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Identifying useful actions to improve team resilience in information systems projects

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Abstract

Due to today's business environment demands organizations need to create teams to perform work in projects, with quality, within time and budget. Therefore, teams play a very important role in the organizational development, by creating conditions that enable to overcome difficulties and to promote the improvement of the organizational overall performance. Hence the relevance of studying the project teams resilience, identifying the actions that can influence the project development and its final outcomes. The resilience of a team can be defined as the team's ability to deal with problems, overcome obstacles, or resist the pressure of adverse situations, without entering into rupture. This research, focused on team resilience, firstly involved a literature review, followed by brainstorming sessions, resulting in a preliminary list of useful actions to improve project team resilience. Then, a survey was administered in order to identify the most useful actions perceived from the identified list. Completed questionnaires were received from 115 team members of information technologies/information systems projects being developed in an academic setting. By identifying the most useful actions perceived, as those having the highest potential for increasing project team resilience, practitioners and organizations can set their priorities towards improving team resilience. The results showed that the top ten list of useful actions identified is composed by very well-known and recognized actions, such as the promotion of collaboration and solidarity among project team members, and the recognition, appreciation and use of the talents and competencies of each team member.

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1. Introduction

The current business environment is extremely demanding and unstable, creating unique challenges to the organizational performance and to its sustainability. The way organizations deal with the markets' shifts and turbulence and their ability to maintain balance and make the necessary adjustments to overcome the challenges felt[1,2], will dictate the degree of strategic flexibility, as well as the dynamic capabilities gained during the organizational transformation process[2].

The organizational resilience can be defined as the firm's ability to rebound from adverse and unexpected situations towards defining the right path to success[1,3]. Especially, by responding to the situations that endanger the organizational survival and its prosperity[4,5], creating outstanding conditions for capitalizing the transformation activities undertaken to overcome the difficulties faced to develop new capabilities towards enduring the organizational resilience[6].

Due to the increasing complexity of organisations, their projects are also becoming more complex, requiring competent and motivated teams to perform work[30]. Therefore, teams play an important role in the organizational development, by creating conditions that enable to overcome difficulties and promote the organizational overall performance. Hence the relevance of studying the project teams resilience[7], identifying the actions that can influence the project development and therefore hinder its implementation and consequently its final outcomes. This is particularly important in information systems projects, considering the lower levels of success that these projects have shown in recent decades[31].

Information Systems (IS) and Information Technology (IT) play an extremely important role in modern organizations, since they are present in almost every aspect of business[32,33]. IT/IS are nowadays a business core asset[34], being the backbone of today's organizations[35,36], essential to improve productivity[32] and reduce operational costs[37]. However, the success of IT projects is far from the desirable[38] and the establishment of effective and efficient project management practices still remains a challenge[39].

Project success has many definitions and various aspects can influence it[40]. The project team is within the main aspect that influence the success[41,42], being fundamental for success to improve the team members productivity[37].

The purpose of the research, described in this paper, aims to discover how project teams might adapt to adversity and develop resilience. Specifically, this paper seeks to answer the research question: what are the perceived useful actions to improve project team resilience? The results presented here are part of a broader research study on the theme project team resilience, in which the identification of the perceived useful actions to improve resilience is one of three objectives of the study. The other two objectives are: (1) identify what characterizes the resiliency of a project team and (2) identify how to assess the project team resilience.

2. Literature review

The word resilience had its origins in the Latin verb *resilire*, which can be defined as the ability to recover quickly from difficult and possible harmful situations[8,9]. Any situation has its own context of adversity[10], requiring adjustment mechanisms to deal with negative circumstances, and stressors, which are environmental stimuli demanding actions from an individual, team or even an organization[11].

