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# ANALYZING RISKS OF SCOPE AND ORGANIZATIONAL RISKS IN IT PROJECTS: A CASE STUDY DURING THE MERGER PERIOD IN THE TELECOM INDUSTRY

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## ABSTRACT

This paper identifies risks of scope and organizational risks in IT projects during the merger period in telecommunications companies and proposes actions for risk mitigation. It adopts an interpretive epistemology in an exploratory case study. The results include a list of unique risks about IT projects in such period, and recommendations for mitigating the risks, which were identified through the research. The theoretical contribution is a list of risks during the merger of telecommunications companies, and to the practical part, this contribution enables project managers to apply the identified findings and mitigations to the risk management in IT projects in a similar setting.

**Keywords:** project management; risk management; IT projects; merger; telecommunications; risks; case study.

## INTRODUCTION

The uncertainties generate risks and are present in all projects [35]. The number of risks is greater in Information Technology (IT) projects, since they have a high level of technological dependence [42]. The relevant identification of risks is a crucial element to the success of risk management [6, 48, 15, 4, 35], which can help reducing the high rate of the project ending in failure [42]. Planning is the key component of management while dealing with uncertainties from the developed products and services [50]. For example, Project Management Body of Knowledge (PMBoK) uses the approach of splitting information through knowledge areas, which includes groups of processes gathered in management: integration, scope, time, cost, quality, human resources, communication, risks, stakeholders and acquisitions [35]. The project manager tries to forecast an event using risk management [23, 35]. Only the risk management is responsible for trying to foresee and prepare the project to respond if the risks become real [6, 48, 4, 35]. This is one of the main factors attributed to the success of projects and therefore to the long-term success in organizations [21]. Mergers and acquisitions often constitute a significant number of involved risks, especially the integration between companies [3].

In companies, the period of merger may cause great uncertainty and impact on projects. The changes in its structure, culture and designs affect it directly and it is also possible to generate new situations, which are expected during this process in the companies [40, 32, 13].

Fusion is a risky operation and often with interruptions in business activities [3]. In some extreme cases, this scenario of changes can lead to the emergence of new risks [35]. Therefore, IT projects on time of companies merging may entail specific risks in this period.

The companies, that provide services for transmission and reception of sound and image, and also give technological answers to the market in accordance with the regulations of the regulatory agency, are represented by the telecommunications industry (telecoms, henceforward) [2]. The impact, that companies suffer from this type of operation, is large [40, 32], and in the case of telecoms companies is much higher, because they use technology as their core competency [2]. In Brazil, for example, there were around 19 mergers in this sector per year, between 2002 and 2012 [29]. In addition, their IT projects can generate more risks in this period of uncertainty [42, 35], where the correct identification of risks can corroborate with the success [35].

In this context, the objectives of this work are twofold: 1. Identify risks of scope and organizational risks associated with IT projects on the merger of two telecoms companies; and 2. Propose risk mitigation actions to future mergers of telecoms companies.

This paper is structured as follows: Section 2 describes the theoretical background of mergers and acquisitions, IT project management, and risks and uncertainties. Section 3 introduces the design of the research. Section 4 describes the analysis of the results. Section 5 and 6 present the theoretical and practical implications, respectively. Section 7 identifies the limitations and further works, and finally, Section 8 presents the conclusion.

# THEORETICAL BACKGROUND

This paper is grounded in three theoretical bases: mergers and acquisitions, IT project management, and risks and uncertainties. The use of mergers and acquisitions can change the scenario as in business expansion strategy [32]. The parties receive specific labels: 1. “acquiring company”which refers to the company that wish to purchase another; 2. “target company” which is the corporation that will suffer the action; and 3. “resulting company”, the company generated by fusion [32]. These operations have different types of mergers and acquisitions [27]: 1. merger, create a new company from two or more companies; 2. incorporation, which is an operation whereby one or more target companies are absorbed by another; and 3. spin-off, whereby a company transfers assets portions to one or more companies [32]. In Brazil, the government agency that has the mission to manage the telecoms industry and protect the interests of users is called the National Telecommunications Agency (ANATEL) [2].

