Effects of human resource management on project effectiveness and success: toward a new conceptual framework

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Project management strategy research has focused on the effects of structure and planning operations (such as budgets, date completion and quality) on project success. In the past, projects have been managed as technical systems instead of behavioral systems. Relatively little attention has been paid to human resource factor. However, the Project Management Institute in its official definition of Project Management Body of Knowledge (P.M.B.K.) included human resource management as one of the six fundamental basic functions of project management. In this arena which lacks theoretical foundation, a relatively recent study made the situation even worse. Pinto and Prescott (1988) concluded that the ‘Personnel factor’ (independent variable) was the only factor in their research that was marginal for project success (dependent variable). This paper takes a critical look at this research and attempts to respond to their controversial findings. The main objective is to improve the thinking aspects and to highlight the validity of the measures used.

Organizations are facing a dynamic environment where the survival conditions are becoming draconian. Their success is tributary to their capacity to adapt their structures and establish viable relations with their surroundings. In this climate, administrators can no longer ignore such influences and are obligated to understand the factors which influence their activities, objectives and effectiveness. Many researchers agree that the human resource function is one of the most crucial elements for an organization’s success. Undoubtedly, today the human resource management (HRM) is renewing itself in the organizations and affirming gradually its strategic role. However, in spite of this tendency, Pinto and Prescott found surprising results in a relatively recent research. The authors conclude that the Personnel factor, even if designated in theoretical literature as a crucial factor in project efficiency, is a marginal variable for project success (at any of the four project life cycles). These results contradict the stream of HRM research in this topic.

This paper reexamines Pinto and Prescott’s findings in order to clarify their surprising results. By doing so, we pay a particular attention to their theoretical framework which still appear in a state of embryo. We debate the flaws of their models which, we believe, led to their controversial findings. Methodological inconsistencies are also discussed. We then present a conceptual scheme that contributes to a better operationalization of the Project Implementation Profile (P.I.P.) instrument used in their study. In line with the research of Tsui, the construct validity of the human resources factor is examined and a model proposed.

Summary and criticism of Pinto and Prescott’s study (1988)

In the past, project management has gained increased attention among researchers in the field of organization theory. According to some, project management is today one of the most researched and theorized topics in management. Among the main fields of interest, we can mention the training of the project managers, the effectiveness of different project structures, the project life cycles, and the identification of project critical success factor. Increased attention has been paid to this last point in recent years. In line with this stream, Baker et al. conducted empirical studies to synthesize a set of factors critical to project success. They found seven factors related to perception. Slevin and Pinto, in their efforts to build a conceptual model, addressed the generability issue by developing a framework of project implementation and a diagnostic instrument for the project manager.
This instrument, called Project Implementation Profile (P.I.P.), was developed through field research. It measures 10 critical factors related to project success (Table 1). Two years later, Pinto and Prescott conducted a study to investigate changes in the importance of project critical success in the project life cycle. Their principal research question was:

Are project implementation critical success factors of equal and stable importance over the life of a project, or does their relative importance (weighting) change as the project moves through different stages of completion (page 6)?

The authors concluded that the 'Personnel factor' was the only factor that was not significant at any of the four life cycle stages. Based on the extensive literature stressing the importance of human factor in organizational success, we question these results.

More specifically, this study can be challenged on the following grounds:

1. No theory was advanced for the inclusion of HRM in their model. Furthermore, no effort was deployed to define the components of project human resource management. Additionally, Pinto and Prescott tried to understand and to justify why 'Personnel' had no effect on project success and concluded that in this type of organizational structure, qualified personnel is 'usually the rule rather than the exception (page 16)'. This contradicts other research in this topic which point to the contrary.

2. The dependent variable 'project's success' lacks rigorous definition and its measurement is not precise. Furthermore, the authors present limited information about the validity of their measure. The latter is very critical since a debate exists about the complexity of this construct.

