DEVELOPING INCENTIVE STRATEGIES FOR IMPLEMENTATION OF LEAN CONSTRUCTION

Luis F. Alarcon[1] and Loreto Seguel[2]

ABSTRACT

This paper describes a methodology that has been developed by a group of Chilean construction companies to select employee and organizational incentives to encourage participation and commitment to the implementation of improvement actions in their organizations. These companies are carrying out joint efforts to implement lean practices that will lead them to gain improved competitiveness in their markets.

The selection of incentives to introduce changes in an organization goes beyond the economic aspects and should address a full range of aspects and levels within the organization, involving upper and middle management, and workers. This paper focus mainly in the incentives for middle management, a level that has been found to be key for successful implementation of changes in the organizations.

The methodology considers theoretical aspects as well as attitudes and perceptions obtained from each organization. The focus of the methodology is in identifying "drivers for change" at different levels: individuals, organizations and as a group of companies. As a result the methodology support the selection of incentives at each one of the levels addressed.

KEY WORDS

Employee Incentives; lean construction; organizational change; human resource management.

[1] Professor of civil Engineering, Universidad Católica de Chile, Escuela de Ingeniería, Casilla 306, Correo 22, Santiago, Chile, e-mail: lalarcon@ing.puc.cl,

[2] Graduate Research Assistant, Graduate Research AssistantUniversidad Católica de Chile, Escuela de Ingeniería, Casilla 306, Correo 22, Santiago, Chile, e-mail: lseguel@puc.cl

INTRODUCTION

At present a group of Chilean companies are developing joint efforts to implement "Lean" improvement methodologies. This project is a part of the activities conducted by the Excellence Program in Production Management of the Pontificia Universidad Católica de Chile (PEGPRO) and also involves the participation of companies of the sector, the active participation of the Technological Development Agency of the Chilean Chamber of Construction and researchers from Pontificia Universidad Católica de Chile.

The general objective of the project is to develop, on the one hand, systematic actions of cooperative research and improvement and, on the other hand, to implement organizational and operational changes that will enable companies to improve their levels of efficiency and effectiveness, so as to reach world class levels of competitiveness. The main areas of work which the first efforts of improvement focused on are: identification and reduction of waste in construction projects (Alarcón 1997), development and implementation of performance indicators (Alarcón and Serpell 1996), Improvement of planning systems, specifically implementing "Last Planner" concepts and methodology (Ballard y Howell 1998).

This paper describes the methodology selected by the group of researchers of the improvement project and participating companies, for determining and selecting incentives to help companies to enhance and increase the implementation of improvements, such as those described in the previous paragraph, inside their own organizations.

The implementation of the "Lean" improvement methodologies inside the organization, calls for levels of commitment and involvement (Coffey 2000). Despite this, at the time when companies implement improvement programs, one of the main issues is to obtain commitment from people in the organization and the necessary involvement with the new challenge. It has been imperative, then, to investigate and go deeper in the reasons and factors that make the implementation of improvements difficult, so as to establish the mechanisms and instances that enhance and permit increasing the scope and effectiveness of the implementation (Hessen 2000). Based on this, another great issue consists in how to achieve that the people in the organization consider the improvement process important and be and feel a vital part of it.

The direction given to the research is a direct consequence of the theoretical knowledge attained by the research team and the experience and capabilities developed in implementing the "Lean" improvements and principles over the last two years. In this sense, ever since the first implementation experiences, aspects such as leadership, confidence, participation and information, among others, became key elements for successfully attaining improvements.

This paper describes in a sequence those stages that have been critical in establishing incentives that enhance and increase improvements inside organizations. This paper addresses the factors to be considered in enhancing improvements and how to diagnose them in the companies. A broad and critical vision of the process is included, as it was prone to both difficulties and oppositions.

DESCRIPTION OF THE METHODOLOGY

The implementation of improvements inside an organization is at present an inevitable process which, though generating benefits and competitive advantages to the companies,

it also exposes them to strong conflicts and dilemmas. Next we describe all the stages that have been developed in the research undertaken to identify the incentives that may help and enhance the implementation of improvements in the Chilean construction companies that are currently implementing "Lean" methodologies and practices.

PHASE 0: "IDENTIFICATION OF AN INCENTIVE SYSTEM, AS A STRATEGY TO FACILITATE IMPLEMENTATION"

The experience acquired by the research team has acquired through monitoring, collecting and analyzing information generated by the implementation of the different "Lean" methodologies, are elements that have been fundamental to establish the importance which the organizational factors have for a successful implementation of improvements.

