GEARS MECHANISM; METAPHOR OF SUPPLY CHAIN MANAGEMENT

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Abstract:

Metaphors are powerful cognitive instruments that help us in making sense of the world around us. We start using them already as very small children and they accompany us throughout our lives. Metaphors of organization rely on a set of assumptions about organizational reality. This is an effort to identify the one new metaphor employed in this literature. A comparison of dominant concepts of Supply Chain and Gear knowledge in an organization shows that the preference of scientists and practitioners for certain metaphors of organization is visual monitoring determined. The history of organization science in research and practice determines the emergence of preferred metaphors. This metaphor, on the whole, facilitates systematic and comprehensive analyses of problem situations, characterization of organizational issues, and disclosure and prioritization of concealed organizational problems in a structured.

Key words: Gear; Supply Chain Management; Metaphor.

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1. Introduction

Effective managers and professional in all walks of life have to become skilled in the art of "reading" the situations they are attempting to organize or manage [Morgan , 2006] the skilled managers know that new visions are sometimes created by reading situations from new angles, For reading organization , Garth Morgan 1943 proposed Metaphors.

Metaphor is often regarded just as advice for embellishing discourse, but its significance is much greater than this; the use of metaphor implies a way of thinking and a way of seeing that pervade how we understand our world generally [8]. use of metaphor is a way of thinking through which one understands the world; metaphors are strong conceptual means used to understand a highly abstract, complicated and theoretical concept; Thus, since metaphors have an effect on the perception of phenomenon's, they don't know the concept or terminology about the situation they want to explain well or know a little because metaphors explain what is unknown by known idioms. [14]

Gareth Morgan (2006) introduced a range of eight metaphors of organization, which he uses as a frame work for ordering the whole of organization science: organizations as machines, organisms, brains, cultures, political systems, psychic prisons, flux and transformation, and as instruments of domination.

If we say that all stages of the supply chain is coordinated to take actions that benefit the entire supply chain, not to exceed, Therefore, to coordinate the supply chain of any chain of actions and decisions impact on other processes may also consider And be sure that each stage of the chain, make decisions that not only benefit themselves and to have significant profit chain.

The Gears mechanism is the most efficient mechanical model for the structure of an organization is in a supply chain.

Gear is a tool that can help to transfer torque that it cans to the torque and rotational speed are used. A model of a gear can cause the correct information in the supply chain. This mechanism can be increased or decreased to control the information flow and direction.

The most common type of gears are spur gears; They have straight teeth, and are mounted on parallel axes. The transition between the rotational axes parallel spur gears are used, they are usually cylindrical in shape, and their teeth are straight and parallel to the axis of rotation.

In this paper, we try to design a model of supply chain management (SCM) by using the gears relations. Gears mechanism is a one of best things that it is made by human. In this mechanism,

all parts should be worked together for transfer force and speed from source of energy to users. The continuation of this studies, we discuss the SCM, Gears and relation them.

2. Supply Chain Management (SCM):

Supply chain management (SCM) is one of the most important competitive strategies used by modern enterprises; the main aim of supply chain management is to integrate various supplies to satisfy market demand [2]. The typical definition of the term supply chain management is as follow: the supply chain comprises all those activities associated with the transformation and flows, from the sources of materials to end users; Management refers to integration of all these activities, both internal and external to the firm. [5]

Supply chain encompasses all activities associated with the flow and transformation of goods from the raw material stage through to the end user as well as the associated information flows; supply chain focuses on the improvement of customer service, profitability and Gassiness performance. [13] In an effective supply chain, enterprises must first find outstanding suppliers, and then establish long – term partnerships with these suppliers to increase enterprises' competitive abilities [1]

Money, components, processes and information flows might establish a supply chain management system but simultaneously, due to government legislation and increasing awareness among the people to protect the environment. [6]

Traditionally, organizations consider criteria such as price, quality, flexibility, etc. When evaluating performance; nowadays, sustainability factors play a vital role for the long term success of supply chain and the purchasing process becomes more complicated with environmental and social pressures. Bowon kim (2005) depicted the production process capabilities and chain relationship among the capabilities by two blow figures.

