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Abstract Title: Indicators of productivity and working conditions: representations in the company

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Abstract: Social construction of safety and its relationship with indicators of performance operations. It is to see how companies relate efficiency of operations with indicators of working conditions, particularly for reasons of absenteeism from work accidents. Research carried out in four large Brazilian companies.

1. Introduction

Indicator is a device that indicates some quality, change, etc., of a situation or system, and draws attention or gives a warning. While efforts are normally made to quantify indicators, this is not always possible (RANTANEN, 2001).

Nogueira (2002) comments the importance of ergonomics indicators quality awards, also defines performance indicators "is given a number that is assigned a goal and that is brought periodically to the attention of managers of an organization "(p. 69). Therefore, the indicator is defined as a quantitative value achieved over time (a statistical function) that provides information about features, attributes and results of a product or service, system or process.

Marketing, operations, human resources (HR), and strategy are all ultimately judged by their contribution to organizational performance. Measuring it is essential in allowing researchers and managers to evaluate the specific actions of firms and managers, where firms stand vis-à-vis their rivals, and how firms evolve and perform over time. In this study, across the 213 papers identified as including a performance variable, 207 different measures of performance were used. The diversity of approaches was further complicated by variation in the use of single, multiple, and aggregated measures. What stands out from this examination is the lack of clarity in the theoretical definition of performance and the absence of methodological consistency in the formulation of the construct(s) used. Table 1 summarizes the measurement of performance used in these papers (RICHARD, 2009).

Measurement of performance 2005-2007 in leading academic management journals[a]

	AMJ	*ASQ*	*JIBS*	*JOM*	*SMJ*	Total
Articles in period	188	49	157	120	208	722
Articles using a performance variable	45	9	39	22	98	213
Percentage using performance as a:[b]						
Dependent variable	73%	67%	62%	55%	72%	69%
Independent variable	9%	44%	18%	23%	21%	19%
Control variable	36%	11%	38%	55%	33%	36%
Source of data						
Survey only	22%	11%	33%	27%	19%	23%
Secondary only	53%	78%	54%	64%	60%	59%
Both	24%	11%	13%	9%	20%	18%
Operationalization[b]						
Objective	76%	89%	62%	59%	79%	73%
Subjective	22%	11%	36%	36%	22%	26%
Quasi-objective	9%	0%	10%	5%	5%	7%
Performance measures used[b]						
Accounting (objective)	47%	33%	49%	50%	60%	53%
Accounting (subjective)	7%	0%	18%	18%	11%	12%
Financial market (objective)	18%	22%	15%	14%	18%	17%
Financial market (subjective)	2%	0%	0%	0%	0%	0%
Tobin's *q* or other mixed measure	4%	11%	5%	9%	17%	11%
Reputation or perception of effectiveness (subjective)	11%	11%	23%	41%	16%	19%
Sales, market share, or related measure (objective)	24%	22%	15%	18%	9%	15%
Sales, market share, or related measure (subjective)	2%	0%	26%	14%	10%	11%
Survival	4%	22%	8%	9%	8%	8%
Number of measures						
Percentage using a single performance measure	60%	44%	33%	45%	52%	49%
Percentage where multiple measures were collected	40%	56%	67%	55%	48%	51%
Multiple measures used in:						
Multiple separate analyses	56%	80%	54%	58%	79%	67%
Aggregation (factor analysis)	17%	20%	38%	25%	21%	25%
Aggregation (averaging)	28%	20%	23%	33%	19%	23%
Percentage modeling longitudinal data	53%	67%	36%	32%	52%	48%

a. *Academy of Management Journal* (*AMJ*), *Administrative Science Quarterly* (*ASQ*), *Journal of International Business Studies* (*JIBS*), *Journal of Management* (*JOM*), and *Strategic Management Journal* (*SMJ*).
b. Percentages may add up to > 100% due to multiple categorizations per article.

Tabela 1. Measurement of performance 2005-2007 in leading academic management journals. (RICHARD, 2009)

Regarding the literature review, indicators that can be used for performance measurement of work activity and indicate relationship to the activities of operators were found. Some of these indicators are described below.

Work pace

Regarding the work organization, it was found that the pressure for productivity increase has a direct influence on the loss of quality of care, which highlights the importance of this indicator in the intensification of work (QUEIRÓZ E MACIEL, 2001).

The work pace requires more attention and supervision because there is a greater number of operations to perform and/or because the fired fellows´ work was divided among those who remained with the company. The accelerated pace of work is a constant, noticed by men and women alike, and this appears to be an "effect" of the implementation of Japanese techniques detected not only in Brazil. The responsibility - transferred to the employee - of keeping the pace of production upstream and downstream, is a situation that often encourages the adoption of uncomfortable, not appropriate physical postures. With the intensified pace of work there has been a lot of health problems, from fatigue to tendonitis and even increase in cases of RSI (repetitive strain injuries) (LOMBARDI, 1997).

