

The key determinants of the project team effectiveness: A case study of a sample of Algerian project teams

المحددات الرئيسية لفعالية فرق المشروعات: دراسة حالة لعينة من فرق المشروعات الجزائرية

Guernoub Hemza , senior researcher at CREAD “Centre for Research in Applied Economics for Development”, Algiers, Algeria, hamzaguernoub@gmail.com

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Abstract:

This study aims to examine the determinants of team effectiveness and to explain what makes a team more effective than other teams. This research is based on a field study of several project teams and on descriptive and analytical methodological approach. Using the input-process -output model, the results of this study confirmed that there is a positive influence of individual and organisational factors on team performance behaviours. The results also highlight the role of interaction and collaboration in the collective learning and the reflexivity of the project team.

keyword: Effectiveness; Project team; Collaboration ; Collective learning.

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*Guernoub Hemza , e-mail:
hamzaguernoub@gmail.com*

1. Introduction :

Today's organizations are increasingly facing an environmental complexity, which is due to the nature of the elements that compose the environment and to the permanent interactions between those elements. In order to respond effectively to this environmental complexity, two trends are observed in organizations: a need for speed and flexibility (Cheryl and Beuerlein,2005, p149). Flexibility of individuals and work is therefore a key element of organization adaptability to environmental complexity. Moreover, competitive advantage is achieved more than ever through knowledge intensity and flexibility (Hitt et al., 1998).

At individual level, flexibility means a shift from a task-based approach to a competency-based approach in the organization. The first approach is a job structure oriented approach which involves identifying and making operational the Knowledge Skills, Abilities, and Other characteristics (KSAOs) that an individual must have to perform a task correctly (Soderquist et al., 2010,p327). By contrast, the second approach is a person-oriented approach, it focuses on the person and what he is capable of, in others words, it focuses on competencies. Competencies are not limited to skills; they are also a set of behaviors that determines how people do their jobs, and the part of creativity, perseverance in this. Furthermore , competencies as behaviors involves all the person-oriented competencies , referred to as meta-competencies (Nordhaug,1998) which includes interpersonal aptitudes such as the ability to communicate and to cooperate with others (Soderquist et al. ,2010,p330).

However, at a collective level the flexibility means more coordination and more collaboration between individuals, through the adoption by the organization of a competency-focused approach to organizing. This new approach is based on knowledge sharing and teamwork. Hence, team-based organization is an organization that uses

teams as the core performing units (Cheryl and Beyerlein ,2005, p150). As a result , a new organization design can be established, this design will incorporate the concept of competency-based organizing, through which effectiveness can be enhanced by individuals being relatively self-managing(Lawler, 1994, p08). The project team is an organization design which fully fit into the competency-based approach.

1.1. Project team effectiveness :

Teamwork can help the organization reach flexibility and performance, by facilitating cooperation and the exchange of ideas and skills. Teamwork could be shaped in many ways (e.g., project teams, self-managing teams, semi-autonomous work groups) , it can be defined as an interdependent collection of individuals, each of whom shares responsibility for organizational outcomes (Janz, Colquitt, and Noe, 1997,p877). One key element of the above definition is that, the team members share one or more common goals. Project teams are one example of teamwork; they are largely based on the coordination of activities between individuals and aim to complete a work that is characterized by a high level of interdependence and cannot be done individually. Project teams operate in an organizational context that impacts their functioning, Duane (1998) pointed out that self-organization (as it is the case of a project team) must be carried out in a systematic and clearly bounded manner (p. 83). In order to achieve its goals, managerial competencies and operational competencies are simultaneously needed for the project team; the first ones are required for interpersonal interaction. Operational competencies enable the person to carry out successfully a specific job of operational nature (Soderquist et al. 2010, p328).

There is a difference between effectiveness and performance , some team can have all the needed competencies , although , they may not perform well, by contrast some other teams can do very well even

though they have limited competencies but their determination may compensate this lack (Margerison, 2001,p119) . To achieve performance, competencies must be mobilized effectively both in individual and collective level.

