
OPERATIONAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT FOR INDUSTRIAL PROCESSES

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Abstract: Operations management is an area of management concerned with overseeing, designing, and controlling the process of production and redesigning business operations in the production of goods or services. It involves the responsibility of ensuring that business operations are efficient in terms of using as few resources as needed, and effective in terms of meeting customer requirements. It is concerned with managing the process that converts inputs (in the forms of raw materials, labor, and energy) into outputs (in the form of goods and/or services). The relationship of operations management to senior management in commercial contexts can be compared to the relationship of line producers to highest-level of production process. Management, including operations management, is like engineering in that it blends art with applied science.

Operation management (control) of the productive process consists of: operational planning, delivery control, process monitoring and operational registration. In operating system management objectives define the required results (W_z) the production process, given the operational system plans. As which he defines not only objective, but also the development of the manufacturing process to observe the given goals (structure, tasks, and sequence operating plan). Operational management is a multi- level control system,

The process of producing new energetic drink L-Carnitine, “Gora” , drinking water in various volumes, juices various volumes and other products.

Keywords: Management, Business, Production, Process.

1. INTRODUCTION

The production process operations management systems management activities, provided directly to the manufacturing process. Here belong: operational planning, coordination processes, analysis and decision-making, monitoring, registration and control operational activities. According to the United States Department of Education, operations management is the field concerned with managing and directing the physical and/or technical functions of a firm or organization, particularly those relating to development, production, and manufacturing. Operations management programs typically include instruction in principles of general management, manufacturing and production systems, factory management, equipment maintenance management, production control, industrial labor relations and skilled trades supervision, strategic manufacturing policy, systems analysis, productivity analysis and cost control, and materials planning. Management, including operations management, is like engineering in that it blends art with applied science. People skills, creativity, rational analysis, and knowledge of technology are all required for success.

Higher management levels acts on the principle of management of operational management (Figure 1.) and control in direct contact with the production process acts on the principle of feedback control information.

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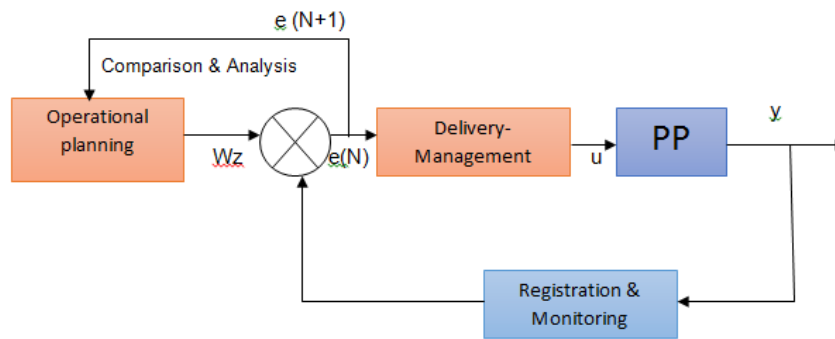


Figure 1. Operating management – as feedback control

Where: $e(N+1)$ – transmission planning period deviation $N+1$.

2. ALLOCATION OF CONTROL, MONITORING AND REGISTRATION

Running through the following tasks: the entire transfer process of production (PP), but also the established function and comparing the outputs "y" production processes of their goals W_z , analyzes the production process of the state and decision-making "y". So W_z harmony between objectives and outputs "y" of the production process to maintain - function control system provides for enforcement decisions in the production process.

So to ensure the collection of data for the manufacturing process - the development and processing of the form required for the production process to analyze and control. So fulfill the function of feedback. Operational management is a multi- level control system, where in:

- The highest level is the operating management. And program for control, based on operational plans, combined with sliding regulative. Program control - because it prescribes not only the last state of the manufacturing process after the planning period T expiration, but also road, transition procedure from the beginning of the condition, means the period beginning the planning state S_t at its end. Moving regulations under the principle applied in such a way, the deviation generated within T_n and is eliminated only in the period T_{n+1} , T_{n+2} , ..., i.e. the deviation is planned for the next planning period.
- W_z It is necessary to say that this is not a work order dispatcher, its control type, characteristic for managers of direct contact with the production process, masters, dispatchers, operations of large systems, heads, etc. Here are the features: in each structure there is no activity as a management target generation, his goal is to realize the goal, to give dispatchers control in a given period analyzed, acting on information and general feedback within a period of planning, if deviation is not removed in a given planning period is passed to a higher level of control.

