services to customers. More precisely, each channel has unique obligations, pricing policies, facilities where shipments are manufactured, and other features. For instance, a wholesale channel contains (among other things) the following features:

1. In the United States, sales taxes are not taken into account when determining pricing.
2. It provides bulk discounts and has a minimum purchase requirement.
3. It could name a particular plant or plants where deliveries are made.

The DC level also allows for the consolidation of reporting. In other words, data may be compiled and aggregated depending on the routes of dissemination. Although it is possible to have more than one, a sales organisation must have at least one distribution channel. Additionally, different sales organisations may be given access to the same distribution channel. GBI traditionally has marketed its goods via the wholesale channel since it is a manufacturing company. Retailers are its clients; they then sell the items to end users. However, GBI has just started selling online straight to end users. Although anybody may use the GBI website to buy a bike, the company finds it very challenging to run a worldwide Internet sales channel due to issues like complicated taxes, shipping expenses, and import charges. As shown in Figure 3, GBI administers both the wholesale and Internet sales channels jointly at the national level. This approach makes sure that the sales team that delivers the customer's merchandise is also the one that is most conversant with the local tax regulations [8].

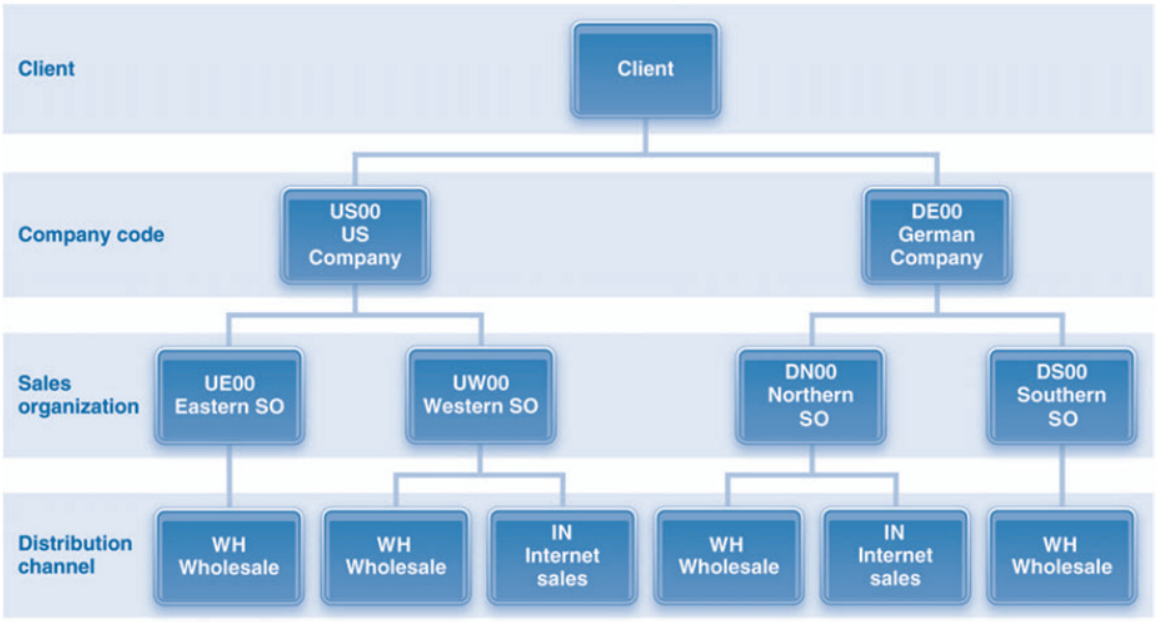

Figure 3: Illustrate the GBI US distribution channels.

Observe that only two of the four sales organisations shown in Figure 3 are engaged in online sales, despite the fact that all four are participating in wholesale sales. Both the Northern German sales organisation and the Western US sales organisation are in charge of overseeing Internet sales for the whole of the US and Germany, respectively. The methods for retail sales, such as price, minimum quantities, and taxes, will be different from those for the other two channels, therefore if GBI were to branch out into retail sales in the future, it would build a new channel called retail to handle these sales. Distribution chains are a special kind of sales organisation and distribution route. At the distribution chain level, master data including material master and price conditions are kept up to date [9].

Division

The majority of businesses combine products and services with comparable qualities into a division. Each division often corresponds to a company's product line. Only one division may be given to a product or substance. Each division may use its own sales techniques, such as consumer pricing arrangements. Additionally, division-level report aggregation is allowed. There must be at least one division in a sales organisation. A sales organisation may have numerous divisions within it, and a division can be allocated to many different sales organisations.

Plant

Plants were covered in earlier chapters in relation to other processes. A facility where the business distributes goods and services to its clients is referred to as a delivery plant in the fulfilment process. A plant is often a production and/or storage facility when it comes to goods. It might just be an office in the case of services. A factory may be a part of many distribution chains. Remember that the combination of a distribution route and a sales organisation constitutes a distribution chain. On the other hand, a distribution chain may be connected to many plants. Figure 4 shows that Plant 1 only supplies Chain 1 and Plant 3 only supplies Chain 3. Plant 2 however, provides for all three distribution channels [10].

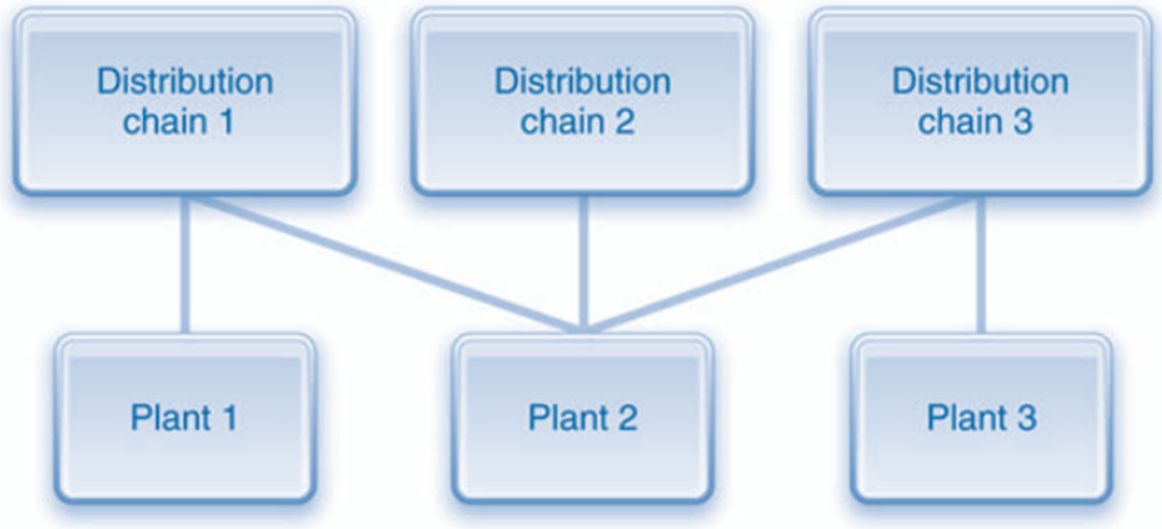

Figure 4: Illustrate the Plants.

The only production facility in the US is located in Dallas, with distribution centres located in San Diego and Miami. When necessary, finished items are transported from the Dallas factory to the other two locations. Contrarily, the merchants send trade items directly to the two regional distribution centres. There is no trade goods inventory at the Dallas factory. Usually, consumers in the Eastern United States get items from the Miami factory, while those in the Western United States receive them from San Diego. The Dallas factory can, however, transport finished items anywhere in the nation when necessary and acts as an overflow facility to the other two factories. The Heidelberg facility in Germany ships to southern regions, whereas the Hamburg plant ships to northern places. The customer, sales organisation, distribution channel, and plant are the primary organisational components in fulfilment for which material master data are defined. Remember that views are groups of material master data, and that each view is defined at a particular organisational level and applicable to one or more processes. Basic data, sales organisation data, and sales plant data are the three viewpoints important to fulfilment.

Basic information is defined at the client level and is relevant to all procedures. For combinations of sales organisations and distribution channels, sales organisation data are defined. The delivery plant, sales units, and minimum quantities are a few examples of sales organisation information. For the specific sales organisation and distribution route, the delivering plant is the ideal facility from which deliveries are made. The units of measurement used to measure the items that are sold include cartons, barrels, containers, cases, pallets, and crates. Minimum order quantities and delivery quantities are included in amounts. There is also a link to the terms of the price (explained later). Each DC might have a different value for these data to support a different sales strategy since the data are defined for each combination of sales organisation and DC. Information from the sales facility reveals specifics on how the commodity will be delivered from that factory. Examples include particular transportation needs (such as refrigeration) and loading techniques (such as a hand cart, forklift, or crane). Keep in mind that if the data are different, materials must be defined for each combination of sales organisation and distribution route, as well as for each plant. The material data will often remain constant across plants or delivery routes [11].

In certain circumstances, the information in a customer-material info record takes precedence over information in other master data, such as the customer master and material master. For instance, all of the materials that the client purchases are subject to the shipping preferences specified in the customer master, such as delivering plant, tolerating delays, and making partial deliveries. These preferences, however, are recorded in the customer-material information record if they differ for various materials. Delivery preferences are recorded in the customer-material data record for a certain material, not in the customer master, for instance, if deliveries are typically made to a specific plant but must be sent to a different plant for a given material.

Due to the weight and size of the shipment crates, RMB recommends that the bikes be sent through special ground freight (truck) according to the customer-material information records for RMB. On the other hand, the business demands that GBI send the shirts via regular air freight (FedEx or UPS 2-day). Additionally, since shirts have a relatively short lead time and can be rapidly reordered, if necessary, the information records show that RMB will accept partial delivery for shirts but not for bikes.

Conditions for Pricing

Companies employ pricing conditions-master data-to establish the selling prices of their goods. For several parts of the final selling price, such as gross pricing, discounts, goods, surcharges, and taxes, businesses set conditions. Conditions may be independent of or related to other conditions, and they can be based on fixed quantities, percentages, or a sliding scale. For instance, a product's pricing may be both material-specific and customer-independent, which means that the vendor must charge the same amount to each of its clients.

Alternately, the pricing might be customer-specific, in which case the business would charge various clients differently, possibly in accordance with certain contracts the two parties had made. Discounts may either be standard or determined on the amount or value of the purchase. For instance, GBI provides discounts of 10% for orders between 100 and 500 units and 20% for orders beyond 500 units. For orders beyond a certain threshold, shipping costs may be waived and are typically calculated depending on the weight of the cargo. As a result, the final price charged to the consumer depends on a number of different factors.

Because a product may be subject to a number of conditions, a business must have a process in place to identify which conditions apply to a given client purchase. The condition approach involves recognising the many condition types that are accessible (gross price, customer-specified price, discounts, goods, surcharges, etc.) and deciding which ones apply to the specifics of the order. Remember that RMB wants to buy 40 bikes and 100 t-shirts in our scenario. Due to the bikes' ineligibility for a discount, GBI will bill each one for $2,800 instead. Although the t-shirts are eligible for a 10% discount, the price will only be $27 per shirt instead of the usual $30.

Two transaction documents-the inquiry and the quotation-are commonly produced as a consequence of presales activity. A simple record of the customer's enquiry in the SAP ERP system is what the inquiry document is. Although it is not necessary to create an inquiry, there are several benefits. The corporation could utilise the enquiry as a source of information when preparing a quote, for instance. Additionally, it may examine data from inquiries to spot missed sales opportunities and then develop plans to avoid more of the same. Contracts and scheduling agreements may be created as a result of pre-sales activities. There is no material movement, hence no material papers are produced. Due to the fact that presales operations have no effect on the company's financial condition, no accounting documentation (FI or CO) are produced.