Ever since the first implementation experiences undertaken in the years 2000 and 2001 (Alarcón and Diethelm 2001), certain organizational elements that could be critical for the successful attainment of new challenges were identified as incentive elements for improvement inside organizations.

Some elements that were stated as critical were:

A CLEAR METHODOLOGY, WITH WELL-DEFINED AND RIGOROUS STRATEGIES

- Clear signals and a high degree of commitment of upper management.
- Establishment of a special organization for implementation, with a clear and rigorous operation.
- The project managers or heads of departments are key officers, both for leadership and commitment that they must exert as well as in removing barriers to the implementation of what is being promoted.
- It is fundamental for the people in companies to have a knowledge of both the "Lean" concepts and the implementation program.
    - The definition of functions, responsibilities and levels of authority of the company's projects managers and/or professionals is critical.

Only by taking into account the preliminary experiences of implementation that have been monitored by the research teams, it was perceived the existence of a cause-effect relationship between the different aspects that are specific and internal to the organization and the results attained by it in the implementation.

PHASE 1: "CHANGING THE COMPANY'S WAY OF LOOKING AT THINGS"

On the basis of what has been investigated and learnt by the research team, the decision was made to identify incentives to enhance the successful implementation of improvements in companies that would take up the challenge in the very near future. With this mind, this challenge was proposed to a group of new companies that were beginning the implementation, to go deeper into the subject, and in this manner be in a position to determine possible incentives for improvement.

In spite of the experience attained by the PEGPRO, the companies established different barriers and difficulties as to how to address the subject. One of the main barriers consisted in the vision which such companies had in terms that incentives for improvement depended almost only and exclusively of economic aspects and elements,

and therefore they felt that the economic issue was the obliged direction that the research had to follow. As a counterpart to the latter, the research team already had learned that this topic had to be addressed in a broader fashion and not only in terms of extrinsic elements, but also in terms of elements that were intrinsic to the organization, so as to achieve a incentives plan that would really operate inside companies (Kohn 1993).

The situation that is stated above, though problematic, permitted developing a methodology that, on the one hand, managed to do away with the barriers and, on the other hand, validated the results and scope of the research.

In this sense, the most important actions undertaken are divided basically in two categories, those in which an interaction and direct discussion was established between the parties so as to unify expectations and find a common horizon, and those promoted exclusively by the research team and whose objective was to find the way to remove and overcome existing barriers. They are:

- **Direct interaction between the parties**
  - ♦ Periodical working meetings were established where all companies and the research team participated.
  - ♦ Different presentations were made to transmit the above mentioned concepts and experience related to the topic.
- **Actions performed by the research team**
  - ♦ Common reading of the related literature. To become involved in a new topic entails the need to establish a language and platform of knowledge that are common to all those involved and thus attain a degree of motivation and involvement that is as homogeneous as possible.
  - ♦ Development and application of a survey to diagnose the situation which each company had regarding the incentives and the implementation of improvements. The survey was administered to most of the professionals in the companies that participated, and the result obtained was so forceful that it permitted to do away with the barriers that blocked the topic and, at the same time, open the doors to address it in broader manner and aimed mainly at the intrinsic operation of the organizational system.
  - ♦ Most of the companies that participated in the research already had incentives systems (90%), being mostly economic in nature (see Figure 1). The latter permits inferring that to enhance improvements in the organizations do not mean only economic incentives, because even though they may exist in the companies, the topic is not settled by it.

