

Historical analysis of team working development

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Abstract

As organizations have to deal with global competition in a complex environment, new ways of organizing have emerged. This paper aims to propose a historical analysis of team work development. It begins with the initial studies of Scientific Management and ends with current concepts of team work.

Keywords: Team; Scientific Management; Historical analysis.

1. Introduction

According to Sacramento, Chang e West (2006), in the twentieth century global competitive scenario – people got closer to all market, so organizations need to be more innovative to overcome the competitors and have success. Collaboration can be a source of differentiation and innovation, becoming a competitive advantage.

Because of the globalization and the amount of change that have been happening in society, companies need more agility and flexibility to become more innovative (MOLLEMAN; BROEKHUIS, 2001; WORLEY, LAWLER III, 2006).

Fleury (1980) thinks that dynamic environments require flexible production systems, since there are constantly requirements for changing the way tasks are performed inside organizations, so employee roles need to be revised frequently.

The necessity for major flexibility led to the replacement of approaches based on work units to ones that emphasize teamwork, highlighting the process results instead of task results (MARX, 2010).

Katzenbach and Smith (2003) say that, when different skills and experience is required, team performance is higher than individual work performance.

The importance and the use of teamwork in organizations have increased substantially, showing the impact of this kind of work organization.

From critical analysis of teamwork characteristics and as a source of competitive advantage to organizations the doubt about how organizations considered teamwork over the time emerges.

So, this paper aims to describe the historical development of teamwork in organizations, analyzing mainly the operations view – it begins with the Scientific Management and goes nowadays.

It's known that management practices exist before eighteenth century, in the "Pre-modern Era", what made many humankind achievements possible. Anyway, in order to achieve the defined objective this paper considers the initial studies of Classical Management Theory as the beginning of work organization.

In accordance with Sacramento, Chang e West (2006), since the beginning, people realized that their individual limitations could be overcome or softened if people were associated with each other, increasing survival's chances.

2. Study developing

Industrial revolution, which began in eighteenth century markedly in Britain, caused the substitution of craft and individual work by large factories, where many people work together using machines as work driving force, in specialized functions with high labor division (FARIA, 1986; ROBBINS, 2000).

Clark (2003) considers that American industry emerged about 1830, when products could be manufactured from standard components based on a project.

Linked with social and economic issues, the new production model, which allowed greatly reduced costs, promoted the rise of big mass production industries.

In accordance with Wood Jr. (1992), the industry work changed people way of life, establishing routine and well defined working hours, besides it required a high level of control.

As these industries was growing in production, size and complexity, the need for management theoretical support increased too. Starting with this necessity, since twentieth century, the management initials studies begun. It was known as Classical Management Theory.

The Classical Management Theory can be divided in two groups: Scientific Management and General Administration.

The major scholar of Scientific Management was Frederick Taylor, who redefined the organizational structure of production, modifying the role and the responsibilities of each level. This modification allowed the definition of work design and work concept by middle management instead of the definition by the workers. It means that planning and executing became two different and separate activities (FARIA, 1986; FLEURY, 1980; FLEURY e

VARGAS, 1983 apud ZANCUL, MARX e METZER, 2006; ROBBINS, 2000; SILVA, 2008).

To make it possible, Taylor studied the required time and the least amount of movements needed to perform each task. Tools and the work itself were standardized. Besides that, he deployed personnel selection, which had to consider skills, fitness and personal abilities to each job.

Taylor still recommended the payment by unit produced – he believed it would improve the productivity of every worker.

Another important scholar of Classical Management Theory was Henry Ford. As he aimed to improve the efficiency of his factory, he developed many concepts related to production system and operations management. These concepts were widely disseminated and applied.

Ford looked for reducing the work time required and to improve productivity of each person. In order to achieve these objectives, he established many concepts as: work should go to the worker place (line production), costs reducing, high level of production and low goods variety (mass production) and employee wage retribution (SILVA, 2008).

Others characteristics of Fordism are “total interchangeability of parts and simple assemble” (WOOD Jr., 1992, p.9).

Clark (2003) comments the influence of Scientific Management in United States: in 1870, organizations were already using charts to analyze and criticize the existed practices.

The precursor of General Administration / Administrative Theory was Henri Fayol, who establishes the distinction between technical activities and management activities.

According with this engineer, professionalization of management study and teaching was necessary. Fayol believed that managers should have peculiar features in order to work as a

manager. So he proposed the 14 principles of Management and the management functions, which are still widely used and disseminate nowadays (SILVA, 2008).