The transmission of the quote to the client is a final result of presales activity. According to the output requirements linked to the quote, the quotation is transmitted in a certain way. Recall that the output criteria dictate the following parts from the discussion previously in this chapter:

1. The output media (such as print, fax, or EDI) via which the quote is issued; • The receiver, or the business with the necessary partner role;
2. The time the quote was sent

Rocky Mountain Bikes requests a quote from GBI for 40 bicycles and 100 t-shirts. It then generates a quote in response. It decides not to reference any already published materials. As a result, it must either manually enter the RMB customer number or look for RMB in the list of clients for its sales region. Input the material numbers and quantities for the materials that RMB has requested, as well as a valid-to date for the quote. The system automatically imports data from the relevant master records customer, material, pricing conditions, and customermaterial information records into the quote when the customer and the materials are connected to it. The output condition will change when GBI completes the quote and is prepared to transmit it to RMB [12].

CONCLUSION

In conclusion, the fulfilment process is essential to ensure that orders from customers are handled effectively, goods are delivered on schedule, and customers are satisfied. The fulfilment procedure has to be reviewed and enhanced on a regular basis. It is possible to find opportunities for improvement by analysing key performance indicators (KPIs) including order cycle time, accuracy, and customer happiness. The fulfilment process may be optimised to increase operational effectiveness by implementing process changes and using technological solutions. Organisations may successfully satisfy orders by giving top priority to efficient order processing, precise inventory management, simplified picking and packaging, efficient shipment tracking, responsive customer service, and continual process improvement. A successful fulfilment process results in happy consumers, recurring business, and a great reputation for the company.

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CHAPTER 9

A BRIEF STUDY ON PRODUCTION PROCESS

Mr. Ashok Bhat, Assistant Professor
Masters In Business Administration, Presidency University, Bangalore, India
Email Id: ashokbhat@presidencyuniversity.in

ABSTRACT:

A basic component of manufacturing is the production process, which entails converting raw materials or components into completed goods. The main ideas and steps of the manufacturing process are summarised in this abstract. Demand forecasting and planning, which define production objectives and schedules based on market demand and available resources, is the first step in the production process. It includes a number of phases, including as product design, raw material sourcing, production, quality assurance, and distribution. The manufacturing process includes quality control, which makes sure that the final product meets predetermined requirements for quality. To find and fix any flaws or deviations from requirements, inspection and testing processes are used. The items are ready for distribution after they have been produced and have passed quality inspection. This step must include packaging, labelling, and logistics planning to guarantee that the items are ready for delivery to clients or distribution channels.

KEYWORDS:

Backflushing, Order Completion, Production Capacity, Production, Resource Tools.

INTRODUCTION

Any manufacturing or industrial business must have a strong production process. It entails converting beginning resources, elements, or inputs into final products or things that are prepared for sale or distribution. Planning and sourcing are only the beginning of the production process, which also includes manufacturing, quality control, and final packaging. This procedure is crucial for satisfying client needs, increasing productivity, and guaranteeing product quality. We shall examine the main elements and goals of the manufacturing process in this introduction [1].

Careful planning and scheduling are the first steps in the manufacturing process. This include setting production objectives, evaluating resource needs, and planning the production flow. Production works smoothly, resources are used effectively, and customer needs are fulfilled on schedule thanks to effective planning. Procurement is the process of finding and obtaining the raw materials, components, or pieces needed for manufacturing. Choosing trustworthy vendors, securing advantageous contracts, and controlling inventory levels to prevent stockouts or surplus inventory are all components of efficient procurement practices. A smooth flow of materials throughout manufacturing is guaranteed by effective inventory management.

Converting raw materials or component parts into completed goods is the central task of the manufacturing process. Depending on the kind of product, this could include different manufacturing processes including assembling, machining, moulding, or fabrication. The manufacturing operations are carried out while following to quality standards and production norms, using machinery, equipment, and skilled labour.

To guarantee that goods satisfy required standards and consumer expectations, quality control is a crucial step in the manufacturing process. At many stages from raw material inspection through in-process supervision to final product testing quality checks and inspections are carried out. In order to preserve the quality of the product and the happiness of the consumer, any flaws or deviations are found and fixed. The items are prepared for packing when the production and quality control operations are finished. This include selecting the right packaging supplies, labelling, and making sure the product is presented properly. Packaging protects the product during storage and transit, improves brand recognition, and gives consumers the information they need [2].

Organising the distribution and logistics of the completed items is the last step in the manufacturing process. To guarantee effective delivery to clients or distribution channels, this involves organising transportation, managing warehouses, and optimising supply chain operations. Effective logistics management shortens lead times and lowers storage and transportation expenses. The goals of satisfying client requests, improving operational efficiency, and preserving product quality are what drive the manufacturing process. Organisations may strengthen their competitive advantage, maximise profitability, and provide high-quality goods to the market by simplifying production operations, optimising resource allocation, and continuously upgrading processes [3].

DISCUSSION

The numerous phases and tasks involved in the creation or assembly of finished commodities and semifinished goods make up the manufacturing process. Depending on the kind of material being produced and the manufacturing strategy being employed to generate it, organisations use a range of production or manufacturing processes. Manufacturing techniques including discrete, repetitive, and process manufacturing are among the most popular ones. Manufacturing that is repeatable and discrete produces physical goods like automobiles, computers, and bicycles. Each unit created is a "discrete" unit, which means it can be counted and is different from other units. Additionally, the materials used to construct the item, such as the wheels and bolts on a bike, are identifiable. But there is a key difference between repetitive and discrete production. The same material is manufactured repeatedly over a long period of time at a comparatively steady pace in repetitive production. In discrete manufacturing, various materials are produced over time in small batches by the firm, with the materials often switching places on a production line [4]. Process manufacturing, in contrast, describes the creation of goods like paint, chemicals, and drinks that are not produced in discrete pieces. Instead, they are created in large amounts and are quantified in units like gallons and litres. Additionally, since the final product contains mixtures of the component components, it is impossible to distinguish them after manufacture.

Consider trying to determine the primary components of a gallon of paint, for instance. Discrete, repetitive, and process manufacturing are shown in the real-world example that follows, as used by Apple, Intel, and Valero, respectively. However, regardless of the specific manufacturing method utilised, businesses often use the make-to-stock and make-to-order production techniques. The requirement to raise inventory initiates the production process in make-to-stock manufacturing. In order to fulfil client orders, inventory is often kept in a warehouse. Even if there are no open client orders, the make-to-stock process begins when inventory drops below certain levels. Contrarily, with the make-to-order technique, the necessity to fulfil a specific client order initiates manufacturing. In other words, it doesn't start until a buyer places an order [5]. A streamlined manufacturing procedure was adopted. In Figure 1, we depict this procedure. A request for production initiates the process. The warehouse is now able to release the raw materials since the request has been approved. These

resources are used in production to create the needed items, which are subsequently transferred to storage.

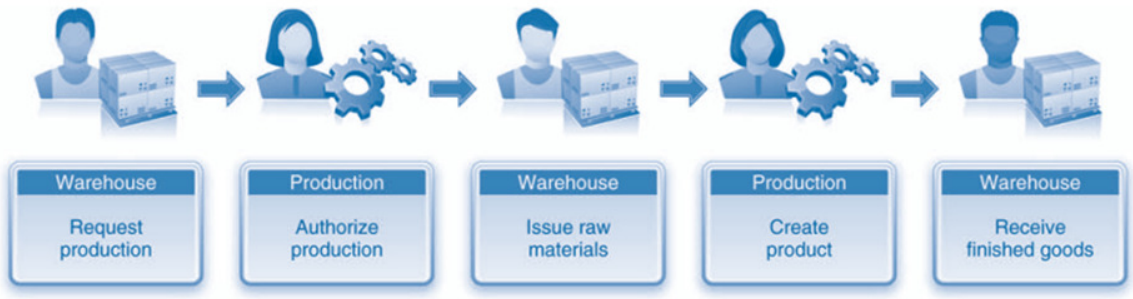

Figure 1: Illustrate the basic production process.

We go into great depth about the manufacturing process in this chapter. Make-to-stock manufacturing is a method used by GBI. Additionally, it uses a separate manufacturing method to create the various bicycle kinds in predetermined numbers or lots. We identify the master data associated with the manufacturing process to start our discussion. The specific process stages are then thoroughly examined. Finally, we will look at how reporting connects to production. Client, business code, plant, and storage site are the four main organisational variables that have an impact on production. All of these facts have previously been covered in earlier chapters. As a result, we won't discuss them in this chapter. Bills of materials, work centres, product routings, material masters, and production resource tools are examples of master data that are pertinent to production. Let's take a closer look at each of them [6].

Bill of Materials

A bill of materials (BOM) lists the parts required to make a certain substance. The BOM is a comprehensive inventory of all the ingredients, including raw materials and semifinished products, that are required to make a certain quantity of the item in discrete and repetitive production. The BOM, which comprises a list of materials required to make a certain amount of the product, is sometimes referred to as a formula or recipe in process industries like chemicals, oil and gas, and drinks. We shall restrict our attention to discrete manufacturing in this book. A bill of materials (BOM) is a hierarchical representation of the components required to make a finished item or semi-finished good (see Figure 2). BOMs may be quite simple or extremely complicated, depending on the material. A BOM for a ballpoint pen, for instance, only includes a dozen or so components or pieces [7].

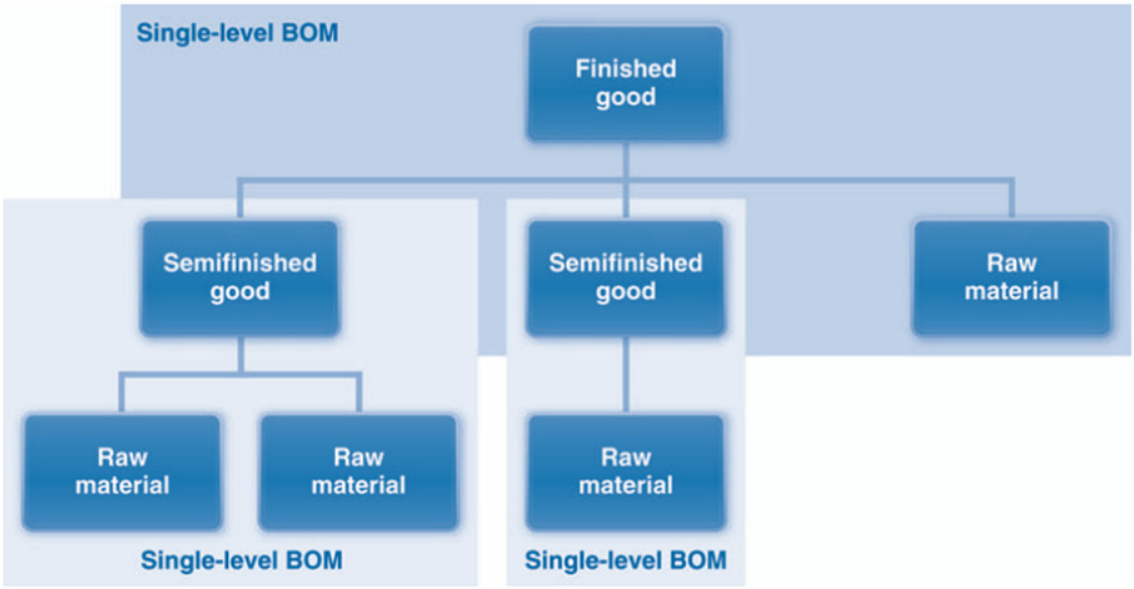

Figure 2: Illustrate the Single- and multi-level BOMs.

