Modeling Management Strategy Impacts on the Organization Effectiveness and on the Social System

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Abstract--**The objective of this research is to create a model for exploring practices and management interventions that can concurrently influence an organizational effectiveness, the quality of its culture and employee health. These three dimensions collectively determine, to some degree, an organization's long-term sustainability. A qualitative dynamic modeling representation is used to capture the interrelationships among these three dimensions and to explore key feedback structures discussed in the literature and which may exist within an organization. The modeling indicated linkages among the three dimensions and many others, and their potential for effecting organizational change. Dynamic hypotheses were formulated based on literature from the fields of management, engineering, social systems and organizational psychology. A field study of an actual organization confirmed these hypotheses and indicated greater dynamic complexity than what may be inferred from the literature.**

I. INTRODUCTION

Numerous theories and studies deal with various aspects of improving organization's effectiveness as it undergoes change. In many studies [1, 2, 3, 4, 5, 6, and others], the emphasis has been on quality directed towards attaining customer satisfaction as the primary long-term objective above and beyond maximizing shareholder value [3]. Focusing on quality rather than focusing on organization's effectiveness represents a paradigm shift in management thinking. The quality management paradigm is based on behavioral approaches that can enhance performance by recognizing the employee as a customer and emphasizing teamwork and participation as vehicles for job satisfaction, motivation, and organizational performance [7, 8, 9]. Despite the presumed benefits from this paradigmatic stress on quality, there has been little emphasis on the importance of the employee's quality life at work as a quality component.

The importance of considering all the components in an organization as parts of a whole system has triggered consideration of the systems approach, a paradigm that views a system as a group of interdependent, interacting parts [10]. The concept of systems thinking has been regarded as an important characteristic of total quality formulations [4, 11]. It was also accepted later as an important core value of performance excellence by the MBNQA (Malcolm Baldrige National Quality Award) [12] and by ISO 9001: 2000 [13]. Despite this, employee health is viewed as a separate issue and not sufficiently important for strategic quality initiatives. Only lately has the interaction between employee health and organizational effectiveness started to intrigue researchers who have begun to turn their attention to ways of advancing employee health in order to improve an organization's productivity [14, 15, 16, 17]. The interaction between quality culture and employee health is also a subject of recent interest [18, 19, 20]. Unfortunately, the literature generated by the interest in these three constructs, employee health, quality culture and organizational effectiveness, does not focus on the systems approach as a tool for understanding the relationships between these three concepts.

In the following paper, the literature review deals with quality programs, employee health and organizational effectiveness. A discussion of systems thinking and its basic concepts follows. Based on the literature and the use of the systems thinking tools, the key inter-relationships between many variables that relate to quality culture, employee health and organizational effectiveness are presented.

II. LITERATURE REVIEW

A. Quality Programs, Quality Culture and Organizational Effectiveness

In the Nineties, much of the literature concerning quality in organizations was devoted to the study of the relationships between quality and other important measures of organizational success, such as productivity [21]; profitability [22]; market value [23]; competitive advantage [24]; and organizational performance [25, 26, 9]. The reason for this focus may have been that the previously prevailing mindset in which quality by itself was not regarded as the end of a process, but as a means to something else. Only later did organizations discover that certain quality approaches, such as zero-defects or six-sigma might also be associated with effectiveness goals [27].

Many researchers investigated the reasons for the lack of success in implementing Total Quality Management (TQM) in the workplace [28, 7, 29, 30]. Some [28, 8, 31] concluded that the low rate of TQM success was a result of focusing mostly on the 'hard' issues and neglecting the 'soft' issues when implementing TQM. 'Hard' issues were regarded [8] as core quality practices and had a more technical orientation [32]. Among these issues were quality information, process management, product design and statistical process control. The 'soft' issues were [8] infrastructure quality practices and involved more of the social and behavioral attributes of quality management [32]. Among these issues were: employer-employee relationships, top management support, customer involvement and other human relationships. At the

root of the many cases of failure in the process of TQM implementations was the emphasis on quality products rather than quality interactions, and not viewing the employee as one of the main customers and the most important stakeholder of the organization [33]. Failure in implementing TQM could mostly be related to the elements that support the implementation process like the lack of support of the company leadership, rather than to the quality practices themselves [28].

Most of the literature that deals with organizational quality culture focuses on the need for a paradigm change with respect to the prevailing concepts and attitudes that are required in order for quality programs to work [34, 35]. A different approach to this issue is presented by Detert et al. [36] who constructed a general framework in terms of culture that can be linked to improvement initiatives in organizations. In their study they demonstrated a link between this framework and TQM values and beliefs and presented eight dimensions that are most frequently discussed in the literature, like ideas about stability versus change and others.

B. Employee Health and Organizational Effectiveness

At the beginning of the Seventies, organizations moved from viewing workforce health in its relation to organizational performance to a more proactive approach, and designed programs that reinforced lifestyle changes [37, 38]. The main concept underlying these programs was that the individual's lifestyle contributed directly to a person's health and organizations need to help individuals change their unhealthy lifestyles. While these programs continue to flourish, other researchers pointed to the link between environmental factors and employee health, especially the effect that stress (an individual's physical and mental reaction to environmental demands or pressures) has on an employee's health [39, 40, 5].

The literature concerning the relationship between health initiatives and organizational effectiveness is far from being consistent in terms of the methods, terms, and approaches that measure and evaluate organizational effectiveness and what influences it. The most frequently term used in the health promotion literature is *productivity* rather than *effectiveness* or *performance*. Even when authors use the word *productivity,* they are actually referring to one measure they believe represents productivity – absenteeism. While acknowledging this shortcoming, they explain it by the fact that methodologies for measuring productivity are lacking.