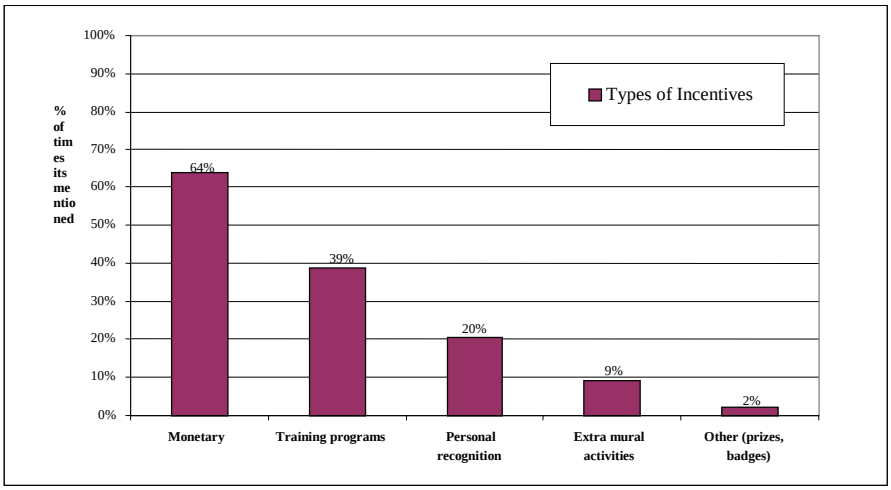

Figure 1: Types of Incentives Existing in Companies

It is also worth mentioning that the project managers are the first priority in terms of involvement when undertaking improvement processes and it is considered that the implementation of changes or improvements is made difficult due to the fact that such professionals quite often lack the knowledge of the theoretical, methodological concepts or simply lack any information on the process.

In the light of the previous results, the myth that all incentives should be based on economic factors was done away with and in doing so the research team was in a position to begin the research by embracing a wider array of organizational agents.

PHASE 2: "DIAGNOSIS INSIDE COMPANIES"

The implementation of a process of improvement considers as the main issue to determine what is to be done to attain the motivation of the people in terms of the improvement process per se.

In the domain of the organizations it is habitual to wonder if the person is motivated, if a given group is motivated or if the people in general are motivated, as the successful attainment of changes in the organizations requires without doubt of the motivation of the people that belong to them. Even though, there exist a series of agents of change external to the organization that may positively encourage the motivation of people, it is no less true that there exist agents of change internal to the organization that motivate the people and that hence facilitate and improve their involvement and commitment to new challenges (Kenneth 2000). The importance of these external agents lies in that they do not need the direct incorporation of economic resources, but rather point at improving the intrinsic functioning of the organizational system, so as to improve it and increase its potential for implementing changes in the organization.

The ultimate purpose was to improve organizational conditions, in order to obtain better results in the implementation of improvements and greater levels of satisfaction of the people.

Methodology of the diagnosis

The methodology consisted basically in preparing and applying a tool that determines the key elements for the attainment of improvements. The formulation of the tool considers

theoretical and practical aspects, the latter being a concrete contribution to the perception and experience attained to date by the PEGPRO in implementing the "Lean" practices in Chilean construction firms.

One of the first activities consisted in generating the theoretical universe of agents of change that would be necessary to diagnose the organizations (Blake & Mouton and McCanse 1991). Some of such agents are shown in Figure 2.

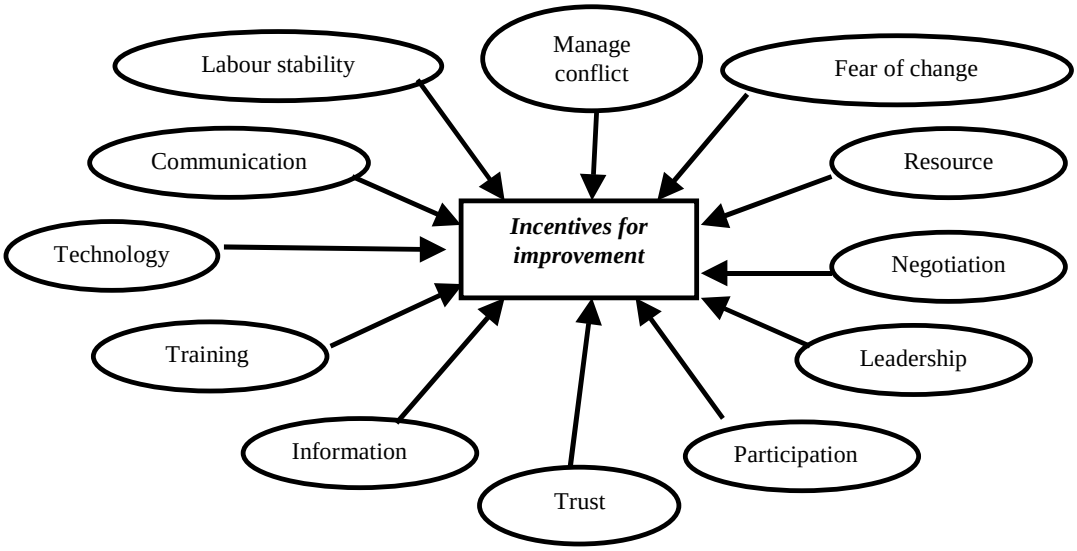

Figure 2: Theoretical Universe of Selected Agents of Change

Having established the theoretical universe, the aspects and nuances of each of them that would be addressed were selected. The selection was based both on the experience acquired by the research team over these last two years and in the need to focus the research so as to give an expedient and accurate answer to the companies

The latter procedure is summarized in Figure 3, where a two-stage selection process was carried out to determine which aspects of such issues would be diagnosed.