The most significant principles of the cited authors can be viewed in picture 1:

| Classical Management Theory Principles | Scientific Management | | Administrative Theory |
|--|-----------------------|------|-----------------------|
| | Taylor | Ford | Fayol |
| - Labor specialization and divided | X | X | X |
| - Time and movements study | X | | |
| - Tools standardization | X | | |
| - People recruitment and selection | X | | |
| - Planning X Executing | X | X | |
| - Payment by production | X | | |
| - Labor standardization | X | X | |
| - Mass Production and Linea Production | | X | |
| - Efficiency as the mayor objective | | X | |
| - Wage retribution | | X | |
| - Management principles | | | X |
| - Management functions | | | X |
| - Management professionalization | | | X |

Picture 1: Principles of Taylor, Ford e Fayol

Marx (2010) considers that Scientific Management, in Taylor's and Ford's perspective, is based on individual work. In accordance with this author, Taylor did not recommend teamwork because he believed that the worker of lower capacity and speed would be the reference of the whole group, which couldn't use technical and scientific work methods. Besides that, teamwork would obscure the analysis of people's differences, which is essential for the payment by production.

As a critique of how the Classical Management considered people – as just another production factor, the School of Human Relations emerged, emphasizing people.

Nevertheless, the studies aimed to improve productivity and people performance in organizations.

Picture 2 synthesizes the view of the School of Human Relations' mayor scholars.

| | Scholar | Major publication | Date | Main thoughts and contributions |
|---------------------------|------------------------|---|-------------|--|
| Precursors | Mary Parker FOLLETT | <i>The new State</i> | 1920 | - Group principle; - Science of the situation: situation defines what must be done; - Conflict management. |
| | Chester Irving BARNARD | <i>The functions of the executive</i> | 1938 | - Cooperation is important to achieve the common objective; - Established three executive functions. |
| School of Human Relations | Hugo MÜNSTERBERG | <i>Psychology and Industrial Efficiency</i> | 1913 | - Base of the Industrial Psychology Movement; - His studies were in line with Scientific Management |
| | Elton MAYO | <i>The Human Problems of an Industrial Civilization</i> | 1923 - 1944 | - He studied the behavior and the productivity in work; - He realized that members of teams with "spirit de corps" are more supportive with each other. |

Picture 2: Synthesis of the ideas of leading thinkers of the School of Human Resources

One of the precursors of this Theory, who must be highlighted considering the purpose of this paper, is Mary Parker Follet. She pointed out the importance of motivation and considered organizations as groups of work instead of hierarchical structures (SMITH, 2002). Her writings were very popular, even so it wasn't actually used in that time organizations' management.

In the same way, during one experiment Elton Mayo's team realized some differences, notable in productivity, between a cooperative and cohesive group which was working isolated and the others production workers.

Wood Jr. (1992) stresses that Mayo identified social needs in work and the existence of informal groups, noting the more humanistic production.

Mayo and his group still realized, via another experiment, the existence of certain corporatism of group's members, avoiding the injury with any member. Researchers figured out that, despite supervisors' orientations, this group used to define and act in accordance with its own objectives.

According to Marx (2010), the School of Human Relation's thinkers were worried to create recommendations to managers towards motivating people in order to improve productivity. So in their propositions there weren't significant changes in production system or in the hierarchical view proposed by Scientific Management.

The mass production system was well broadcast and utilized (since Ford), but it wasn't appropriated to Japan needs in post-war. From the necessity of a production system that were more appropriated to Japan restrictive conditions, people that worked in the car assembler Toyota developed a system which got well known as *Toyota Production System* (CLETO, 2002; MONACO and MELLO, 2007).

The Toyota Production System has some particular characteristics, as high concern with product quality, confiability and durability; caring for machines and equipment; inventory reduction; reduced setup; concern with quality since the product project; keeping cleanliness and orderliness is part of people work; and the establishment of partnerships with suppliers to ensure the quality of inputs, to get competitive cost advantage and differentiation (HAYES and WHEELWRIGHT, 1984).

Besides that, the assembly line is divided in separated parts (smaller or little lines) which are independent. This modification allows the separate analysis of the labor of each work station and enables that workers stop their work station without affecting others lines. This model made employees more autonomous about their own work (MUFFATO, 1999).

According to Wood Jr. (1992), in Toyota System, product modifications are faster - it made the small lots production's costs feasible. In addition, the Japanese model advocated lowering inventory rates and the continuous search for quality improvement. In order to get this, workers need to be well trained and motivated.

Related to people role in Toyota System, Hayes and Wheelwright (1984) add the deployment of a climate where people are stimulated to discuss quality problems (searching the causes). Besides that, workers are encouraged by managers to opine and talk about recommendations and suggestions. Attached to this, there is the company interest that workers look for enlarge their skills, so they can work together, using high level equipment and get better results.

Group as a way of working is very important for Japanese system and it's an outstanding characteristic of this production model. The Japanese management is participative, characterized by the mutual respect and the common interest in working together to achieve the objectives – communication and feedback are frequent. Different people, whose have some kind of relationship (as suppliers, clients, workers and Unions) share objectives e interests (HAYES e WHEELWRIGHT, 1984).