The BOM for a Boeing 747 aeroplane, on the other hand, is very complicated and contains more than 6 million materials. BOMs may either have a single level or many levels. A multi-level BOM has more levels than a single-level BOM, which only has one level in the hierarchy. For instance, the BOM of an aircraft could have more than 50 levels. BOMs are classified as single levels in SAP ERP. But by layering a number of single-level BOMs, SAP ERP may create multi-level BOMs. When a component in a bill of material has its own bill of material, this is referred to as nesting. Figure 2 depicts this structure as a multi-level BOM made up of three single-level BOMs. Three things are included on the BOM for the finished good: two semifinished products and one raw material. Every semifinished item, in turn, has a BOM made up of one or more raw ingredients. (The raw materials come from an outside source and don't have a BOM.)

A BOM for a material is defined significantly at the plant level. In other words, many plants could use various BOMs to create the same material. When several materials were employed to produce the substance, this is the situation. For instance, while producing a completed item, one plant can utilise a slightly different bolt than another plant. The touring bikes' BOM (Figure 3) shows the components needed to put the bikes together. While the deluxe touring bikes have a deluxe wheel assembly made of carbon composite wheels, the professional touring bikes have a professional wheel assembly made of aluminium wheels. The carbon composite frames for the professional and deluxe motorcycles are available in three colours: red, black, and silver [8].

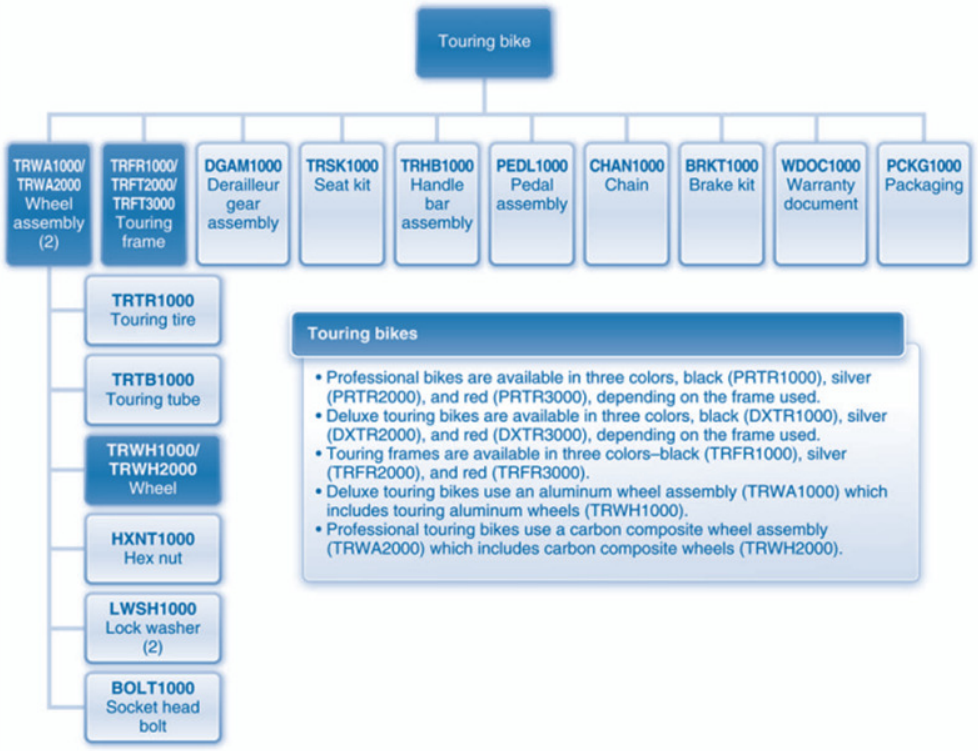

Figure 3: Bill of materials for touring bikes.

Men's and women's off-road bikes with aluminium frames and wheels are also produced by GBI. The size of the frame on men's bikes is different than that on women's bikes. In Figure 4, the BOM for off-road bicycles is shown.

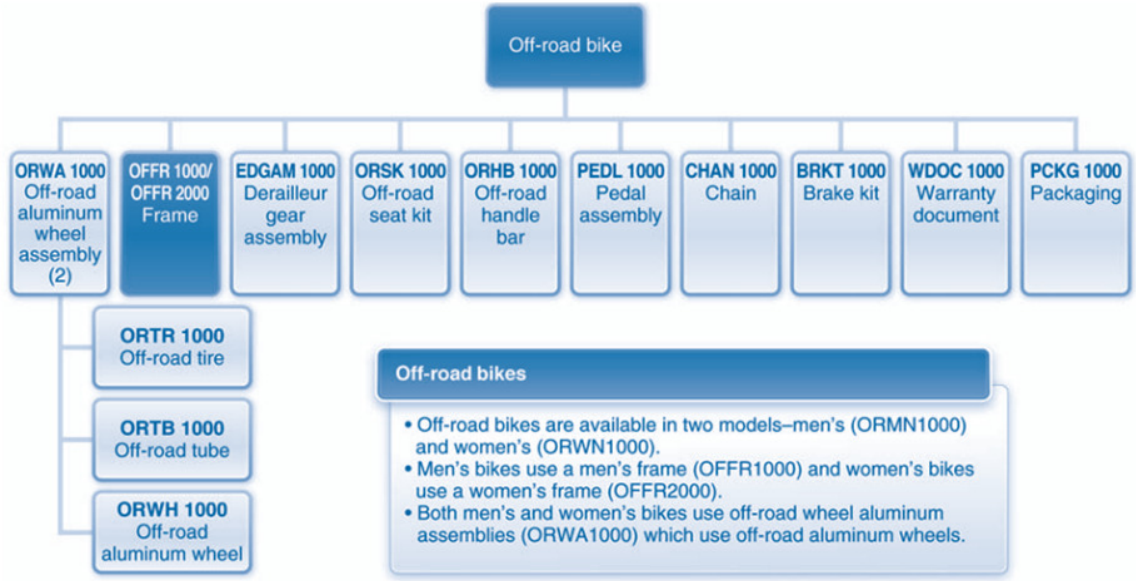

Figure 4: Bill of materials for off-road bikes.

Multi-level BOMs are shown in Figures 3 and 4. The wheel assembly is a semifinished item that is produced utilising three basic materials in both figures. All of the remaining component elements are raw substances. The BOM will be changed to reflect that the pedal assembly is a

semifinished product if GBI chooses to manufacture it rather than buy it. The second level of the BOM will also include the basic components required to create the pedal assembly. Making a production order is the main duty of the authorise manufacturing stage, as we have explained. This work may be accomplished in a variety of ways. A production order may be produced with or without reference to a scheduled order, as we've previously seen. Additionally, scheduled orders may be converted whole, partly, or separately. One planned order is transformed to one manufacturing order via individual conversion. Multiple intended orders are handled simultaneously, or collectively, during collective conversion. One or more manufacturing orders may be the result. Finally, partial conversion refers to the inclusion of just a portion of the anticipated order quantities in the manufacturing order.

Partial conversion often results in many manufacturing orders, each of which refers to a portion of the material in the intended order. Choosing the relevant master data, such as BOM, routing, and PRTs, is another step in building a production order. Remember that the processes required to generate the material are identified by a route. Sometimes, the ERP system will choose a suitable route on its own. The system then moves the chosen routing's activities into the production order. Additionally, a route may be chosen manually. In these situations, the system presents the material's available task lists or routings, and the person producing the production order selects the most suitable one. Significantly, a production order may be created without a route being specified. In this instance, the system develops a default operation automatically, which is then included in the production order [9].

Remember that the BOM lists the parts required to make the substance. Once again, the system chooses an appropriate BOM and adds the components to the manufacturing order automatically. Components must be manually added to the manufacturing order if there is no BOM available. Now imagine that (1) the production order is prepared using a planned order as a reference and (2) the planned order contains the BOM and the routing information. In this instance, the system incorporates this data into the manufacturing order automatically. Keep in mind that the material master is not queried again for the actual BOM and routing information. Instead, information about the operations and components is simply transferred from the planned order into the production order. Additionally, even when either the BOM or the routing changes, these data are not immediately retrieved from the material master after they have been added to the production order. The system has to be manually prompted to re-read or obtain the BOM and routing data in order to reflect changes.

Throughout the process, many production-related processes are occasionally completed. Period-end close is another name for periodic processing. In order to update the data in financial statements, companies define certain time periods, such as months or quarters, when they perform various accounting procedures. The determination of work-in-process, overhead allocation, and order settlement are all examples of periodic processing. The direct manufacturing expenses are added up in the production order. Indirect costs or overhead costs are used to describe additional expenses that are not directly related to production. Ones who are not directly engaged in production at the work centres, such as managers and supervisors, are paid wages in addition to facility expenditures like utilities and maintenance. These expenses are amassed in designated cost centres and recurringly distributed to the production orders in accordance with predefined procedures [10].

A decrease in the inventory of these materials is noted when they are released to manufacturing. The finished items are not finished, nevertheless, and are not added to inventory until thereafter (at the moment of satisfactory reception). Neither the finished products nor the component materials are included as inventory items in the balance sheet during this interim period. Instead, they fall under the category of work-in-process (WIP) inventory. If the manufacturing

process is brief and the material value is low, as in the case of GBI, WIP is not a significant problem. For things like buildings and aeroplanes, however, manufacture may take months or even years, and the value of the inventory used at that time is extremely high. In these circumstances, the manufacturing materials are regarded as WIP inventory and need to be accurately recorded in the general ledger. To complete this duty, a business will compute the value of WIP on a regular basis and publish the results to the general ledger so that the financial statements reflect the current inventory correctly. A business has a variety of methods for calculating WIP. A consideration of these strategies, nevertheless, is beyond the purview of this work.

As we said previously, a variance is the difference between the total debits and credits in the manufacturing order. These discrepancies must be resolved, that is, posted to the proper general ledger accounts, either regularly or after the manufacturing order is finished. The variation amount is credited to the manufacturing output settlement account. Remember that the whole cost of manufacturing is included in this account since it was credited at the goods receipt phase. A pricing difference account or a manufacturing output settlement variance account, for example, may receive an offsetting entry [11].

CONCLUSION

As a whole, the manufacturing process comprises a series of basic and complex steps that turn raw resources into completed goods. Careful planning, sourcing, production, quality control, packaging, and distribution are all required. Sustainability and environmental effect should be taken into account throughout the manufacturing process. Responsible manufacturing benefits from the adoption of eco-friendly procedures, the reduction of waste production, and energy use optimisation. Businesses that prioritise sustainability improve both the environment and the reputation of their brands. Organisations may achieve operational excellence, provide high-quality goods, and satisfy customer expectations by managing the manufacturing process well. It requires a comprehensive strategy that covers planning, acquisition, production, quality assurance, packaging, and distribution. To guarantee long-term success in a company environment that is continually changing, concerns for continuous improvement, innovation, and sustainability are crucial.

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CHAPTER 10

INVENTORY AND WAREHOUSE MANAGEMENT PROCESSES

Ms. Anandasrinivasan Deviprabha, Assistant Professor
Masters In Business Administration, Presidency University, Bangalore, India
Email Id: deviprabha@presidencyuniversity.in

ABSTRACT:

The effective storage, monitoring, and transportation of items inside a company is made possible by inventory and warehouse management operations, which are essential elements of supply chain management. An overview of important theories and methods for managing inventories and warehouses is given in this paper. Maintaining ideal stock levels, reducing stockouts and excess inventory, and guaranteeing proper monitoring of inventory throughout its lifespan are all essential components of effective inventory management. To maintain inventory accuracy, it comprises procedures like demand forecasting, inventory replenishment, and cycle counting. Organisations may optimise inventory levels, lower carrying costs, and boost overall operational efficiency by using inventory management approaches including ABC analysis, just-in-time (JIT) inventory, and economic order quantity (EOQ) models. The physical components of managing and storing merchandise inside a facility are covered by warehouse management. In order to facilitate effective material movement, it requires layout design, warehouse organisation, and optimal space use. Picking, packing, shipping, put-away, and receiving are important warehouse management procedures. By using technologies like barcode scanning, RFID, and warehouse management systems (WMS), these procedures may be made more efficient, mistake rates can be decreased, and inventory visibility is improved.

