SMART LOGISTICS COMPANY SYSTEM STRUCTURE

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Abstract

SMART logistics company system - of SMART LCS, based on the philosophy of advanced process control, allows for comprehensive coordination company processes and flows. The main structure of the of SMART PLS attributes is to create a comprehensive, multi-level, enterprise logistics system, with some degree of intelligence, to accept the results of the latest research and development in the form of SMART production technology and logistics, application of the principles of technological Logistics (TL). Logistic model company model is understood as a system of another company, the transition flows of materials, energy, information, finance, which are implemented chain activities and operations.

Keywords: Strategic planning, business plan, logistics, production system

Introduction

SMART logistics company system (LCS) enables a comprehensive coordination of business processes and flows. It is based on the philosophy of advanced process control and security of its function within a whole life-cycle, which include the support of the design, planning, and operative and operational activities. SMART includes adaptations of real objects, virtual objects (mathematical models), base data, and Visual communication at the level of partial operations and components through machines and aggregates to the comprehensive production technology. This is achieved by providing data and knowledge base for all stages of the life cycle, research and development and application of technological principles Logistics (TL) and advanced concepts processes handling APM (Advanced Process Manipulation). The application of the latest achievements of science and research in the form of SMART in the field of production technologies and logistics are in the structure of enterprises logistics system requires that you

use the appropriate approaches to the management of business processes. This is a detailed analysis of the levels of micro logistics and describe the business flows and processes topology. The analysis and the results of the strategy, in turn, shall come forth the proposal for optimal hierarchical balance sheet optimization model.

Characteristics of SMART LCS

The structure of enterprise's logistics system is composed of three basic levels. Individual levels correspond to different outputs.

At the macro level – the strategic level of the logistics system, which contains nine basic partial of strategy:

- product strategy,
- production strategy,
- the organization of the production process flows,
- business organization - the organizational structure,
- capacity strategy
- the corporate planning system,
- supply, purchase strategy,
- distribution-sales strategy,
- financial and economic strategy.

The output is not only their definition for the needs of the applicant, as well as the processing of a specific procedure for the creation of a strategic plan, algorithm. (Fig. 1) A major output of the experience with their verification, defined for the operation and effectiveness of the environmental impacts of the company. Their generalization allows you to define a universal methodology for the creation of business logistics strategies.

On the micro level – in intercompany logistics system are the output results of detailed analysis of business processes and flows in them going in the form of two business models. In the field of business flow is hierarchical balance sheet optimization model, which is not only the image of the topology of business flows, but provides invaluable information on material and energy balance, balance, and particularly the capacity of the resulting cost balance. This model is an invaluable tool for business planning system at all levels.

The second outlet on the logistical level, the business process model. In the model are described in detail the various business processes, their relationships and links with the other business processes, hierarchy and priorities and topology. This model, the results are used in the creation or new business processes and the activities, i.e. the organization in the formation of the new organizational model of the company.

At the lowest level of the logistics system – at the level of use of logistics in the technological process is the output of advanced system monitoring and management, and 3D and 4D visualization of information materials. The use of RFID systems in the management of buffer belt transport loose materials is unconventional. Well let's go to batch-custom production system, which is a new concept in quality management of mass production and perhaps the first applications of the concept of mass production on the contract in terms of the processing of raw materials.

The second area of outputs at this level is the use and verification of the results of previous research in the field of optimization of material flows. SMART materials and processes and their advanced control is based on the principles of self-regulation and internal control processes, maximizing the use of gravity in construction and system of PULL, i.e. on its attractive principle. Meets the following logistical requirements:

- eliminate the need for processes, flows, storage bins,
- integration of processes and equipment
- flow storage bins,
- the balance of the volume of stock in tanks,
- harmonization of production and transport benefits in the production process,
- minimizing, the equality and continuity of material flow, the directness.

The ideal in terms of optimization of stock is such a production process that works without the need of storage facilities, that is, everything is done by the JIT (just in time). Such a situation represents a technology-organizational optimum. However, to achieve this State is probably impossible. Yet in a limited scale removal necessary storage facilities is real and feasible by bringing the performance and capacity of the machinery and equipment and, in particular, through the integration of manufacturing operations and processes into a single unit that removes the need for a technological service (handling and storage) processes and equipment between them.