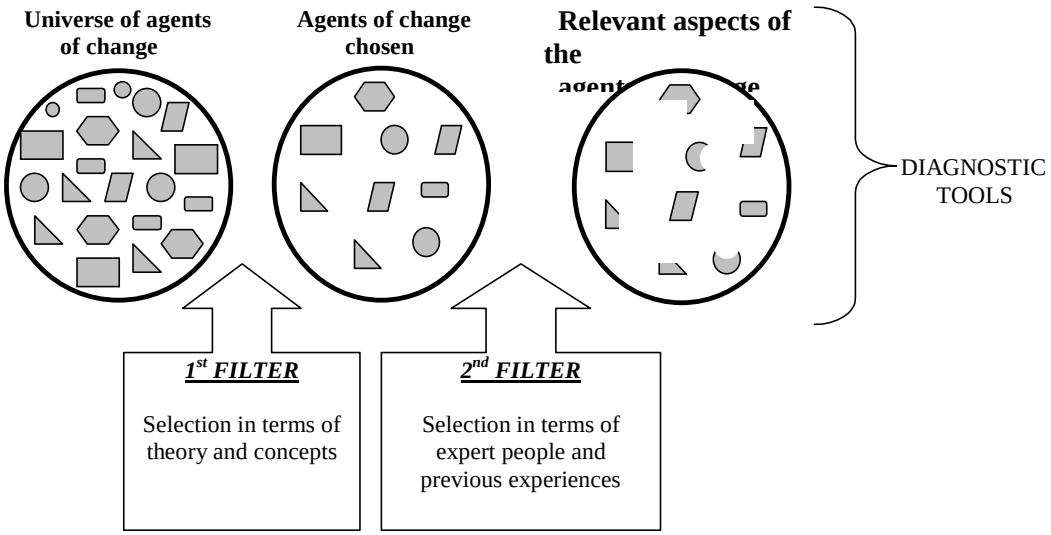

Figure 3 : Methodology for Selecting the Relevant Aspects of Agents of Change to be Included in the Diagnosis Tool

Continuing with the methodology, a diagnostic tool that would be applied to all the companies participating in the research was structured and developed (Briones 1998).

At the moment of formulating the preliminary version, and complying with the fact that it was a research and development topic conducted jointly by the companies and the researcher from PEGPRO, a feedback process was carried out regarding the formulation and scope of the tool. Hence, the process was valuable in two senses, integration of theoretical aspects with the specific real situation, identity and appreciation from each one the companies with respect to the topic and the way it would be diagnosed.

Finally, though the universe that was considered to apply the diagnostic tool included all the companies, at least in this opportunity, it was only applied to the project managers and/or company professionals or middle managers. The latter due to information collected previously in Phase 1. The general information of the sample is shown in Table 1.

Table 1: General Information on the Sample

INFORMATION	***DESCRIPTION***
Total companies	7
Type of Companies	Building and Industrial Assembly
Number of respondents	78
Number of questions	102
Type of formats	6 (5 closed and 1 open)
Type of analysis	Aggregate

PHASE 3: "ANALYSIS OF RESULTS"

One of the main objectives stated by the group of companies participating in the implementation was to ascertain and put into practice the benefits that working collectively offers. Consequently, the first priority was to consider aggregate processing of the diagnostic tools that were applied. Nonetheless, it is important to point out that when making a quick and preliminary analysis of the individual results of each one of the companies, they, at first sight, resemble and match the general results of the group. These results are based on the perceptions of the individuals during the diagnosis stage (Phase 2 in Figure 4), a current effort is underway to implement incentive actions (Phase 4 in Figure 4) and measure their impacts. A brief discussion of the results from the diagnosis is carried out in the following paragraphs.

Motivation

One important conclusion, because it validates the direction and methodology of the research developed to date, is that economic rewards are not a priority element of motivation for project managers and professionals. This is clearly shown in Table 2.