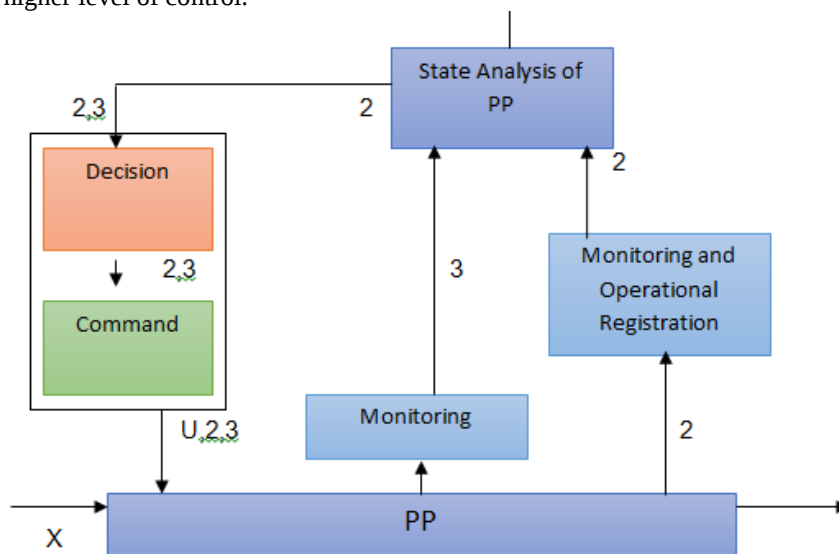


Figure 2. Dispatching management (DM) structure C,

- c.) Direct control, which has these features: - process status is recognized by the dispatcher directly in the product through their senses, not medially through some other medium - the condition is evaluated during the analyzed period, after the rest - situation analysis, decision, command, decision and implementation are performed in the same period of planning - the condition is checked only in the planning period, but during the period, and also applies to making the conversion.

3. OPERATIONAL PLANNING – PRODUCTION SCHEDULE

Operational planning is the final stage of decision making on the future of manufacturing in the hierarchy of the whole production process of creation: prediction, global planning, and capacity planning, operational planning. On the other side of the market there is demand for the company to confirm as possible "date" that is required for a term, the company to implement the flexibility, especially when production throughout the requirements, the company shortened period T to provide application customers (temporarily) on the other hand the company limits space for optimism, resulting in increased production costs. This dilemma has several solutions: a.) be within the schedule, b.) development of several hierarchical levels of production according to schedule, c.) automation of production processes of planning and coordination.

Moving under schedule based on the principle that the production schedule was developed T_n period, schedule $T_n - 1$ is then definitely after re - planning and implementation and in terms of examples. $T_n - 2$, $T_n - 3$, preliminarily. Then company expands space layout of internal coordination between separate production of separation, especially during the long production cycle (major and planning period). Production may be several hierarchical levels, different layout parameters, i.e. freedom or level of planning period. Market adoption of flexible and non- expanding schedule period will be achieved through the production of schedules for development of process automation and production schedules in coordination, automation makes individual production processes, participating product processing. For what a whole range optimal products processing. This parameter depends on the level of freedom, which is applied to production. Sometimes it is enough to define only product order processing time definition of startup and operation of termination not needed. How more strict, more definition the production process to make her the freedom to deliver. The production schedule should be really purchase, it should preserve the space for human creativity during its realization cannot plan for machine capacity, and it should keep the reserve removal injuries are not considered to be which production. Only in these cases production has adequate authority and natural respect. In case of fully automated production of free levels may be lower, or may be defined more strictly. The model is divided so that over time you can open and time to close, consistent with the fact that the model development time as a production input, for example, product processing termination or additional manufacturing operations interruption case closed while the model already in the scope of a given planning period, the production is ready, in terms of external criteria, it does not depend on the time when the product or operation will be interrupted.