These practices of Toyota System are known as job enrichment. According Fleury (1980), this practice improves the diversity of tasks that are performed by the same person and raises gradually her level of responsibility.

A usual working group practice in Toyota System are the improve teams, which are known as "Quality Control Circles". Munchus III (1983) says that Quality Control Circles are small groups of voluntary workers, who work in the same area. In order to be able to analyze and solve their area problem (which is their responsibility), they are trained to use quality tools and problem solution method

The wide adoption of Quality Control Circles in Japan started in seventy years, so it isn't considered as the mayor factor of high quality of Japanese goods (HAYES and WHEELWRIGHT, 1984).

In 1983, a joint venture between two car assemblers (Toyota and General Motors) resulted in a new factory in California - NUMMI (*New United Motor Manufacturing Inc.*). The Japanese model was applied - quality and productivity level achieved in this plant were much higher than others General Motors plants and similar to others Japanese plants. (NUNES et al., 2009).

Zancul, Marx and Metzker (2006) consider that the critical analyses of Scientific Management principles and job enrichment promoted the conception of Sociotechnical School and semi-autonomous groups.

Although the initial studies of Sociotechnical School begun in the fifties (as a way to improve quality work life), sociotechnical principles' mayor diffusion happened when it were applied in a new plant of a car assembly (in 1989).

One of the principles of Sociotechnical School is to join the social part – related to people (control structure and work organization) with the technical part – productive structure, equipment, informational and communicational systems (MOLLEMAN, BROEKHUIS, 2001).

The semi-autonomous groups deployed by Volvo in different Swedish plants, between seventy and ninety years, had some remarkable features: autonomy, long operation cycles, payment based on the knowledge of the production process, Union support to this organizational configuration and keeping the quality and productivity results (MARX, 2011).

In the last decades of the twentieth century, Volvo was considered as an organization that had a more humanistic production approach (WALLACE, 2004).

In accordance with Muffato (1999) and Wood Jr. (1992), this plant was designed with people in mind, aiming to obtain the best work conditions.

The plant was organized in six assembly units, composed by eight work groups. The production used a 'dock system', where the product stayed while it was assembled by the workers. Groups were formed by seven people (at the maximum) and they could assemble until four cars (at different process levels) simultaneously (MUFFATO, 1999).

Team autonomy in this model (sociotechnical) is much greater than in Japanese model. (NUNES et al., 2009). These authors point that Japanese structure teams aim to improve rotation to increase the operational flexibility, to create a more pleasing climate and an ergonomic labor.

Still comparing the models, Bowen and Lawler III (1995) reported that research showed that NUMMI performed better than the Volvo plant, where sociotechnical principles were applied, with semi-autonomous teams that had autonomy to decide how to carry out their work.

The model implemented by Volvo had good and increasing results. However, these results were insufficient for the company to re-occupy a prominent position in the market and overcome the productivity indices of the Toyota System (Nunes et al., 2009).

Several factors led to the closure in 1992 of Volvo's factory, where the implementation of socio-technical principles started. Sometime later, the passenger car division was sold. The closing of this plant unfeasible Volvo's sociotechnical system to be well known and widespread. The application of this system got restricted.

Nevertheless, Wallace (2004) comments the hybridization of Toyota production system in the Volvo factory in Curitiba. In this plant more humanistic practices are used with techniques of the Japanese system. Self-managed teams (where the operators work with minimal direct supervision, share responsibility for improving their process, negotiate the

necessary resources to achieve their objectives, are responsible for their indicators, for product quality and for the production time) were established.

The Toyota system is the most widely system used in the market nowadays – it is the reference in the pursuit of productivity, quality and flexibility (CLETO, 2002). Ferro and Grande (1997) report that the quality improvement groups have been widely used by organizations in different countries; the need to be more competitive, since 1990, created different group activities.

In accordance with Clark (2003), changes in economic policy and in the production model have led to new organizational directions, resulting in the decline of the vertical model. This period is characterized by crises in large and medium-sized companies; identification of new management methods and tools - related to the change of the paradigm from specialization to innovation, which provide productivity gains; and investments to establish organizational networks and strategic alliances between organizations.

Many organizations still use scientific management as a model to deal with its market, but it's only feasible when the organization is in a very stable market, where there is little requirement for product and process changes (Wood Jr., 1992).

3. Final considerations

Figure 3 summarizes the vision of teamwork in each of the schools examined in this text. It is possible to identify how this form of work organization was considered throughout the studies and empirical analysis.

The Classical Management Theory is considered the basis of Management studies. The current way organizations operate and much of what is known nowadays derive from these

initial studies, which were performed to understand the reality and to propose manufacturing practices in order to improve efficiency.

