# The Integrated Management System (IMS) and Ergonomics: An Exploratory Research of Qualitative Perception in the Application of NR-17

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### Abstract

The integrated management system (ims) has been guiding business management utilizing the requirements of ISO 9001, ISO 14001, OHSAS 18001, and SA 8000 in an integrated way instead local decision. Ergonomic sciences are presented as a tool to improve the occupational health and safety of workers. In Brazil regulatory standards apply, in the case of ergonomics to NR-17. This study aims to present the qualitative and exploratory survey research as to the workers knowledge. Regarding normative system and their agreement or disagreement with the ergonomic requirements described in the NR-17. The research was carried out with a group of professionally active technical students. The results shown that 54% of respondents are not aware of IMS norms or their companies do not have a certified management system, and 60% say their seats still have some type of ergonomy problems.

## Introduction

In the last couple of years, the business management are thinking out and broadening the vision about the quality beyond the production and product. Append to this, the customer and stakeholder requirements of the productive system: quality (ISO 9000), environmental (ISO 14000), health and occupation safety (OHSAS 18001) and social responsibility of the company (SA 8000) [1,2].

The ergonomics is a field's study that make possible to apply actions to the continuous improvement about the conditions of work on physical, cognitive and organizational aspects with focus on discovery new solutions to the ongoing problems [3].

Nowadays, there is normative system integration through the requirement's integration to satisfy the stakeholder. To attend the IMS (Integrated Management System), and improve the workstation this study aims to show through a quality exploration survey the answer for the following questions: What the level knowledge about IMS? What the attendance level about the workstation ergonomic requirements according the Brazilian Regulatory Standard on Ergonomic, NR-17?

### Integrated Management System (IMS)

The Integrated Management System, that meet the quality (ISO 9000), environmental (ISO 14000), health and occupation safety (OHSAS 18001), and social responsibility of the company (SA 8000) requirements and allow to extract as much information from all process, departments, and organization's services. This activity supports the organization to meet the legal requirements and the customer needs [1].

The following Figure 1 shall to understand in an easy way the IMS concepts by [1]. Many authors highlight that any productive process always can produce desirable and undesirable (with damages) products and can harm the environment, the society, and the health and safety workers [4].

Usually the system integration might occur between the quality management (ISO 9000), environment management (ISO 14000), health and safety (OHSAS 18000), and social responsibility (SA 8000) [2]. Therefore, the literature steers the ergonomics requirements in the workstation through the NR-17 according following Figure 2, and the OHSAS 18000 requirements.

### The ergonomic

The study about ergonomic had started in 1850, through a paper published by a Polish scientist named Wojciech Jastrzebowski. This title's paper was "Ergonomics or science tests of the based on the laws of science on nature" [5].

This term (ergonomics) is a combination of two Greek words. The first one is "ergo" that means work and the second one is "monos" that means work's law [6]. The same author set out that ergonomics is a study that adapt the work to the worker and their (workers) relationship to machines, equipment, and all productive activities [3,5,7,8].

The ergonomic study aims to decrease the negative impact that might harm the worker [7]. The workstation's study analyzes issues relating: transportation, unloading, dumping, lifting, furniture, equipment, environmental workstation, and the organization of work [5].

### The NR-17

The NR-17 is a Brazilian Regulatory Standard that aims establishing parameters to adapt the work to the physiological and physical of the workers. To provide comfortable, safety, and occupational health [8].
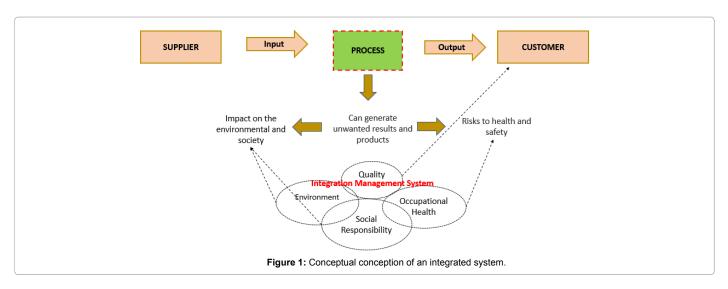
The NR-17 was establish trough the ordinance number: 3.214 on 06/08/1978 in the Official Journal of the Union. This standard aims to check the adaptation's work to the worker [9]. The items 17.3.2 and 17.3.3 from the NR-17 describe the furniture's requirement in the workstation. These aspects constitute the basis about ergonomic knowledge of this study's survey and showed in the following Table 1.
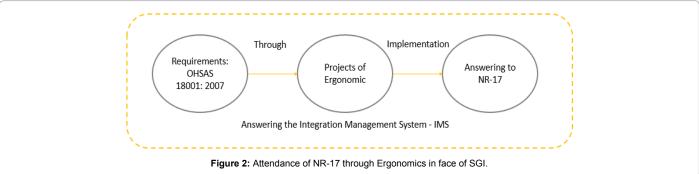
**Figure 1:** Conceptual conception of an integrated system.



