FACULTY OF MACHINE BUILDING

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PhD THESIS
- Argument -

INTEGRATED WORK DESIGN.
Ergonomics and Communication in the Management of Production Systems

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2010
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Research rationale

Romania’s accession to the European Union lead to an interaction of the Romanian organizations with an external background characterized by a high competitiveness, especially with foreign organizations, and freedom of action on the European market. To be competitive companies have to come up, as fast as possible, with competitive products and services in terms of price and quality. The Lean Management principles and methods support this desideratum by focusing the organizational activities on the real needs of the client. Thus, it is not necessary to reinvent the methods used by foreign companies - proved to be a real success - but it is necessary to adapt them to the management of the Romanian companies.

Having as a model the tendencies identified in approaching the production systems at a global level, the PhD thesis presents examples of “good practices” that act as an impulse for the Romanian companies in adapting and using Lean Management principles, methods and instruments.

The content of the PhD thesis is multidisciplinary and builds up a connection between Ergonomics – Communication – Lean Management. By integrating the points of view coming from ergonomics, work psychology and human resources management, the thesis promotes the harmonization of interests regarding work design.

The concept ergo-organization – proposed to refer to the organization that capitalizes the human resource by involving the management and the employees in improving the production system, to enhance the performance of work – is based on the connection between Ergonomics – Communication – Lean Management. The methodological novelty – IWD (Integrated work design) – sustains the fact that “the quality of the work result” is crucial and is obtained through the reflection of each stakeholder objectives in the work situation. The integrated approach of work design involves not only the management but also the employees, the work design within the production system being a responsibility for the management of different levels: human resources management, strategic management, production management, management of health at work.

The main concern was to determine the factors that influence the organizations to be attractive for an as much as possible competitive work force and to propose some suggestions regarding the capitalization of the human resource for the improvement of work results.

The results of the research activities achieved for PhD thesis Integrated Work Design. Ergonomics and Communication in the Management of Production Systems support the general hypotheses that formed the foundation for the research: the Romanian employees represents a potential that the management has at its disposal to meet the difficulties of differentiation from the competitors (difficulties amplified by Romania’s accession to the European Union and by the changes in the external background – the global crisis).
The structure of the paper

The structure of the paper promotes the equilibrium and the harmony in every aspect of the human life, by the fact that each of the II-VII chapters is structured in an equal number of subchapters.

The objectives of the research

The main goal for literature research was the identification of ways through which the employees’ involvement can be capitalized for the improvement of work performance. It was sustained through secondary objectives:

SO₁: Identifying the factors which influence the management of work within sustainable production systems;
SO₂: Identifying the management methods and instruments regarding the increase of work performance within the production systems;
SO₃: Identifying the factors which influence the attractiveness and involvement of work performance;

The applied research was concerned with the determination of ways of harmonizing management and employees’ interests to increase the attractiveness and performance of work and was sustained through secondary objectives:

SO₄: Proposing a method for integration of the ergonomics, work psychology and human resources management point of view regarding the work design;
SO₅: Designing the applied research regarding the increase of work attractiveness and performance;
SO₆: Determination of the factors that influence the work attractiveness and the involvement in the increase of work performance;
SO₇: Identifying some paths of involvement in the improvement of work outcomes.

The main concern was the determination of the factors that influence the organizations to be attractive for an as much as possible competitive work force. It has been taken into account the proposal of some suggestions regarding the capitalization of the human resource for the improvement of work outcomes, through a secondary objective:

OS₈: Elaborating a recommendations guide regarding the capitalization of the human resource through the employees’ involvement in the improvement of work outcomes.

The methodology of the research

The methods of research used for the PhD thesis were: the literature analysis, the survey, the content analysis, the cluster analysis (classification), the factor analysis and the case study.

The synthesis of the applied research carried out for the PhD thesis is shown in figure 1. The applied research consisted in the achievement of two studies. 45 hypotheses were stated.
The method used to obtain primary data was the survey. A total of 660 students from Technical University of Cluj-Napoca, Faculty of Machine Building, took part. \textit{SPSS.10 for Windows} was used for testing the hypotheses and 27 hypotheses were confirmed.

