

# How Integrated Production Planning and Cross Employee Planning Increases Productivity

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## **Abstract:**

This paper is designed to show how integrated process planning and cross employee planning can be a vital part to any business operation. It will also uncover how different integrated processes and employee relations will help a business to grow. Various topics ranging from enterprise resource planning, integrated planning in supply chains, the non-linear approach, innovation and digitalization coupled with cross training and empowerment, Human resources, and Manager Employee relations complement each other and could bring an organization together. Various thought processes and intellectual reasoning skills were instrumental in all consideration of this project. Many antiquated processes were changed over the years to update operations in the business world where conventional means were not effective. Integrating product planning and employee planning optimized operations both in the product and service industry and I will accent many of these optimizations. With recent technological advances and human relations tactics, project management and organization has been streamlined and works more productively than its predecessors. Regardless of the industry, integrated process planning, and cross employee planning could possible turn a dinosaur into a competitive part of the economy.

## **I. Enterprise Resource Planning Program**

The introduction of the Enterprise Resource Planning software revolutionized the production industry. The software integrated many departments of the business bringing them together harmoniously. Many planning stages were changed when this software was brought to light. The ERP allowed organizations to effectively plan and coordinate many operations in the business to limit spending money and time on resources. The ERP also allowed organizations to plan assets according to the project and the projects deadlines.

By sharing information over several areas, the ERP organized project management by calibrating information such as inventory control. By using the current inventory levels in its information analysis, the ERP could forecast how many items could be produced by estimating how many parts were available to complete a total product. By using this information, inventory control managers could make an in-time decision whether to order more products or wait to replenish their inventory levels. Management would also be allowed to make real time decisions whether a product is a liability to a company or a benefit. Processes of control and contribution called for up to date reporting from the ERP and could rely on the information given by the ERP to make profitable business decisions.

Secondary to product production, the ERP also allows other facets of the organization to optimize. Financial reports generated from the ERP will allow companies to examine cost control analysis, capital investment opportunities, asset management, and debt management. (Reid & Sanders, 2016) Organizations were able to see the operations cost and availability in real time and were able to update projections according to this information. The organizations upper management team would use this module to assess the pros and cons of adopting a new product line or expanding on an existing product to include improvements to design, functionality, and the trends that their consumers were following. In many cases, the ERP was the main reason why a project was funded or dismissed. Financial departments could project cash flows, depreciation levels, and investment rate of return by utilizing the ERP. When an organization uses the ERP the financial side of the business can be planned and forecasted to ensure that they remain profitable.

The most important part of the ERP is that the programs are fully functional. (Reid & Sanders, 2016) The ERP allows other parts of the organization to react to a change in inventory levels, sales, purchases, and inputs by immediately reporting the changes to other departments. If a sale of an item is made during the process of operations, other departments are notified, and they can adjust process to that sale. If one thousand units of an item were sold, the accounting department can account for the sale and record the transaction as revenue. The inventory department can

adjust their inventory levels to account for the transaction. The purchasing department can decide to replenish vital parts of the item to begin production. The production department can schedule manufacturing of the sold item to replenish stock. The human relations department can react to scheduling needs based on the volume of sales.

While the ERP is key in instrumenting product accountability, financial awareness, and production implementation, it can also assist the human resources department as well. The ERP will allow the human resources manager to implement schedule changes to support the increases or decreases of sales. The human resources department can make up to date decisions whether to schedule more employees, cut back on work hours, or implement cross employee training. By allowing the ERP to inform the human resources department of any new changes, employee placement can be manipulated to assist in the production of more items or to cut the hours of employees on staff to limit the spending of funds on workers that are not necessary to complete the tasks surrounding the operation.

### **II. Integrated Planning in Supply Chains**

The supply chain is an integral part of the production planning process. The decision to hire a supplier can be detrimental or essential to the organization. Typically, a supplier is chosen based off the impact it will make to an organization. If a supplier is more of a cost than a benefit to a company, executives could make the decision to go with a supplier that would benefit the company. Many organizations look at cost to decide on the supplier. Other organizations look at the abilities of transportation to influence their decisions.