KEYWORDS:

Inventory Management, Interim Storage Areas, Stock Transport Order, Warehouse Management.

INTRODUCTION

Inventory management and control are often used interchangeably. However, they really relate to two distinct concepts. Managing stored inventory is a topic of inventory control. Contrarily, inventory management is a more comprehensive word that covers the complete stock management process, from ordering to shipment. Effective stock storage and lowering warehouse expenses are key components of inventory management. By preventing deadstock and stockouts, it seeks to create balanced stock levels. When done properly, this increases cash flow and saves money without having an adverse effect on consumers [1].

However, it's crucial to establish a reliable method of inventory management before you polish your business's inventory control procedure. You must first communicate with suppliers and simplify fulfilment in order to get your warehouse up and operating efficiently. The inventory management procedure comprises 5 steps. It's crucial to make sure you have the fundamental processes covered before you can enhance your inventory management process. Five crucial phases that are necessary for every inventory management process are outlined below:

1. Receive and examine the goods

Receiving your order from the supplier is the first stage in the inventory management procedure. For the next phases to go as smoothly as possible, it is essential to get this section

correct. When the order is delivered, the first thing that should be done is to examine the goods. Making sure the amount, product, and serial codes are all accurate is crucial. Additionally, you should make sure that all items are in excellent shape and that handling circumstances, such as temperature, are appropriate for perishables.

2. Arrange and stock goods

The items must be properly kept in the warehouse and entered into your leave management system once they have passed inspection. Being deliberate about product storage at this point is a smart idea. Techniques for categorising items in the warehouse by SKU and product category might be useful. Additionally, it's critical to keep best-selling items close at hand by keeping them in the most convenient storage locations.

3. Accept the client's order

Taking client orders is the next phase in the inventory management process. A point of sale (POS) system will normally be used to handle the orders and take payments. The warehouse workers will be able to examine the order data thanks to the POS system's inventory management capability, which is either built-in or connected to an inventory management programme.

4. Complete the order and dispatch the package

After a consumer place an order, the following step is to precisely and quickly supply the order, package it, and send it. Finding and choosing the items in the warehouse should be quite simple if the second phase of the process was improved. When packing a product, it's crucial to take the consumer experience, durability, and sustainability into account. Send the buyer a confirmation email with tracking information as soon as the merchandise has been sent [2].

5. Order fresh inventory

It is essential to check that the quantity of items and the timing of new orders are accurate while replenishing your stock. Utilising the reorder point method can help you reduce the likelihood of stockouts and deadstock, two issues that have a detrimental effect on your bottom line. Reordering is automated by certain inventory management systems, which saves time and eliminates errors due to human error.

DISCUSSION

The IM-related products movements presented in earlier chapters will be reviewed and expanded upon in this chapter. Then, in the context of the procurement, fulfilment, and production processes, we will talk about the organisational data, master data, and procedures connected to WM processes. We will also emphasise the connections between IM and WM in these conversations. The four product motions involved in inventory management are shown in Figure 1. The products receiving process, shown by a "1" in the figure, has previously been covered in relation to the procurement and manufacturing processes. In a similar manner, we covered the goods problem (shown as "2" in the figure) in relation to the fulfilment and manufacturing processes. In earlier chapters, we also discussed stock transfers ("3") and transfer postings ("4"). We will go through and expand on the topics of these commodities movements in this section. Remember that businesses carry out goods movements using certain movement types that establish the data required to carry out the movements and the general ledger accounts that will be impacted [3].

The chapters on production and procurement concentrated on a products receipt that is produced against a production order and a purchase order, respectively. However, it is normal

to record a goods receipt without making mention of an order. The initial receipt of merchandise and an unanticipated reception from a vendor or an unanticipated return from a client are the two situations in which this happens. When a SAP ERP system is first deployed, an organisation utilises a movement type that includes the first receiving of inventory. The number of items in inventory grows as a consequence of this movement, and the general ledger accounts get the necessary posts. When a reference document, such a purchase order or a manufacturing order, is missing, unexpected receipts happen. For instance, a supplier could provide items for free (perhaps as samples), while a client might return products without prior consent. When this occurs, the business adds these items to inventory using a goods receipt and the relevant movement type [4].

A goods problem causes inventory to decline as opposed to a goods receipt, which increases it. A goods issue in the fulfilment process denotes the delivery of finished products or the exchange of items with a client in response to a sales order. A products issue in the manufacturing process refers to the issuance of unfinished or semifinished items in response to a production order. After that, these components are put to use in the manufacturing process to produce finished items. Last but not least, a goods issue generates the necessary CO, FI, and material papers.

A goods problem might be unintended, much as a goods receipt. In other words, a products problem might happen independently of a sales order or a manufacturing order. Such a commodities movement often takes place when items are given away for scrap, sampled, or used for internal purposes. Materials are thrown away or trashed when they are no longer useful because of ageing or obsolescence. Testing the quality of the materials is part of sampling. The corporation only checks a small sample of the materials instead of examining all of them if the testing is destructive that is, if the method makes the materials useless or if the materials are costly. Last but not least, items may be removed for internal use, such as for research and development. In each of these scenarios, the right movement type is necessary [5].

Transfer Postings

Several additional circumstances, in which there isn't always a physical transfer of things, call for the usage of a transfer posting. Here, we take into account two scenarios: stock posting from consignment to warehouse and posting from material to material. A material's material number may be changed via a material-to-material posting. This method is often used in sectors like medicines and chemicals where a material's properties alter over time. Boiling and cooling grains and water is one of the phases in the process of making beer, for instance. Yeast is added to this substance, which is known as wort, and then put into a fermentation vessel. Beer is created after the fermentation of the wort. As a result, over time, one substance (wort) transforms into another (beer). Additionally, a business may sometimes alter a material's material number. In both situations, the business utilises a transfer posting with the proper movement type to change the material number from the old number to the new number [6].

Vendor-owned inventory, or goods that are kept in the customer's premises even if the vendor maintains ownership, is the second situation in which a transfer posting is not followed by a physical movement of materials. Large corporations like Walmart often have arrangements like this. Let's utilise GBI to show how this procedure works. Imagine that GBI and one of its suppliers have a contract that calls for raw materials to be delivered to GBI on a consignment basis. In this instance, the materials' inventory amount is raised and their status is changed to consignment stock after the goods receipt is submitted. The materials are not recognised in GBI's balance sheet, but the company has no debt to the seller. Therefore, the products received has no impact on GBI's financial situation. The vendor account, the account used for accounts

receivable reconciliation, and the inventory account are unaffected. When GBI utilises the raw materials in the manufacturing process, the materials' status will shift from consignment to warehouse stock (either for unrestricted use or for quality inspection). Now that the supplies have been utilised, there is a financial effect that is reported in the general ledger using the proper movement type: GBI owes the vendor for the amount of materials used [7]. There are three alternatives for transferring materials, depending on the organisational levels involved: employing a one-step process, a two-step procedure, and a stock transit order. At the conclusion of this section, stock transport orders are discussed. Figure 1 depicts the one-step and two-step processes.

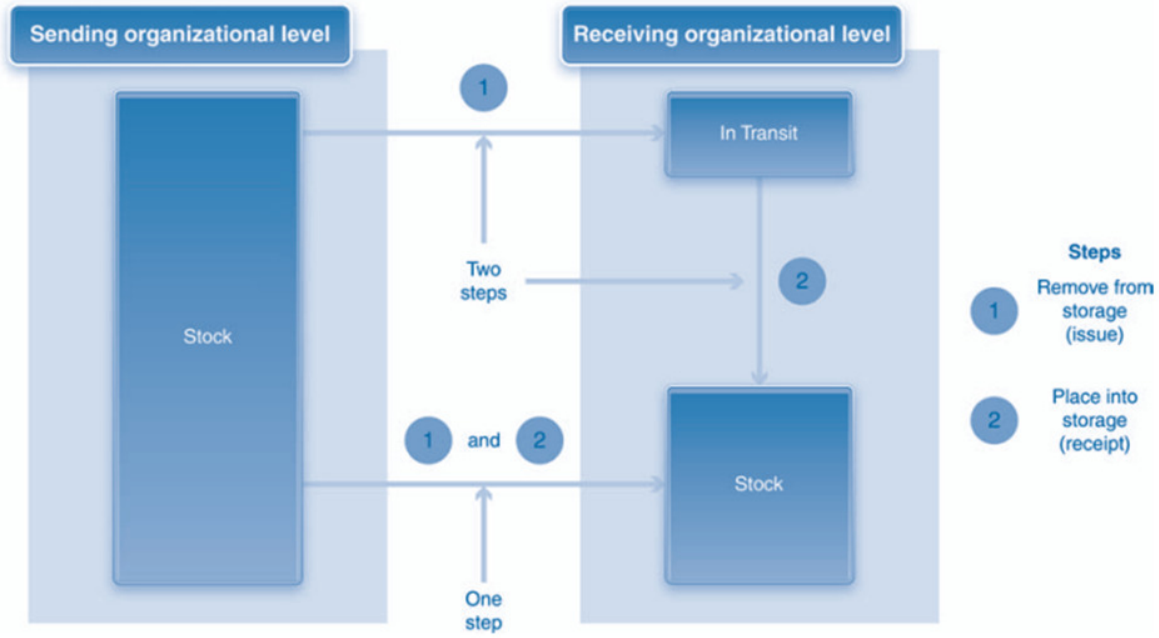

Figure 1: One-step and two-step procedures.

Issue and reception are the two activities that make up material motions. When materials are issued, they are taken out of storage at the providing or sending site, and when they are received, they are put into storage at the receiving or destination location. As suggested by the name, both jobs are completed in one step when using the one-step technique. As a result, a quantity drop at the place that supplies and an increase at the location that receives are noted simultaneously. This approach is suitable when the two places are nearby and there isn't a significant delay between issuance and reception. In contrast, a two-step technique requires two stages to fulfil the two jobs. The moment the supplies are taken out of storage, the first phase (problem) starts. At this point, the quantity of inventory is decreased at the place that supplies and increased at the destination location at the same time. The commodities, however, are given the in-transit stock status here since they do not reach the target site right away.

Later, a second step (reception) transforms their status from being in transit to being available for unrestricted usage (or another state), depending on the final location. When there is a delay between the two steps, such as when the sites are far apart geographically, businesses use the two-step movement. The destination site is informed that supplies are on their way there by the in-transit status. When the same individual lacks the authority to make changes at both sites, the two-step movement is employed in this circumstance as well. However, despite their conceptual differences, stock transfers and transfer posts are both carried out via a transfer posting in SAP ERP. The difference lies in the particular form of movement that is used. A material record is prepared throughout both the one-step and two-step processes, just as in any commodities transfer. One material document is produced during the single-step method. Each material transferred is represented by two line items in this record, one for the issue at the providing site and the other for the reception at the receiving place. Two material documents are generated throughout the two-step process: one at the time of issuance and one at the time of reception.

For each material transferred, there are two line items in the material document prepared in the first step: one for the issue and one for the reception into in-transit status. Because the movement (from in transit to unrestricted usage) only takes place at the receiving site, the material record prepared during the second phase only comprises one line item for each material transferred. Depending on the organisational levels involved in the movement, it may or may not have a financial accounting effect and, as a result, result in the creation of FI documents. Storage location to storage site, plant to plant, and company code to company code are the three organisational level pairings that are conceivable. We then talk about them.