To understand the nature of team performance and team effectiveness, many models have been proposed by authors. The classic model and yet the most famous model to explain team effectiveness and performance is the IPO model (the input-processes-output) in which inputs lead to processes which in turn lead to outcomes (Jiang et al., 2012).

1.1 The IPO model of team effectiveness

The input-process-output model is the dominant way of thinking about team effectiveness (Barrick et al. 1998, p377). In this model , inputs are related to antecedent factors that enable and constrain members' interactions (Mathieu et al. 2008 ,p412) , those inputs are classed in three categories according to their level; individual , group and organizational level (Barrick et al. 1998, p377) . At the individual level we refer to individual team member's characteristics like competencies and personal attributes, at the team (the group) level we address more factors such as task structure and leadership style, finally at organizational level we look into organizational design and environment.

Theory have suggest that the impact of this factor on the output take place through the team process (Cramton and Webber,2005), which describe members' interactions directed toward task accomplishment (Mathieu et al. ,2008 ,p412). The factors described above drive team a process which is considered to be at the same time a mediator between these factors and the team outputs. In this case, team process describes the transformation stage from inputs into outcomes (inputs or results). Team processes are mediating mechanisms that can be divided into two

groups: the first one is related to member's action, the second one describes internal processes such as, cognitive, motivational, or affective states (Marks and al., 2001). The second group of mediators is also referred to as emergent states (e.g., potency, psychological safety, and collective affect) (Mathieu et al., 2008).

Consequently, processes are explanatory mechanisms that mediate between team inputs and outputs. They could be affective, behavioral, cognitive, or some combination of the three (Ilgen et al. 2005, p517). One of the most important behavioral team processes is cooperation. Team cooperation is a key behavioral dimension of team process (Jiang et al., 2012) and a critical mediator in the team effectiveness . Moreover, team ability to create synergistic gains through cooperation is believed to be a key prerequisite to effective team outcomes (Hackman, 1987). Synergy is the capacity of team members to integrate each member's effort, and as a result reach better team performance.

Generally, performance is the most linked term to outcomes. A differentiation exists between performance behaviors and performance outcomes. Behaviors are actions that are relevant to achieving goals, whereas outcomes are the consequences or results of performance behaviors (Beal and al, 2003). Examples or performance behaviors are learning behaviors and team process improvement (the search for better ways to do things, or proactivity). Team process improvements can be obtained through error discussion, and experimentation, this should lead to the ability to adapt and to improve (Mathieu et al., 2008).

Team reflexivity is another example of performance behaviors , it imply that the team reviews its objectives and its work methods, in light of changing circumstances (De Dreu, 2002,p290), team reflexivity can lead to team innovation, this latter is the capacity of the team to implement new ideas in order to ameliorate work methods and procedures , and as a consequence makes better product and services or

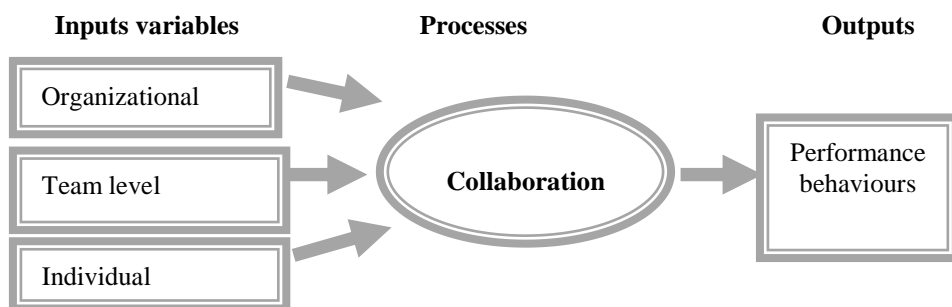
even create a new ones (Anderson and & West, 1998).