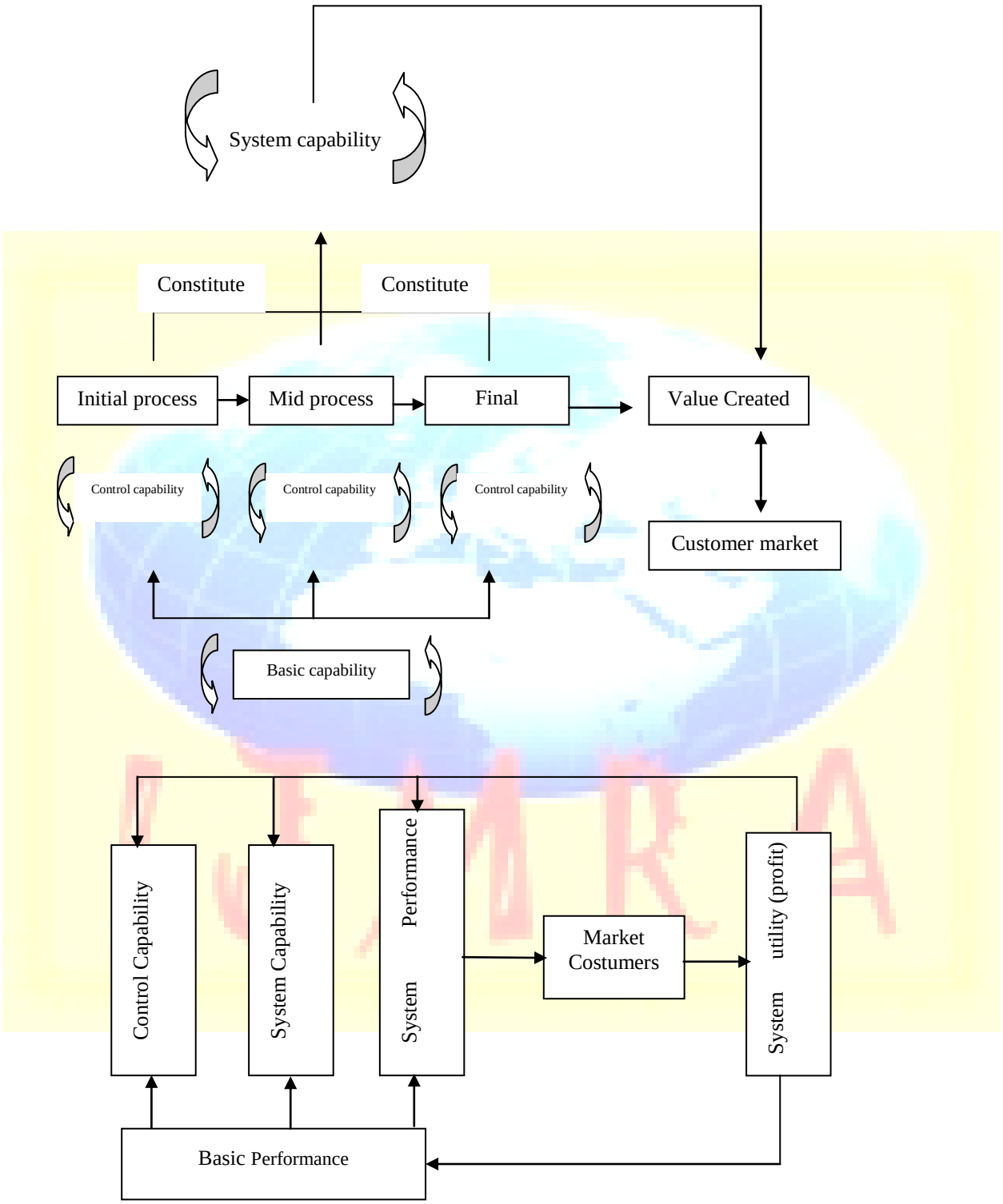

System capability
Constitute
Constitute
Initial process
Mid process
Final
Value Created
Control capability
Control capability
Control capability
Customer market
Basic capability
Control Capability
System Capability
Performance System
Market Costumers
System utility (profit)
Basic Performance