3. From a methodological perspective, many aspects appeared to lack rigour. Even if the Cronbach alpha scores used in this study to assess measure reliabilities for 10 critical success factors ranged from 0.70 to 0.90, the authors recognized serious multicollinearity problems. The correlation matrix presented in page 11 of their article showed that the independent variables were strongly intercorrelated (Pinto and Prescott). They tried to resolve this problem by 'Ridge Regression'; however they pointed out that this procedure produces biased estimates (Pinto and Prescott, page 12). Thus, this methodological issue may have invalidated their findings.

In addition, as the authors mention in their discussion, the items "comprising the Personnel scale are not useful from a construct validity standpoint for assessing the factor of personnel (page 16)". This may explain the non effect of 'Personnel factor'. Finally, the questionnaires were mailed to 586 members of the Project Management Institute (PMI), which is essentially a national organization of project managers. This means that essentially project managers have evaluated the personnel factor. In this sense, the P.I.P. instrument does not evaluate the training, the motivation, the experience, the commitment of the project managers as independent variables. This is another weakness in the research because the project managers are considered in project management literature as a central actors for success and effectiveness.

### Human resources and project management: toward a conceptual framework

Projects usually involve attention to a variety of human, budgetary and technical variables. Although many definitions exist, most researchers agree that projects generally possess the following characteristics: limited budget; date for completion; quality standards, and a series of complex and interrelated activities (generally project structure or matrix structure). From a review of the literature on project management, many researchers and practitioners consider performance, effectiveness and success as synonyms. This confusion in the definitions of these concepts is widely reported in organizational theory.

#### The concept of project's success (dependent variable)

It appears that it is the different conceptualizations of organizations and their roles that lead to various models of effectiveness such as the "Goals models", the "Legitimacy models", the "Internal processes or internal functioning approach", the "System resource models", the "Strategic constituencies models". Each of these perceptions leads to different definitions of organizational effectiveness and criteria. As Connolly et al. reported, the central differentiation among current effectiveness statements is in how they specify the evaluative criteria used to define "how well the entity is performing or could perform (page 211)".

Historically, projects have been managed as technical systems instead of behavioral systems. The focus was concentrated on the results with a mechanistic approach. Thus, the main objective was in general to attain target dates, to achieve financial plans and to control the quality of the final product. Success, effectiveness and performance were related to these 3 principal criteria. Gobeli and Larson, in their study about the effectiveness of different project structures, stress that these criteria were each rated by respondents as the most important one for assessing effectiveness.

The foundation of this tradition in project context correspond to a particular conception of organizations and a whole management philosophy (a project culture according to Elmes and Wilemon) where effectiveness is related to the achievement of the goals. This tradition and tendency is perfectly compatible with the
The conception of the "goals model which define effectiveness by the degree of achievement of their goals." 

In this optic, 'success' is corresponding to the effectiveness and the efficiency of the project. According to Brudney and England,\textsuperscript{39} efficiency is broadly understood as the maximization of output for a given level of input or resources while effectiveness is directed to the achievement of goals or objectives. Usually, success represents a level of satisfaction expressed by the project manager in reference to the three criteria mentioned above. This could be qualified as the traditional and the mechanistic approach to effectiveness in project context. Today however, we note an evolution of these concepts. Besides the traditional focus, concerns for other criteria are analyzed. For instance, Freeman and Beale\textsuperscript{18} identified seven criteria for measuring the success of projects (Table 2).

They revealed that the evaluation of the success (effectiveness of the project) will vary with the type of rater. The authors proposed also that project success could be measured from three viewpoints: sponsor's view, project manager's view and sponsor as project manager's view. Therefore, success could be defined as the level of satisfaction expressed by at least one of the three actors mentioned by Freeman and Beale\textsuperscript{18} on the basis of the seven criteria identified in Table 2. As well, users's satisfaction could be factored when necessary. This is a more innovative definition of success and effectiveness because it can provide (for instance from the sponsors) information on the background, the experience and the abilities of the project manager. From users's view, it can provide information about the post-project problems and precise how much the project has filled the need of the clients (Table 2, see managerial and organizational implications).

