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Conflict in cross-functional teams: a practical case analysis

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Abstract

The present study is a qualitative analysis of the tensions that occur in cross-functional teams (CFTs) and the way in which they can affect the teams' accomplishments.

The research is focused on a single case, COHITEC 2005, a program aimed at transforming new technologies into businesses that took place in Lisbon, Portugal, starting March 2005. In this program, participants were organized in cross-functional teams that included researchers and management students. Semi-structured interviews were made to a sample of 17 participants. These interviews were recorded and transcribed. A table was then elaborated based on the primary data provided by the subjects and these data were classified in different categories.

A three-stage model of group dynamics is proposed. The major findings of this project point to the role of interpersonal relationships on group outcomes. More specifically, several patterns associated with team malfunction were uncovered, the clearest ones being autocratic decision-making and arrogant behavior from some team members, as well as escalation in relationship conflict.

Implications from these results are discussed, both for future research and for practice.

1 Introduction

The motivation to develop the present study results from my participation in the COHITEC 2005 program that took place in Lisbon, starting March 2005. This program is jointly organized by FEUNL (School of Economics and Business of Universidade Nova de Lisboa), the University of North Carolina and COTEC (a Portuguese state-run organization devoted to foster technological development and entrepreneurship). The main goal of the program is to promote the creation of high-growth startup companies based on new technologies developed in Portuguese universities.

The program involved several cross-functional teams (CFTs), composed of investigators and MBA students or alumni. All participants had at least one university degree and several had PhDs or post-doctorates.

I was involved in the COHITEC 2005 program as a former MBA student. Throughout this experience, interesting and unexpected behaviors from participants were perceived. In some cases, personal conflicts among group members led to the team's collapse.

This was an intense experience, thus the motivation to delve deeper into the "team dynamics" topic, as part of the work for the MBA dissertation.

One goal of this research study is to analyze a specific case, where several cross-functional teams were created, and to develop some theoretical propositions on CFT's dynamics, grounded on a qualitative methodology.

A second goal is to provide some practical recommendations, which can be used in future editions of the COHITEC program and maybe in other contexts, where CFT's are a basic work unit.

I started this study with no preliminary hypothesis, besides my personal opinion (resulting from my participation in the program) that inter-personal relationships are a crucial factor in team success and play a key role in team accomplishments. Therefore, I decided to focus my study on a few variables, namely team structure, leadership and decision-making, goals and expectations, class differences and inter-personal conflict.

This paper will proceed with a conceptual background, where the relevant literature will be reviewed, followed by the description of the qualitative methodology that was used. Main results will then be reported and finally discussed.

2 Conceptual background

2.1 Groups and teams

Several definitions of "group" have been proposed, with a more or less extensive set of criteria like members "being involved in frequent interaction" or "feeling they share a common fate" Cunha et al (2003). However, one criterion appears to be of paramount importance: its members should have the perception of belonging to a group and external people also must regard them as such.

For example, Schein, 1980, cited by Cunha et al, 2003, defined group as any number of people that: 1) experience mutual interaction; 2) are psychologically aware of each other and 3) have the perception of forming a group.

The organizational interest in groups and teams is associated with the role they have in company operations, despite their advantages and disadvantages. In a world where complexity and turbulence increased dramatically, and where the need for creative problem solving is largely felt by managers across functions and levels, being able to pool a diverse set of competences and information across the organizations is one of the instruments companies have to increase innovation and decision making in complex situations.

Among groups' advantages and disadvantages, we can emphasize the following (Cunha et al, 2003):

Advantages

- The group approach is more effective in solving new or complex problems;
- Often, problem resolution demands multiple skills that are more easily found in a group of people;
- Through the confrontation of different points of view, strengths and weaknesses of each proposal become more clear;
- New ideas are more likely to appear;
- People are more willing to accept decisions for which they have contributed.

Disadvantages

- Decisions usually take more time;
- Individual responsibility is diluted, leading to riskier decisions;
- Agreements are often based on "intermediate" compromise solutions, which may be worse than individual propositions.

Theoretically, groups and teams are different constructs. According to Katzenbach and Smith (1993), not every group is a team. "Committees, councils and task forces are not necessarily teams. Groups do not become teams simply because that is what someone calls them" (Katzenbach and Smith, 1993).

The same authors assert that a team is a number of people, as small as possible, but containing enough individuals with complementary skills to attain the desired objectives, joined together by common goals and mutual accountability.

Nevertheless, in this paper, I will not make this distinction and I will use the words "group" and "team" interchangeably.