Figure 1

The firm must first develop its basic capability. Supported by basic capability, control capability is associated with individual process. The company's system capability is the one the market will observe and it can be forged only when the company is able to integrate control capabilities from the entire organization's perspective. As for applicability, basic capability is the most open to generalization, since its knowledge and skills are so general as to be useful for wide variety of processes. Regarding the decision time horizon, basic capability requires the longest perspective in that it takes time for the company's employees to acquire basic knowledge and skills. It is true also because the basic capability needs the most comprehensive bases for individual learning.

In supply chain management, we follow goals as blow:

Collaboration with suppliers in the improvement of materials and development of new materials. [9]

Involvement of suppliers in the buyer's new product development. [9]

Intensive information exchange with suppliers. [9]

Manage the entire supply chain process as a single entity

Reduce total supply chain costs

Reduce cycle time in processes and in product development

Improve customer satisfaction.

Joint planning, share information and risk, team approaches

Fewer suppliers/parties involved in the supply chain, longer-term relationship.

Minimum inventory investment throughout the supply chain.

Figure 1.

At t chain, sequence of organizations – their facilities, functions and activities – that are involved in producing and delivering a product or service.

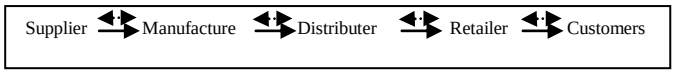


Figure 2.

3. Gear knowledge:

A Gear is a rotating machine part having cut teeth, or cogs, which mesh with another tooted part in order to transmit torque. Two or more gears working in tandem are called a transmission and cap produce a mechanical advantage through a gear ratio and thus may be considered a simple machine.

Nisbett Budynas (2006) introduced four types of gears:

Spur, helical, bevel, and worn gears. The forces transmitted between meshing gears supply tensional moments to shafts for motion and power transmission and create forces and moments that affect the shaft and its bearings.

In this paper, we use the spur gears to show a supply chain management so in the following discussion is only a spur gear.

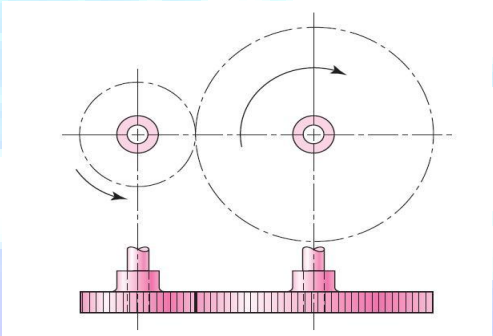


Figure 3.

Spur gear, illustrated in figure.4. have teeth parallel to the axis of rotation and are used to transmit motion from one shaft to another , parallel , shaft.

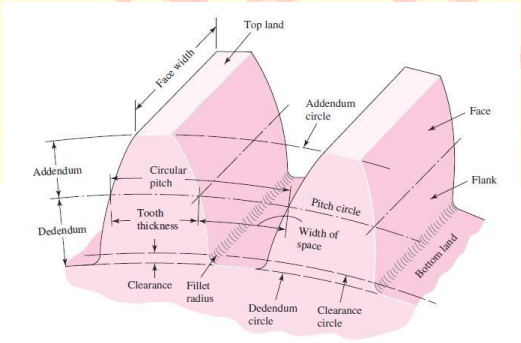


Figure 4.

The terminology of spur – gear teeth is illustrated by Nisbett Budynas (2006). The pitch circle is the optical circle upon which all calculations are usually based, its diameter is the pitch diameter .The pitch circles of a pair of mating gears are tangent to each other. A pinion is the smaller of two mating gears. The large is often called the gear.