Later, certain researchers have started to view health in a broader context, specifically when dealing with an organization's health. Grawitch et al. [41] identified five general categories of healthy workplace practices in organizations that were linked to employee well-being and organizational improvements: work-life balance, employee growth and development, health and safety, recognition, and employee involvement. According to Rosen [42], in healthy companies, products and profits are not the immediate goal; they are the result of doing everything else right. Organizational success, improved quality, better service, and competitive advantage are the by-products of shared values and collective efforts.

C. Systems Thinking

The systems approach distinguishes itself from the more traditional analytical approaches by emphasizing the interactions and connections between the different components of a system. The interactions of the parts become more relevant to understanding the system than understanding the parts. According to systems thinking, system behavior results from the effects of complex feedback systems.

In order to understand the complexity of a problem, the problem has to be identified by describing verbally the relationships between all the components of the system and then the conceptual model is built, describing visually these relationships using casual feedback loops and stating the dynamics hypotheses that describe the behavior of the system over time.

III. THE CONCEPTUAL MODEL

The aim of this literature review was to build a holistic framework that will focus simultaneously on promoting organizational and employees' outcomes, assuming that a balance between these two outcomes is the best for both the organization and its employees in the long-run. The literature review provides the researchers with a tool to explore ways in which quality culture and employee health interact and mutually influence each other and then impact organizational effectiveness. The estimated hypothesis is worded using dynamic hypothesis. A dynamic hypothesis is a potential explanation of how the system structure causes the observed dynamic behavior as a result of the interactions between several factors in the system over time [44]. The following dynamic hypotheses were developed following the literature review summarized previously. The relevant studies that provided inspirations for each of the dynamic hypotheses will be mentioned at the end of each description.

A. The Dynamic Hypotheses

The first dynamic hypothesis (Learning Loop in Fig. 1) says that to operate effectively in an organization, a manager or employee should be involved in a learning process that influences his mental models (perceptions), so that he can develop new ways of thinking which can lead to a greater acceptance of change and growth. Assuming that there is a desire for this kind of learning and openness, this may result in closing the gap between the current mental models (defined by the collective skills, knowledge and experience) one has and the new mental models one encounters. The

effort to close this gap will lead to decisions and then to actions that one needs to take in order to achieve more experience, skills and knowledge. This effort in turn leads to more learning and a greater degree of openness leading to new skills and the motivation to minimize the gap between the desired and achieved level of learning and openness (based on [43, 45]).

The second dynamic hypothesis (Stress/Control Loop in Fig. 1) describes that the more experience gained through the development of one's skills and knowledge, the more control one has over his life. The greater the alignment between the sense of control (represented by experience, skills and knowledge) and the desire for control (which is measured in the same way), the less the perceived gap between the desired control and the perceived control. Consequently less stress is introduced into one's life. This in turn encourages a person to look for more experience and more learning opportunities (based on [5, 14, 39, 40]).

The third dynamic hypothesis (Job Satisfaction/Health Loop in Fig. 1) phrases that the more experience, skills and knowledge the individual gains, the greater the job satisfaction one feels as long as the perception of the level of collaboration, the level of decision latitude, and the level of participation and involvement are close to the levels that one desires. According to the literature, these concepts define important components of job satisfaction. The closer the level of job satisfaction is to the desired level of job satisfaction, the more one feels pleased (this relationship is assumed as part of the link between job satisfaction gap and employee health). Subsequently, this pleasure positively influences one's state of health. If an employee experiences an increased sense of well-being, he tends to be less absent and more productive at work. This in turn provides him with more opportunities to take more actions and develop more skills and knowledge (based on [5, 16, 17, 39]).

The fourth dynamic hypothesis (Stress Recovery Loop in Fig. 1) says that lack of knowledge and skills leading to a feeling of lack of control increases stress up. If this build-up is accompanied by a low perceived level of decision latitude, then stress accumulates even more. This causes a person to experience a greater distance from his/her desired comfort zone. The greater the perceived gap with respect to one's comfort zone, the greater the chances that he will get sick, a state that provides him with an escape route to lower his/her stress (based on [5, 39, 40]).This dynamic hypothesis deals with the linkage between stress and illness.

The fifth dynamic hypothesis (Absenteeism/Stress Loop in Fig. 1) explains that the low health status of an employee may lead to absenteeism reducing a person's productivity and the ability to acquire more skills, experience and knowledge which increases his/her attendance gap, subsequently causing the person to be less productive and therefore, hindering one's ability to acquire more skills, experience and knowledge. This state, in turn, increases the perceived control gap, leading to even greater stress. As stress accumulates, the perceived comfort zone gap increases, eventually causing even more illness (based on [5, 16, 17, 39]).

The sixth dynamic hypothesis (Motivation Loop in Fig. 1) says that the greater the job satisfaction one experiences, the more motivation one has at work. When motivation is high, commitment is also high, which positively influences actual job performance. This holds true as long as the level of communication needs with the other workers is commensurate with the job requirements. If actual job performance is high, the job quality level is high, resulting in a higher level of actual organizational effectiveness. When the actual organizational effectiveness rises, the effectiveness gap decreases and management satisfaction increases. This positively influences employee satisfaction and motivation (based on [20, 46, 47, 48]).

The seventh dynamic hypothesis (Health/Quality Loop and Effectiveness/Quality Loop in Fig. 1) describes that quality culture increases with an increase in the implementation of such managerial practices as collaboration, expanded decision latitude, participation and involvement, better communication and long-term planning. Quality culture positively impacts employee motivation as well employee health status and actual organizational effectiveness. These development decrease employee attendance gaps (the gap between the desired attendance at work and the actual attendance) and the organizational effectiveness gap. This in turn increases the actions at work taken by the employee and increases his current experience, skills and knowledge. More experience and knowledge decrease the openness gap (the gap between the current experience, skills and knowledge and the desired level of learning and openness) and finally increases quality culture (based on [20, 34, 36, 47]).

