Dissertation title:

Technology transfer and industrial development in emerging countries under structural change

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The transfer process is complex and its totality is much greater than the sum of its parts. Therefore it cannot be understood by the isolated examination of its various parts because the boundaries between them are fuzzy. For that reason, a holistic approach was adopted to make the whole picture of the transfer process perceived.

In order to reduce the complexity of transfer process by describing its flows, a Three-Phase hierarchical model was constructed.

Since total quality management approach has proven its utility in many processes (production, R&D, administration...), it was essential to study to role that can play for the success of the transfer process. Therefore the principles quality management implementations in the process of transfer were defined. Furthermore, the integration of the different quality tools into the transfer process.

A Three-Phase model for identifying a set of invariants, best practices, the group of exchanged objects during the transfer and a list of the discussed topics was developed.

The traditional methods of the management disciplines have been applied, such as the linear and nonlinear regressions for depicting the performance of the transfer.

A new approach borrowed from other disciplines has been applied to overcome the limitations of the traditional methods which required the construction fuzzy logic models. Thanks to this method, the generated fuzzy models are fully interpretable and they have good predictive power while the nonlinearities of the transfer process are taken into account.

As a combination of all quantitative analysis methods, the concept of dominant variables is introduced. It allows the definition of the most pertinent variables for all the methods. It is inferred, that the organizational variables are the most important.

Since the success criteria of a transfer are contradictory because of the interactions between them, the method of multi-objective optimization was applied to define the Pareto Optimal combinations. For this reason, two frameworks have been used to program and to be able to resolve the multi-objective optimization problem of five equations.

The findings of the study were put together for designing an integrated methodology based on the PDCA-cycle for the monitoring of the transfer process from the prediction of the performance of the future project until the management of the project implementation to fill the gap in the literature regarding methodological tools for technology transfer management.

In order to confirm the results of the present study and make necessary changes, two case studies from of technology transfer projects were investigated.