The independent variables

Undoubtedly, effectiveness is the central aim of every organization. The most productive companies in the USA manage their human resources in ways that are different from less productive organizations.\textsuperscript{6} To be effective in today's highly competitive environment, project management activities needs to devote a significant amount of skill, knowledge and attention to human resources. Managing people effectively influences many results of a project. For instance, the importance of training in project management context is widely reported in the literature.\textsuperscript{31,32,34} Hubbard\textsuperscript{35} underlined that the major project failures are usually sociological; these issues included unqualified staff, inadequate training, inexperienced management etc. Some researchers as Todryk\textsuperscript{33} reveal that the project manager training is a key factor for increasing effectiveness because he/she could be a team builder and create an effective team. Thornberry\textsuperscript{36} and Rogers\textsuperscript{37} argued that the organizational behavior, the lack of training in the planning process and the misdirected priorities affect directly the success in project context. As a large organizational literature reveals, the success in organizations can never be reached without a qualified and motivated personnel.\textsuperscript{36,37,6} At another level, Van de Ven and Koening\textsuperscript{55} have proposed a qualitative model which integrates the competencies required at any project stage. Afesmama,\textsuperscript{38} in his effort to develop a quantitative framework, insists about the crucial step in project context of assessing and forecasting human resources needs. Considering that Prescott's study could be an embryo for future studies and theoretical developments, we propose to test the impact of the ten independent variables (see Pinto and Prescott\textsuperscript{2}) on the dependent variable of our model (Figure 1). Our general proposition HI is : The Personnel factor will affect significantly the project's success.

To test this proposition, researchers should modify the 'Personnel' factor and clarify its construct validity. Some knowledge of the personnel construct is available in standard personnel textbooks\textsuperscript{39,40} or in a conceptual models of human resources.\textsuperscript{41} However, because of their validity, we propose to use and adapt the eight dimensions identified by Tsui and Milkovich\textsuperscript{42,7} (see Table 3, points 1 to 8).

The internal consistency reliability estimates (of these dimensions) were high across all the samples (all coefficients exceeded 0.75 with a median 0.87). Further, their construct validity was demonstrated in many empirical studies.\textsuperscript{7,42-44} This instrument could
eventually be completed by two items belonging to the personnel factor in the P.I.P. (such as the commitment of the project team and the job description clearness). Table 3, points 9 and 10). Finally, as we underlined in the precedent section, it is crucial to integrate the training of the project manager in order to evaluate its influence on the success (Table 3, point 11). In case of multicollinearity (as noted by Pinto and Prescott's study), we propose to conduct a factor analysis in order to extract some factors. According to 2 recent Canadian studies using Tsui's dimensions to evaluate the effectiveness of human resources management in large industries, it appears that these dimensions could be reduced into 2 principal components based on a factor analysis. Factor 1 measured more traditional human resources activities and was labelled HR; factor 2 measured dimensions pertaining to more traditional labour relations and was labelled LR.