Production companies rely heavily on their supply chains. 60% of distinctive spending from any manufacturing organization will come from its supply chain. (Erenguc & N.C. Simpson, 1999) There are many themes of focus on supply chains. A supplier must be flexible, and they must be able to bend and mold with production requests and demands. A supplier can be the deciding factor whether a business will stand and be successful, or if it will fail due to the inability to compete. Many suppliers will give organizations other options and discounts to remain competitive. An organization should look at many different facets of the supplier's organization when determining their selection for a supplier.

One of the factors that should be considered with a supplier is their frequency for deliveries to the organization. If a supplier has a set delivery schedule to a manufacturing company, the receiving department may not be able to accommodate the supplier causing either a missed shipment or a back log of inventory. A supplier that can only deliver items to an organization on a certain date or time could dramatically impact production. An organization must make sure that the frequency of deliveries can coincide with the needs of the business. If a supplier is unable to deliver products when requested, they could cause an organization to miss key timeline targets and could cause a loss to the organization. By ensuring flexibility of delivery, the organization can remain fluid and allow for changes in productivity schedules and product output.

Secondly, a supplier must be cost effective to support the organizations vision. When a supply chain is too expensive, companies will look for other options that will fit their needs. An organization will look at transportation costs and delivery charges to ensure price stability. If a competing supplier offers the same delivery but at a fraction of the price, organizations will do the obvious thing and go with the lower cost. Product availability, employee workload, inventory surplus, and general operating expenses will cause an organization to cut costs from every direction and transportation costs are abundant in the production industry. Suppliers remain competitive by consolidating shipments and transportation fees to lower the end cost to the consumer. Supply organizations that fail to remain flexible will often be passed over for the next cheapest supplier. Many organizations will look to foreign companies for their supplies.

An effective supplier is a valuable supplier. If a supply organization can prove that they can plan effectively, an organization will shift their focus to that company. Advances in communication programs such as the ERP can dramatically improve the supplier's ability to plan more effectively. (Erenguc & N.C. Simpson, 1999) A supply organization that is receiving information about a manufacturers inventory levels and outputs can forecast deliveries and possible cancelations dramatically reducing the cost to the manufacturer.

### **III. Multiple and Flexible Process Plans**

Organizations attempt to maximize time and minimize cost to ensure profitability and longevity of their company. The multiple and flexible process plans were invented and examined for many years before they were implemented. Organizational teams investigated several possibilities that would maximize output and minimize the operation time to guarantee that they were achieving mission completion without spending excess money and human resources. These processes were timed, and various extenuating circumstances were introduced to these tests to ensure possibility.

Operation flexibility (Phanden, Jain, & Verma, 2012) was one of the process plans. Organizations would look at a component of their production and see if the product could be made on any of the other machines on the production

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floor. This gave the organization the opportunity to expand their possibilities of manufacturing this product in case one of the machines went down or were in use. Thusly this concept was designed to allow for multiple parts to be made on multiple machines. The reason why this was so important was because the experts wanted to maximize the abilities of the equipment in the production arena. These additional abilities of the purchased equipment would become to be an integral part in the fluidity of the organization.

Sequencing flexibility (Phanden, Jain, & Verma, 2012) was another process plan that looked at changing the sequence that a manufacturing process was performed. The reason behind this idea was to expand on fluidity. If a process was regimented and structured, it did not allow for any type of contingency. Unseen circumstances such as one of a kind orders, personalized materials, and unrequired additions to a product can arise in today's economy. By adapting this sequencing flexibility process, it allowed manufacturers to produce a product in a different way to eliminate unnecessary steps therefore reducing labor costs. The unnecessary steps would cost manufacturers time and money.

Finally, the option of Process Flexibility (Phanden, Jain, & Verma, 2012) process plan was investigated. This process plan looked at the option of manufacturing identical features using different operations or steps in the operations process. For example, if an organization manufactured lawn equipment and their focus was on rakes, the organization might want to adapt different operational steps according to inventory levels. If a shortage of wood was affecting the organization, operations might be shifted towards making plastic handles constructed of the same material that the rake blade was made from. By doing this, the organization could use its time more wisely building a substitute product instead of halting operations until supplies were available.