Therefore, at the same time that new technologies increase the worker´s safety, they relieve certain physical effort and facilitate the tasks, and also bring new time charges, accelerate the work, increasing mental and physical pressures (LOMBARDI, 1997).

Ambulatory Complaints/Pain complaint at work

The use of different technological resources with diverse forms of control and organization is contributing to workers' exposure to different types and intensities of risk, mediated by the particularities of various industrial processes (PENATTI, 2006).

Health complaints are little understood by the companies´ medical services, because they often relate to the effects of the technology race and the lack of time to meet the goals and deadlines (ASSUNÇÃO, 2003).

In the study by Queiróz and Maciel (2001), they mention several authors who argue that ergonomics has shown that repetitive movements, use of force, incorrect postures at work, factors related to the organization's activity and the environment frequently occur in all industrial activity and can cause health problems to the worker, increase the absenteeism and affect their activities of daily living.

The presence of discomfort and pain in the workplace is very common and can be found in several studies like the study by Santos (1994) about ergonomic projects in call centers, in which by evaluating symptoms and complaints of users in daily work, it was found that in six call centers studied (passive centers with workdays of 6 hours without pauses with an interval of 20 minutes for a snack), between 36.8% and 66.6% of the evaluated attendants complained about feeling frequent headaches and between 10% and 25% made reference to daily headaches, and used daily medication. In addition to the headaches, there were complaints of frequent pain on the back between 51.60% and 66.90% of the attendants (lumbar and cervical), on legs between 13% and 46.50% of the attendants, eyestrain between 25% and 59.10% of the attendants, pain and other symptoms in the hands between 8.30% and 31% of attendants (QUEIRÓZ E MACIEL, 2001).

Difficulties in performing tasks

In many studies it is found the report of difficulties perceived by operators in performing their tasks, for example, the study on call centers, where the physical work environment interferes with the workload: - the lack of acoustic treatment, combined with large concentration of people in the room, becomes a disturbing element in performing the activity. The noise level interferes with understanding the client's request and therefore the quality of care (QUEIRÓZ E MACIEL, 2001).

Another factor that may hinder the performance of tasks is inappropriate furniture, as in the study by Santos (1994) in which the tables are not adjustable and are inadequate to the use of computerized systems. The chairs are adjustable, but not always all these adjustments are used for lack of the user´s awareness. It was even used as an analytical tool the form of Difficulty Analysis Activities - DAA. This was created to receive the information or data of operations reported by the operators.

The study by Duarte and Mauro (2010) also showed the operators´ difficulty performing their activities; and regarding the ergonomic risk factors stood out: inadequate distribution of staff and/or team (83.3%); insufficient knowledge of the principles of ergonomics (73.3%); wards with inadequate architectural environment (layout) of the job posts (73%), inadequate load handling (63.3%); lack of tools and/or instruments for performing the tasks (60%); need to adopt awkward postures of the body (53.3%); inadequate space to perform the activities (50%); insufficient furniture in the wards and inadequate storage of materials (30%); adoption of body postures for prolonged periods (23.3%).

Regarding other difficulties, it is highlighted that the workplaces of the team studied evidenced in the research are inadequate to the work of professionals, as in their physical environment, space, ventilation and temperature are not in accordance with the regulations proposed (DUARTE E MAURO, 2010).

Absenteeism

In order to improve and increase productivity, companies need to manage and monitor the number of absences from work of their employees, which is another important indicator of health for them. Used to designate the deliberate absence of workers in the work process, the term "absenteeism" can find a wide range of issues that directly affect the employees´ quality of life (MIARA *et al*., 2010).

Among the so-called human factors in the work process, including the so-called occupational diseases and turnover, absenteeism is one of the most damaging effects to the work process, the worker´s social support. Absenteeism is characterized in that sense as having a dual effect: from the worker´s point of view, the possibility of deductions in salary, lay-off or other related problems; in terms of work organization, the difficulty of achieving the planned work and the damages arising by chance (OLIVEIRA, 2011).

The formula for calculating the absenteeism, according to Lombardi (1997), is:

$$\text{Absenteeism rate} = \frac{\text{Number of men/days missed through absence from work}}{\text{Average number of employees x number of working days}} \text{ X } 100$$

It can be classified as: absenteeism-illness (justified absences for sick leave); absenteeism due to occupational disease (work accident and/or occupational disease); legal absenteeism (protected by law, such as pregnancy, disgust, gala, blood donation and military service);

compulsory absenteeism (suspension imposed by the employer, by arrest or other prevented from attending work), and voluntary absenteeism (unexcused personal reasons). The employee may even be absent from work for reasons of family character, for reasons of force majeure, financial difficulties or problems, transport problems, low motivation to work, poor leadership oversight and inadequate policies of organization. Absenteeism in relation to the organization of work has been translated into dissatisfaction, lack of motivation and work team overload (SANTOS, 1994).