1.3.The problematic and the hypthesis :

In order to conduct our empirical study, we chose a sample of project teams within Algérie Poste Company. In fact, Algérie Poste as a public company is committed to achieve its strategic development plan (modernization), which is implemented through several project teams. For this reason, the project team effectiveness is a fundamental question in this company. Therefore, the primary goal of this study is to find an answer to the following question: What are the determinants of the project team effectiveness in Algérie poste company ?

To answer this question, we must understand the team effectiveness through a contextual approach that takes into account all its aspects. In this study the input-process-output framework (IPO model) will be used as the basis for examining project team effectiveness. However, this model was adapted to fit the context and the hypothesis of our case study and to build the research model of the study.

Fig. 1: The research model of the study



Source: Adapted by the researcher from Mathieu, et al., (2008), p 413 .

What makes a team more effective to others has been the focus of so many studies. In our research we will be interested in the team performance behaviors as one example of the project team outputs and we will try to understand the factors that determine this, but we will also examine the processes that explain the impact of those factors.

In order to better control our research, we have issued the following hypotheses:

- There is a positive influence of individual perception and organisational factors on project team performance behaviours.
- The impact of those factors take place through interaction and collaboration process.
- Team performance behaviours enable the project team to work more effectively and to learn through experience.

2. Study Methodology :

In order to answer our problematic, we conducted an empirical study within Algeria poste based on a descriptive and an analytical research methodology. The study adopted also a quantitative research methodology based on the collection of data through the questionnaire. This questionnaire was structured around several sections and variables linked to the research model of our study. An analytical approach has been used to explain the result of the questionnaire survey and to describe the main factors that determine those results.

2.1. The study sample and data collection :

The sample consisted of 72 persons who were members of different project teams. After writing the questionnaire and testing the validity and the stability of its content. The first version of the questionnaire was tested with a sample of 13 team members, selected randomly. Out of 100 questionnaires distributed, we were able to retrieve 72 useful

questionnaires, which means a response rate of 72%. The data collected by the questionnaires was subjected to a statistical analysis by SPSS.

2.2. Measures and study tools :

To test the hypotheses, a measure was developed for each variable of the team effectiveness. The items were generated to fit the activity context of these teams and the nature of their work. The five-dimensional Likert scale (1 = strongly disagree, to 5 = strongly agree) was used to measure the items (statements). The items questioned team members about different features of team effectiveness. The literature and the conceptual framework served as first source to develop those items and constructs. Factorial analysis, correlation and regression analysis have been used to identify the study variables and to examine their reciprocal impact.

3. Study Results :

The data from the questionnaire were analysed by the SPSS software to both identify their meaning and allow a better understanding of the links of interdependence between the constructs and the dimensions.

3.1. Factorial analysis:

The data from the questionnaire were analysed by the SPSS software to both identify their meaning and allow a better understanding of the links of interdependence between the constructs and the dimensions.

Factorial analysis is an exploratory method of analysis. The use of this method will allow us to identify the major dimensions of the study variables and to highlight their importance. Factor analysis would allow an aggregation of factors and the identification of the underlying dimensions; it would also reduce and summarize the data by indicators. For the extraction method that has been used and with regard to the

needs of our study, we have decided to use the principal component analysis (PCA). This method is used for quantitative data or ordinal qualitative data. In our case, this method was applied to ordinal data under the Likert scale which is a classification scale; the categories assigned to the variables are classified in order. Factor analysis revealed different sub-dimensions in our questionnaire sections:

Table 1: Sub-dimensions in the questionnaire sections

The sub-dimensions
Section 1: Individual perceptions as a member of the team
Sub dimension 1: Satisfaction and recognition within the team
Sub dimension 2: Sense of belonging to the team
Section 2: Quality of personal relationships and team interactions
Sub dimension 1: Trust and openness within the team
Sub dimension 2 : Team spirit
Sub dimension 3: Collaboration within the team
Section 3: Teamwork and organisational factors
Sub dimension 1: The organization and content of the teamwork
Sub dimension 2 : Leadership style
Sub dimension 3: The team composition
Section 4: Team performance behaviours
Sub dimension 1: Collective learning
Sub dimension 2: Team reflexivity

Source: Extracted from the factor analysis with SPSS

Each sub-dimension is composed of many questions (items), the sum of the questions forms a distinct construct, and for example the sense of belonging to the team construct is made of 3 questions: Q 1, Q 2, Q 3.