The types of IT projects can be split into: development, in which the deliverable is a computer system, a customized ERP or other process that requires development in a computer language [36, 46]; or infrastructure, which are characterized by the installation of software, environmental reliability and control of IT items [36]. In addition to this, in a project with dynamic environment, only agile methodologies promise to deliver higher productivity, quality and a greater chance of success in software development projects [5]. Scrum is applied to the development of projects with small teams, using small development cycles, which facilitates faster adaptation to changes in volatile environments, the use of up to two weeks tasks cycles, and turnover in the various functions of members of the development team [44; 18].

An event or uncertain condition originate risks and may affect at least one objective of the project [35]. The risk management project includes continuous processes [23, 35], which increase the likelihood of positive events and decrease the negative events [35]. The risk identification process should be done early to avoid failure in projects [24, 25, 9, 35], considering the nature of the company [1]. The main risk management approaches include: PMBOK [35], the IPMA-NCB [23] and the strategic level the Enterprise Risk Management (ERM) [8].

# RESEARCH METHODOLOGY AND PHILOSOPHICAL UNDERPINNINGS

The definition of the epistemological and ontological guidelines helps to understand the assumptions and analysis of the items that composed the search [41]. This exploratory study adopts a predominantly interpretive epistemology, with the qualitative technique [49] and inductive approach [45]. The researchers assume the role of an outside observer. The case study is an empirical investigation of a phenomenon in depth and context, especially when both are not evident, in which the context must be considered [49]. The unit of analysis is IT projects in Company-A in the period of merger from 2007, with Company-B. Data collection was through: 1. Semi structured, interviews with the employees who worked during the period and had the project management function or similar; 2. collection of documented information; and 3. information provided by the written media or from the digital era. Data analysis was carried out by triangulation of data [22]. The flow of processes performed in this study follows the following order:

1. Listing the risks in IT projects in literature: We have looked for papers that identified risks in IT projects from local teams and we have obtained it by searching for the words "Risk", "Project" and "IT" in the following leading journals between 1981 and 2014: Project Management Journal, International Journal of Project Management (IJPM), Information Systems Journal, Journal of Management Information Systems, Journal of Management Research, MIS Quarterly, Technovation and Telecommunication Policy, Brazilian Journal of Management, and Iberoamerican Journal of Project Management (IJoPM);
2. Categorizing risks found in literature: The identified risks have received a label which represents the focus that was referenced in an IT project. Only risks about scope and organization were considered;
3. Interviews with IT project manager in Company-A: We have designed a semi-structured questionnaire based on the interview protocol presented in Appendix A. The interviews have been carried out with people who had the function at or close to a project manager. The interviews could not be recorded by determination of respondents. For this reason, they have been accomplished with another researcher, who has simultaneously held the notes, which were gathered in a single document;
4. Listing the risks in IT projects of interviews, projects and Media Artifacts: All documents collected in interviews and the information gathered constituted the basis for the identification of risks and document requirements, besides the requests of process changes. We used specialized industry magazines and large circulation newspapers;
5. Classifying Risks in IT Projects: We have classified each identified risk in the previous item according to the categories: scope or organizational;
6. Identifying exclusive risks: We have kept the identified risks in the triangulation, which do not have equivalence in the risks listed in the literature. The comparison to the literature builds the internal validity, raises the theoretical level, and improves the construction of the definitions [11];
7. Proposing mitigation actions to the identified risks: Mitigation actions have been suggested to the identified risks in item 6.

Based on that we have elaborated the following six propositions to provide guidance for this study:

**Proposition 1: There is a preparation for the moment of merger between telecoms**. The directors and others in management positions prepare for the merger. This time may vary according to the reason of the operation [40, 32];

**Proposition 2: There is an organizational restructuring in the IT field.** The company may suffer an organizational restructuring during the company merger period [40].

**Proposition 3: The projects receive estimates of time and scope.** Project data should be clearly specified in the Project Charter [35], as well as important information which can be provide by IT area, and this can help to adequate resources [36, 46]. All projects must receive time and scope specifications [23, 35].