Table 2: Essential Elements to Attain a High Motivation in the Organization

1 st	Personal Recognition
2 nd	High an Effective Participation
3 rd	Training to enhance on-the-job-growth
4 th	Economics Rewards
5 th	Security of having stability in the company

Training

It is believed that training is an undisputed agent of change for implementing improvements inside an organization and the training workshops generate a greater participation and commitment towards such processes. In the particular case of training workshops, conducted at the companies, it is believed that they have really been a contribution and have facilitated the implementation of improvements. Finally, it is concluded that the main elements to be transmitted in a training session must be the motivation to the process and the company's commitment to it.

Leadership

On the other hand, even though a commitment with upper management can be observed both in terms of participating in the improvement program as well as creating conditions for their subordinates to participate in it, the existence of a person that leads the improvements project can not be clearly perceived. In fact, the results show that there is a 40% of the respondents that do not clearly identify a leader that guides and motivates the implementation of the project. By way of an analysis, it may be inferred that the origin of the process issue is in the act of delegating that is made by upper management to some person that it trusts, as it may happen that that person is not sufficiently competent to lead the process or else the manner in which he has been assigned the responsibility is not adequate.

Information

The level of information that is handled with respect to the progress of the improvement project (attainments, difficulties) has a significant influence on the behavior and attitude of the persons that belong to the organization. However, a 55% of the respondents was unaware of the progress which the improvement project has in his or her company, and furthermore, 33% had not received any type of information prior to its implementation regarding the project and its methodology and scope.

Knowledge

For project managers and professionals in the companies it is fundamental to have a thorough knowledge of the objectives and goals stated for improvement. However, the real situation is different, since a 42% of the sample shares objectives and goals different to those stated by the improvement program. It is important to improve this situation, because having a clear knowledge of the goals and objectives permits, on the one, hand to compound expectations among the participants and, on the other hand, understand where one wants to go, how they expect to get there and which is the role and commitment that each one of the participants must assume.

Resources

Contrary to what is thought quite often, the allocation of economic resources is not a priority action for improvement, but time is. This is due to the fact that, at least at its outset, an increase in the amount of work is generated because it becomes necessary to prepare, order and analyze new information with the purpose of using it for the decision making process and the subsequent follow-up and control of the processes. As a complement to what has been stated, only 40% of respondents were used to introduce improvements in their current practice. Therefore, it becomes fundamental to improve the definition of functions and responsibilities of the project managers and professionals in the companies. This change in the way of looking at things needs, without any doubt, breaking away from the traditional way of functioning that characterizes the Chilean construction sector and which is reflected in the typical sentence. "We have always done it this way"

In spite of the fact that the implementation generates from its outset an increase in the work-load and time becomes scarce, this does not seem to be an obstacle for the companies to face improvement processes. In fact, it is believed that the companies can assume the demands of such challenges with a greater degree rigor in the implementation.

Commitment

It was stated categorically that a greater degree of participation permits reaching better levels of commitment. In this sense, it is worth pointing out that most of the respondents expresses a willingness to carry out actions which go beyond what they are contractually bound to do, a willingness which is ratified by two other results; the first is that 95% of the respondents expressed a high level of identification with the company and the second is that 9 out 10 of them stated that they are comfortable in their present job positions.

Organization

The implementation of improvements calls for the operation of a special organization that supports the development and persistence of the new challenges undertaken. However, in spite of the fact that up to now the setting up of a special organization has been considered as a compulsory action, only 45% of the respondents perceive the existence and operation of any such organization.

PHASE 4: "CHALLENGE AND FUTURE ACTIONS"

Future actions consider the selection and implementation of incentives in each individual company and collaborative follow-up of the impact of the actions to perfect and improve

the effectiveness of the methodology. Even though this phase has not been fully developed, it is expected that will positively improve the design of incentive plans in accordance to the diagnosis made in the previous stages. The success of this phase rests mainly with the active participation of upper management and company leaders and with an adequate monitoring and control of the impacts associated to each one of the improvement actions.

Figure 4 shows a graphic and synoptic outline that summarize the phases which have been a part of the research methodology; it also describes for each of the phases associated, the participants, the barriers or difficulties and the player that has had a fundamental role in such phase.