3.2. Correlation and regression analysis:

Table 2: Correlations between the questionnaire sections

		Correlations			
		Section 1	Section 2	Section 3	Section 4
sec 1	Pearson correlation	1	,532**	,657**	,742**
	Sig. (bilateral)		,000	,000	,000
Sec 2	Pearson correlation	,532**	1	,500**	,678**
	Sig. (bilateral)	,000		,000	,000
Sec 3	Pearson correlation	,657**	,500**	1	,620**
	Sig. (bilateral)	,000	,000		,000
sect 4	Pearson correlation	,742**	,678**	,620**	1
	Sig. (bilateral)	,000	,000	,000	
	N	72	72	72	72

** . The correlation is significant at the 0.01 level (bilateral).

Source: Extracted from the correlation's analysis with SPSS.

The correlation analysis shows a positive correlation (relationship) between the variables of our study. First of all, this correlation is observed between the input variables (individual perceptions, teamwork and organizational factors) with a value of **0.657**. The positive correlation is also seen between those variables and the quality of team interaction which is considered a mediating variable (**0.532 and 0.5**). Furthermore, a high correlation is indicated between the inputs variables, the mediating variable and the outputs variables (**0.742, 0.620 and 0.678**). The significant is 0.00 which is less than 0.05, so the correlation coefficient is statistically significant which means that there is a positive relation between the variables.

The data from the questionnaire were analysed by the SPSS software to

both identify their meaning and allow a better understanding of the links of interdependence between the constructs and the dimensions.

Regression highlights the relationship and correlation between many variables, but it also predicts the value of a dependent variable as a function of one or more independent variables.

Table 3 : Regression model

Model	R	R-square	R-square adjusted	Standard error of estimation
1	,820 ^a	,673	,658	,35710

a. predictors : (Constante), sect3, sect2, sect1

Source: Extracted from analysis with SPSS

R2 is the percentage of change in the output variables explained by inputs variables. These variables explain 67.3% of the variance in the outputs. This model is very significant statistically (0.000) that is to say that we reject the null hypothesis, so there is a relationship between the dependent variable and the others independent variable.

3.3. Discussion :

In the first part of the questionnaire team members were asked about their perceptions as member of the team, the factor analysis has revealed that recognition is the most important element to make team member feeling as part of their team, recognition can be received from others team members or from the team leader.

The factor analysis of the second part of the questionnaire has enabled us to identify trust, openness and collaboration as the main features of the team interactions. In fact, when members could speak openly and honestly in meetings and in front of other team members, the result would be more sharing of their knowledge and their work experiences with the team, this will boost team creativity and collective learning. Our results confirmed previous research findings , for example research in the innovation field has suggested that there is a

significant relation between participation , the level of openness of the group and innovation (Burningham and West, 1995).

The analysis of the organizational factors that drive team effectiveness has shown that the organization and content of the teamwork is a key factor, the team members were asked if the team's mission is clear and the objectives are relevant, this will facilitate considerably the teamwork. Another key element in the organizational factor as revealed by our analysis was the leadership style, in fact this style will determine the scope of initiative given to the members and the way the work is done. The qualities of the project team leader will allow him to exert an influence on the behaviours of the team members and to organize the missions and activities of the project team.