By using these process plans, a company could expand their product availability and cut down on labor costs. One of the main expenses incurred in any organization is labor costs. Employee wages, utility costs, insurance, and other expenses increase the longer operations are being conducted. These process plans can be implemented singly or in conjunction with one another to ensure productivity and eliminating the excess use of resources within the constructs of the organization. Many companies use a hybrid of these three processes to ensure maximization of labor costs and decrease spending on unused assets.

### **IV. Made to Order Production**

In today's economy, the customer is looking for a more personal experience with their product or service. This can place a huge wrench in the middle of production. Variations in size, color, density, and accessories can place excess cost and considerable time on a manufacturer. Planning a process to satisfy a customers' need for personalization can be a lengthy process. The integration of customizable machines to produce one of a kind products can be very expensive.

Organizations have implemented protocols to handle requests from their client base by changing certain aspects of their operation. Eliminating certain steps in production requires research and planning to ensure that the organization does not lose its profitability. Manufacturers will remove processes to accommodate their customer orders by changing the way the products are made or constructed. Many organizations believe that customizability brings loyalty. An organization that can focus on making an item or service personal to their customer will almost guarantee a return customer. Work load control, constant work in process, and web-based supply chain solutions help many manufacturers contend with the one of a kind orders. (M., L.C., & B.G, 2007)

### **V. Innovation and Digitalization**

The digital age drives the global economy and without technology and innovation, the introduction of new products and services would be impossible. From the advances in mobile technology to communication innovation, digitalization and Cyber-Physical Production systems have revolutionized the manufacturing and service-based industries. Instantaneous results, product availability, and customer service is only one click away but, the systems in place to make this all possible are not that easy.

Cyber-Physical Production Systems (CPPS) are attached to technology and the forces that drive the economy. (Meissner & Aurich, 2019). For the CPPS to work it must ensure it is able to connect with other devices that feed it information. An online system that is relying on the internet and or phone connections must be compatible with the services that are available. Machinery must be able to connect to a platform to receive specifications, dimensions, and details to be effective. Bluetooth connectivity has made communication between production part more accessible but for it to work correctly it must remain on the network. As strong network coupled with up to date machinery can cut down on labor costs dramatically.

Smart phones and smart technology are a driving force in any industry. The ability to multitask and perform several operations in the palm of one's hand is more of a necessity than a luxury. These devices allow the consumer and the manufacturer to be in touch with each other at a moments notice. Many applications allow the consumer to begin the

customization process using specifically designed programs that feature options that let the customer design their product to their own specification. The manufacturing process must be equipped to allow smart devices to connect to their platforms to ensure that the customer gets their order. The planning process often involves many departments of the organization to communicate with each other to ensure product reliability. (Meissner & Aurich, 2019)

One positive thing about CPPS is that it allows organizations to accumulate large amounts of consumer data over a short period of time. Consumer data is very valuable to an organization because it allows the company to forecast rises and falls in sales and it helps them determine when they need to increase inventory. Other consumer data is used to design product lines and discontinue items that were not popular with their consumers. An organization can use archived information to determine product availability for seasons, holidays, and other spikes in the year.

Cyber security is a main concern to any organization that conducts business on the world wide web. Many businesses have been the target of lawsuits when they are found to be lacking the proper cyber security necessary to safeguard consumer information. Large volume retailers such as Target have been sued over breach of security violations regarding personal consumer information. Outside sources attempt to gain the personal information of customers such as credit card numbers, social security numbers, and other sensitive information. Businesses have the responsibility of safeguarding the information that has been given to them from customers during normal business transactions.

Aside from consumer information, threatening companies also wish to obtain information about a company that could be considered sensitive in nature. Operational plans, marketing plans, innovations in product lines, operational processes, and other business-oriented information must be kept confidential for a business to survive. Companies often send scouts to check out their competition and see if they have any secret projects that they can steal to boost their sales and shareholder wealth. Many organizations have asset protection services designed to ensure that their product ideas, services, and operations are safe from any intruders wishing to do harm to the company.

### **VI. Employee Cross Training**

Cross training of employees can be one of the most beneficial tools that an organization could have. Cross training enables organizations to maximize their labor assets and save on labor hours spent. By allowing companies to cross train their employees, they could essentially double their employee productivity by continuing to have the current numbers of employees on the payroll. When employees know other aspects of their organization and are trained to work in those other functional areas, employees have a better understanding of the organizations operational flow charts and standards. An employee that understands how their position affects other parts of a company will be able to relate their job performance to the other parts of the organization.