CONCLUSIONS

The determination of incentives to facilitate the implementation of "Lean" improvement methodologies in Chilean construction companies, has permitted develop not just a diagnosis but also an applied research methodology that is expected to provide new insights on incentives for organizational change in the near future.

The obtained results as part of diagnosis, and the further analysis realized on them, has permitted not only determine agents of change that boost improvements inside the organization, but also to validate perception and inferences established in the preliminary experiences of implementation of "Lean" improvement methodologies in the Chilean construction companies.

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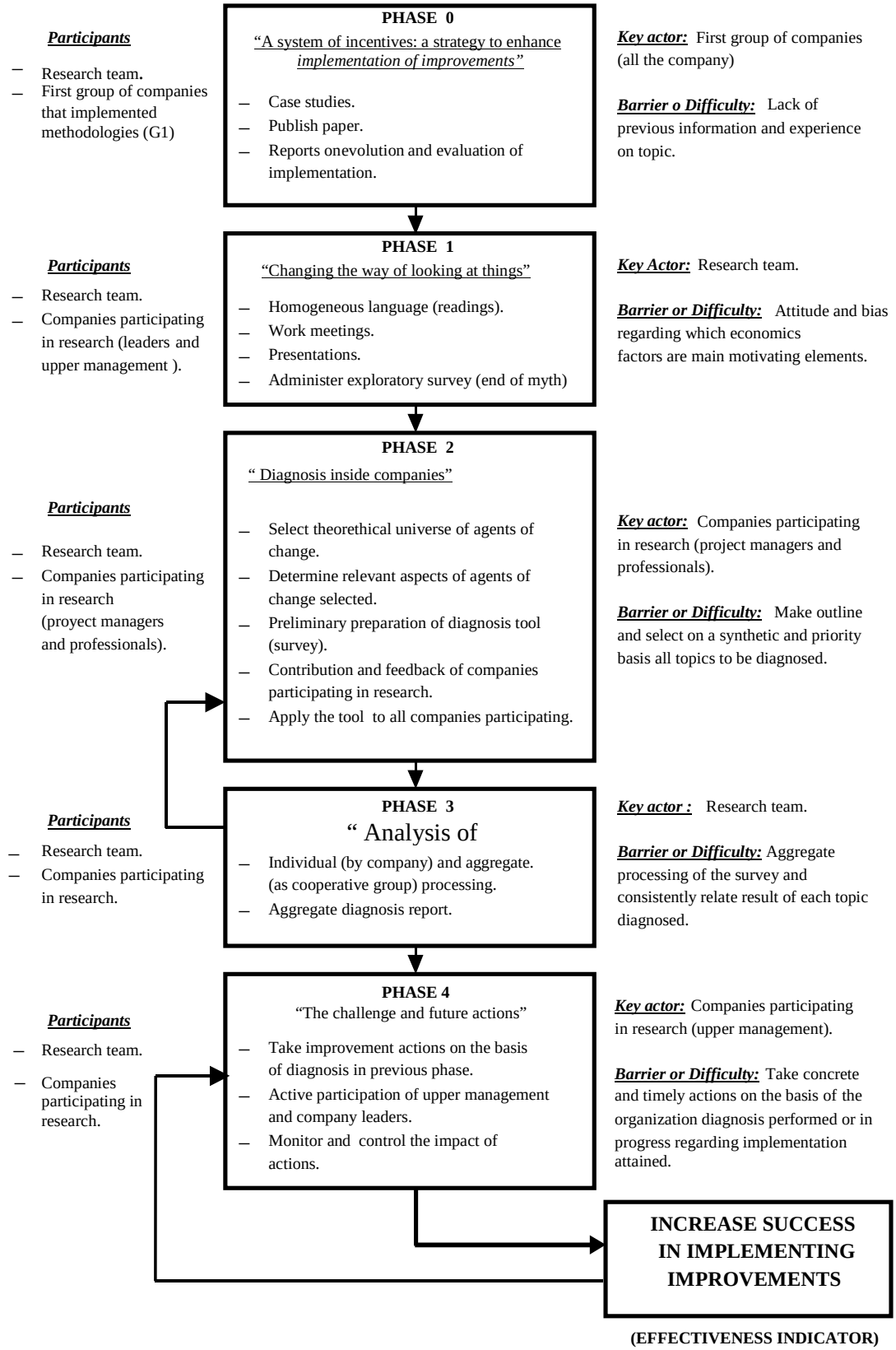

Figure 4: General Outline of the Research Methodology

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