C. The Full Qualitative Model

Based on the dynamic hypotheses that were extracted from the literature, a conceptual model was constructed, demonstrating the linkage among the variables and processes that are significant components of quality culture, employee health and organizational effectiveness. Fig. 1 presented the unified model, which was constructed by linking all the previously described loops.

While all the relationships and connections in Fig. 1 are important for an organization, one can conclude that the most significant loops for the purpose of this research are the Health/Quality and the Effectiveness/Quality loops and the Motivation loop, since they highlight the connection between quality culture employee health and organizational effectiveness and how they mutually influence each other.

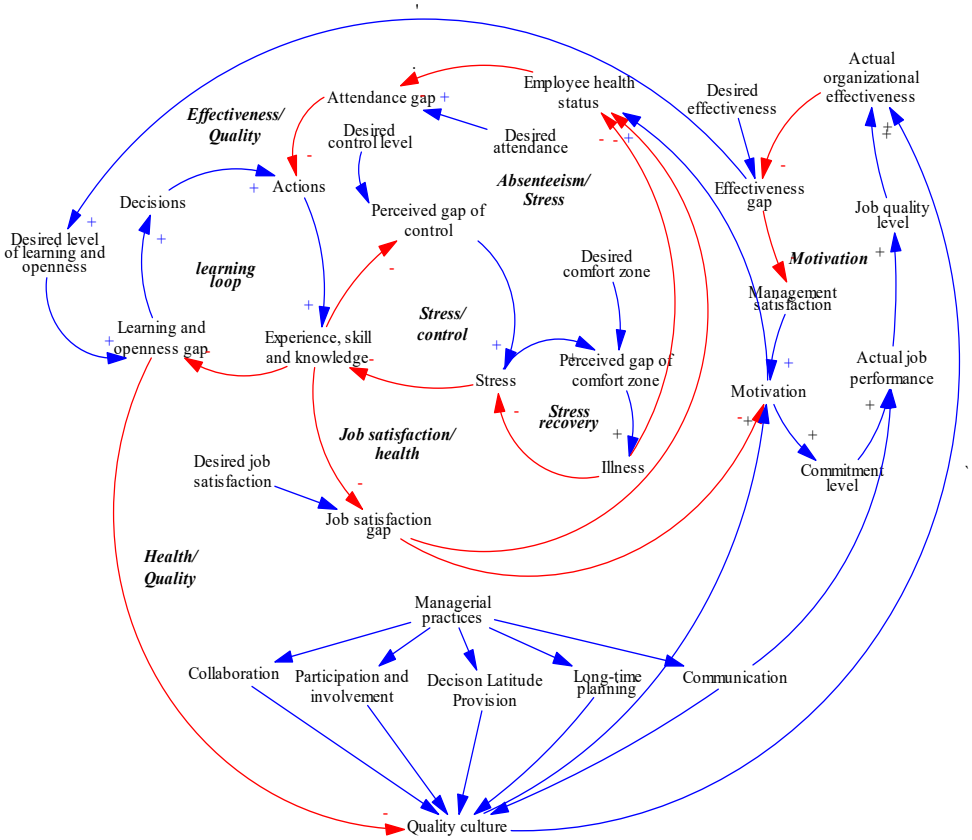

FIGURE 1
The Full Qualitative Model Derived from the Literature

IV. THE CASE STUDY AND THE QUALITATIVE MODEL

In order to investigate whether relationships between quality culture, employee health and organizational effectiveness in a social environment are similar to those found in the literature, a company was chosen from a list of organizations that expressed an interest in our research. Among the factors that led to choose this company were: a company awareness that quality programs were essential for its existence; the work relied primarily on the employees; and the company was perceived to be competitive in its line of business. Of the companies that met these criteria, the one that was selected was chosen randomly.

A. The Case Study Setting

The case study was conducted at a production facility located at a subsidiary of the firm. The firm produces and distributes powdered food blends using sensitive packaging which requires a high level of quality standards. Concurrently, the firm also needs to maintain a high level of effectiveness in order to remain profitable in the competitive global economy. The concurrent objectives of maintaining high quality standards while striving to ensure costs remain at a minimum have created a host of problems for the firm's management.

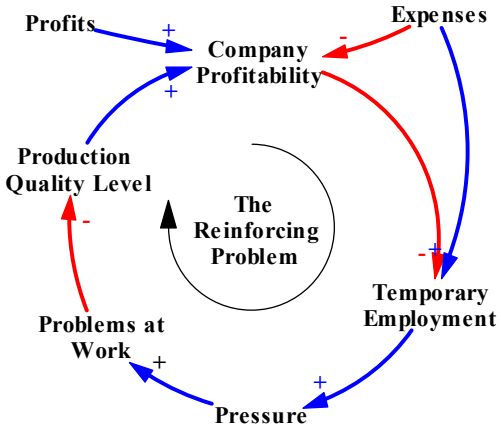

FIGURE 2
The Problem as Derived by the Firm's Management

The two conflicting objectives, i.e., reducing costs and facilitating the development of a quality culture, compelled the firm's management to seek a way of attaining both objectives simultaneously rather than compromising one for the other. The requirement of keeping costs low, which can lead to temporary unemployment for some employees and

low salaries for all creates a lot of pressure. This in turn creates problems in terms of maintaining the necessary quality level associated with the production processes and has had a negative impact on profitability. Fig. 2 describes the company's problem as derived by the management.