There are several methods of cross training that an organization has at its disposal. Depending on the size and budget of the organization, the method of cross training could either make or break a companies training objectives. A Training Manager, or Human Resources Manager would conference with the finance team and other departments of the company to discuss which type of training method would be most effective. Cost, employee availability, training locations, and other variables would come into view when discussing the cross-training options available for the organization.

On the job training is a tool that organizations use to cross train associates. (S. & S., 2018) Usually, a senior member of the department would take on the task of training other associates in that specified department. This have several advantages and a few draw backs. One advantage is that the associate is already aware of company safety and operational guidelines. By allowing an associate to receive on the job training, the associate can implement safety guidelines to the additional training and use them harmoniously. Another advantage to on the job training is that the associate will not use any overtime while conducting the training. This allows the Human Resources Manager to maintain their labor budget while training an associate that is already employed with the organization. One draw back to on the job training is that the trainer might use short cuts and cut corners to show the associate how to do the job faster sacrificing policy and standard guidelines. To remedy this, the Human Resources Manager must select a trainer that is well versed in company policy and that will ensure guidelines are followed.

Off the job training is another way that organizations can cross train their employees. (S. & S., 2018). This process involves wither classroom or off-site training that the associate would have to do outside of the organizations view. Trainees would attend the training on the company payroll and would not be able to perform duties for the organization while training. Many organizations with multiple departments will employ this training tactic to ensure the associate receives the proper training associated with the new directives. Human Resources Managers would have to ensure that their budget will allow the associate to be trained off site. Many off-site courses and training come at an additional cost to the organization. Training issued by other organizations can come with a few drawbacks. An associate may not be able to incorporate company policy to the new training and could possibly violate some company safety and

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operational policies. Another drawback is that the employee will have to be compensated for travel time and other expenses. If the training is in a location that requires lodging, firms may be obligated to pay for the lodgings, incurring multiple expenses.

Apprenticeship training is another way that an organization can cross train their employees.(S. & S., 2018)An apprenticeship requires an employee spend significant time off site with another organization or training firm to ensure that training is completed in a controlled setting. Many apprenticeships come with an official certification or accreditation after the training is completed. Unfortunately, apprenticeships can be expensive. Many firms will charge the home company to offer their employees these apprenticeships and they could be costly. In addition to the cost of the apprenticeship, organizations must fill the missing position with a temporary employee while the home employee is going through training. Many organizations are not able to afford the additional labor costs and they will avoid this type of training method.

Training Center or Vestibule Training is one of the least explored options for organizations. (S. & S., 2018)This option features artificial training environments and will often showcase real world experiences during the training. Organizations will often send their employees to this training much like an apprenticeship. It incurs the same drawbacks such as additional staff requirements, costs, and additional labor costs. The Training Center option is often used when new operations or equipment is introduced to a workforce. Many times, and organization will send their employees to this training when a new piece of equipment is introduced to a job specialty such as manufacturing or transportation.

Cross training can have very powerful impacts on an employee in an organization. Many employees that have received cross training have improved performance and work ethic. When an employee is cross trained, many studies have shown that the employee has a new focus on the job and will often increase their productivity.(S. & S., 2018) Associates have the training to assist other departments within the organization and they feel that they have the ability to do more for their organization. Many associates will use this training to seek advancement in the organization which motivates them to continue to make positive progress. Cross training can also extend the longevity of an associate in a firm. Cross trained employees feel like they are an integral part of the organization which gives them empowerment.

### **VII. Employee Empowerment**

Employee empowerment is best described as employee involvement within the organization. (Wilkinson, 1998). This is by far, one of the most miniscule benefits of employee empowerment. An empowered employee can be one of the best tools that an organization has in its arsenal. By empowering employees, the organization can give the employee vision and motivation, thereby increasing motivation, performance and productivity. When an employee feels empowered, they will often seek out new products and procedures within an organization and encourage innovation. As an employee feels more empowered, they will often use their dedication to the organization to help the organization grow and succeed.