The applied research comes with an input in the field of knowledge by presenting an innovative vision of work design, from the student’s perspective – a perspective that can be described by the collocation: \textit{the future of Romanian management, partially censored by the cultural reality of work in the Romanian production systems}. We support this with two arguments. The first argument is the fact that the model \textit{Steps towards ergo-organization} – proposed by the PhD thesis – was validated on a representative population of students from Technical University of Cluj-Napoca, Faculty of Machine Building, selected to give more weight to specialization Industrial Economic Engineering - which offers knowledge in management of production systems specific areas. The second argument sustains the last part of the collocation by the fact that 51% - 75% of the students who participated in both surveys said they have work experience in an organization.

\textbf{Elements of theoretical – methodological novelty}

The change that the PhD thesis suggests – through the conclusions and the contributions brought to knowledge in the field of work design – concerns the exploitation of the employees’ potential through the harmonization of the management and the employees’ interests in work. To answer this desideratum the following terms were proposed:
**Ergo-organization** – a term proposed to refer to the organization that capitalizes the human resource by involving the management and the employees in improving the production system, to enhance the performance of work.

**Integrated work design** – a term proposed to refer to the assigning of responsibilities, taking into account the management and the employees’ needs, through the reflection of all the determinants of the work results – factors of organizational, individual and external nature (economic, demographic, socio-technical etc).

The elements of **theoretical novelty** sustain the harmonization of the management and the employees’ interests, having as aim the increase of work attractiveness and performance.

Traditionally, work design is an aspect of great importance for the human resources management. The element of **methodological novelty** – IDW (Integrated Work Design) – sustains the fact that “the quality of the work result”, obtained through the reflection of each stakeholder objectives in the work situation, is crucial, as can be seen in figure 2.

![Integrated work design – harmonization of the management and the employees' interests](image)

**Figure 2: Integrated work design – harmonization of the management and the employees’ interests**

**The contributions of the thesis to the knowledge development in the field**

Through the proposed objectives, the PhD Thesis contributes to the knowledge improvement in the field of work design on three plans. Firstly, through the theoretical contributions, the research brings an input through:

- The study of the evolutions in the approach of work design within production systems;
- Identifying the ergonomics contribution to the sustainability of the production systems – on the one hand, the ergonomic intervention is seen as externality and on the other hand the *ergonomic production system* is seen as the result of maintaining the balance of the ergonomic design at different levels, to obtain a sustained competitive advantage;
- Identifying the valences of communication for the increase of work performance – communication in work is seen through “perception management” and it is highlighted the importance of attitude in work to obtain cooperation for the increase of work performance;
Identifying some management methods and principles, successfully applied by competitive foreign companies – highlighting the support of Lean Management for the sustainability of the production systems;

Proposing a method for integration of the ergonomics, work psychology and human resources management point of view regarding work design.

Secondly, the PhD Thesis contributes to knowledge improvement in the field by coming up with two terms: ergo-organization and integrated work design. The model Steps towards ergo-organization, proposed by this thesis, highlights the necessity to exploit the human resource in an organization by harmonizing the management and the employees’ interests, to enhance the attractiveness and performance of work. The originality of the Steps towards ergo-organization model is determined by the proposed means to harmonize the interests of the two parts involved (the management and the employees) – integrated work design (IWD).

Thirdly, the recommendations guide regarding the capitalization of the human resource, elaborated in this thesis, proposes a scheme for the IWD process and solutions for applying the IWD concept.

Conclusions

The contributions brought in the field of knowledge represent a starting point for future research and an impulse for the Romanian management to adopt a mentality that will promote the proactive attitude and the collaboration at work. The conclusions of the research lead to the certainty that to exploit the employees’ potential, the Romanian management has to, on the one hand, know and adopt the management principles and the current methods of production – successfully applied by the foreign companies – and, on the other hand, to realize the fact that every employee represents a potential that, through an adequate motivation system and by encouraging a proactive attitude regarding the improvement of work outcomes, can be exploited in the process of changes within the organization.

Future research paths are opened, firstly, by the limits of the research presented by the thesis – the impossibility of identification, through the established methodology, of the managerial perspective, on the one hand, and of the influence of the Romanian organizational and managerial culture, on the other hand. In this way, the model Steps towards ergo-organization – proposed by the thesis to sustain the theoretical concepts that lead to the harmonization of the management and of the employees’ interests, to enhance the work attractiveness and performance – can be developed through a research from the point of view of the different Romanian managerial and organizational cultures. There are also presented other six possible future research paths.