B. The Group Modeling Process Results

The application of the system dynamics approach to analyze and understand the problems of the firm requires the involvement of all concerned parties within a group model-building process. In order to assure that the right individuals would be included in the group, it was decided to include only employees directly connected to production. This meant that in addition to the production workers, employees from maintenance, quality control, inventory and operations departments were included.

C. Problem Definition

The first phase in developing the conceptual model was to articulate the problem of the organization as the participants perceived it. The problem was defined at the organizational level and at the personal level.

The model shows the current situation which is described by loop B1: The more orders are waiting, there more immediate treatment are made, which decreases the number of orders waiting but also causing a lot of side effects that are described by several loops: Loop R1 describes that the more immediate treatments, the more mistakes and defects, causing more stress, decreasing performance capability, increasing the number of orders that are waiting and so on. Loop B3 shows that the more mistakes and defects, the less customers' satisfaction, decreasing the amount of orders. Loop B4 shows that customers' satisfaction also decreases because of decreasing of the performance capability, and therefore decreasing the number of orders waiting.

The real solution for the problem is described by loop B2. If the firm is interested to solve the root problem, than more effort has to be invested in improvement, which will increase performance capability, which will decrease eventually the number of orders waiting.

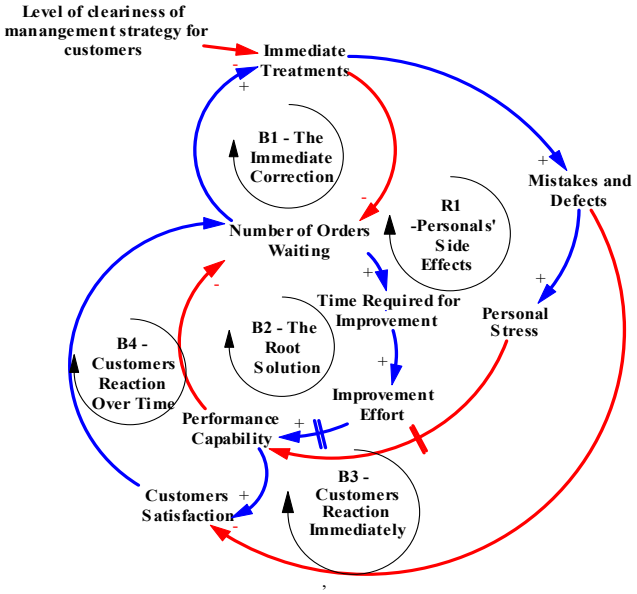

FIGURE 3
The Firm's Problem as Perceived by the Group Participants

From the conceptual model of the problem, one can see that when management's strategy is unclear, the workers tend to look for immediate solutions in order to solve the problem, but on the other hand, it causes side effects. Using a long-term view, the model shows that the investment in improving the process has a balancing feedback loop (B2) affecting the whole system to create more positive situations.

D. The Subsystems Chosen by the Group Modeling Building

In order to determine the systems' boundaries' for the model, the group participants ranked the firm's departments according to their involvement level to the problem. Six subsystems have been selected by the group. These subsystems and their interrelationships are the building modules of the conceptual model for the entire enterprise. The six subsystem models (Fig. 4) are as follows:

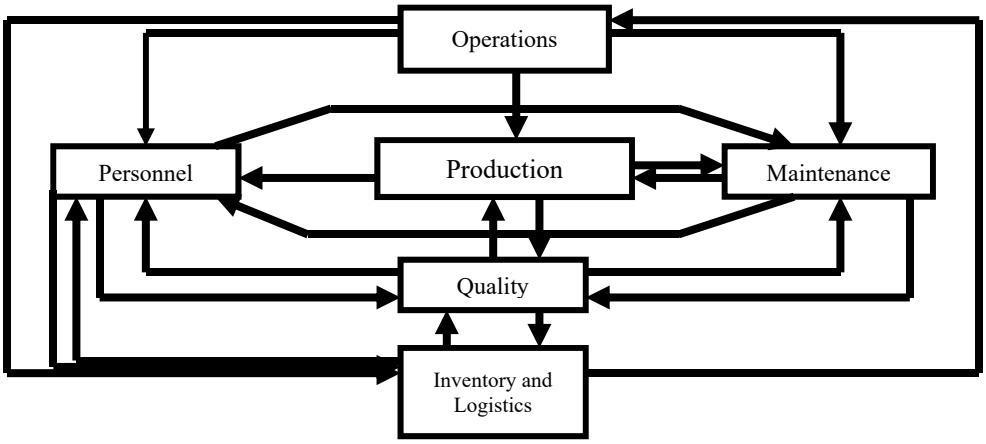

FIGURE 4
The Subsystems and their Interrelationships

E. The Full Conceptual Model of the Firm

The full model of the organization as conceived by the workers was constructed after each subsystem's model was built separately. Figure 5 provides the full model. Certain variables are critical in terms of providing the links between the subsystems: the production performance gap (the gap between the production performance target and the actual production performance), impacts the inventory subsystem, and the quality assurance subsystem. Problem and faults, impacts the maintenance subsystem, the quality assurance subsystem and the personal subsystem. The commitment and involvement variable which belongs to the personal subsystem impact the maintenance subsystem and production subsystem. Personal stress impacts the production subsystem and the quality assurance subsystem. Time devoted to urgent actions, which is a quality assurance variable, impacts the production subsystem.

Following are the dynamics hypotheses for the firm's conceptual model, which describe the relationships between the various variables in each loop. First the balancing loops are explained and then the reinforcing loops.

When the production performance gap (the gap between the production performance target and the actual production performance) increases, the pressure on employees increases, decreasing time per task, decreasing also the standardized level of work (actually the work is not done according to the standardization), which increases the work completion rate, increases the actual production performance and decreasing the production performance gap (loop B1).