The ability to properly deal with unexpected events, focusing on a set of actions to compensate the persistence of damaging circumstances, will require an specific set of competencies, experience and attitudes[12]. Therefore, resilience will enhance the individuals' recovery period and will guarantee a strengthened will, as well as an increased resourceful repository for future situations[13], which is critical for human functioning and to organizational sustainability[14]. The resilience can also be used to characterize individuals' ability to overcome setbacks and to, somehow, measure their life achievements and career expectations or ambitions[15]. In the end, as mentioned by Coutu [16(p6)] "More than education, more than experience, more than training, a person's level of resilience will determine who succeeds and who fails".

Nevertheless, the scenario changes when we start focusing on teams' resilience and not, exclusively in the individual. In general, the mechanisms considered in the resilience of a team are similar to those pointed in the individual. However, the teams' work dimension and the interactions between its members brought up a new set of aspects that need to be properly considered, in order to measure its dependencies and impacts on teams' overall performance[17,18].

The resilience of a team can be defined as the team's ability to deal with problems[1,19,20], overcome obstacles[1,2,5], or resist the pressure of adverse situations (e.g. the early leaving of a team member), without entering into rupture, and allowing a positive adjustment to successfully perform particular tasks, increase reliability, longevity and the overall performance[20,21]. This ability translates into a set of determinants that make the team more or less resilient. These determinants can be boosted to protect a group of individuals from the potential negative effects of the stressors they collectively encounter during the project execution[22]. The ties developed between members (degree of teams' connectivity) and its openness, enables teams with the proper conditions to face and overcome the problems that they might impact on the project objectives, as well as to enhance the learning possibilities and generating new insights which will increase the adaptability process when experiencing new adversities in the future[22,23,24]. The organizational capacity to develop a resilience attitude between its members should be supported in specific competencies, routines and processes, in order to gain the proper alignment towards moving forward, and creating an adjustable setting to enhance the integration of all the aspects needed to construct a resilient organization. The resilience work integration should focus in three different dimensions: individuals; teams or groups; and organizational context.

In the individual dimension the common aspects presented focus on the ability to solve problems, have strong faith and confidence, as well as a combination of resourcefulness and counterintuitive agility gained through practicing useful habits and by being prepared to any situation[2,5]. Team resilience should focus on developing a group structure, shaped by common rules and values, based in a shared transformational leadership; thoughtful interactions amongst team members during unexpected situations, proactive awareness to promote an emphasis on team improvement[22,25]. The organizational context should foster a positive orientation through the development of strong core values[1,6] coupled with a sense of purpose[26], a clear vision and communication, a non-hierarchical structure (diffuse power) and accountable environment[27].

3. Methodology

The existing theory available that comprehensively explains how to improve team resilience is very scarce[7,12,22,25]. As a result, this research cannot simply be about conclusively testing a single theory, but instead must emphasize the generation of theory based upon actual findings and data. Therefore, an empirical research was undertaken. The research involved a literature review, which enabled to create an initial list actions to improve team resilience, followed by brainstorming sessions between three researchers, with high experience on information systems and project management areas. From the brainstorming sessions resulted a theoretical list of team resilience influencing actions. Then, a survey instrument was administered to measure the importance of each identified influencing action, in order to identify the perceived most useful actions from the list identified.

The questionnaire was structured into three parts. Part A was divided in a series of questions designed to investigate which were the most useful actions to improve the project team resilience (see Table 1). Part B was divided in a series of questions aimed to evaluate individual resilience (out of scope of this paper). Part C of the questionnaire gathered information about respondents, their experience and work context (e.g. project role, gender and age).

A seven-point Likert scale was used to measure each action of Part A, from 1 = "without influence" to 7 = "total influence".

The questionnaire was pretested with five team members, namely to evaluate ease of understanding and time required to complete. Only minor revisions were required; for example, minor re-wordings to questions to remove ambiguities and slight changes to the layout of the questionnaire to improve readability.

The questionnaire was distributed via the researchers' professional contacts. The project managers of 28 information technologies/information systems projects being developed in an academic setting were contacted to invite their team to participate in the survey. Each participating project team had between three to six team members

(a total of 131 questionnaires). The participants were asked to fill out the survey and return it on site to the researchers. Strict confidentiality was stated in the survey cover.