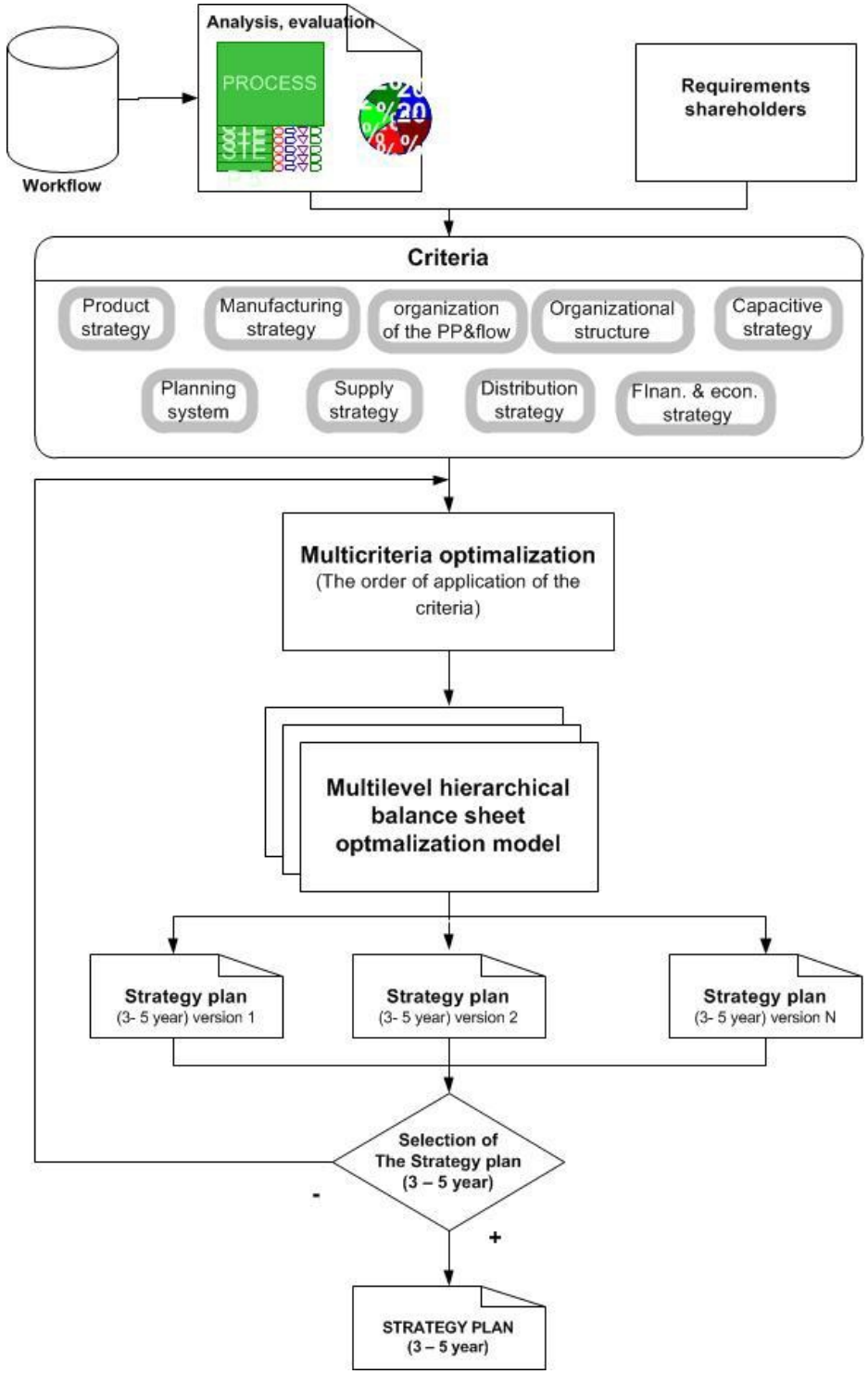

Fig. 1 Procedure of the strategic plan of the company

If it is impossible to remove completely the possibility of streamlining the system for storage of material flow analysis is the use of flow-FIFO (first in/first out) storage system with piston-flow material in them. In these tanks there is no mixing of the raw materials of different quality from different batches going after each other. Flow storage facilities are working on the principle of gravity, are structurally simple and allow you to create self-organized systems. The balance of the volume of stock in tanks means the determination of the optimal capacity of the tanks and the determination of the optimal level in stocks in them according to the needs of a technological process. On the one hand, on the other hand the stocks linked funds are essential for optimal functioning of some technological processes. Condition for ensuring effective and smooth running of the production process is the determination of the optimal size of the production and transport benefits. The new concept, which is based on the principle PULL requires a review existing systems and not only align the production and transport benefits in the production process, but also to adapt to customer needs. The basic criteria of optimality of material flow are its length, linearity, uniformity and smoothness. The location and layout of the process and the length of the material flow and continuity of uniformity that affects the directness is influenced by the level of its usage. All the material flow characteristics affect its economics. The fulfillment of the requirements for minimizing, directness, equality and continuity in the design can reduce investment costs and running costs, in particular in the course of the process to reduce the cost of shipping and handling costs resulting from a reduction in inventories and work in progress and the cost of maintenance, etc.

Structure SMART PLS

SMART PLS working balance sheet based on hierarchical optimization model manages the collection and archiving of production and technological data processing and analysis, planning and evaluation of production and maintenance, optimize production processes, planning and management of production processes (Fig. 2).