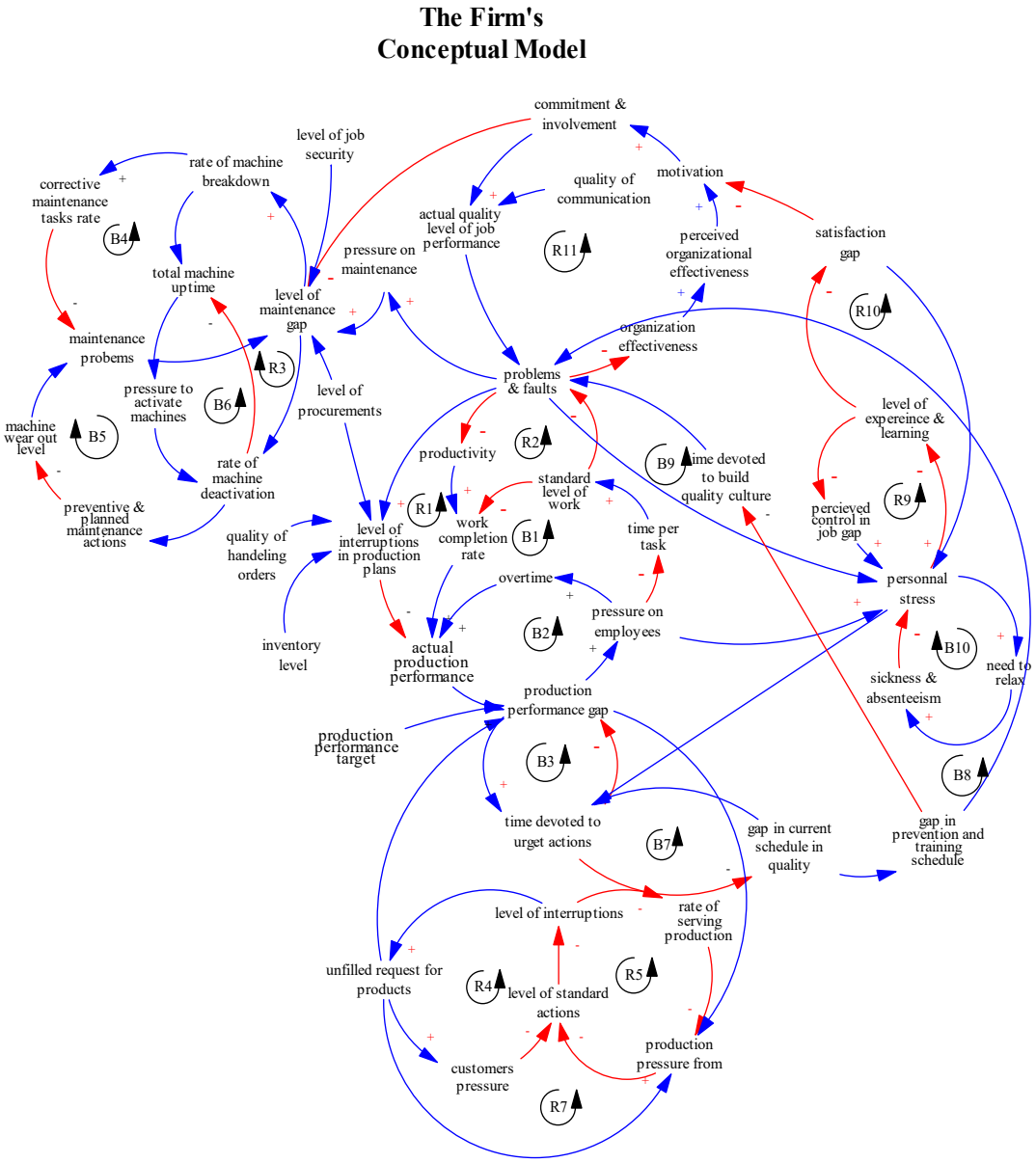

FIGURE 5
The Firm's Conceptual Model

When the production performance gap increases, pressure on employees increases, increasing overtime, increasing the actual production performance and this in turn decreases the production performance gap (loop B2).

When the production performance gap increases, it causes the time devoted to urgent actions to increase, which in turn decreases the production performance gap (loop B3).

As the level of maintenance gap (the gap between the desired preventive maintenance and the actual maintenance) increases, the rate of machine breakdowns increases, which causes the corrective maintenance tasks rate to increase (corrective maintenance is competed on the urgent maintenance tasks), which decreases the maintenance problems and decreases the maintenance gap (loop B4).

As the level of the maintenance gap increases, the rate of machine deactivation increases, forcing more preventive actions. The more preventive or planned maintenance actions, the less machine wear out, the less maintenance problems occur and the level of maintenance gap decreases (loop B5).

When the rate of machine breakdown is high, the total machine uptime decreases, which creates more pressure to activate the machines, which lowers the rate of machine deactivation, and the total machine uptime increases (loop B6).

When the gap in current (daily) scheduled tasks (the gap between the number of completed scheduled tasks and the delayed ones) increases, the time devoted to urgent tasks increases, lowering the current schedule gap (loop B7).

When the gap in current schedule increases, the gap in prevention and training schedule (the gap between what is done for prevention and training and what should have be done) gets bigger. This causes more problems and faults to happen, and causes more stress for the workers subsequently increasing the time devoted to urgent actions to and lowering the current schedule gap (loop B8).

When the gap in prevention and training schedule increases, time devoted to build the quality culture decreases, causing more problems and faults to happen, and increasing workers' stress. This in turn increases the time devoted to urgent actions and lowering the current schedule gap (loop B9).

When personal stress increases, the need to relax increases, causing for more absenteeism to occur, thus decreasing personal stress (loop B10).