**Proposition 4: IT projects receive risk management treatment in Company-A.** Risk management should be carried out in all projects [35];

**Proposition 5: Risks are easily identified in IT projects.** Project managers identify the risks using specific techniques [35];

**Proposition 6: There are specific risks in the merger period for IT projects.** Due to the amount of changes in the merger period [40], you can have risks in times of great uncertainty [35];

**Proposition 7: There are mitigating actions for the risks found.** After identifying the risks, it is necessary to implement mitigations, and opportunities should be potentialized [35].

## The Study Objects

The two analyzed companies have specific characteristics from the point of view of its organizational structure, market and maturity in project management. The “acquiring company”, called Company-A, is a multinational installed in Brazil for nearly two decades and initially had landline services in a few states. It had a weak organizational matrix and the presence of project managers is not part of the available positions [35]. Despite this feature, many other positions, usually of coordination, had exercised the function in the place of project managers.

The target-company, called Company-B, is also a multinational installed in Brazil for over a decade and always had a mobile focus. It did not have a culture project and, like Company-A, had a weak organizational matrix [35]. It has increased the market share in recent years [29], and it was periodically probed by Company-A, which came to acquire interests by purchasing of shares [14].

Although the operation performed, under the legal point of view, has been characterized by the incorporation of Company B by Company A [2, 38], the way it was spread in the media, it was considered a merger [14, 47, 16], even before the staff of their respective companies got to know that. In this study, to follow a standardization of various sources, we will consider the label "fusion".

Chronologically, the preparations for the operation began in 2007 through the purchase of assets [14, 47, 16], which was confirmed in the interviews. The telecoms agency approved the merger with three constraints items, which should be addressed by mid-2012 [2]: 1. Expand mobile offer in remote areas; 2. Increase mobile telephony coverage with 3G technology; and 3. Provide telecommunications infrastructure for scientific research networks. Other communication vehicles also covered the events [14, 47]. Until December 2014, the merger was not totally accomplished. Besides that, another merger occurred in the beginning of 2015, which prevented new data.

## About the Interviews

Although the hostile setting characterized by an environment of distrust, fear of dismissals and many organizational changes in both companies, we conducted eleven interviews with employees involved in the period of merger. We followed the recommendations [20]: 1. Among respondents, there was the subject domain and a common experience sharing; 2. Respondents reported their experiences independently and there was a consensus on the events; 3. The respondents were of a relatively homogeneous population and the objectives were clear; 4. There was data saturation, from the sixth interview; and 5. The sample was for convenience, in which one can identify patterns, even in small groups, since they all had experience in the same phenomenon. The end of the interview process occurred when there was saturation of the data and the continuity of interviews would return insignificant improvements [11]. The three project managers interviewed mentioned some risks in engineering. Based on these reports, we interviewed an engineer who confirmed the data collected by the project manager.

The proportion of the source of the respondents to the interviews was greater in Company-A (82%) than in Company-B (18%). The Company-A did not have the position of project manager, but one can find employees acting as a project manager. This is common in business, and one can consider it as an employee who just did not get the label, but is fully capable of responding as a project manager [39]. In this research, there were those who acted as project managers, even before taking office as “Project Manager”, when they were “Department Administrator”, “Engineer”, “Process Analyst”, “Business Analyst” or “Senior Systems Analyst”. Appendix A lists the function of each respondent in the period of merger.

## Categorization and Classification

In this paper, the categorization of the risks, which were listed in the literature, received a term to identify its activities within the area of IT projects, resulting in the following categories: 1. Scope, which includes the risks related to scope and environment; and 2. Organization, risks attributed to the company, structure and customers.