The team composition is another key factor, this result is confirmed by previous research studies. For instance, Drach-Zahavy and Somech (2001, p120) emphasize that the heterogeneity of the team influences the interaction process, the more heterogeneous the team, the more its members engaged in exchanging information, learning, and negotiating. In relation with the team size, Duane (1998) has concluded that in order to success, a team must be able to make decisions and implement them quickly and effectively (p, 87). For that, the team's size should be eight to twelve members, so they will not be faced with logistical issues, and loss of intimacy and trust when they are large (Duane W. Cross, 1998, p87).

The last part of the questionnaire aimed to identify the output of the project team work, the factor analysis has enlightened two groups of key elements of performance behaviours. The first group is related to collective learning and capitalization of past lessons and, the second group relate to the collective reflectivity and the capacity of the team to think of new ways to do work and to make collective decisions.

- *Team interaction as a mediator between inputs and performance behaviours*

Recognition and the sense of belonging to the team will have an influence on the satisfaction and motivation within the team, so the members will enjoy working in the team and therefore engage in more collaboration acts with other members. Besides, the more the team members collaborate together the more they would develop a team spirit and a feeling of trust (engagement in the team's missions and sharing the same values with the other members).

Moreover, the more the members interact and share their experiences, the more they learn how to solve problems and how to adapt their objectives and goals , And the more they share information the more they are able to make collective decision and as a result change the way the work is done for the best . According to Hackman (1987) effectiveness is not only related to the actual team result or performance (current effectiveness), because it can also refer to the future capability of the team members to work together (future effectiveness or team viability). This capability can be threatened by the lack of cooperation and motivation of the team members.

If member trust each other it will be easier for them to communicate and to cooperate, this will create a sense of solidarity between them, current results for trust and team effectiveness match those obtained by other studies. The interaction process can embrace 3 stages, input, process and output (Wang, Y. 2018, p1). The process stage is made of four elements learning, negotiation (mainly when conflict happens), exchanging information (communication) and trust (Drach-Zahavy and Somech 2001, Wang, Y. 2018).

However, the content of the work will have to be adapted and discussed. In order to work effectively, team members should be

involved in team objective setting and decision-making process, this will increase their commitment over time which is a fundamental condition to achieve any progress because everyone will perceive the team goals as part of his own personal goals.

4. Conclusion :

This study responds to a managerial necessity for Algerie poste, this company must focus its strategy on the flexibility and the adaptability of its resources through project teams. The project team is a form of organization based on flexibility, sharing and collaboration between the members.

The main objective of this study was to identify within the project teams of Algerie Post the factors that determine team effectiveness and to examine the interaction between them. In the literature on the team effectiveness, several approaches have attempted to explain the nature of this notion. For the purposes of our study, we have chosen to use the Input-process-output model framework which focuses not only on the factors that drive team effectiveness but also on the dynamic between them. The results of the study supported the main hypotheses; in fact, they indicate that there is a positive influence of individual perception (especially recognition) and organisational factors (leadership style and the content of the teamwork), on project team performance behaviours. The impact of those factors takes place through interaction and collaboration process. Finally, the results show that team performance behaviours enable the team to work more effectively through collective learning and team reflexivity.

Despite their importance, individual and structural variables cannot fully predict team effectiveness; the processes that emerge and take place within the team are also fundamental elements that drive the team effectiveness. Therefore, team processes can be seen as action

undertaken by team's member to accomplish their work plus the interaction between members. Team effectiveness is therefore built up over time, within a human system composed of several actors. This system is intelligent and capable of creating its own future thanks to the learning over time of the actors. In this perspective, effectiveness is prompted by individual and collective cognitive processes through which each person can contribute to the team output.

The conclusions that can be drawn from this study are of course limited by the small sample size; our primary motivation to complete this research was to only highlight the variables that affect team effectiveness. Hence, further researches can be conducted to understand the mechanism that drives team effectiveness at a large scale. For example, the question of management style and leadership must be carefully addressed, in view of the primordial role of the project team leader in mobilizing the team potential.

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