When the production performance gap increases, pressure on employees increases, decreasing time per task, decreasing also the standard level of work. This causes more problems and faults to happen, which increases the level of interruptions in production, decreasing actual production performance and increasing the production performance gap even more (loop R1).

When production performance gap increases, pressure on employees increases, decreasing time per task, decreasing also the standard level of work. This causes more problems and faults to increase, which decreases productivity, decreasing the work completion rate, decreases the actual production performance, and increasing the production performance gap even more (loop R2).

When more corrective maintenance tasks are provided, the machine wears out faster. When the machines wear out increases, there are more maintenance problems. More maintenance problems increase the level of maintenance gap, and also the rate of machine breakdown increases, causing more corrective maintenance tasks to be needed (loop R3).

When the unfilled request for products increases, it increases the customer's pressure, which causes the level of standard actions to decrease, and therefore the level of interruptions increases, which causes the unfilled request for products to increase even more (loop R4).

The higher the level of standard actions, the lower is level of interruptions, the higher is the rate of service for production, which decreases the production pressure, causing the level of standard actions to increase even more (loop R5).

When the unfilled product requests increases, it increases the production pressure for goods that will be delivered to inventory, which causes the level of standard actions to decrease, and the level of interruptions to increase, which causes the unfilled product requests to increase even more (loop R7).

When personal stress increases, experience and learning opportunities decrease, causing Perceived Job Control gap (the gap between the desired Perceived Job Control and the actual Perceived Job Control) to increase, which increases personal stress even more (loop R9).

When personal stress is low, more experience and learning opportunities are provided, thus decreasing the employee satisfaction gap (the gap between the desired satisfaction and the actual satisfaction), and lowering even more personal stress (loop R10).

When the rate of errors and defects increases, organizational effectiveness decreases, causing a decrease in the perceived organizational effectiveness and decreasing motivation, commitment and involvement, actual job performance level and finally there is a decrease in the actual quality work level. In turn, this increases the rate of errors and defects even more (loop R11).

F. Insights from the Qualitative Model

The crux of this research was to investigate the dynamic behavior associated with the interactions in an organizational system among quality culture, employee health and organizational effectiveness. The initial dynamic hypotheses that were derived from the literature were the initial departure points for the group modeling process, but they did not necessarily end up in the final qualitative model representation since interrelationships in real systems are generally much more complicated than those that have been derived from the literature.

The conceptual model in this case is the product of the modeling group, and it conveys the way they perceive their work reality. The variables they chose were those they were familiar with in their daily routine. Terms like quality culture,

employees' health and organizational effectiveness were not necessarily known to them, and they might use other labels to convey similar concepts. As for this group, quality culture was conveyed by the current schedule for quality activities, the time devoted to urgent quality activities, and the time devoted to building the quality culture. Employee' health was understood to be a mixture of the pressure on employees, the personal stress, the need to relax, absenteeism, and the level of employee satisfaction. Organizational effectiveness was described using several variables and their relationship like the production performance gap, the actual production, the problems and faults and others.

The loops of the conceptual model show the linkage between the production performance gap (the gap between the production performance target and actual production) and pressure on employees, and depicts how both influence organizational effectiveness (loops B1, B2). On the other hand, the production performance gap and pressure on employees create an atmosphere that can lead to more problems, increasing the level of interruptions in production, which causes production productivity to decrease (loops R1, R2). These two reinforcing loops explain the deteriorating (or reinforcing) situation caused by the relationship between employee health and organizational effectiveness.

Loops B7, B8 and B9 capture the linkage between quality and organizational effectiveness. The production performance gap leads to pressure on quality activities and an increased focus on urgent activities rather than on process improvement activities. Focusing on short-term solutions, rather than investing time and effort in long-term solutions directs organizational efforts towards local urgent problems rather than training and learning. Thus the gap between desired perceived job control and actual perceived job control increases (loop R9) consequently decreasing employee satisfaction, further increasing personal stress (loop R10). This also impacts the quality of the employee's work, causing more problems to occur and employee stress to increase (loop R12). These three reinforcing loops: R9, R10 and R12, exhibit the complicated relationships among quality, organizational effectiveness and employee health.

We can conclude from the above relationships that the organization's ability to effectively pursue its goals is mutually impacted by the pressure on the employees and their personal stress and by the quality level of the production, which together impact organizational effectiveness. When the decision-maker decides to institute specific interventions, the interactions between feedback structures should be acknowledged. According to the case study, it can be concluded that managment strategy has an important impact on the social system of the company and on its effectiveness.

V. RESEARCH LIMITATIONS AND FUTURE RECOMMENDATIONS

This research initially started from the notion that organizations are social systems. Viewing organizations as systems requires the use of interdisciplinary tools that are aimed at improving organizational and employee outcomes. It is important, in the future, to conduct more field research in order to ascertain whether a particular theory about the relationship among key organizational concepts can be generalized.

In this study, organizational effectiveness is represented only within the production subsystem. Employee health refers to health problems that stem from stress. Future research should explore the concepts that are the basis of this study, possibly formulating other definitions of organizational effectiveness, quality culture and employee health and examining the organization’s behavior as a result of these interrelationships. Furthermore, this research took place in a small packaging firm that has certain production and cultural characteristics. Similar case studies should be performed in other types of firms, taking into consideration their particular characteristics. In the current study, the model only includes the production, maintenance, quality, inventory and personal subsystems. In future research, the system boundaries could include other subsystems such as administration, marketing and others, depending on the specific firm.