LIS Z

The collection and archiving of data, production and technological workflow:

- material flow - quality and quantity,
- equipment - machine parameters, jobs,
- energy economy - consumption standards,
- accepted codes – recipe ...

LIS V

Reporting, analysis, planning:

- transforming data into charts, tables - regular reporting to various levels of management,
- design optimization measures in balancing the processes of the company,
- preparation of innovative applications into production,
- planning in the company:
  - the expert system for the development of strategic plans,
  - the annual production plan,
  - the flexible scheduling and controlling.

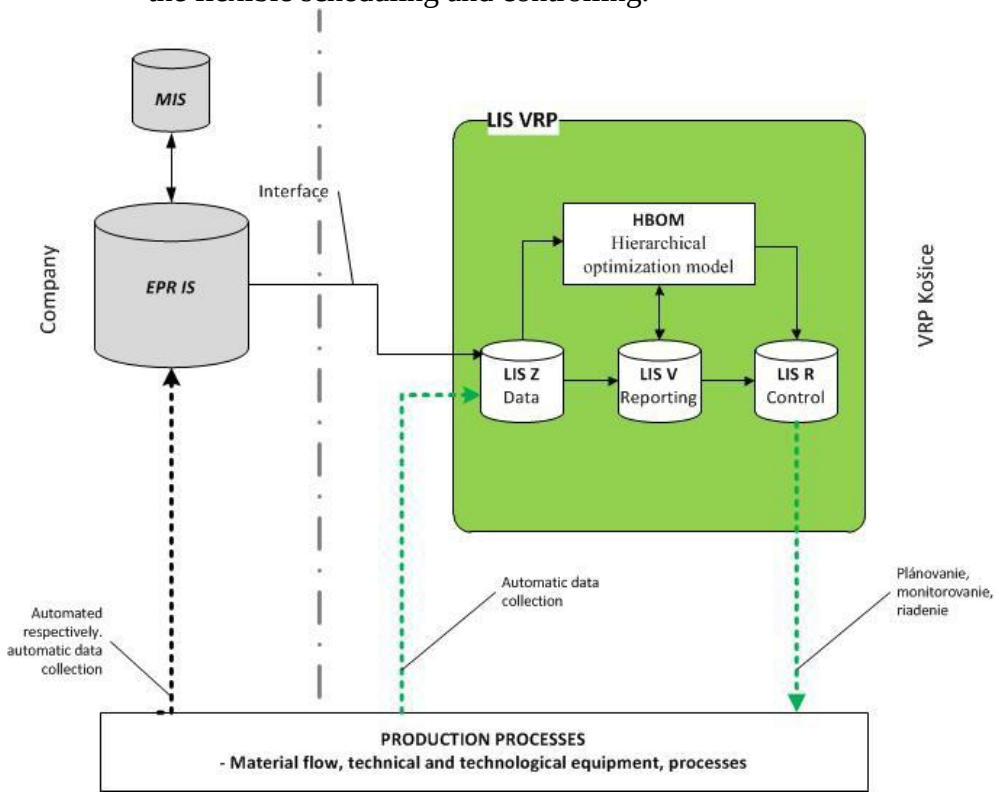

Fig. 2 Structure SMART PLS VRP

LIS R

Process control, optimization and innovation processes, and the strategic implications of:

- PULL production management,
- PUSH production management,
- management of warehouse management,
- managing purchasing and supply

- maintenance management,
- management of optimization processes,
- management of innovation processes.

HBOM

Hierarchical balance sheet optimization model for all levels of management designed to simulate the material flow technological scheme of the company:

- strategic level - drawing up strategic plans and investments,
- tactical level - annual production plans, simulation optimization measures and innovative approaches,
- operational level - simulation optimization measures and innovative approaches to technology level.

Applying the proposed structure SMART PLS is possible to Building the IS environment and the society. It is important to prepare for communication interface and compatibility of the two systems, or SMART PLS operates as a standalone system.

Conclusion

The SMART systems such as advanced production systems, reduce restrictions on the process, and ensure that their conduct in a natural way with the minimization or completely removing the external management interventions. . Implemented processes run around their optima. At the same time it is possible to simplify the technology, equipment and organization of the process. Hierarchical access can optimize processes independent of structural, organizational, operational and physical level. The task of the structural levels is to reduce restrictions on the process so that it ran up freely with maximum interior rear-view links corresponding to the ideal technology. In the majority of processes can be more or less will come close to this State, which is referred to as a technology optimum process. Technology-optimum process can be a measure for each of the alternatives. The aim is not just to find the optimal output optimization process, but also the optimal course of process. Organizational-level is determined by the optimal trajectory for specified process conditions process within the framework of its possibilities. Operational level will process near optimum trajectory. Under optimization from the perspective of the impact of means not only finding but also improves the overall optima, relatively.

The realization of SMART system represents a significant "upgrade" technology. The benefits will be achieved in the reduction of the production costs, particularly in energy saving and in higher recovery of raw materials.

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