# ANALYSIS OF THE RESULTS

## Risks Identified in the Literature

The risks identified in the literature of IT projects were classified according to the following categories: Scope and Organization. In the category Scope (see Figure 1), It has volatile environment (LE01), lack of stable requirements (LE02) and many mistakes in defining scope (LE03, LE04, LE05, LE06 and LE07). Figure 2 lists the risks relating to Organizational category, which demonstrate changes (LO01, LO04, LO05 and LO07), conflicts (LO02 and LO03) and insufficient resources (LO07).

| ID | Risk / Description | Authors |
|---|---|---|
| LE01 | **Volatile environment**<br>Environment project continues with many scope changes after the start, such as time, number of users and tool being used. | Boehm (1991); Jiang e Klein (2000); Schmidt et al (2001); Wallace (2004); Khan (2010); Buckl et al (2011); Lamersdorf (2011); De Wet (2013) |
| LE02 | **Lack of stable requirements**<br>Changes in definitions and / or goals for work packages were defined after | Boehm (1991); Schmidt et al (2001); Wallace (2004); El Emam (2008); Pinna e Arakaki (2009);<br>De Wet (2013) |
| LE03 | **Project Complexity**<br>More complex project than originally planned | Jiang e Klein (2000); Wallace (2004); Gholami (2012); Khan (2010);<br>De Wet (2013) |
| LE04 | **Scope misunderstanding**<br>Scope definition with obscure or not finished | Boehm (1991); Schmidt et al (2001); Nakashima e Carvalho (2004); Khan (2010); De Wet (2013) |
| LE05 | **Failed Identification of business rules**<br>Failure in the survey of project business rules | Schmidt et al (2001); Wallace (2004); Pinna e Arakaki (2009) |
| LE06 | **Lack of process maturity**<br>Lack of or incomplete processes defined by the customer | Pinna e Arakaki (2009) |
| LE07 | **Criterion changes of deliverables**<br>Changes the way the deliverables will be available | Buckl et al (2011) |

Figure 1: Risk of Scope category in the literature. In the ID column, "L" stands for Literature and "E" stands for Scope.

| ID | Risk / Description | Authors |
|---|---|---|
| LO01 | **Simultaneous organizational changes**<br>Customer changing the structure of the company while the project is underway | Schmidt et al (2001); Bannerman (2007); Wallace (2004) |
| LO02 | **Cultural conflicts**<br>Cultural clashes between users, technical or management team | Gholami (2012); Khan (2010) |
| LO03 | **Internal conflicts**<br>Conflicts between users of client departments | Schmidt et al (2001); Wallace (2004) |
| LO04 | **Senior Manager Change**<br>Changing the senior project manager with key-user role | Schmidt et al (2001); Wallace (2004) |
| LO05 | **Project owner change**<br>Changing the project sponsor after the project started | Schmidt et al (2001); Wallace (2004) |
| LO06 | **Insufficient resources**<br>Insufficient resources available to the project, such as budget and time | Jiang e Klein (2000); El Emam (2008) |
| LO07 | **Withdrawal of Support of Top management**<br>Senior management removes the power and / or aid the project manager | Jiang e Klein (2000); Wallace (2004) |

Figure 2: Risk of Organizational category in the literature. In the ID column, "L" stands for Literature and "O" stands for Organizational.

## Risks Identified in the Interviews

The analysis conducted based on the notes of the interviews about the preparation of the merger, processes, risks, problems and finally, it has generated nine risks. According to respondents, the risk identified in the category Scope, showed in Figure 3, reflect the absence of information of the manager (RE01) responsible for changes in the systems, as follows an excerpt of the interview with the Project Manager R3: "... changes (...) caused by the lack of technical knowledge and processes of the project manager ... ." In another interview it was reported that the projects have gone through situations of personal loss, treatment with suppliers and aggregation processes from Company-B that ended up changing their specifications. The project manager R8 reported: "... the company underwent restructuring teams, contract review, development of mobile business processes (...) impacting on projects ... ."

| ID | Risks / Description | Respondents |
|---|---|---|
| RE01 | **Changes in the specifications of projects**<br>Changes in the specifications of the projects, especially in the testing phase, caused by the lack of technical knowledge and processes with the Company-A manager | R3; R5; R6; R8; R10 |

Figure 3: Risk of Scope category in the literature. In the ID column, "R" stands for Respondents and "E" stands for Scope.