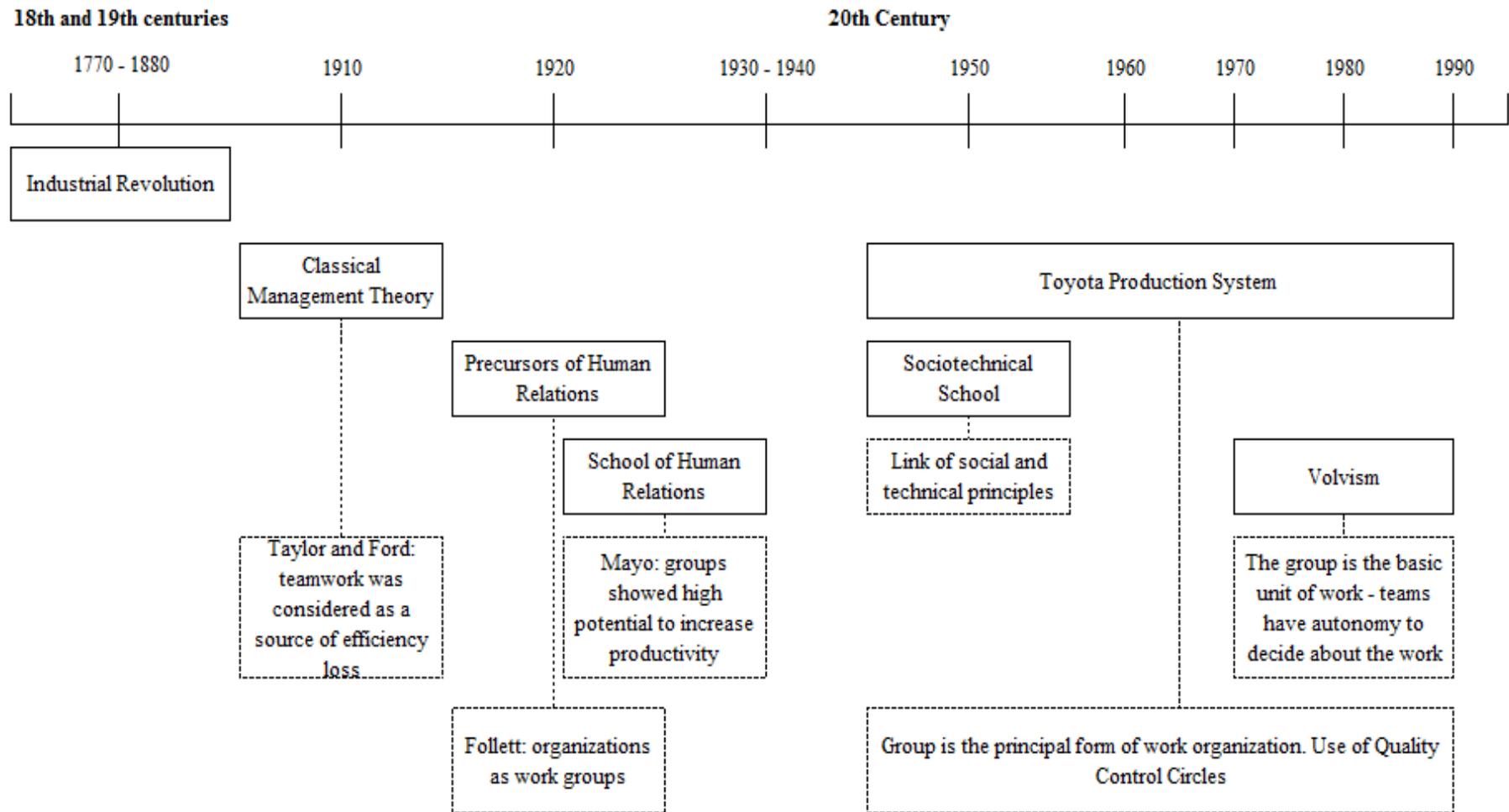
For a long time this paradigm remained the only work organization model, especially in industries, but drastic social changes (relating to both consumers and workers) required new working practices.

From these analysis emerged: a more humanistic vision of the work, workflows that perform much better than other models and new ways of thinking and analyzing organizations.

Very often these new forms became an alternative for the radical changes that has occurred in the world in the past 50 years. It can be an answer for organizations to remain sustainable, despite the increased demands of customers and the speed of change.

An organizational form that has appeared as an enabler of the flexibility needed in this new scenario is teamwork. Since it's not an entirely new model, it's interesting to analyze how it was treated over the years by various scholars and how it was applied in organizations.

Thus, this study described the evolution in the use of teamwork, which has been strongly recommended for some specific organizations environment.



Picture 3: The evolution of management thinking about teamwork

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