**Figure 2:** Attendance of NR-17 through Ergonomics in face of SGI.

## Materials and Methods

### Study object

This study selected forty-nine students from a technical school, that is in the Interior of Sao Paulo, Brazil to form the study objective. All students were selected for already being in the labor market even they still are studying at the technical school. They are between eighteen and twenty-five years old. These learners have also studied Ergonomics and Productive System during their class.

In this analyze the companies that the students work does not segregated in specifics sector of industry, was opted to analyze all companies, ever in different sector to provide a broad vision. All the companies are in the same region of school.

### Data collection process

The method applied in this study was the Survey. The survey method aims to provide knowledge in a determined area through the gathering information about process, people and environment [10]. The survey method can be exploratory and descriptive. In this study was used exploratory type that shall to get an insight about a subject and build up a database to future surveys and studies [11].

A multiple-choice questionnaire was created. Each question uses the Likert Scale with the five following points: totally agree, partially agree, indifferent, partially disagree, and disagree [12]. Before to being applicated, was realized a test and check to make sure all the questions were clear, comprehensive, and objective.

### Analyze procedure

All the answers were gathered and for each question was analyzed the response level according the Likert Scale.

## Results

The surveyed points were divided in three categories. The first one is about the students and company's profile; the second category is about the IMS knowledge, ISO 9000, ISO 14000, OHSAS 18000, and SA 8000; the third category is about the workstation conditions and NR-17.

Regarding which section in the company the surveyed works, the responses shown the majority students works in the production area, followed by the administrative area and service area - 54% of the students working in a production area, 25% in an administrative area, and 21% in a service area.

About the size of the company the responses shown that 68% of students works in a small industrial company. According how long had been working in the company, the results shown that 61% have from zero to two years in the labor market and these responses can be explained by the fact that these students come from a technical school.

Regarding the Integrated Management System (IMS), 54% of the students are unaware of the IMS or their company does not have anyone normative system certification. 26% of the students know the quality system (ISO 9000), 11% of the students know the environment system (ISO 14000), 6% of students know the health and safety system (OHSAS 18000), and 3% of the students know the SA 8000.

| NR-17 Items | Perceptive exploratory aspect of the item |
| --- | --- |
| 17.3.2 For manual work sitting or having of being made standing, the benches, tables, desks and panels should be providing the worker with conditions of good posture, visualization and operation and should meet the minimum requirements: | a) have height and characteristic of the work surface compatible with the type of activity, with the required distance from the eyes to the working field and to the height of the seat; b) have a work area that is easy to reach and worker; c) have dimensional characteristics that enable positioning and movement of the segments body. |
| 17.3.3 The seats used in the workstations must meet the following requirements comfort minimum: | (a) height adjustable to the worker's height and the nature of the function performed; b) characteristics of little or no conformation in the base of the seat; c) rounded front edge; (d) a shape that is slightly adapted to the body to protection of the lower back. |

**Table 1:** Aspects furniture's workstation by [9].

| Which section in the company the surveyed works | 54% are working in a Production Area |
| --- | --- |
| The size of the company | 68% of students works in a small industrial company |
| How long had been working in the company | 61% have from zero to two years in the labor market |
| IMS knowledge, ISO 9000, ISO 14000, OHSAS 18000, and SA 8000 | 54% know anything about IMS; |
| | Only 26% of the students know the quality system (ISO 9000) |
| | 6% of students know the health and safety system (OHSAS 18000); |
| | 3% of the students know the SA 8000 |
| NR-17 - about workstation's conditions | Only in 29% of the cases their seats can be adapting according the personal height. |
| NR-17 - comfortable seat | 61% of the students have some discomfort in their lower back |
| NR-17 - desk, height compatible | 61% of surveyed are comfortable with |
| NR-17 - appropriate transporting and handling | just 46% of the students answered that their workstation is proper |

**Table 2:** Summary of results.

The issue from the NR-17 about workstation's conditions shows that only in 29% of the cases their seats can be adapting according the personal height. This fact confirms the necessity to improvement the workstation. About the comfortable seat, 61% of the students have some discomfort in their lower back. The issue about desk, height compatible, show that 61% of surveyed are comfortable with.

Another issue was about the appropriate transporting and handling, just 46% of the students answered that their workstation is proper. This fact shows that there is a great difficulty to build a proper workstation according the height and conditions of each worker. And all of this can result in a worker's dissatisfaction. A summary of results is presented in Table 2.

## Discuss and Conclusions

This study aimed to show through a quality exploration survey the answer for the following questions: What the worker's knowledge about IMS? What the attendance level about the ergonomic requirements furniture according the NR-17 in their workstation?

The results show that 54% of students are unaware of the IMS or their company does not have anyone normative system certification. And the most known system is the quality system (ISO 9000). Just 29% of the students, their seats can be adapting according the personal height. 61% of the students have some discomfort in the lower back, and 61% of students are comfortable with work-table and height compatible.

This result can be warning to a continuous improvement to the ergonomics requirements through the NR-17 to attend all the IMS.

To further researches, one of the possibilities is expending the surveyed number, maybe in different professional's level. To aim the possibility to analyze the difference. Another important research is to survey other areas or segments (services, healthy) and in different locality.

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