Risks related to the corporate environment were gathered in the Organization category. Figure 4 shows that the most referenced risk was the exchange of senior management (RO01), as the report of the project manager R11: "... There was a process of evaluation of best practices between the two companies, with mapping of current processes and monitoring of best practices. Based on this document, the works were started to plan the new management executive organization chart (...) from the new model and history (...) managerial restructuring and exchange of chairs ..."

The conflict between the business and strategy (RO02), one focused on quality and another in the results were indicated by the interviewee, who was acting as business manager R4: "... The mobile phone market heating pressed the Company-B to implement aggressive policies of sales to compete. Moreover, the Company-A, which had a negative experience in operating with a focus on sales (... ) that resisted Company-B model, mainly because assumed quality commitments and attention to customers with the protection agencies and regulatory that contradicted the interests of the Company-B ... ."

This change caused a possible cancellation of projects due to changes in management (RO03) or insistent cost reduction request (RO04). Some improvement projects of the Company's quality have been discontinued (RO08), as stated in the business manager R4: "... I found that all of our projects were at risk because some of the meetings I could see the level of interest of the Company-B in the continuity of our projects, mainly due to the costs ... ."

The Company-A did not leave clear rules for dismissal (RO06) from the beginning, generating an apparent tranquility (RO05), because after a layoff, it was said that there would be no layoffs, but they continued to occur. The project manager R2 comments: "... loss of human capital (...) without clear rules on dismissal ... ."

The artificial environment was becoming unsustainable and uninformed (RO09), reports the business manager R4: "... To reassure us, our director said in a meeting that Company-A would be in charge of decisions to the new structure. But exactly the opposite happened ... ."

Some employees, due to possible disruption of services and low quality, stressed that the company's image could be ruined (RO07). The project manager R2 said: "... Shutdown due to lack of operational capacity (...) with the degradation of image ... ."

## Exclusive Risks in the Merger Period

We analyzed the risks found in the interviews to identify those which have no reference in the list of risks identified in the literature. The comparison was performed by using the listed risks in the existing categories. Figure 5 shows the results of categories. This list does not include the risks found in the interviews that were referenced in the risks identified in the literature. We analyzed the exclusive risks in the two categories studied in this paper as follows:

- **Scope:** The risk of changes in the specifications of projects (RE01) is associated in the literature with the risks of volatile environment (LE01) which describes about the continuity of the project in unstable environments or with many changes, thus it is not an exclusive risk.
- **Organizational:** Risks addressed to the exchange of senior management by other executives (RO01) and conflicts between the business strategy (RO02) were identified in the literature. The risks of project cancellations due to management changes (RO03), lower costs (RO04) and others risks (RO05, RO06, RO07, RO08 and RO09) found no support in the literature.

| ID | Risks / Description | Respondents |
|---|---|---|
| RO01 | **Senior management swap**<br>Several executives from a company occupying sensitive positions were quickly replaced by another company | R2; R4; R11 |
| RO02 | **Conflict between corporate strategies**<br>A company owned a market strategy and generated conflict with the vision of another company which had a different strategy | R4; R11 |
| RO03 | **Project cancellations due to management of change**<br>Because the exchange of the company's top executives all related projects could be canceled | R4; R11 |
| RO04 | **Cancellations of projects due to the focus on reduction of costs**<br>Due to strong cost reduction pressure, many projects could be canceled | R4; R11 |
| RO05 | **Artificial environment of tranquility**<br>Out of apparent tranquility, but with contradictory actions | R4 |
| RO06 | **Lack of clear rules on dismissal**<br>Due to lack of clarity in dismissals criteria any employee could be dismissed at any time | R2 |
| RO07 | **Image degradation**<br>Possible company image degradation before the market | R2 |
| RO08 | **Discontinued work on quality of services**<br>Operational structure designed to ensure the quality of service was discontinued | R4 |
| RO09 | **Contradictory information**<br>The same information from different sources with different content | R4 |

Figure 4: Risk of Organization category in the literature. In the ID column, "R" stands for Respondents and "O" stands for Organization.