The circular pitch p is the distance, measured on the pitch circle, from a point on one tooth to a corresponding point on an adjacent tooth. Thus the circular pitch is equal to the sum of the tooth thickness and the width of space.

The module m is the ratio of the pitch diameter to the number of teeth. The customary unit of length used is the millimeter.

The diameter pitch p is the ratio of the number of teeth on the gear to the pitch diameter. Thus, it is the reciprocal of the module.

The addendum is the radial distance between the top land and pitch circle. The dedendum b is the radial distance from the bottom land to the pitch circle. The whole depth h_t is the sum of the addendum and dedendum. The clearance circle is a circle that is tangent to the addendum circle of the mating gear; the clearance c is amount by which the dedendum in given gear exceeds the addendum of its mating gear. The backlash is the amount by which the width of a tooth of a tooth space exceeds the thickness of the engaging tooth measured on the pitch circles.

4. Organization theory:

Peter F.Drucker (1986) considered five dimensions for working that they are physiological, psychological, social and community band, Economic and power dimension of work.

Physiological dimension say's the human being is not a machine and does not work a machine. Machines work best if run at the same speed, the same rhythm, and with minimum of moving parts. The human being is engineered quite differently. Working requires latitude to change speed, rhythm, and attention span fairly often. It requires fairly frequent changes in operating routines as well.

If organization parts are same as machine parts then they can be controlled by human better. Gears are best mechanical parts can be shown relations and now can be changed speed and rhythm in a system.

The strengths of this approach can be stated very simple. Garth Morgan (2006) used bureaucracies for organizations that are designed and operated as if they were machine.

We expect of organizations as if they were machine to operate as machine: in a reutilized, efficient, reliable, and predictable way.

4.1. Strategic management in organizations:

Customers' input should be gathered at the beginning of the strategic planning process. Customer interviews and other types of surveys can be used to gather customer input and reveal customers' desires and expectations. The key is to focus on what the customers expect as a result of using your products and services.

Supply chain management is a defined as the planning and management of all business activities involved in fulfilling customer requests, such as sourcing, procurement, operations, marketing and logistics management.

The main goal of supply chain management is to facilitate the integration of supply and demand management for the purposes of improving the performance of individual companies and the supply chain as whole. [15]

4.2. Managers in organizations:

Peter Drucker (1999) commented on managers are the basic resource of the organizational enterprise. They managers are everywhere have subjected themselves to steady barrage of speeds and programs in which they tell each other that their job is to manage the people under them.

The management is clearly segmented into three distinct layers.

These three layers: Top management, middle management and lower management.

Top management is more focused on planning strategic issues but less involved in directing function, lower management is more focused on directing and less on planning and Middle management should facilitate the continuous improvement.

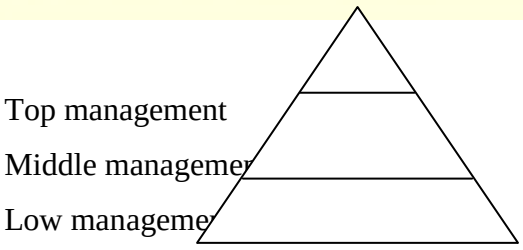


Figure 5.

5. Metaphor of Gears:

The metaphor of Gears invites us to think of systems where all parts can work together in such a way that the speed and accuracy will be vary based on the time.

5.1. Gears and Management levels:

We can classified Gears shafts into three categories:

The first shaft is top management that it transfers propulsion to the system and it can controls strategic planning.

Last shaft is lower level and it focuses on directing and outputs. Others just be facilitated the continuous improvement.

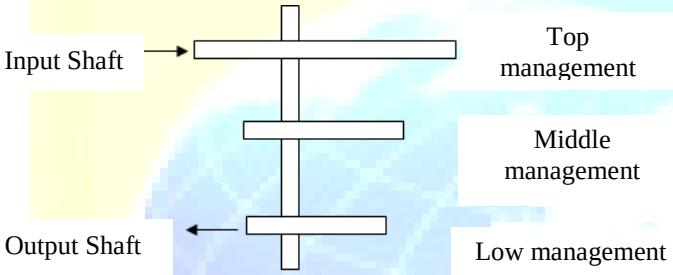


Figure 6.