The questionnaire took about 15 minutes to complete, and was distributed between June and July of 2014.

Questionnaires were received from 118 participants. Three of the questionnaires received were not used in the analysis, due to incomplete responses, yielding a final response rate of 88% (corresponding to 115 complete questionnaires).

Most of the respondents were male (83%). The majority (55%) was between 23 and 30 years old, and 36% were work-students.

The respondents participated in projects classified into four types: custom development (32%); information systems analysis (25%); consulting (25%); other, including business intelligence, workflow, etc. (18%). The average duration of the projects was three months.

Table 1. Actions to improve project team resilience

Code	Actions to improve project team resilience
TRS_01	Establish specific indicators concerning the project results
TRS_02	Assure the systematic feedback of project results
TRS_03	Assure the redundancy of non-human resources (e.g. equipment)
TRS_04	Assure the redundancy of human resources
TRS_05	Set teams with the necessary competences to perform the project activities
TRS_06	Provide training to develop the competences necessary for the project
TRS_07	Manage project stakeholders expectations
TRS_08	Help each team member to perceive the usefulness of their work
TRS_09	Minimize the individualistic behavior in favor of the teamwork results
TRS_10	Focus the team effort in the project results
TRS_11	Minimize disturbances during the project life cycle (e.g. lack of information, rumors, etc.)
TRS_12	Report team members the priority activities for each other
TRS_13	Control project progress and highlight any default by the team
TRS_14	Ensure that team members with low performance feel the need to improve
TRS_15	Performing project control close to the project team
TRS_16	Empowerment of the project team (give decision-making power to the team members)
TRS_17	Make a work schedule flexible in order to answer the needs of each team member
TRS_18	Develop individual resilience of project team members
TRS_19	Identify the most important behavioral characteristics of each team member that can "strengthen" the project team
TRS_20	Identify the most important behavioral characteristics of each team member that can "weaken" the project team
TRS_21	Avoid bureaucracy in project management
TRS_22	Promote solidarity between project team members in work development
TRS_23	Involve the project team in the project plan development
TRS_24	Promote that all project team members put forward their ideas and that they feel their ideas are taken into account
TRS_25	Align all project team members with the project objectives
TRS_26	Identify the best strategy for the project execution
TRS_27	Encourage project team members autonomy and versatility
TRS_28	Promote collaboration among project team members
TRS_29	Implement a participative project management philosophy
TRS_30	Implement suitable motivation systems
TRS_31	Seek to minimize the project ambiguities
TRS_32	Promote the ability of project team members to learn from mistakes
TRS_33	Implement project risk management processes
TRS_34	Help the team to manage change
TRS_35	Identify and clarify the acceptable and unacceptable behaviors of team members (e.g. sarcasm, etc.)
TRS_36	Identify and eliminate barriers to the project execution (e.g. physical environment conditions (temperature, noise, etc.), interpersonal relationships (e.g. unsolved issues from the past), antisocial behavior, etc.)
TRS_37	Promote an active listening of all project team members
TRS_38	Encourage assertiveness among team members (e.g. "talk about what should be spoken")

TRS_39	Place the team always over the individual interest
TRS_40	Provide opportunities for the project team for continuous learning
TRS_41	Develop project team building
TRS_42	Implement effective communication processes
TRS_43	Stimulate a positive and loyal project team environment
TRS_44	Ensure the adequate working conditions
TRS_45	Encourage that project team members recognize their weaknesses and mistakes
TRS_46	Promote the request and acceptance of excuses between project team members
TRS_47	Reinforce the need for team members always give the benefit of the doubt before reaching negative conclusions
TRS_48	Promote the recognition, appreciation and use of the talents and competences of each team member

Notwithstanding the projects have been developed in an academic setting, they share the same characteristics of professional projects, being the project success indexed to the benefits obtained by the project customers (entities internal or external to the university where the projects were developed). In nine of the 28 project teams (32%) occurred at least one "crisis" situation (for example, one team member leaving the team prematurely or by internal conflicts).