Furthermore, it is expected that the school of thought to which researchers belong might influence the outcomes of their research. Therefore, other researchers from different backgrounds should build similar models in order to learn how educational background can influence how the results of a case study are interpreted. This research was conducted after problems merged within the firm. In order to investigate the validity of these research results, it would be advisable to conduct a study when there are no apparent or specific problems.

Throughout this research, the general conceptualization of organizational systems was enhanced since the three constructs, employee health, quality culture and organizational effectiveness, affect some of the complex organizational dilemmas. For example, the trade-off between long-term and short-term goals, the conflicts between objective and measurable outcomes and subjective outcomes, etc. were found to be important. The findings of this research can be applied over a wide range of situations since the three constructs that were studied are of interest to all enterprises.

In order for the organization to be able to reach a better status in the global competitive environment, it is recommended for the organization to literally adopt the concepts of systems thinking which includes among others; long-run plans, understanding the behavior over time of the relevant variables, working in teams and encourage feedbacks as daily habits between the workers and the costumers as well as between the management and the workers.

In summary, this research is an attempt to understand the linkage between organizational effectiveness, employee health and quality culture. Further research should involve more researchers and examine more case studies in order to generalize the findings of this research and to deepen the

understanding of system behavior as a result of the relationships among these concepts. From a practical point of view, one could use the key feedback loops described in the system conceptualization section to ascertain how different interventions could potentially impact the behavior of the enterprise. For example, how would training employees about preventive medicine impact the overall culture and organizational effectiveness? How would the enterprise justify the expense of such a program in the context of the anticipated benefits?

The modeling results provided empirical evidence of the linkage between quality culture, employee health and organizational effectiveness. The next phase of this research, modeling formulization, i.e., gathering data, providing equations, simulating the model, quantitative analysis, validation and verification and policy analysis, are beyond the scope of this paper.

REFERENCES

[1] Jiang, J. Y. & Liu, C. W.; "High performance work systems and organizational effectiveness: The mediating role of social capital." *Human Resource Management Review*, vol. 25, pp.126-137, 2015.

[2] Matthews, J. R.; "Assessing organizational effectiveness: the role of performance measures." *Library Quarterly*, vol. 81, no. 1, pp. 83-110, 2011.

[3] Koys, J. D.; "The effects of employee satisfaction, organizational citizenship behavior, and turnover on organizational effectiveness: A unit-level, longitudinal study." *Personnel Psychology*, pp. 54, pp. 101-114, 2001.

[4] Deming, W. E.; *The New Economy*, MIT Center for Advanced Engineering Study: Cambridge, MA, 1994.

[5] Karasek, R. &Theorell, T.; *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*. Basic Books, Inc: New York, NY, 1990.

[6] Argyris, C.; *Overcoming Organizational Defenses. Facilitating organizational learning*, Allyn and Bacon: Boston, MA, 1990.

[7] Beer, M.; "Why total quality management programs do not persist: The role of management quality and implications for leading a TQM transformation." *Decision Sciences*, vol. 34, no. 4, pp. 623-641, 2003.

[8] Fotopoulos, B. C. & Psomas, L. E.; "The impact of "soft" and "hard" TQM elements on quality management results." *International Journal of Quality & Reliability Management*, vol. 26, no. 2, pp. 150-163, 2009.

[9] Anderson, M. & Sohal, A. S.; "A study of the relationship between quality management practices and performance in small businesses." *International Journal of Quality and Reliability Management*, vol. 16, no. 9, pp. 859-877, 1999.

[10] Sterman, D. J.; *Business Dynamics, Systems Thinking and Modeling for a Complex World,* Irwin McGraw-Hill: New York, NY, 2000.

[11] Deming, W. E.; *Out of the Crisis*, MIT Center for Advanced Engineering Study: Cambridge, MA, 1986.

[12] Malcolm Baldrige National Quality Award (MBNQA); *Criteria for Performance Excellence*, NIST: Washington, DC, 2008.

[13] International Organization for Standardization; *Quality Management Systems – Requirements, ISO 9001:2000,* ISO Publication, 2000.

[14] Hasson, H., Brisson, C., Guérin, S., Gilbert-Ouimet, M., Bari-Gingras, G., Vézina, M. & Bourbonnais, R.; "An organizational-level occupational health intervention: Employee perceptions of exposure to changes, and psychosocial outcomes." *Work & Stress*, vol. 28, no. 2, pp. 179-197, 2014.

[15] Wilson, G. M., Basta, B. T., Bynum, H. B., DeJoy, M. D., Vandenberg, J. R. & Dishman, K. R.; "Do intervention fidelity ad dose influence outcomes? Results from the move to improve worksite physical activity program." *Health Education Research*, vol. 25, no. 2**,** pp. 294-305, 2010.

[16] Riedel, E. J., Lynch W., Baase C., Hymel, P. & Peterson, W. K.; "The effect of disease prevention and health promotion on workplace productivity: A literature review." *American Journal of Health Promotion*, vol. 15, no. 3, pp**.** 167-191. 2001.

[17] Berger, L. M., Murray, F. J., Xu, J. & Pauly, M.; "Alternative valuations of work loss and productivity." *Journal of Occupational and Environmental Medicine*, vol. 43, no. 1, pp.18-24, 2001.

[18] Lagrosen, y., Bäckström, I. & Lagrosen, S.; "The relationship between quality management and health-exploring the underlying dimensions." *International Journal of Productivity and Quality Management*, vol. 5, no. 2, pp.109-123, 2010.

[19] Baptiste, N. R.; "Tightening the link between employee well-being at work and performance: A new dimension for HRM". *Management Decision*, vol. 46, no. 2, pp. 284-309, 2008.

[20] Browne, H. J.; "Benchmarking HRM practices in healthy work organizations." *American Business Review,* vol. 18, no. 2, pp.54-61, 2000.