Transfer from one storage location to another

A storage location-to-storage location transfer occurs when stock is moved between two storage areas inside the same plant. The movement of materials inside a single plant is done for a variety of reasons. Materials obtained from a vendor or from manufacturing may sometimes be first kept in a temporary staging area and then transferred to a more permanent location. Stock transfers are used to move items from the staging area to the permanent site since it is designated as a storage location. Another situation is the need that all items obtained from a vendor be examined for quality prior to being positioned in their permanent positions. These items are originally set up where the examination will take place. This inspection area is classified as a storage place, exactly like the staging area we just spoke about. The business employs a stock transfer to shift the items to the more permanent location once the inspection is over [8].

One-step or two-step processes may be used to complete a transfer inside a plant, as shown in Figure 2. Specific movement kinds are indicated by the numbers on the arrows. Keep in mind that the materials may be in any stock state in the providing site and can be transferred into any stock status in the receiving location when using the one-step approach. A two-step process, on the other hand, is only feasible when the resources are being used freely at the site that supplies them. Additionally, the materials may only be used without restriction.

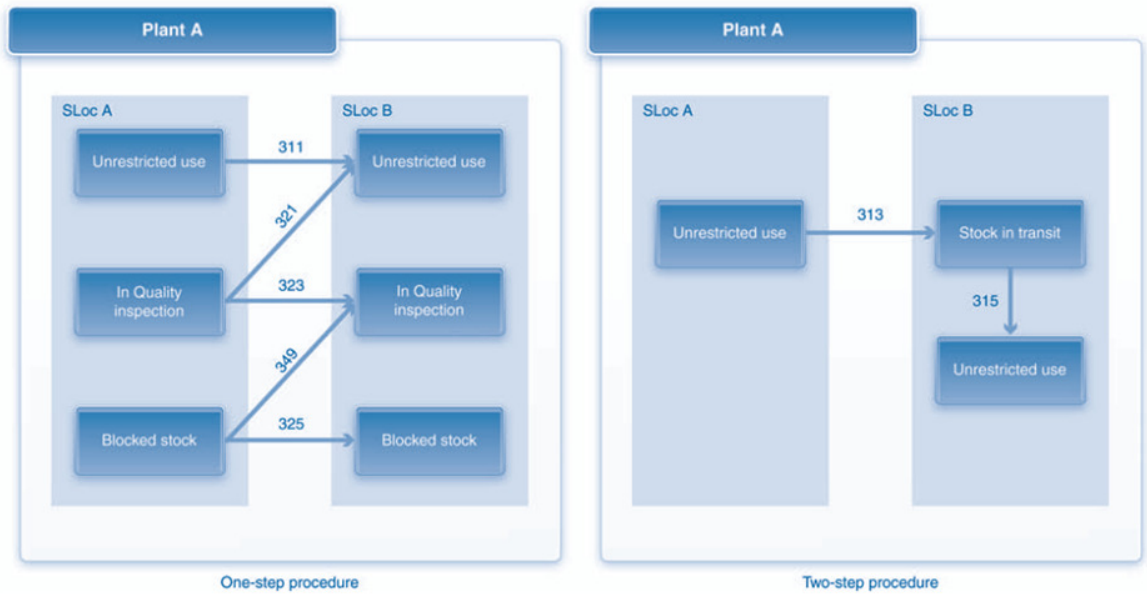

Figure 2: Stock transfer within a plant

The amount available for unrestricted usage at the place that supplies is decreased when the first step (issue) is posted, and a comparable increase is reported in the location that receives. The merchandise, however, is in transit at the receiving site. The status of the contents is changed to unlimited usage when they are actually received.

Transferring materials between storage sites within the same plant has little impact on valuation since materials are normally appraised at the plant level rather than the storage location level. Consequently, no FI document is produced. When all amounts of the same materials are valued equally, this statement is true. However, sometimes different amounts of the same substance have a distinct value. For instance, commodities generated inside are valued differently from those acquired externally, as are those bought from various suppliers. The corporation keeps separate material accounts for each valuation type when materials are evaluated differently via a procedure called as split valuation. A financial accounting effect results from the transfer and the creation of a FI document if the item being transferred is split-valued and the valuation type changes as a consequence of the transfer.

Transfer from Plant to Plant

Plant-to-plant transfers refer to the transportation of materials between two plants that are part of the same business code. Plant-to-plant transfers may be executed using a one-step or two-step approach, as shown in Figure 3. Normally, only items with the unrestricted usage status are transportable across plants. The amount of materials in inventory is decreased at the issuing plant (Plant A in the figure) and raised in the receiving plant (Plant B) in both the one-step and two-step processes. The receiving plant's supply situation has changed. The materials are made available for unrestricted usage at the receiving facility in the one-step operation. In contrast, a two-step process places the materials in the stock in-transit state at the receiving site after the first step (issuance), and when the materials are actually received, the status is changed to unrestricted usage.

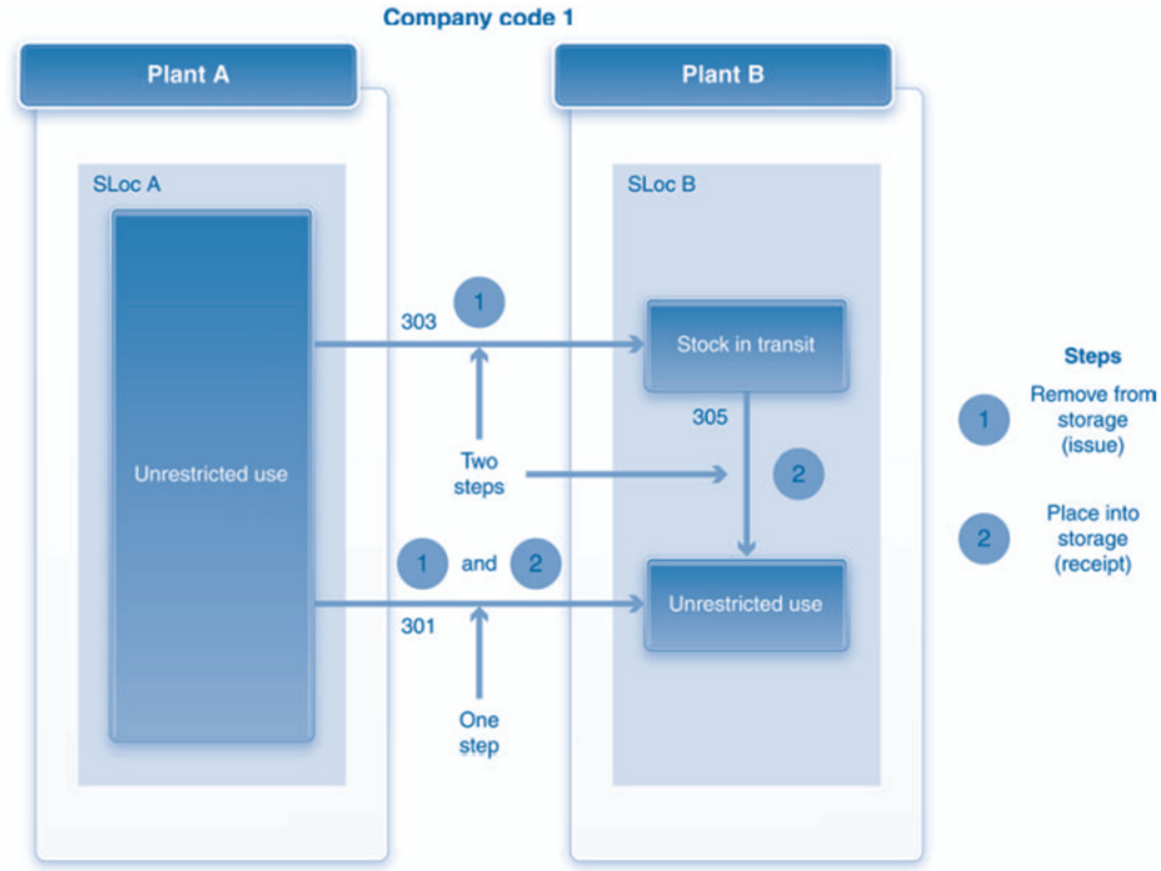

Figure 3: Illustrate the Plant-to-plant transfer.

Material papers are produced as a consequence of plant-to-plant transfers and storage site-to-storage location transfers. Each material transferred results in the creation of a single material document with two line items. Two material documents are generated in the two-step process: one at the time of issuance and one at the time of reception. There is just one line item in the material document that was prepared at the time of receipt.

A movement from one plant to another signifies a change in the value of the materials since materials are valued at the plant level. There is a consequent FI effect. Both one-step and two-step actions are used to build a single FI document. The FI document is prepared at the moment of issuance, when the accounting effect happens, in the two-step procedure. Therefore, at the moment of receipt, no FI document is produced. The material is also evaluated at the valuation price of the facility that supplies it [9].

Transfer from Company Code to Company Code

A transfer from one company code to another for materials between two facilities is referred to as a company code. Both the one-step and two-step processes may be used to complete this kind of transfer. The motions are remarkably similar to transfers from one plant to another in both situations. The two facilities in this instance are situated in distinct company codes, which is the apparent difference. As a result, two FI documents one for each business code are produced. The material account is represented by one line item, and the offsetting line item is for a clearing account set up to handle such a transfer.

Orders for Stock Transport with Billing and Delivery

The business registers a goods receipt against the STO when it gets the supplies at the receiving facility. The amount retained for unrestricted use grows, material accounts are debited for the cost of the materials received, and the GR/IR account is credited, just as in the procurement process. Documents and related materials are produced. Notably, the value in this scenario is based on the STO's purchase price as opposed to the other two STO-related situations. From the standpoint of the fulfilment process, the providing plant subsequently generates an invoice based on this pricing, which serves as the selling price. As a result, the value of the delivery facility is unaffected by the valuation of the materials. Instead, it is based on a transfer price that has been agreed upon by the entities that make up an organisation. The system changes the relevant revenue and receivables accounts in the general ledger of the sending plant when the billing document is produced.

The invoice is subsequently verified by the receiving facility, just as during the procurement procedure. The system updates the proper GR/IR and accounts payable records in the general ledger of the receiving plant. Additionally, corresponding FI documentation are produced. In contrast to the purchase procedure, no explicit payments are made by the receiving plant to the providing facility. Instead, when the invoice validation stage is finished, payment is made by a money transfer between the proper accounts in the two business codes. The accounts payable and receivable accounts are also updated at this time. As per typical, related FI documentation are produced. When moving commodities between factories, employing a STO offers several benefits over traditional stock transfers [10].

1. When a STO is formed, the business may do an availability check to see if materials are available in the factory that supplies them.
2. The STO may include delivery fees and the chosen carrier.
3. Both factories' material planning may take into account the quantities in the STO as well as anticipated deliveries and revenues.
4. STOs rather than POs may be created from purchase orders.
5. The STO's purchase order history section allows users to keep track of the history of the numerous tasks connected to the STO.
6. Goods may be received in a variety of stock statuses, including blocked stock and quality inspection.

In summary, inventory management involves organising and transporting commodities between storage areas inside a plant or across facilities. The plants could be associated with one business code or many. Depending on the sort of movement, a number of alternatives are available for moving materials. The movement is at the level of the storage site in all of the solutions we have thought about. Recall that supplies are maintained in storage areas until they are required. Large rooms in a building, or even a specific sector inside a big room, may serve as storage sites. It's crucial to remember that although IM can monitor the number of things in a storage area, it cannot pinpoint exactly where they are. For instance, GBI's Dallas facility features a raw material storage area (RM00) where it keeps a variety of supplies such tyres, tubes, frames, and wheels until it needs them for manufacturing. Although IM can monitor the amounts of these goods at the storage facility, it is unable to pinpoint the precise position of each substance. Therefore, the plant staff must manually find the raw materials when production requires them [11], [12].