Cronbach's Alpha was computed to test the reliability and internal consistency of the responses. Cronbach's Alpha is .961 (48 items), which is considered excellent[28] (above 0.7 is a desired threshold[29]), indicating a high degree of internal consistency in the responses.

4. Results and discussion

The ranking obtained of the perceived useful actions to improve the project team resilience in information systems projects is shown in Figure 1. The interpretation of this figure is straightforward. The action perceived as the most useful is the TRS_28 'promote collaboration among project team members', which is pointed in the literature as an important factor for the team resilience development. While the one perceived as the least useful is TRS_03 'assure the redundancy of non-human resources (e.g. equipment)'.

An open question of this questionnaire has asked the participants to suggest new actions that could contribute to improving the project team resilience. However, none of the respondents suggested any further action, which could be a good indication that the actions available covered in the questionnaire fully characterize the project teams resilience. Other factor that might confirm the argument previously presented is that the level of agreement of respondents with statements available is extremely positive. The mean values range between 4.5 and 6.5, which indicates that the study participants consider all aspects identified in the literature and resulting from the researchers' brainstorming sessions as having influence on the resilience of the team, corroborating the the prior list of actions or improving initiatives framework for project team resilience.

The median (the value above and below which half of the cases considered fall) is 6 for most actions to improve the project team resilience (94%), as also the mode (the most frequent answer) is 6 for 70% of the tools and techniques, which evidences the positive direction of respondents' answers. The standard deviations show low values (between 0.72 and 1.27) which indicate a low variability of answers.

The top ten perceived useful actions to improve the project team resilience (mean close to 6.5 influence) is composed by very well-known and recognized actions, which are:

- TRS_28: Promote collaboration among project team members;
- TRS_22: Promote solidarity between project team members in work development;
- TRS_48: Promote the recognition, appreciation and use of the talents and competences of each team member;
- TRS_32: Promote the ability of project team members to learn from mistakes;
- TRS_25: Align all project team members with the project objectives;
- TRS_43: Stimulate a positive and loyal project team environment;
- TRS_24: Promote that all project team members put forward their ideas and that they feel their ideas are taken into account;
- TRS_41: Develop project team building;

- TRS_10: Focus the team effort in the project results;
- TRS_37: Promote an active listening of all project team members.

These actions collected are strongly supported by the literature previously presented, and are mainly related to the collaboration and cooperation between team members, focus on results, project team commitment, communication and proactive awareness to promote an emphasis on team improvement, as well as the development of an accountable environment.