[21] Benavides-Chicon, C. G. & Ortega, B.; "The impact of quality management on productivity in the hospitality sector." *International Journal of Hospitality Management*, vol. 42, pp.165-173, 2014**.**

[22] Singhal, R. V. & Hendricks, B. K.; "The financial justification of TQM." *Center for Quality of Management Journal*, vol. 8, no. 1, pp.1-19, 1999.

[23] Lin, C. & Su, C.; "The Taiwan nation quality award and market value of the firms: An empirical study." *Production Economics*, vol. 144, pp.57-67, 2013.

[24] Powell, C. T.; "Total quality management as competitive advantage: A review and empirical study." *Strategic Management Journal*, vol. 16, pp 15-37, 1995.

[25] Macinati, S. M.; "The relationship between quality management systems and organizational performance in the Italian National Health Service." *Health Policy*, vol. 85, pp. 228-241, 2008.

[26] Samson, D. & Terziovski, M.; "The relationship between total quality management practices and operational performance." *Journal of Operations Management*, vol. 17, pp. 393-409, 1999.

[27] Sudit, F. E.; *Effectiveness, Quality and Efficiency: A Management Oriented Approach*. Kluwer Academic Publishers: Boston, MA, 1996.

[28] Yamada, T. T., Poltronieri, F. C., Gambi, N. do L. & Gerolamo, C. M.; "Why does the implementation of quality management practices fail? A qualitative study of barriers in Brazilian companies." *Social and Behavioral Sciences*, vol. 81, pp. 366-370, 2013

[29] Page, R. & Curry A.; "TQM - a holistic view." *The TQM Magazine,* vol. 12, no.1, pp. 11-17, 2000.

[30] Saad, G. H. & Siha, S.; "Managing quality: critical links and a contingency model." *International Journal of Operations & Production Management*, vol. 20, no. 10, pp. 1146-1163, 2000.

[31] Savolainen, T.; "Towards a new workplace culture: development strategies for employer-employee relations." *Journal of Workplace Learning,* vol. 12, no. 8, pp 318-326, 2000.

[32] Naor, M., Goldstein M. S., Linderman, W. K. & Schroeder, G. R.; " The role of culture as driver of quality management and performance: Infrastructure versus core quality practices." *Decision Sciences*, vol. 39, no. 4, pp. 671-702, 2008.

[33] Sadia, R.; *A System Dynamics Approach Linking Employee Health, Quality Culture and Organizational Effectiveness*, Virginia: Ph.D. Dissertation, Virginia Polytechnic Institute and State University, 2006.

[34] Harvey, L. & Stensaker, B.; "Quality culture: Understanding, boundaries and linkages." *European Journal of Education*, vol. 43, no. 4, pp. 427-442, 2008.

[35] Dellana, A. S. & Hauser, D. R.; "Towards defining the quality culture." *Engineering Management Journal*, vol. 11, no. 2, pp. 11-15, 1999.

[36] Detert, R. J., Schroeder, G. R. & Mauriel, J. J.; "A framework for linking culture and improvement initiatives in organizations." *Academy of Management Review*, vol. 25, no. 4, pp. 850-853, 2000.

[37] Goetzel, Z. R.; "The financial impact of health promotion and disease prevention programs – why is it so hard to prove value?" *American Journal of Health Promotion,* vol. 15, no. 5, pp. 277-280, 2001.

[38] Aldana, G. S.; "Financial impact of health promotion programs: A comprehensive review of the literature." *American Journal of Health Promotion*, vol. 15, no. 5, pp.296-320, 2001.

[39] Abdullah, D. N. M. A. & Lee, O.; "Effects of wellness programs on job satisfaction, stress and absenteeism between two groups of employees (attended and not attended)." *Social and Behavioral Sciences*, vol. 65, pp. 479-484, 2012.

[40] Anderzen, I. & Arnetz, B. B.; "The impact of a prospective survey-based workplace intervention program on employee health, biologic stress markers, and organizational productivity." *Journal of Occupational Environmental Medicine*, vol. 47, no. 7, pp. 671-682, 2005.

[41] Grawitch, M. J.; Gottschalk, M. & Munz, D. C.; "The path to a healthy workplace: A critical review linking healthy workplace practices, employee well-being, and organizational improvements." *Consulting Psychology Journal: Practice and Research*, vol. 58, no. 3, pp. 129-147, 2006.

[42] Rosen, H. R.; *The Healthy Company*, Jeremy P. Tarcher/Perigee: New York, NY, 1992.

[43] Senge, M. P.; *The Fifth Discipline*, Currency Doubleday: New York, NY, 1990.

[44] Oliva, R.; "Empirical validation of a dynamic hypothesis." *Proc. of the Int. Conf. of System Dynamics*, eds. G.P. Richardson & Sterman, J. D, System Dynamics Society: Cambridge, MA, pp. 405-408, 1996.

[45] Forrester, W. J.; "System dynamics and the lessons of 35 years." In *A Systems-Based approach to policy making,* edited by K. B. De Greens, Kluwer Academic Publishers: Cambridge, MA, 1993.

[46] Keating, E. Oliva, R., Repenning, N., Rockart, S. & Sterman, J.; "Overcoming the improvement paradox." *European Management Journal*, vol. 17, no. 2, pp. 120-134, 1999.

[47] Jaffe, T. D.; "The healthy company: Research paradigms for personal and organizational health." In *Organizational Risk Factors for Job Stress*, edited by Sauter, L. S. & Murphy, R. L. American Psychological association: Washington DC, 1995.

[48] Arshadi, N. & Damiri, H.; "The relationship of job stress with turnover intention and job performance: Moderating role if OBSE" *Social and Behavioral Sciences*, vol. 84, pp. 706-710, 2013.