5.2. Organization Parts and a Gear:

Fred R.David (2011) presented three stages for the strategic management process: strategy formulation, strategy implementation, and strategy evaluation.

Strategy formulation includes developing a vision and visions, identifying an organization's external opportunities and threats, determining internal strengths and weaknesses, establishing to pursue.

When we are designing a gear, Goals, type of application, the strength and the external forces are considered.

Strategy implementation includes developing a strategy supportive culture, creating an effective organizational structure, redirecting marketing efforts.

The ratio of the pitch circles of mating gears defines the speed ratio and the mechanical advantage of the gear set.

Strategy evaluation is the final stage in strategic management that it is the primary means for obtaining information about particular strategies are not working well.

Katsuhik Ogata (2010) the system's stability is sensitive to the error between the actual system and its model; this means that when the designed controller based on a model is applied to the actual system, the system may not be stable to avoid this situation, we design the control system by first setting up the range of possible errors and then designing the controller in such a way that, if the error of the system stays within the assumed range, the designed control system will stay stable.

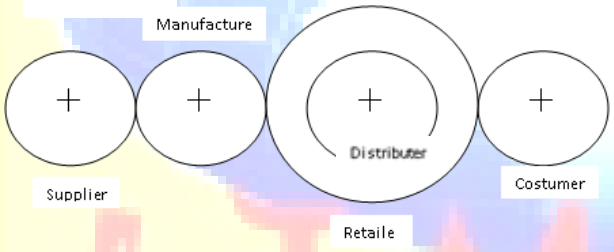
5.3. Supply chain by Gears Management:

A supply chain that it is a system of organizations, people, technology, activities, information and resource in moving a product or service from sup live to customer.

All the constituent parts of a supply chain are same as a set of gears that they work together to coordinate and output of one sector is the drive of the other part.

Figure 4 is shown relations between parts of a supply chain by set of gears. The important point is that changes in one part can be changed the speed and accuracy.

Figure 7.



5.4. Balance the input and output:

The zone of action of meshing gear teeth is shown in figure 5. we recall that two parts of a supply chain contact begins and ends at the intersections of the two addendum circles with the pressure line.

Also it is shown the equal between input and output by fighting tooth.

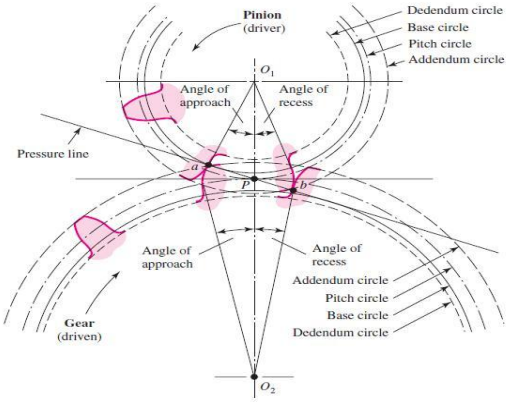


Figure 8.

6. Conclusion

Using the theory of gears, we can find a better view of the supply chain. Because gear is human – made and it is one of mechanisms that the components must work together and coordinate. Figure 8 summaries the metaphor of Gears and supply chain.

SUPPLY CHAIN	**1. Management levels** **- Top management** **- Middle management** **- Low management**	**2. Organization Parts**	**3. Supply chain**	**4. Balance Between Input And Output**
METAPHOR	Identifying Similarities Between The two Subjects → Dominate Image of Organization → Organization theory / New Organization Structures			
GEAR	1. Gear's shaft - Input shaft - facilities shift - output shaft	2. Gear parts : 2.1: diametric pitch 2.2: Number of teeth 2.3: pitch diameter 2.4: module 2.5: pitch diameter 2.6: circular pitch	3. set of Gear's	4. Balance in meshing of gears

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