| Category | ID | Risk / Description |
|---|---|---|
| Organization | RO01 | **Senior management swap**<br>Several executives from a company occupying sensitive positions were quickly replaced by another company |
| | RO02 | **Conflict between corporate strategies**<br>A company owned a market strategy and generated conflict with the vision of another company which had a different strategy |
| | RO03 | **Project cancellations due to management of change**<br>Because of the exchange in the company's top executives all related projects could be canceled |
| | RO04 | **Cancellations of projects due to the focus on reduction of costs**<br>Due to strong cost reduction pressure, many projects could be canceled |
| | RO05 | **Artificial environment of tranquility**<br>Out of apparent tranquility, but with contradictory actions |
| | RO06 | **Lack of clear rules on dismissal**<br>Due to lack of clarity in dismissals criteria, any employee could be dismissed at any time |
| | RO07 | **Image degradation**<br>Possible company image degradation before the market |
| | RO08 | **Discontinued work on quality of services**<br>Operational structure designed to ensure the quality of service was discontinued |
| | RO09 | **Contradictory information**<br>The same information from different sources with different content |

Figure 5: Unique risks in IT projects in the period of merger of telecoms companies.

## Analysis of the Propositions

The propositions were verified based on the results obtained from the data triangulation:

- **Proposition 1:There is a preparation for the moment of mergers between telecom companies**. We can observe that the preparation did not happen in the same way in all levels according to the news regarding to the merger in the media outlets (FSP, 2014; TELECO, 2014) and the interview with the Administrator R5: "... we knew that every-

thing would be divided and that each one would go to his own corner (...) the grapevine was buzzing and everyone had a story to tell... ."

- **Proposition 2: There is an organizational restructuring in the IT field.** The interviews revealed that there were two different situations: In Company-A, the impact was greater in systems that had to receive new Company-B services that resulted in technical staff changes and functions, as explained in the interview with Administrator R5: "...Some other systems stopped, no advancing further and remember that some programmers began appearing in public... ." On the other hand, the impact was smaller in the Company-B, as described by the Process Analyst R7 of this company: "...the impact on the Company-B (...) there was restructuring in the area, but it did not affect my area, it was transparent... ."
- **Proposition 3: The projects receive estimates of time and scope.** Respondents were unanimous to assert that projects have date of delivery and the scope of projects was usually defined in three to four objectives. The project manager R2 said that a project was delayed 100% due to changes related to the merger. Project managers R2, R3 and R4 commented that several projects had the scope changed to meet the new guidelines of the company.
- **Proposition 4: IT projects receive risk management treatment in Company-A**. According to the data collected in the interviews, risk management was carried out almost casually. Respondents with project manager function managed to list the risks in the interviews, but there was no formal document on the subject.
- **Proposition 5: Risks are easily identified in IT projects.** Respondents related risks in the projects directly associated with their department. Only two respondents, who worked close to top management, commented on the concern of the company's image in the market, proving that the company image impacts directly on the amount and ease of identification of risks. As it was reported by Project Manager R2: "... the standstill was due to the lack of operational capacity, which could lead to the degradation of image ...". Besides that, Business Manager R4 stated: "... we were getting over the most critical period experienced by the company, motivated by the lack of quality of our services and products (...) the work aimed at rescuing the credibility of customers, protection and regulatory agencies, as well as the media. The goal was accomplished successfully and at that time, the challenge was to maintain the achieved rates. The focus was quality... ."
- **Proposition 6: There are specific risks in the merger period for IT projects.** We found nine specific risks in the merger period around IT projects, as shown in Figure 5, among the most listed risks are feelings of insecurity and anxiety, contradictory information and conflicts between corporate strategies.
- **Proposition 7: There are mitigating actions for identified risks.** It was possible to gather the actions carried out in the period to mitigate the risks, according to the data collected in the interviews. The first action relates to the impact of layoffs on the team with the change of shifts of the remaining employees, who needed to stay longer, as reported in the following passage by Project Manager R2: "... [changing] shifts, [leaving] staff on alert, changes in days off.. ". In another group, the risks were centered on gathering information and processes, in which the breakdown of established workflow was necessary so that the most reliable information could be obtained, as related in the extract by Project Manager R3: "... made contact directly with users (...) contact with other teams from other projects... ." Other actions were related to remaining suppliers who helped in the understanding of the services, called "assisted supervision," and the creation of documental procedures, as what can be seen in the interview with Project Manager R2: "... creating rollback procedures (...) 'Assisted supervision' by suppliers ... ." Thus, mitigating measures were taken so that the projects could continue, even with the shortage of staff and all the adversities of the period.