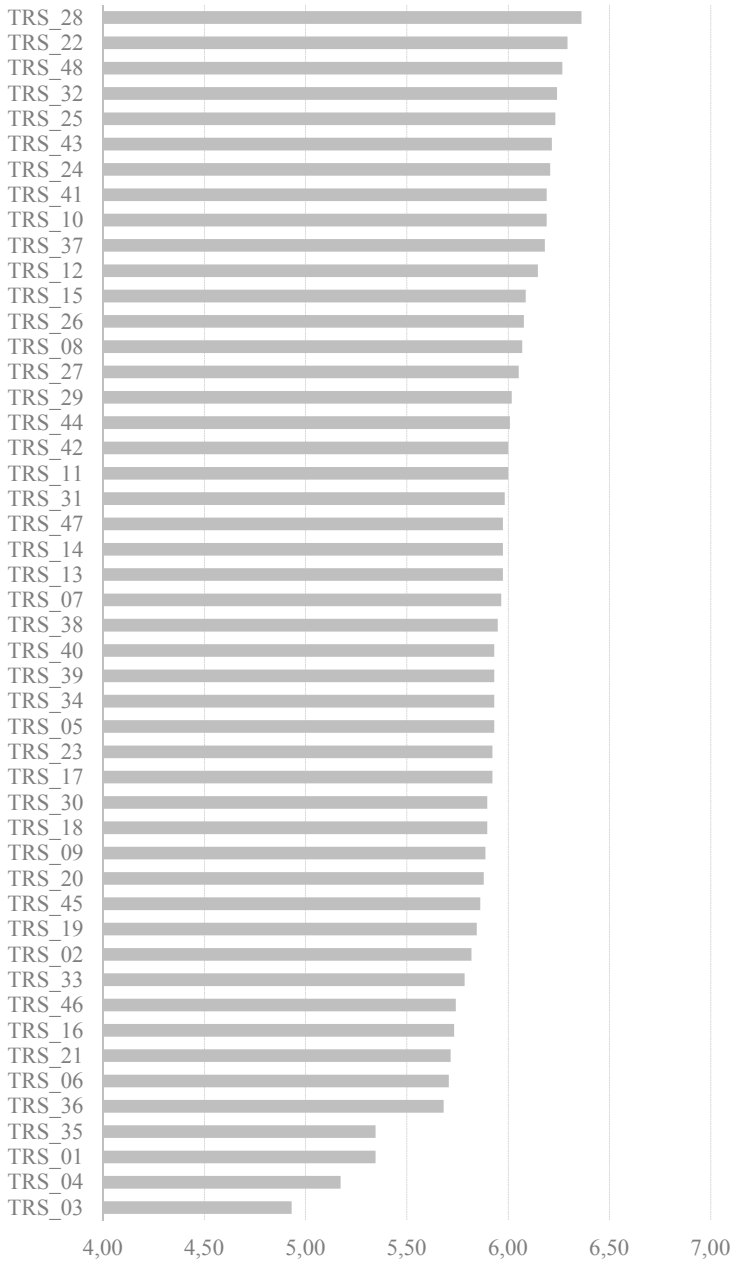

Figure 1 - Ranking of actions to improve the project team resilience in information systems projects

5. Conclusion

This paper intends to increase the awareness of the professional project management community about the concept of resilience, especially by setting priorities to improve project team resilience. In a daily basis the project managers need to take the most of their project teams. Nevertheless, problems between members are common and frequently affect the overall performance of the project. Therefore, organizations and practitioners can use this results to enhance their project team resilience by examining the top 10 actions identified in this study as the most useful to increase project team resilience. Over time the individual gains obtained through each project will create an organizational learning spiral that with the proper management mechanisms and context will definitely contribute for gaining new capacities that will foster the organizational resilience and performance.

Between the 48 actions surveyed, the results shown a slight variation in the perceived level of benefit that professionals obtain with the use of the specific actions to improve project team resilience. For all actions the mean values range between 4.5 and 6.5. The standard deviations show low values which indicate a low variability of answers. The action perceived as the most useful is the 'promotion of collaboration among project team members', while the one perceived as the least useful is 'assuring the redundancy of non-human resources (e.g. equipment)'.

A main limitation of this study relates to the data collected context. The data has been gathered in an environment that can be considered research laboratory, since all were academic projects. Nevertheless, it should be noted that all projects had an external client (companies or other institutions similar to the university context) and the project success was defined in relation to effective benefits obtained by the client from the project results. Therefore, the degree of confidence in the results can be considered high.

As pointed out at the beginning of this paper, the promotion of resilience in the organizational context and among project teams enables firms to take the appropriate actions to unanticipated events that potentially threaten its existence. The ability to be resilient is not an unique attribute of just some organizations but can be properly developed and managed to ensure the embeddedness of the key factors and dimensions to guarantee its adoption and to note the benefits gained over time.

Further work could involve the collection of data from other project contexts, in order to identify if the perceived most useful actions to improve team resilience are dependent on the project context (e.g. industry, duration, and geographic location). The question deals with the identification of which actions differ in which contexts, namely in the academic and industry "worlds", and what future developments in project management practice do these results suggests. Moreover, it is our ambition to develop a structural model regarding the project resilience and performance dimensions by using the key determinants compiled by the actions selected during the literature review and in the brainstorming sessions and now confirmed by the project managers interviewed.

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