Toldrá et al. (2010) stated that the increased illness and disability among workers is due to a combination of factors, such as workload, unhealthy and dangerous work processes, use of obsolete equipment and technology, harsh working environments, problems of the organization of work and new forms of labor division.

Absenteeism has demanded a lot from organizations and their managers, because their causes are linked to several factors, ranging from social issues, health, personnel management, among other problems, thus making this subject complex and difficult to manage (OLIVEIRA, 2011).

2. Objective

Both in Brazil and in other European countries, Central America, there are government agencies that take on the role of worrying about the working conditions that companies offer their employees, however, there is a shortage of indicators that can assess the working conditions.

Therefore, the aim is to understand through an exploratory research, and incorporate

information from companies working conditions and analysis tools which use as performance indicators in health and safety.

3. Methods

The methodology used was the multiple case study, which consisted of interviews with HR managers in four large Brazilian companies of different branches. The interviews lasted around 30 minutes each, open interviews with a basic script without closed questions.

4. Results

In relation to the interviews, one can see that each company has its own internal health programs following the Brazilian legislation (BRAZIL, 1978) as PCMSO Program (Medical Control of Occupational Health) and PPRA (Program for Prevention of Accidents and Risk).

The health indicator common to all companies is absenteeism.

Company 1

The health program of this company has two "strands": Assistance Program and Occupational Medicine.

- Assistance Program: is a program of employee benefits. It consists of a program of guidance and follow-up of employees´ health in terms of doctor visits, exams, surgeries, etc.

- Occupational Medicine Program: in this program, security engineering through programs like the PRAP, collects the risk data. These risks involve the ergonomic, chemical, respiratory, thermal, accidents, etc. After collecting these data, they perform the measurement of these risks and send them to the occupational physician. This, based on the nature of these risks, asks for additional exams, such as blood exams, audiometry, ECGs.

The exams made by the physician are hiring, periodical, change of position and firing ones.

One year after the examination by the employee, the doctor will see what "factors" of the exams were normal and abnormal. As for those who were abnormal, they will seek solutions. There are more immediate solutions like the use of IPEs, but there are also cases which require deeper solutions like carrying out projects.

For each risk, there is a program of "combat" to it, for example: risks to hearing, there is the HCP (Hearing Conservation Program), for chemical hazards, there is the RPP (Respiratory Protection Program).

For the indicator "complaints," the complaint comes to the occupational therapist of the company, who holds the anamnesis and sends the case to the doctor, who asks for additional exams to be able to point the causal nexus. At this point, the complaint is registered. They use the indicator: number of complaints by area.

Each program has its goals, providing the Performance Plan for each employee.

The indicator absenteeism is also used. It can be classified as non-medical or medical. The medical is when the absence was justified, and non-medical when it was not justified.

The manager said that a company that invests in health may cost more in the short term than one that does not invest, but it will certainly benefit only in the long term. According to him, there is no way to speak of indicators, without mentioning risk mapping before. These risks are not only health, but also reputation, legislation (enforcement agencies) as well as ethical/moral (concerns about operators´ health. Slogan "Our concern is about health and safety,"

to what extent this is true). He finally emphasized: well monitored indicators => competitive advantage.

Company 2

The model used by the company to address its health indicators is based on the model MCOHP (Medical Control and Occupational Health Program). Exams are performed: hiring, periodical, firing, audiometric, visual acuity, returning to work and when there is a change of job. These exams are performed by legal periodicity and their results are based on monitoring employees´ health, mainly of the MOD. This monitoring is done periodically so that if something different appears on the exams there is time to take measures.

It also made an annual report of each case. When you need to take action, changes are made like changes of IPEs used, change of job post. In more serious cases, it is also made "counter-evidence," which would be a more specific analysis of the event, held outside the company.

The follow-ups can be individual or collective. The individual measures are individual protection equipment (IPE) and the collective are the environmental (environmental reports), which are conducted by third parties, and they assess the physical risk factors such as noise, accidents, and temperature. For each risk there are actions, for example, for noise, there are confines of machines; there is thermal insulation for heat, exhaust, etc.

The indicator ETSSN is used by the company, evaluated together with the safety engineering and medical area.

Other indicators:

- Monthly absenteeism rate;

- Reasons for absenteeism;

- Leave for health problems;

- Exams performed during working hours: they are asking employees to schedule exams outside working hours as an attempt to reduce this indicator.

The company is divided in business units. These units are autonomous, but interdependent. Each unit has its “owner”.

Company 3

The company has 2 teams related to health, one internal and another external.