Table 3  Tsui's dimensions for assessing human resources management

<table>
<thead>
<tr>
<th>Point</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Staffing/human resource planning: recruitment, selection, forecasting human resource demands and supplies, career planning...</td>
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<tr>
<td>2</td>
<td>Organization/employee development (organizational needs analysis, job needs analysis, person needs analysis, programs and budgets for training)</td>
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<tr>
<td>3</td>
<td>Compensation/employee relations; efforts to implement policy and equal pay, process salary actions, communicate to management the strategy related to employee relations, provide advice and counsel to management on employee relations problems, try to avoid conflicts among employees...</td>
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<tr>
<td>4</td>
<td>Employee support: all actions conducted by the direction of the project to help employees in their work to inform them and assist them in case of need</td>
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<tr>
<td>5</td>
<td>Legal requirement/compliance: efforts to treat employees fairly according to their contracts, to legislation</td>
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<tr>
<td>6</td>
<td>Labor/union: efforts in order to negotiate labor agreement with union, administer labor contract, determine labor strategy with union</td>
</tr>
<tr>
<td>7</td>
<td>Policy adherence: assure proper administration and disciplinary procedures, ensure equitable administration</td>
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<tr>
<td>8</td>
<td>Administrative services</td>
</tr>
<tr>
<td>9</td>
<td>Commitment of the project team</td>
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<tr>
<td>10</td>
<td>Job descriptions clearness</td>
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<tr>
<td>11</td>
<td>Training of project managers</td>
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</table>

The intervening variables

Many academics argued that life cycles affect organizational effectiveness. In project management, this concept is also very popular and has caught the attention of many researchers. As Pinto and Prescott's mention, one of the most accepted project life cycle has been proposed by King and Cleland and Adams and Barndt. Four stages were identified: conceptualization, planning, execution and termination. Each project stage implies a different intensity of effort, a different type of task and kind of actors. Thus, the variations of these cycles could eventually have an influence on success. According to Adams and Barndt and Pinto and Prescott the effect of the critical factors on success vary when the project cycles change. That explains why, for instance, technical tasks have an influence on success only in the execution and termination stages. Accordingly, these findings suppose that 'project life cycles' could be considered as an intervening variable. Indeed, Kervin reports that "Moderator variables affect how a primary or a key independent variable covaries with the dependent variable. A moderator variable (M) affects the degree or form of the relationship between an independent (X) and dependent (Y) variable: M affects X-Y (page 167)". In this sense, we expect that the independent variables derived from the P.I.P. and discussed in the precedent section are under a moderator influence when they affect project success (Figure 1). Due to the fact that the selection of human resources, the employee support and the legal requirements are crucial at the beginning of every project and because the training, the commitment and the policy adherence are so important at the other stages of the project, our proposition H2 is: The relation between the independent variables and the project's success of the model will be positively affected by the four project life cycles.

On the other hand, during the last decade, the study of the structural impact of organizations has won more and more attention on a theoretical base to measure their effectiveness. In project management, one of the most interesting investigation was the Gobeli and Larson study. The authors pointed out that each organizational structure in project context has its strengths and weaknesses. According to them, the type of structure chosen will significantly affect the success of the project. Their aim was to assess the relative effectiveness of five structures: Functional, Functional matrix, Balanced matrix, Project matrix and Project team. In their findings, they carried out that the project matrix and the project team were rated as the most effective. These structures affect the project manager roles and the coordination of the activities, the intensity of the conflicts and (by this process) amplify or reduce indirectly the effectiveness of the project. At this level, our proposition H3 is: The more the structure adopted in projects will be a 'project team' oriented, the more the relation among the independent variable and the dependent variable will be positively affected (intervening effect).

Conclusion

A central concern of project management is the improvement of its conceptual foundations. As Fabi
and Petersen revealed, human resources management in project context is still elementary. Publications are relatively rare, the majority of the researches is simply a case study or expert's reports. The effort in future research should concentrate on overcoming the gaps that characterize the P.I.P. instrument and improve the theoretical foundation in this topic. Researchers should attempt to retest the conclusions of Pinto and Prescott that corroborate a non impact of the 'Personnel factor' on project success. Specifically, they should emphasize two fundamental questions: (1) is personnel a significant factor for project's success? and (2): does the organizational structures and the project life cycles have an intervening effect on the relation among the independent variables and the project's success? Traditionally many key variables affecting the project effectiveness have not been integrated in the same studies. In this sense, the integration in the proposed model of the intervening impact (structures and the life cycles), two fundamental variables in project management, will be a first step for a real theoretical improvements to this topic.

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