  Other actions were related to outstanding suppliers who helped in the understanding of the services, called "assisted supervision," and the creation of documentary procedures, as can be seen in the interview with the pro-

ject manager R2: "... creating procedures rollback (...) 'Supervision assisted' by suppliers ... "

## Considerations for Analysis of Results

The merger took place in three main moments. The first in 2007, when Company-A bought the shares of Company-B. A second moment, almost two years later, with the preparations for the operation and management level of some key processes. And in a last moment, when there was the official statement by ANATEL, its internal disclosure and the media.

IT projects have suffered in various ways: dismissals of team members, immediate need to integrate systems, new services, new development methodologies and different databases. The risks identified in the interviews revealed the speculation environment and dismissals in which the employees were inserted. Some executives tried to deny the situation, but the actions were frustrated.

The interviewees mentioned some actions that are still being carried out: 1. the main system which has more than two decades is being changed; 2. documentation of systems and environment is being updated; 3. attempt to rescue the lost know-how because of dismissals; 4. generation of documentation for environmental understanding; and 5. reformulation of teams with members of the Company-A and B.

The deadline of this research was on August 31, 2014, and until then, the merger had not yet been fully accomplished. Many systems were still in the integration phase, speculation of some specific layoffs and the creation of a new cultural identity still in training.

## Recommendations for Mitigating Risks

In each identified risk we propose mitigating actions to be incorporated into the project risk management in future mergers of telecom companies, as shown in Figure 6. These recommendations are based on both the reality founded in the companies and the best practices in the literature.

- Mitigation 1: Using Scrum: In addition to Scrum, which can be used in various types of organizational environments [37, 33], the application of this methodology is suitable for small teams [44, 19] and in dynamic environments, as the period of merger between the companies [32]. Because of the team members do not have fixed functions, anyone can be a systems analyst, developer or other function at different times [44, 19], promoting the continuation of activities, even with redundancies or turn-overs. Therefore, the application of Scrum can mitigate the risk on RO06 by use of small teams. The characteristic of fast deliveries within two weeks with an executable product, called "done" [44), covers the RO01, RO07 and RO08 risks. The volatile environment is related to RO02 risk.
- Mitigation 2: Use of Project Management Frameworks: Application of PMBoK [35] may assist in mitigation for the application of lifting requirements techniques, as the brainstorm and mind map in risk RO09 to corroborate to clarify the company's information. The mitigation of the risks on RP03 and RO04 can be accomplished by application of cost management process to the financial control of projects by monitoring costs, use of PERT/CPM and use of budgets and forecasts [35] contemplating the new board interests in controlling costs and eliminating the need of use the shared management. The IPMA-NCB [23] has an area denominated Conflict Management in which can be found cases related to disputes and concerns in the corporate environment, corresponding to RO05 risk.

| Mitigation | ID | Risks |
|---|---|---|
| Scrum - Small Teams | RO06 | Lack of clear rules on dismissal |
| Scrum - Fast Delivery with "done" | RO01 | Senior management swap |
| | RO07 | Image degradation |
| | RO08 | Discontinued work on quality of services |
| Scrum - Volatile Environment | RO02 | Conflict between corporate strategies |
| PMI – Data Collection Techniques | RO09 | Contradictory information |
| PMI – Cost Management | RO03 | Project cancellations due to management of change |
| | RO04 | Cancellations of projects due to the focus on reduction of costs |
| IPMA-NCB – Conflict Management | RO05 | Artificial environment of tranquility |

Figure 6: Mitigation of risks using Project Management Frameworks.