CONCLUSION

The storage and transfer of items inside an organisation are dealt with by inventory and warehouse management (IWM) procedures. IWM and the manufacturing, fulfilment, and procurement processes are tightly intertwined. Warehouse management (WM) comprises procedures that enable sophisticated administration of materials inside and between facilities, while inventory management (IM) concerns the flow of items into and out of plants. Organisations that need to carefully monitor their enormous amounts of pricey goods are more likely to utilise WM. Typically, a transfer demand, which is triggered by an IM operation that generates a need to move products, starts the WM process. The movement is planned using a transfer need, and is subsequently carried out using a transfer order. The items are physically transferred to and from the storage bins once the transfer order has been established, and the transfer order is then confirmed. The main connections between IM and WM are transfer needs and temporary storage spaces. Four goods movements make up IM: stock transfer, transfer posting, goods receipt, and goods issue. The information required to complete a goods movement and the general ledger accounts that are impacted are determined by specific movement types.

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CHAPTER 11

A BRIEF DISCUSSION ON MATERIAL PLANNING PROCESS

Dr. Narayana Srikanthreddy, Assistant Professor
Department Of Management, Presidency University, Bangalore, India
Email Id: srikanthreddyn@presidencyuniversity.in

ABSTRACT:

The purpose of the essay is to assess the importance of production control and material planning for the realisation of an organisation. The supplies needed for every business are determined by the production schedules and sales projections. The planning and control process for the materials takes into consideration both the materials on hand or in the pipeline as well as those that are not yet available for the operation. The manufacturing flow process includes the crucial component of production control, whose goal is to maintain customer satisfaction by fulfilling delivery dates as scheduled. Any successful business should prioritise satisfying its clients. This includes satisfying them with the quality and quantity of their orders. In order to do this, it is necessary to set work routes and timetables properly in order to make the best use of resources, including personnel, equipment, and supplies, as well as to provide operators a way to guarantee that the plans are followed.A lack of sufficient material planning and management can cause any organisation to lose market share, clients, and maybe even its life. This underlines the need for organisations to pay close attention to how materials are used in the manufacturing process and to maintain a sufficient plan for the ideal inventory level. Since the cost of inventory accounts for a large portion of working capital for the whole organisation.

KEYWORDS:

BOM Selection Method, Demand Management, Master Production Scheduling, Net Change Planning, Planned Independent Requirements.

INTRODUCTION

The method for planning materials and production is a crucial component of a production plan. In assembly-line manufacturing, materials planning is crucial. Production is a manufacturing organization's main reason for being. Any manufacturing business has to deal with obtaining the raw materials, carrying out the processes necessary to produce the product, and giving the completed product to the clients. These tasks are not all as easy as they seem to be. It requires considerable forethought. Planning your materials resources becomes important in this situation. In a Manufacturing organisation, producing the ideal result is just as crucial as producing it at the appropriate time with the best use of the available resources. Production may possibly be summed up as the integration of purchasing, manufacturing tasks, and product delivery. Even so-called simple operations contain laborious tasks that need careful planning, such as "what material to purchase" and "when to purchase" completed goods. But there isn't a single answer that will work for all businesses when it comes to questions like "how the manufacturing process could be designed best," "what the ideal inventory level should be," etc. From one organisation to the next, the demands, procedures, and needs of the company as a whole vary, and the way that materials resource planning is implemented in the organisation changes in line with these variations. The goal of materials resource planning is to keep the least amount of inventory while still reducing expenses for the business. Prior to the notion of materials resource planning, it was of utmost necessity to stack and store a sizable quantity of the raw materials (also known as inventory) needed to carry out the manufacturing operations.

The corporation used this tactic to reduce ambiguity. However, it is certain that a hefty sum must be spent on inventory. In addition to this, there is always a chance that the material will be wasted because it may not be necessary to make the finished product, it may have gone bad due to its short shelf life, or the storage conditions in the organisation may not have been ideal for it. This drives up the price of producing a product even more [1].

Materials planning not only gives information about delivery and stocking but also about production planning and scheduling. Instability and fierce rivalry in the business environment are two characteristics of the new market circumstances created by economic globalisation and the opening up of trade markets. In terms of pricing, quality and range, service and delivery speed, competition is escalating constantly. The elimination of obstacles, international collaboration, and technology advancements increase competitiveness. In terms of production, the focus is on lowering costs while raising quality.

In the meanwhile, manufacturing companies deal with the same real-world issues regardless of their goods. Material planning is an essential component of the whole manufacturing process. It is crucial to successfully manage material planning since it has a significant impact on both the operational and production aspects. Keeping precise track of the organization's material requirements is crucial. If a business doesn't do this, the compensation charges that the firm would have to pay would be quite high and harsh.

When it comes to material planning, a corporation must deal with a wide variety of factors, some of which are crucial. Lot sizes and setup times, for instance, are crucial aspects of material planning. In addition, the problem of external supply chain participants is also significant. Another key development that occurs when a corporation is performing material planning is logistical problems. Materials planning is a sub-plan of the broad organisation plan since it is developed from the organisational planning process as a whole [2].

DISCUSSION

Historically, GBI's material planning has been fairly loose. Other procedures have not been connected with planning for diverse materials. Instead, the business purchases or creates materials as needed. But as GBI has grown to encompass additional facilities, supplies, and clients, a variety of issues have arisen due to the unstructured planning. Rarely are inventory levels adequate; sometimes there is too much inventory and other times there is not enough. Customers have on various instances demanded things sooner than GBI could provide them. This lack of comprehensive planning and coordination has led to higher costs from accelerated manufacturing or procurement, unanticipated expenditures from maintaining extra inventory, and missed revenues. The management of GBI is well aware that poor planning is the same as preparing for failure. They propose to adopt a productive material planning procedure at GBI as a solution to these issues.

Answering the following three simple questions is the focus of material planning: (1) What materials are necessary, (2) How many are required, and (3) When are they required? Any of these three questions that can't be correctly answered can lead to inefficiencies, lost sales, and unhappy customers. The basic goal of material planning is to maintain a balance between supply and demand for materials so that the right amount of resources are accessible when they are required [3].

The demand for materials, which makes up the first component of this equation, is mostly driven by other processes. For instance, the manufacturing process employs raw materials and semifinished items, while the fulfilment process uses trade commodities and finished goods. These procedures won't work well if the resources are not accessible when they are required.

For instance, if raw materials are unavailable, the business will be unable to provide completed items on schedule. As a result, it won't be able to complete client orders as the required resources aren't on hand. A stock-out is what we call this circumstance. If clients won't tolerate late delivery, a stock-out might lead to lost revenue.

The procurement and manufacturing procedures typically handle the supply side of the demand-supply relationship. In other words, materials are often either bought or created. Excess inventory is created when more resources are produced or purchased than is required. This causes a cash flow problem until the extra items are finally utilised. For the business, the money held up in inventory represents a lost opportunity. Storage fees, insurance premiums, and the possibility of obsolescence all incur additional expenditures. Additionally, certain commodities, such computer parts like memory and hard drives, might see a sharp decline in value [4].

Figure 1 shows a simplified material planning procedure. Sales and operations planning (SOP), which employs strategic revenue and sales targets set by senior management to produce specialised operations plans, is the first step in the process. These plans are converted into the specifications for specific materials during the demand management phase. Requirements outline how many supplies are required as well as their timing. The materials requirements planning (MRP) process uses these needs to produce the final procurement bids for all materials. These proposals start the manufacturing or purchasing procedures that create or acquire the required materials. These materials are ultimately used by the business to carry out the fulfilment procedure.

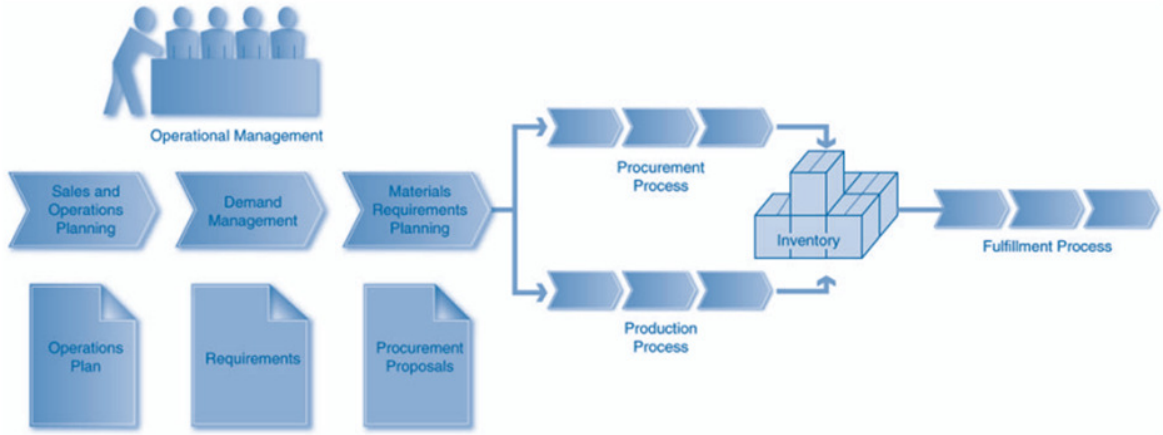

Figure 1: A basic material planning process.

The customer, business code, plant, and storage sites are organisational data that are pertinent to the material planning process. All of these ideas have been covered in earlier chapters, so we won't go over them again here. The master data associated with the material planning process is described in the next section. A thorough explanation of the procedure steps is included after this section. We talk about reporting in relation to material planning as we wrap out the chapter.

Client, company code, plant, and storage sites are organisational data that are important to the process of material planning. We won't go over any of these ideas in this chapter since we've already covered them in earlier chapters [5].

The master data pertaining to the method of material planning is described in the next section. A thorough overview of the procedure stages follows this section. A consideration of reporting in relation to material planning concludes the chapter. Figure 2 presents information on MRP and job scheduling. There may be a lot of MRP data. In order to make the data easier to understand, they are split into four views or tabs, referred to as MRP 1, MRP 2, MRP 3, and MRP 4. These facts apply to both discrete and repetitive production. We will only talk about statistics that are pertinent to discrete manufacturing. Information about MRP and job scheduling is defined at the plant level. In other words, they are unique to each plant. The company's strategy for the material is based on these statistics, which dictate the tactics and procedures it will use. As seen in the following list, each MRP view offers a unique collection of data.