4. PRODUCTION OF NEW PRODUCTS

The process of producing energetic drink L-Carnitine, "Gora" juices and other products consist of two parts: The first part is the treatment of water, where it is filtered through "polish filters" without any chemical treatment which retains its natural chemical composition; The second part of the process of producing bottled water flavored with L-Carnitine, "Gora" juice is filling and packaging in PET bottles suitable in case 0.5; 1,5 l.

4.1 WATER TREATMENT

What kind of water treatment will be applied depends on physicochemical and microbiological properties of the used water that must be processed and packed in suitable packaging, according to the law. The resulting analysis examined water dictates the principle of treatment can be carried out in accordance with the installed equipment and provided technology.

Through plug reduced the $\phi 100$ mm from the main line, water pipeline engages the top U.S. accepted 12 m³. Excess water pour tube back into the river, and the container required quantity of water pump draws for future treatment. Before that, the water passes through the UV ultraviolet sterilization lamps, because of possible occurrences of bacterial pollution in certain time periods, possible accidental situations. So go on microbiological safety of treatment for future use water, which further passes through the filtration "polish filters" with varying degrees 5 μ , 1 μ and 0,5 μ . Water once again going through ultraviolet UV lamps through another filter 0,2 μ . This way prepared and treated water is sent to the production process of filling or packaging flavored water.

4.2 PRODUCTION AND FILLING

Charging a flavored water with additives is carried by pipes to the appropriate syrup plant. L-carnitine supplements, syrups and fruit aromas of vitamin C or lemon flavor of fruit and other accessories should be in accordance with the norms and instructions of the manufacturer. This ready flavored water pipes leading into the mixer.



Figure3. L-Carnitine and fruit additives supplements mixer

Carbonation of the water before it is cooled by heat exchangers (liquid glycol chiller of water) at 6-8oC, then carbonated (with the addition of carbon dioxide CO₂). Prepared flavored water nozzles through pipes leading to device-charging machine.



Figure 4. Production of PET tubes

Empty bottles, PET tubes, blowing the horn in the form ready for flavored energy drink L-carnitine or fruit juice. The resulting bottle ringer's device containing two zones (first zone for ozone water, and a second zone, pure water treatment water).



Figure 5. Charge of L-Carnitine and fruit juices

This way rinsed bottle is filled, and closes with the transporters is referred to the process of labeling, coding or imprinting of its service life. This coded and labeled bottle is packed and the packages are arranged on pallets wrapped in foil and stored in the warehouse.



Figure 6. Labeling

4.3 STANDARD CIP CLEANING SYSTEM FOR CHARGING

For perfection in hygiene and consistent set of standards for use in the food industry, materials that are manufactured appliances and machinery must meet all norms and standards. The system must meet the requirements for CIP (Cleaning in Place), or wash the equipment after each use with appropriate chemicals for cleaning, washing and disinfection.



Figure 7. CIP cleaning standard of charging system

CIP (Cleaning in Place) equipment consists of a bowl of water and a bowl of sodium carbonate or other chemicals and containers are cylindrical or square with a volume of 4 m³, equipped with probes for measuring the level of liquid. There is also a hot amendment where a steam heated water or with a chemical solution to a suitable temperature for indoor disinfection of pipes and equipment for charging. CIP (Cleaning in Place) station contains a pump that draws from one of the vessels liquid disinfectant to disinfect equipment. The speed of the fluid must be greater than 2 m/s, to achieve turbulent flow.

5. CONCLUSION

Management, including operations management, is like engineering in that it blends art with applied science. People skills, creativity, rational analysis, and knowledge of technology are all required for success. Operations management programs typically include instruction in principles of general management, manufacturing and production systems, factory management, equipment maintenance management, production control, industrial labor relations and skilled trades supervision, strategic manufacturing policy, systems analysis, productivity analysis and cost control, and materials planning. The process of producing new energetic drink L-Carnitine, “Gora” juices and other products.

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