## Theoretical and Practical Implications

This research contributes to the literature by means of an investigation of the origins and consequences of the identified risks. The risk of exchange of senior management by other executives (RO01) and what will be the consequences for the staff and the market. Conflicts between the business and the strategy (RO02) should be studied on how the market will react and the impacts on organizational culture, especially in relation to project cancellations due to management changes (RO03) and lower costs (RO04). In addition to this, emphasizing the use of project management frameworks in specified situations presented in exclusive Risks.

In practical, the risks identified in this study allow project managers to rethink their strategies to develop risk management in IT projects in telecoms companies in the period of merger. The risk of scope category was not unique, but respondents, suggesting that should be considered as an important item in the IT project management, often mentioned it. In addition, the contribution of this work goes beyond identifying and proposing mitigating actions for each of the nine new risks identified through the application of the actions described in the section Risk Mitigations: use of Scrum and frameworks Project Management. These are the necessary tools to assist the IT project managers, who can make the implementation easier because they are closer to the techniques team.

The research allows project managers rethink their risk strategies in IT projects in telecoms companies in the period of merger in which may include the risks identified about categories scope and organization in their risk matrices. One can use the identified risks at work and

the recommendations in mergers of other industries. These risks can be also used as input of the Enterprise Risk Management [8] in a company.

## Limitations and Further Works

The limitations for this research include the merger of a single sector, and the barriers we can mention: the difficulty in order to obtain documents of IT projects, the merger is still in process that can contribute to the emergence of other risks not listed in this research, the restrictions when applying interviews to the employees, the impossibility of interviews with the senior positions of the involved companies and the need for validation of the Scrum methodology in such environment. It is appropriate to clarify that this case study, as an experiment, is generalizable to theoretical propositions as an analytical generalization [49], in an identical situation or theory [31].

Proposals for future work include the use of the unique risks and mitigating proposals in other mergers of telecoms companies, applying the same study. Which means, using the methodology of action research, studying the merger impact on the organizational culture of the target company during and after this period, and also, on projects that have the scope changed by Company-A's strategy.

## Conclusion

This research adds to the body of knowledge of projects, the identification of nine unique risks in IT projects during the merger period of two telecoms companies, focusing on scope of projects and actions directed to the organization. Among the most reported risks are the insecure environment that permeated all areas and the high rate of layoffs that impacted the IT projects. From the list of unique risks, it was possible to propose mitigating actions, as follows: 1. the use of Scrum methodology, suitable for small teams, volatile environment and constant deliveries; 2. the application of project management techniques, which were related to the knowledge areas of PMBoK and IPMA-NCB to address the specific risks presented, as cost management and conflict management.

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# APPENDIX A: PROFILE OF THE RESPONDENTS

| Respondents | Function | Area | Company |
|---|---|---|---|
| R1 | Operations Consultant | Projects | A |
| R2 | Project Manager | Projects | A |
| R3 | Project Manager | Projects | A |
| R4 | Project Manager | Process | A |
| R5 | Department Administrator | Process | A |
| R6 | Engineer | Engineering | A |
| R7 | Process Analyst | Process | B |
| R8 | Project Manager | Projects | A |
| R9 | Business Analyst | Process | A |
| R10 | Senior Systems Analyst | Projects | B |
| R11 | Project Manager | Projects | A |

# APPENDIX B: INTERVIEW PROTOCOL

| # | Question |
|---|---|
| 1 | Before the official date of the merger, was there some preparation to receive the impacts from the operation? |
| 2 | What risks can you comment in this project? |
| 3 | In the period of merger, which risks can you characterize to be specific? |
| 4 | Will the risks identified in period of merger be applicable to companies in other sectors? |
| 5 | Was there some risk mitigating action? |
| 6 | What are the changes that have occurred in the project because of the merger? |
| 7 | Was there restructuring in the IT field after the merger? |
| 8 | What has changed over the company as telecom? Was the IT department communicated in advance? |