DESIGN FOR PUBLIC SERVICE OFFICES BASED ON ERGONOMIC ENVIRONMENTAL ANALYSIS

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1. Context

Public service is considered an essential service for the population. However, it is noted the unpreparedness of their environments built for the realization of this activity.
Starting from the premise that the constructed space acts "as a living organism that interacts, conducts, enables, shelters and comforts those who use it" (Villarouco, 2008), this study highlights the environment constructed as a means of carrying out the activities performed. In this sense, by adapting it to the user of the space, the space starts to contribute positively to the health of workers and to the company.
In a work environment, in addition to organizational aspects, environmental aspects are important tools to improve the conditions of work. As the functional needs of users are directly related to the requirements of the task, in order for the environment to meet these requirements, one must consider the size and shape of the space, the circulation flows and the layout of the furniture, in addition to the thermal, luminic and acoustic comfort (Bins Ely, 2003).

The design of the job must follow the characteristics of the tasks performed and their interrelations, because adverse physical and organizational conditions can make it difficult to obtain a pleasant environment, the execution of the work in a safe way and have a negative impact on labour productivity. Van de Voordt (2009) attentive to the psychological aspect that work environment provides, should be pleasant and inspiring.

2. Method

There are many variables involved in identifying the proper performance of a built environment, which makes the task of assessing such adequacy complex, notably when we look at it under the focus of ergonomics (Villarouco, 2008).

Meeting the demands of making improvements in the environments of public service, systemic approaches were used to understand and identify the factors involved in human activities, and ergonomic analyses were performed in the environments constructed from three Brazilian public offices, called Service Station A, Service Station B and Service Station C. The ergonomic methodologies adopted were the Ergonomic Macro Analysis –AMT (GUIMARÃES, 2006) for environment A, the human-task-machine system approach~SHTM (MORAES and MONT'ALVÃO, 2003) for environment B and the Ergonomic Methodology for Space Evaluation Built – MEAC (VILLAROUCO, 2009) for environment C. The ergonomic analyses guided the elaboration of architectural projects for the reform of physical spaces.

Service Station A

AMT (Guimarães, 2006) is an ergonomic method of action with a participatory approach that focuses on the human being, the work process, the organization, the environment and the machine as a whole of a broader system. In this method, workers are involved in decisions about their work and activities, and are encouraged to make decisions at the organizational level, getting involved in the organization.
In the AMT are considered the subsystems of sociotechnical system: the social subsystem (human), the technical (technological), the work project (work organization) and the one related to the external environment (GUIMARÃES, 1999).

The AMT is structured in four main stages: initial needs survey, organizational structure design and intervention, implementation of the process and measurement and evaluation of organizational effectiveness. In the initial survey, unstructured interviews were conducted with the employees, in which they spoke freely about their work. The answers were tabulated so that the aspects mentioned first and more frequently by the workers were considered as priority ergonomic demands. The demands were translated into ergonomic actions directed to the architectural space; the other demands were presented to the leaders of the institution, in order to base a set of actions that would strengthen changes in the physical environment. Following the result of the ergonomic analysis, the built environment reform project followed the guideline of standardizing work environments.

Service Station B

The SHTM (Moraes & Mont'alvão, 2003) is conceptualized in the systematic man-task-machine, observing the person-centered approach that controls the system. In this way, for the system to be effective, it must be designed from the operator's point of view. Through the approach, the problem and the Human-Task-Machine system are recognized, reaching the ergonomic diagnosis with the ergonomic recommendations.

The intervention is divided into five stages: appreciation, diagnosis, design, validation and ergonomic detailing. In the ergonomic assessment, the mapping and delimitation of the ergonomic physical-environmental, movemental and informational problems was performed. On-site observations and interviews were conducted. The problems were hierarchized from the human costs of labor. In the ergonomic diagnosis, systematic observations of the activities of the task in a real work situation were performed. According to the results of the ergonomic analysis, in ergonomic design, the space was adapted to the physical and cognitive characteristics of the users, having as reference the distinction of waiting and services spaces, in addition to respecting the flowchart of the public in attendance. The workstations were sized according to the needs of use.

Service Station C

MEAC (VILLAROUCO, 2009) analyzes physical space combining physical-spatial evaluations with tools to identify environmental perception. Based on a systemic approach, it covers variables of the areas involved in the built space, having as its primary element the user of this space and his environmental perceptions. MEAC is comprised of four analytical stages: Global Environmental Analysis, Environmental Configuration Identification, Environmental Assessment in Use in Activity Performance and Environmental Perception. After the analysis, we arrive at the Ergonomic Diagnosis of the Environment and end with the Propositions.

In the global analysis of the environment, information about the environment and activities is collected. In the Identification of the Environmental Configuration, the physical and environmental conditions are verified, through the survey of environmental data. The assessment of the environment in use in the performance of activities aims to identify how much facilitator or inhibitor the environment represents to the development of the activities it houses. In Environmental Perception, the most cognitive variables are identified, verifying the user's perception of the environment. The conjunction of responses revealed that they perceived that the environment was not suitable for the performance of their activities, and indicated which demands would be a priority for them: improvement in internal distribution, interventions in environmental conditions and adequacy in furniture.

In the ergonomic diagnosis, a general understanding of the situation is obtained, generating data for the phase of propositions of interventions and solutions of the issues that negatively interfere in the performance of the system, which constitute the recommendations for interventions in the environment.

3. Results

Although different ergonomic methodologies were used, it was noticed that the ergonomic demands related to the physical environments and ergonomic recommendations were similar and complemented. Despite the limits faced by the attendant's task, the ergonomic analyzes performed pointed out as the main demand the proposal for a new physical arrangement for the sector.

All methodologies used interviews with users, in order to collect information about workers, their desires and impressions about the environment.
Information about the environment was collected by the three methodologies in a structured and free way, and the demands were systematized based on the responses of the users of the environments. In the AMT analysis, the demands were prioritized by the results of the interviews, while in the SHTM and MEAC analyzes, the users' desires and complaints were combined with the physical survey carried out in the field.

However, the elements generated for the elaboration of the built environment project are prioritized by the information collected in the AMT, revealing the more organizational character of the ergonomic action. In the SHTM analysis, the functional aspects between man and the environment are evidenced in the investigation, and in MEAC, the data collected in the environment are validated through the user's perception of their environment.

4. Conclusion

Using three different methodologies, an attempt was made to increase the field of ergonomic investigation, considering that the tools identify different aspects during the research, which could come to complement each other in the general understanding of the public service environments.

The three methodological tools presented relevant aspects for the global understanding of the relationship between the user and his environment. However, it is observed that the elements complement each other in the analyzes, considering the aspects that they reveal during the studies.

From the results of the interventions, it is observed that the type of analysis directs the choice of the use of each methodology, considering that the AMT analysis is aimed at investigating issues involving the administrative hierarchical levels in the organization of the work, the SHTM analysis studies in detail the activities in real work situation, and MEAC focuses on the functional and physical aspects of the environment.

Thus, it is recommended that the choice regarding the use of the ergonomic investigation methodology is mainly focused on the aspects that one wants to investigate in the ergonomic analysis, and that the tool that best suits the particularities of the environment and the purposes of the investigation is also verified.

5. References

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