In the internal team, the employee goes to the doctor with his/her complaint. The company's doctor will indicate the treatment or forward to another doctor outside the company, and if so, the company is responsible for monitoring this case. The health program follows the company's health PMCOH models, SESMT[1] , and there is an ergonomics program that is responsible for breaks/labor gymnastics, occupational rehabilitation and reintegration, monitoring of projects (all new projects are followed by the new ergonomics team).

When the company doctor identifies the causal nexus of the employee´s complaint about the work, the company ergonomics team studies the case and performs analysis of the posts and the need for adjustments to the workplace.

[1] Service Especialized in Safety Engineering and Labor Medicine

The external team is responsible for exams that are not made in the company and the focus is on occupational health. All exams are made based on the relationship with work.

The company also has an agreement with “Unimed”[2] on medicinal products and tracking of cases.

The only health indicator the company uses is absenteeism, which is linked to the data from the ward (the operator´s complaint).

Company 4

Each manager has a plan of action, i.e., a plan to achieve goals.

One of these plans is named P3E (Program of Enterprise Excellence), which is divided in 3 “dimensions”: values, proceedings and people. Within "people" are all activities involving the HR, such as managing people, careers, and health and quality of life at work.

Regarding the indicators used by the company, there is:

- Absenteeism;

- Overtime: the relationship between the number of accidents and absenteeism;

- An indicator of reintegration will be implemented;

- Safety indicators like frequency and severity of accidents: there is a new security program, "Behavior Program," in which was set up a committee (the president of “CIPA”[3] , a security technician, the HR manager, the supervisor of occupational safety and ergonomics and the

[2] A health insurance company in Brazil
[3] “CIPA” = Internal Commission for Accident Prevention

operator´s manager and supervisor) that will go to where there was an accident or incident to investigate how the accident/incident happened;

- Pure health indicator: not yet implemented, but the goal is a census of people´s life habits, influencing their health.

Regarding the HR supervisor, there are other controlled indicators, such as:

- Number of people who smoke;

- Number of people who drink booze;

- Number of people who are addicted to drugs;

- Number of people with high cholesterol;

- Number of people with diabetes

- Number of people who are overweight, among others.

The health model starts when the operator comes to the clinic and puts his/her complaint in a totem. Then the doctor looks at him/her, and, if appropriate, forwards him/her to an expert who will solve the problem or withdraw the operator, who after returning from leave, is evaluated by the group of ergonomics to be reinserted. If there is no need to refer to the specialist, the very company´s physician decides whether there is need for leave or opening of "CAT"[4] , and when the person returns to work, is also evaluated by the ergonomics.

There is also a partnership with Unimed, which works as a health insurance to help the operators schedule external medical appointments.

[4] "CAT" = Communication of Work Accident

5. Discussion and Conclusion

Regarding the literature review, one can see that health indicators can be basically divided into two major groups: the legal and managerial indicators.

The legal indicators consist of indicators based on regulatory standards, and are used as instruments of surveillance and even punishment by organs of inspectors, which makes them regulators of workers´ operating methods.

On the other hand, the indicators referred as managerial are the indicators "created" by the organization itself, seen as auxiliary tools for measuring performance and occupational health conditions.

By analyzing what the literature brings on these indicators, it is possible to conclude that there is a wide range of health indicators; however, it is interesting that they are restricted in some useful indicators for companies and organizations.

When conducting case studies, it can be realized that companies do not have precisely the concept of health indicator, or were unable to define which of the indicators could be considered indicators of health and, in general, their programs are based on regulator standards like PMCOH, PRAP, SESMT, among others.

Considering that absenteeism was the indicator mentioned by the four companies, it can be considered a very useful performance indicator of manpower because it provides information on system productivity and manpower, since the absenteeism may result from dividing the total number of hours projected by the total number of hours worked. This indicator can be defined as an rate of leave for medical reasons (RMR). By studying the reasons for why the absences occur,

a link to the ICD (International Classification of Diseases) lets you check whether the disease is related to work activity, i.e., it allows to verify the causal nexus.

Therefore, when considering the literature very wide and companies do not have proper knowledge about health indicators, the need and relevance of indicators are justified to better define the indicators for organizations and also provide models that can measure their performance in occupational health more clearly.

In conclusion, research and interventions in ergonomics use assessment tools of working conditions built from the interaction between the analyst and the observed which work as a performance measure of the relationship man/work regarding ergonomic hazards analyzed. The use of a results measurement system and validation of proposals for improvement of work situations used in ergonomics can also be understood as a measure of performance evaluation, either of quality of interventions, or the perception of improving conditions of work by operators.

In conclusion, the social construction of indicators of safety and working conditions in enterprises is virtually nonexistent. Companies evaluate their effectiveness in a precarious way, using basically an indicator of working conditions, absenteeism. Therefore, it is necessary that companies have more knowledge on this subject, in order to build a supportive social environment within the organization and provide better working conditions to their employees.

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