Employee empowerment tends to be more individualized rather than a mass collective.(Wilkinson, 1998) Many organizations will choose key associates for this empowerment tactic based on work performance, job classification, and tenure of the position. Employee empowerment can be useful, but it could also cause favoritism and indecisiveness within an organization. When an employee stands out in an organization, they are often met with resistance and skepticism. Instead of being a positive influence in the organization, an empowered employee can cause division and separation within the ranks of the company.

Information sharing is a key aspect to employee empowerment.(Wilkinson, 1998)By involving selected associates in the information sharing process, it allows the employee to feel important and empowered to make positive contributions to the organization. If a manager involves an associate in management meetings, strategic planning, or operational organization, the associate will feel compelled to introduce new ideas and opinions during the meeting and they will feel that they are an integral part of the organization. Managers will often take specific associates under their "wing" and give them ideas and the motivation to become more productive associates.

Upwards problem solving is another tool associated with employee empowerment. (Wilkinson, 1998) This process allows associates to fix common problems during daily operations within the employee collective. By allowing upwards problem solving, management teams would not need to be involved in miniscule problems during the operations process and would allow managers to attend to larger scale problems. If an associate uses the practice of upwards problem solving during a manufacturing problem, the associate can save production time by solving the problem themselves and sharing the results with the team. Upwards problem solving can increase autonomy in special work projects and in various other aspects of the position. (Wilkinson, 1998)

Employee empowerment breeds self-management. When an associate must be closely watched and monitored, simple menial tasks must be checked up on throughout the day. If an associate must be reminded to punch in, take their

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scheduled breaks, and complete normal tasks, management will spend an excess amount of time ensuring the tasks are completed. An empowered employee will ensure that all their subtasks are complete because they feel that they are an integral part of the organization and will avoid being babysat. The empowered employee will be proactive and innovative and will allow the organization to grow and introduce new productivity results.

### **VIII. Scheduling**

Cross trained associates can often be the fix to any scheduling problem. Life can always complicate an organization. Associates calling out sick, vacations, budget cut backs, and other obstacles can be detrimental to the work flow of an organization. Many companies will often use their cross trained associates to cover certain problem areas as in scheduling. In a retail setting for example, you can take an employee that works in the receiving area that has been trained in customer service to rescue a failing customer service department. The associate can be asked to work in the other department for the day and the budget will remain unphased. If a work load in one section is short and an associate can be used in another department that they were trained in, the associate can be placed there to fill in any scheduling gaps within a moment's notice.

Cross trained associates can also be a key item to a workforce while they are working in their primary position. A cross trained employee can explain problematic areas that are affecting their primary department by showing the other associates where the problems were coming from. Many organizations will use this tactic to improve department cohesion and to encourage department interdependence. When an organization uses their cross trained associates as temporary trainers, the associates will take the training more seriously from the associate because the cross trained associate has credibility within the department. Scheduling a crossed trained associate within their primary department could also motivate other employees to receive cross training.

Limiting the availability and use of cross trained associates is a key objective that many organizations struggle with. When a company has a large base of cross trained employees, managers often use them as a constant instead of a last resort. Organizations will feel that the cross trained associate would be a better fit to their schedule to handle contingencies and emergency incidences. When organizations limit the use of cross trained employees, they will maximize their work load and minimize their work stress by providing consistency to the cross trained associate. When organizations abuse the abilities of cross trained associates by continuously scheduling them to fit the needs of the company, the associate could feel overworked and abused, thusly driving productivity negatively. (Easton, 2011)

### **IX. Human Resources**

The Human Resources (HR) Department is an integral part of any organization. The HR manager must be able to concentrate on placing correct personnel in their designated areas in accordance with productivity needs, production needs, budget constraints, safety requirements, and various other parameters. The HR Manager must be able to address complex problems and be able to come up with viable solutions to present to executives and higher management. The HR manager must be versatile with various programs, reporting tools, and employee regulations. The HR manager is the bridge between associates and higher management and can be the determining factor in any organization.