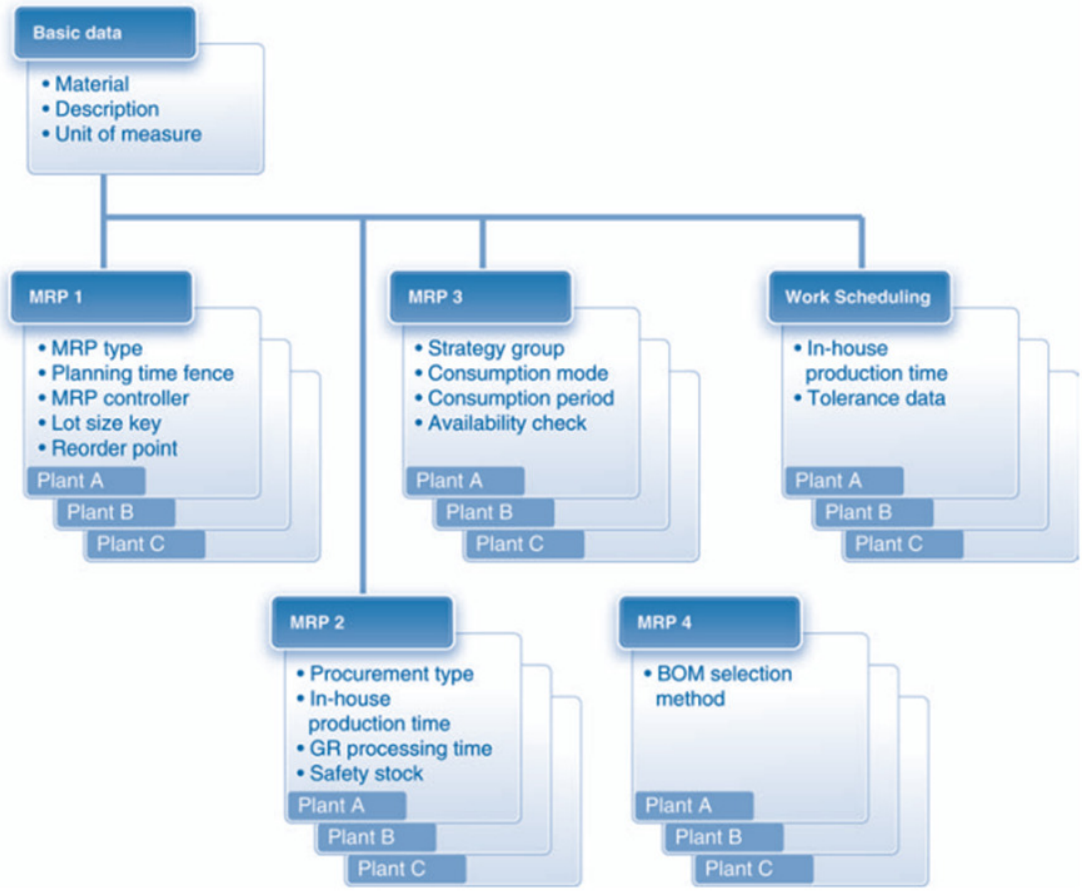

Figure 2: Material master data for material planning.

1. The MRP 1 view defines the overall material planning strategy and establishes the appropriate material procurement volume for the business.
2. The MRP 2 view identifies the window of time the system may utilise for scheduling and transmits information that the system uses to decide whether to create or purchase materials.
3. The MRP 3 perspective identifies the method the system will use to identify the amount of material that is readily accessible and how that material will be created.
4. The system takes data from the MRP 4 view to choose the right BOM.

The setup, takedown, and processing times are among the production time-related statistics in the task schedule view. The main information included in the MRP and work scheduling views of the material master is discussed in depth in the next section [6].

Type of Procurement

One or more procurement proposals are the byproducts of the material planning process, and these proposals may either start the manufacturing process or the procurement process. Depending on the procurement type, a material may be acquired outside (through the procurement process), internally (via the manufacturing process), both, or not at all. Typically, traders buy raw materials and trading commodities from vendors. As a result, the type of procurement for these items is designated as external. Finished and semi-finished items, however, are often made in-house. As a consequence, in-house manufacture is often used as the method of procurement for these kinds of commodities. But on occasion, a business will have to buy items from outside suppliers because it lacks the materials or other resources to make them internally. The procurement type is set to both in these circumstances. None of the procurement types should be used for obsolete materials. At GBI, the procurement type is defined as internal for partially finished items, as external for trade goods, and as internal for raw materials [7].

MRP Type

Engagement of the organisation is essential for MRP success. More often than not, Chief Executive Officer (CEO) engagement in the process is associated to successful implementations. Participation of the CEO creates the environment for concentrated organisational action. Avoiding system development based on "nice to have features" is another criterion. The MRP system's information should match the degree of detail needed for production. A system could appear stunning yet have extraneous functionality. Production employees draw a card and transmit it to the supplier, for instance, when a manufacturing system employing Japanese Kanab visual signals need extra raw materials from a supplier. Therefore, setting up a firewall and separating the deployment of the MRP system from present practise would be a mistake. To model organisational peculiarities and attempt to fit MRP around them, a "assessment of current situation" (see process model) should be carried out at the level shown in the picture.

Successful MRP instances are driven by ongoing monitoring of design and implementation efforts. In this regard, interconnections with other organisational information resources are a problem that should not be disregarded. Since MRP is a component of organisational information management architecture, it helps organisations accomplish more general objectives like quality, customer happiness, just-in-time delivery, etc. Monitoring, on the other hand, needs measurements. Metrics do not have to be universal; rather, they should match the supply and output needs of production planning.

By concentrating on the demand profile and manufacturing setup costs, we can discriminate between three different product kinds. We differentiate between four categories of materials with regard to manufacturing by concentrating on consumption patterns (steady vs. variable use), levels of supplier collaboration, demand, and cost. With sufficient consideration for the particulars of the production, entries of the table may be utilised to describe performance measures. Be aware that a single MRP system may be evaluated using several metrics depending on the product production it is intended to support. When MRP is considered in the context of organisational resource planning, a distinct viewpoint on measurements is revealed.

Types of MRP Users and Businesses

MRP systems may be divided into four groups based on their intended application and organisational deployment, known as ABCD. Class A denotes complete MRP implementation. MRP system comprises vendor scheduling, shop floor dispatching, capacity planning, and linkages to human resource planning. It is integrated with the company's finance system. Performance is continuously monitored, and precise master production schedules and inventory records are maintained. Class B denotes a partial implementation. The MRP system is only used in manufacturing, although it also includes master production scheduling. Class C reflects a traditional MRP strategy in which the system is restricted to inventory management. A MRP data processing application is represented by Class D. Instead of being a tool for making decisions, the system is used to keep track of data.

The second strategy utilises an exploding bill of materials in which certain components of an assembly are accessible but others are not. It is estimating the quantities of all materials (components) required for the manufacturing schedule. Thus, a bill of material is a list that includes the code, nomenclature, unit, amount, site of usage, and anticipated price for each component for each item. In order to combine the needs of various components, a succession of bills of materials are put together in a matrix arrangement to form an explosion chart [8].

The buying department receives the completed bill of materials and initials the purchasing actions. Thus, lead time is taken into consideration during material need planning. Bill of Materials preparation via list explosion is quiet and easy when using computers. What Are the Benefits and Drawbacks of Material Resource Planning? The following are some benefits and drawbacks of material resource planning, like with any system-based process:

Material Resource Planning Benefits

1. It supports keeping inventory levels at a minimum.
2. Materials planning also lowers related expenses when inventory levels are kept to a minimum.
3. Material tracking is made simple, ensuring that all lot orders are filled with an economical order amount.
4. Material planning optimises capacity utilisation and allots items the proper amount of time based on demand projections.

Material Resource Planning drawbacks

1. The inputs that material planning gets from other departmental systems are very important.
2. If input data is inaccurate, material planning results will likewise be inaccurate.
3. Maintaining a reliable database with all data relevant to inventory records, manufacturing schedules, etc. is necessary for material planning; otherwise, the result would be wrong.
4. To get the most out of the material planning system, end users must get sufficient training.
5. The material resource planning system requires a significant time and financial commitment.

Creating a Time Barrier

The quantities and timelines that the material planning process generates for procurement bids often need to be modified. For instance, higher-than-expected demand may result in unexpectedly high raw material usage. In certain situations, the planning procedure may

enhance the projected acquisition amounts or schedule them to arrive sooner. adjustments to procurement proposals made in the distant future often aren't a big deal, but adjustments made in the near future might be problematic since other departments or organisational procedures could have used the initial bids as the basis for their planning. Due to this, businesses set a time limit during which the ERP system is not permitted to automatically alter purchase bids. The planning time fence refers to this time frame. No purchase requisition with a date of 30 days or fewer from the present date may be updated automatically by the system, for example, if the planning time fence is set to 30 days. If adjustments must be made, they must be done manually [9].

Availability Check Group

The approach the system employs to assess whether a certain amount of content will be accessible on a certain date is defined by the availability check group. The most popular approach, known as available-to-promise (ATP), takes into account a wide variety of factors that describe the material's availability and demand. Existing inventory, purchase requisitions, purchase orders, and manufacturing orders are examples of supply aspects. Reservations for materials, safety stock, and sales orders are examples of demand components. The availability check group provides the system with information on the supply and demand factors it should consider when calculating availability. The availability check group is utilised by numerous processes since material availability is an issue in many areas of an organisation. For instance, it is used in the fulfilment process to guarantee that materials can be supplied to a client on the required delivery date and in the production process to guarantee that materials are accessible prior to the release of production orders [10], [11].

CONCLUSION

The term "materials planning" refers to a well-thought-out strategy for using the organization's inventory and resources to their fullest potential. One cannot overstate how crucial production control is. Any organisation must be proactive in terms of sufficient planning and production execution if it is to thrive and keep up with dynamism in a highly competitive environment. In order to obtain the proper output, one must buy the correct things in the right amounts for the right sort of task, with time being a critical factor in all aspects. This is where effectiveness and efficiency matter in material planning. Materials planning is the systematic planning of each and every component related to the creation of commodities. Planning to acquire materials is the foundation of the whole function of material management in any integrated system for materials management. The purchase function and subsequent material functions are launched by material planning. Similar to material planning, production control is a crucial area that organisations must manage. This involves creating work plans that assure the best possible use of resources, including people, equipment, and materials. Make provisions for ensuring that the plant operates in line with these plans, and initiate corrective action as needed.

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CHAPTER 12

A STUDY ON UNDERSTANDING PROCESS INTEGRATION

Mr. Kunal Saxena, Assistant Professor
Department Of Management, Presidency University, Bangalore, India
Email Id: drkunal@presidencyuniversity.in

ABSTRACT:

In this chapter, Process Integration (PI) is introduced. The PI approach was created and refined in the 1970s in reaction to the oil crisis of the time, which had made gasoline costly and in short supply. Naturally, the Heat Integration (HI) sector saw the first advancements, which focused on energy conservation and efficiency. The implementation of HI in the oil, chemical, and energy sectors was a major success. Due to this achievement, advancements in a number of related sectors, such as mass integration and water integration, followed. PI is still at the forefront of energy research and industry interest more than 50 years later, and new paths for expanding its uses are being discovered. The chapter begins with a short history of PI before reviewing current centres of competence in this field and offering sources for more knowledge and guidance.

KEYWORDS:

Centres of Process Integration Research, Heat Integration, Mass Integration, Water Integration, Process Integration, Process Integration Research Consortium.

INTRODUCTION

Businesses may link their people, data, and applications thanks to business process integration (BPI). BPI enables businesses to more effectively coordinate their efforts both internally and with their partners, clients, and suppliers. The complexity of processes increases as an organisation expands. For instance, one seller can easily manage purchase orders. However, you may add tools to handle this process as you interact with additional suppliers. Then you may include software to handle your accounts, pay bills, and maintain track of your inventory [1].

Sooner or later, a single process may include many different technologies. Because the data is siloed from one another, this might reduce productivity and obstruct your automation attempts. Integrations and retrieving external data are among the largest obstacles to process automation, according to 39% of I.T. and engineering executives. In order to integrate their systems and provide uniform access to reliable, consistent data from all sources, businesses require a process integration solution. Lack of business integration might otherwise result in high productivity costs.

Three Different Process Integrations

Every system integration differs from the next. Systems may connect with one another via a variety of integrations, which include data effortlessly transferring across software programmes is known as a "native integration." The programme already has these connectors, making the setup procedure simpler. All you have to do is provide permission to the applications you wish to connect. An API integration is the exchange of data between two or more programmes using their respective application programming interfaces (APIs). If there are no native connections, you may, for instance, develop a custom API to link your online shop with a payment processor

to take orders. Third-party integrations: Businesses with specific requirements often create their own software. However, using an existing tool to add a certain function is often more useful. Instead of creating a feature from scratch in these circumstances, you might leverage third-party connectors. The integration you choose will primarily rely on the configuration of your technological stack. However, the objective is to link distinct systems and increase the effectiveness of numerous operations [2].