Talent management is one very important role that the HR manager must master. (Armstrong, Human Resource Management Practice, 2007) Placing the correct skill set within an employee can be the ruling factor in any department. When a HR manager can extract the crucial skills from an employee that would greatly impact an organization, the HR manager can be a critical part of the department's success. When a potential employee is evaluated by the HR department, the mission and the vision of the organization must be top priority to the individual. HR managers will evaluate all of the potential candidates and see if they are equipped with the knowledge and skills needed to accommodate production planning and daily operations.

Operational Change is ever present in the Human Relations community. (Armstrong, 2007). HR Managers must ensure that the right person is there for the right job at the right time. When there is a change to operational procedures, HR Managers must be flexible and intuitive. Often a practice in an organization can change due to innovation, policy, and trends. When the HR department is static and unwavering, they can often put the wrong element into an organization, jeopardizing operations and productivity. (Armstrong, 2007) When an HR department is fluid and capable of adapting to the business stream, they can place key associates in departments that are focusing on the change thusly increasing productivity and profitability.

### **X. Manager / Employee Synchronization**

When integrating production planning and cross employee planning, managers and employees must always be on the same page of music. Managers must ensure that their employees are aware of the organizations mission and vision. Operational guidelines are constantly changing with trends and the needs of the economy and managers must

ensure that this is communicated to the associate. Organizations tend to focus on the bottom line of the financial records and fail to realize that communication between all departments and their leaders is key to the organization's success.

Managers must be consistent, cohesive, and forward thinking in a changing organization dynamic. (Tansel & Gazioglu, 2013). Managers must ensure that they follow guidelines and communicate these guidelines consistently with their employees to ensure operational integrity. The role of the manager has changed over the course of the past five decades. The years of managers sitting behind their desks yelling orders over a cup of coffee are long gone. The new management vision is one of integration and example setting. Managers are obligated to know the entire process from inception to completion and they are tasked with the training and supervision of their associates.

During the integration of process planning and cross employee planning in the organization, confusion can arise. The manager must be aware of all facets of the operation and they should be able to communicate this information effectively to their associates. (Tansel & Gazioglu, 2013). When an associate has been cross trained into an additional department, the manager should have the capability of instructing the associate how to integrate both knowledge bases into their new roles within the organization. Employees that have multiple skill sets should be aware of the causes and affects of their operational procedures to ensure that they see the entire picture. When an employee is instructed to complete an additional task in addition to their primary obligations, the associate must understand why they are being introduced to this new process and how this process can affect the entire organization. Clarity is key to an associate and management must be able to provide that clarity.

### XI. Integrated Production Planning Plus Cross Employee Planning

The concept of integrating production planning and cross employee planning is a crucial part of the growing economy. The ability of combining tasks with the correct personnel can be the determining factor between an organization's doors remaining open or closing forever. When a company can properly use their assets and combine their talented associates with new and upgraded machinery, they can increase productivity, profitability, and shareholder wealth. Often organizations get into a rhythm and will stay with the same antiquated processes and procedures when other companies are using these techniques to become more competitive and valuable.

Integrating production planning and cross employee planning can impact the output of costs and labor cost dramatically. By implementing production planning using multiple and flexible process plans, flexible supply chains, innovation and digitalization and cross trained employees, an organization can drastically reduce production costs and labor costs. If an organization can find many uses from one type of machinery, they can cut down on production costs by using that same piece of equipment to accomplish a task instead of making the large purchase by acquiring a new machine. An organization can eliminate a majority of their costs by using flexible supply chains that will assure the prompt and accurate delivery of the necessary items needed to create their products. Becoming one with technology and embracing the digital age is also a positive change a company can adopt to reduce costs and labor costs. Also, organizations that believe in their employees and training them to become more fluent in the processes of their business can cut down on labor hours thusly reducing labor costs.

Integrating production planning and cross employee planning is the future of business. Organizations are finding new and different ways to improve themselves to remain competitive with new start ups and on-line companies. Many consumers want their products fast, accurate, and cheap. The everyday consumer is quick tempered and often easily aggravated and does not want to hear excuses from manufacturers. Organizations must make constant, in time decisions to remain competitive and operational. Giants such as Amazon, Wal-Mart, Target and other retailers are constantly improving their operations, and smaller businesses feel the pressure of competition constantly. An organization that believes that the way of business should reflect the ways of the industrial era is destined for failure. Combining these two processes together can greatly improve the chances of any organization succeeding.

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