DISCUSSION

The idea of process integration, which holds that the many processes are interrelated and that actions in one process nearly always affect steps in another process, was also presented in previous hapter. For instance, the production process and the procurement process are started, respectively, by the planned orders and purchase requisitions that are produced by the material planning process. Figure 1, which we used to show process integration.

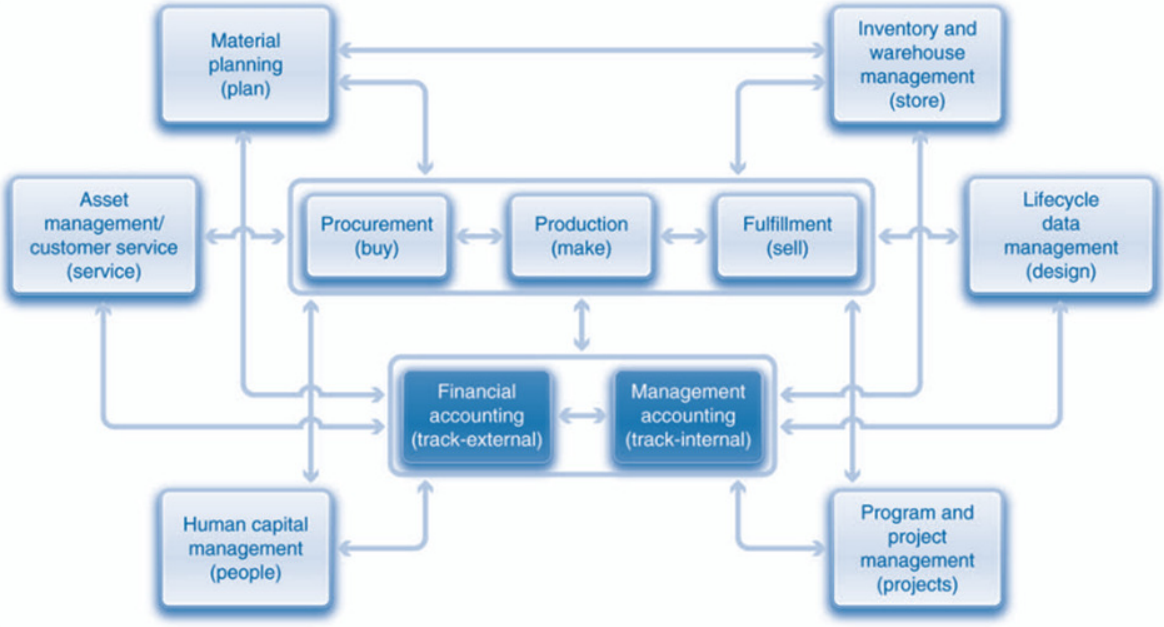

Figure 1: Illustrate the Integrated business processes.

In order to emphasise the deeper links and important operational interdependence among the processes that we discussed in former chapters, we will approach them from a holistic, integrative viewpoint in this chapter. We will give two situations where GBI must complete a client order to assist you understand these interdependencies. The first case has an order for swapping t-shirts as the item. The procedures of inventory and warehouse management (IWM), fulfilment, and procurement will all be involved in this scenario. But it won't include the manufacturing process since it concentrates on exchanging items. The manufacturing process will be included in the second scenario, which includes a client order for a finished object (a bike). Both scenarios will look at the flow of actions, paperwork, and data as well as the results of the many procedures required in completing a client order. These scenarios provide increasingly difficult and realistic choices that the organisation must make when the steps cross process borders, in contrast to prior chapters where we made several assumptions to simplify the description of the particular processes [3].

One of the main objectives of an ERP system is to enable holistic process execution due to the closely linked structure of business operations. Companies may provide "one version of the truth" to everyone engaged in carrying out the different activities by using a single, integrated ERP system. Employees may quickly access the information they need to make informed choices while also learning how the many processes are interconnected with one another thanks to an ERP system. In order to grasp how these processes are connected, it is important to first study a few ideas from each process.

1. In the chapter on material planning, we discussed the make-to-stock and make-to-order core production planning methodologies. For supplies that are acquired from a vendor, there are similar procedures available, including procure-to-stock and procure-to-order. The material inventory acts as a stopgap between the production and procurement processes on the one hand, and the fulfilment process on the other, in the make-to-stock and procure-to-stock strategies. In other words, the business uses the manufacturing and procurement processes to have a supply of goods on hand from which to fill client requests. In contrast, the business does not keep a material inventory while using the make-to-order and procure-to-order techniques. Instead, the manufacturing and procurement procedures are started when required as a result of client orders received throughout the fulfilment process.
2. We discussed how the fulfilment, manufacturing, or material planning processes produce requirements that set off the procurement process in previous chapter. When a corporation uses a procure-to-order approach for selling products, procurement is triggered by fulfilment. When the business uses a procure-to-order method for raw materials, manufacturing sets it off. Finally, when a business uses a procure-to-stock approach for either raw materials or selling items, it is prompted by material planning. We also added a scenario where GBI bought 500 t-shirts from Spy Gear due to poor stock. This case study illustrates a situation in which a demand from material planning initiates the procurement process. It also serves as an example of the procure-to-stock method [4].
3. We discussed a procedure that used a sell-from-stock method in the chapter on fulfilment. For instance, we described how the ERP system evaluates availability based on both existing inventory and projected receipts from either procurement or production in the explanation of the availability check method. Additionally, we presummated that the supplies required to complete the transaction in the case in which GBI supplied deluxe touring cycles and t-shirts to Rocky Mountain cycles were on hand in inventory. As a result, GBI used the sell-from-stock tactic.
4. Therefore, rather than a client order, the situation that led to GBI manufacturing men's off-road motorcycles was a requirement to boost inventory. The create-to-stock, procure-to-stock, and sell-from-stock techniques all make use of inventory as a stopgap between operations to decouple or lessen their dependence on one another. We shall no longer assume that there is a sufficient inventory of raw materials (for manufacturing) and finished items or trade goods (for fulfilment) in this chapter in order to highlight the interconnectedness of activities [5].

Processes for Procurement, Fulfilment, and IWM

We shall illustrate interconnected processes using the following example. A GBI client, Rocky Mountain Bikes (RMB), placed an order for 800 t-shirts (SHRT1000) with GBI. RMB is part of the Western U.S. sales organisation, thus GBI will ship the t-shirts from its warehouse management-capable San Diego facility. The following presumptions will be used:

1. The San Diego facility now has 200 t-shirts in stock, each for an average of $15.43.
2. There are 1,500 t-shirts in stock in the Miami facility, with a moving average price of $15.25 per item.
3. Spy Gear offers t-shirts to GBI for $14.95 each.
4. A purchase order (PO) for 800 t-shirts has been submitted by RMB to GBI.
5. Each t-shirt sold by GBI costs $30.

In this instance, there aren't enough t-shirts on hand in the San Diego facility. As a result, the procurement process will start when the client places an order. Remember that businesses may get resources from both internal and external sources, such as vendors and other plants. When a factory sends or receives goods, WM operations are activated to select or store the items if the plant is warehouse managed. When the necessary supplies are in hand, the fulfilment procedure may move on to the shipping phase.

The "FI" sign is used to identify actions that have a financial accounting effect, the "CO" symbol is used to identify actions that have a controlling influence, and the "M" symbol is used to identify actions that have a material impact (i.e., the movement of products). Remember that a process step that affects the general ledger generates a FI document, while a process step that includes a goods transfer generates a material document. All of the procedure stages were carried out without any hiccups when we discussed each phase in turn. Once again, we chose this strategy with the presumption that the required supplies would be in stock.

The fulfilment procedure begins when GBI receives RMB's purchase order for 40 Red Deluxe Touring Bikes. Since RMB is part of the Western U.S. sales organisation, the bikes will be sent from the warehouse management-capable San Diego factory. Only 10 bikes are now in stock in San Diego, according to an availability check the ERP system does during the sales order processing stage. As a result, the plant uses a STO to ask Dallas for a stock transfer. Dallas does not currently have any bicycles in stock, thus the STO is a necessity that will start the manufacturing process [6].

The factory will complete a goods issue against the STO after manufacturing is finished in Dallas. By taking this action, the number of bikes in Dallas that are now in transit decreases while the number of bikes in San Diego climbs. The bikes are changed from being in transit to being available for unrestricted usage when the materials arrive in San Diego and the facility completes a goods receipt against the STO. The goods receipt starts the warehouse management (WM) process, which stores the bikes delivered from Dallas into storage bins since the storage facilities in San Diego are warehouse controlled. Following the conclusion of this phase, the fulfilment process may move on to shipment. This phase will once again start the WM procedure, but this time it will choose the bikes required to complete the order. The last phase of shipment, goods issuance, may be completed once the motorcycles have been selected. The last two phases of the fulfilment process, invoicing and payment, come after the goods issue.

Businesses use add-on software with smoothly integrated API or flat file interfaces and an ESB (enterprise service bus) for communications to combine processes and workflows with an ERP system. The add-on software and ERP software are compatible because add-on software fields are linked to ERP software fields. In order to use integrated software functions, users must log into the ERP system [7].

ERP connection enables customers to customise and simplify system workflows and business processes to meet their own internal procedures. Businesses do business process re-engineering (BPR) on a regular basis to map, analyse, and simplify processes and get rid of processing time bottlenecks. Automation from an intelligently built integrated ERP system helps businesses optimise their operations.

How Does ERP Integration Get Better with AP Automation Software?

Automated capabilities that are lacking from ERP systems are added by integrated AP automation software to improve ERP integration and dramatically lower the costs, mistakes, and fraud risk associated with processing accounts payable and vendor payments. Through the same user interface and log in, an add-on global payables automation tool effortlessly interacts with the ERP system. Tipalti AP automation offers automated online vendor invoice validation with EDI document matching, self-service supplier onboarding, worldwide bulk payments utilising chosen payment methods, currencies, and automatic payments reconciliation. Tipalti reduces staffing requirements and saves time by eliminating 80% of the burden associated with accounts payable.

The complete supplier, invoice workflow automation (IWA), and automated payments gap in standalone ERP systems is filled by the Tipalti cloud payables automation SaaS add-on. The complete worldwide B2B supplier bulk payment process is not covered by other AP automation tools. The financial records of your business get precise payment information automatically from Tipalti. The customer service at Tipalti is outstanding. Tipalti improves ERP integration while meeting your goals and expectations for your organisation. Your business has more time to support FP&A and decision-making when you use the Tipalti integration solution for automating global bulk payments [8].

Which Systems Fit into ERP Software?

The following classes of outside software are often included into ERP systems:

1. Customers Relationship Management (CRM)
2. Online storefronts
3. AP automation applications
4. Software for product lifecycle management (PLM)
5. Software for managing projects
6. Software for business intelligence (BI)[9]

Processes in the actual world of company operations are seldom as orderly or straightforward as they have been portrayed in this book. We have made an effort to highlight in this chapter both the intricate interdependencies across organisational processes as well as the potential effects of individual actions on following phases in the process or on related processes. Businesses must be acutely aware of these interdependencies and the possible effects each action may have across the organisation while making both big and minor decisions. In the first case, GBI received a customer order for trading goods, decided whether to buy them from an outside vendor or transfer them from another warehouse, carried out the purchase or transfer, managed the inventory of the received goods, and then finished picking, packing, shipping, and billing the customer for the goods [10], [11].

CONCLUSION

A crucial element of ERP (Enterprise Resource Planning) systems is process integration, which enables smooth information sharing and communication across various corporate activities and departments. ERP improves productivity, cooperation, and decision-making inside an organisation by merging diverse activities into a centralised system. To be effective, process integration involves careful planning, stakeholder participation, and change management, it is important to keep in mind. To get the most out of ERP systems, businesses should engage in thorough training programmes, build transparent governance structures, and constantly review and improve their linked processes.

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