2.2 Variables that affect team dynamics

Variables known to affect teams' dynamics are traditionally organized in one of the following three-stage models:

- The **input-process-output** model (Hackman and Morris, 1975, cited by Denison et al, 1996)
- The **context-process-outcome** model (Guzzo and Shea, 1993, Mowday and Sutton, 1993 and O'Reilly, 1991, cited by Denison et al, 1996)

These models are very similar and the latter is usually considered as a variation of the former. They differ mostly in the way variables are arranged.

For example, in their description of the input-process-output model, Cunha et al (2003) arranged the variables in the following way:

Inputs: Intra-group variables (dimension; members' characteristics; roles; standards; status; development stage; cohesion), task attributes and environmental variables.

Process: Required/emergent behaviors, leadership style, communications, contribution, influence, group atmosphere, task functions and maintenance functions.

Outputs: Productivity, performance, innovation, well-being, viability and member satisfaction.

For this study, I picked a subset of variables which, given the observations made during my participation in the program, I believed were the most relevant to explain teams' achievements and failures. Next I will skim through these variables and present alternative definitions to some of them. I will also make some changes to the abovementioned model and introduce a new dimension which I named team **value**.

2.2.1 *Efficacy, effectiveness or performance?*

Traditional definitions and models

Besides the definition of groups and their advantages and disadvantages, organizations (and researchers alike) obviously have a special attention to pay to the outputs of group work. There appears to be no consensus, in traditional literature, about the meaning of the words "efficacy", "effectiveness", "efficiency", "productivity" and "performance". Each author, depending on his/her theoretical positioning, presents a set of definitions, descriptions and measurement criteria and techniques. Sometimes, "efficacy" includes dimensions as "member well-being" and "future team viability". Other times, it is only based on tangible variables like quantity/quality of the group's outputs and speed of execution. Some authors (Hackman, 1987, cited by Pescosolido, 2003; West et al, 1998, cited by Cunha et al, 2003) believe that "performance" is one dimension of "efficacy". Others (De Dreu and Weingart, 2003) say it's the other way around. Others, yet, like Bettenhausen (1991), discuss group performance and group effectiveness without ever providing an explicit definition of these concepts.

Next, I present a brief review of definitions and evaluation techniques as proposed by established authors.

Hackman (1990) cited by Pescosolido (2003) proposes three dimensions of group **effectiveness**:

1. Productive output: the degree to which the group's output meets the standards of those that receive or use it;
2. Capability to work interdependently: the degree to which the group's members are able to work together in the future;
3. Growth and well-being of members: the degree to which the experience of being in the group enhanced the individual members through their own personal learning or development.

According to this model, the group that performs its assigned task well but is not able to work together in the future is not a truly effective group. Some years later, Hackman would summarize his views about group performance in the following way (Hackman, 2004):

*My simple three-item checklist for assessing how well a team is doing is: are the **clients happy**? Is the **team getting stronger** as a performing unit over time? And, do the individual members of the team find in their work more **learning and fulfillment** than they do frustration?*

Deeter-Schmelz et al (2002) maintain that the variables comprising **effectiveness** can vary, depending on the context and the types of teams being studied. Regarding student teams, they believe two variables seem most representative of **effectiveness: task performance** (external evaluation of team-produced outputs) and **goal achievement** (the extent to which team members believe they have realized their set goals).

In Jehn (1995)'s study, **group performance** refers to the degree to which the product or service of the group meets the standards of the organization as rated by the group's superior and by the group's productivity records. **Member's performance** is the degree to which the member meets the standards of the group and organization as rated by the group's, superior, company performance evaluation and individual productivity records.

West et al (1998) cited by Cunha et al (2003) propose that **efficacy** comprises four dimensions: productivity, group viability, individual well-being and innovation.

De Dreu and Beersma (2005) merge two of the abovementioned concepts when they state that "relationship conflict reduces **effectiveness of performance**".

And finally, alluding to the concept of self-efficacy, Lindsley et al, 1995, cited by Gibson, 1999, stated that "group **efficacy** is a group's **belief** in its ability to perform **effectively**".

According to De Dreu and Weingart (2003), most studies provide an objective team performance measure or ratings by supervisors. Among others, **decision quality**, **product quality** and **production quantity** have been used as measurement criteria.

For example, in a field study with teams of MBA students, Jehn and Mannix (2001) measured performance by using the **ratings of the teams' final project reports**. Scores were given by two independent raters.

In another study, Jehn (1995) measured group performance by using departmental records provided and standardized by the firm and by **supervisors' ratings of the groups**. The standards incorporated **productivity** and **error rate**.

In a study based on a realistic simulation of business life (where a number of fictitious companies, represented by the various teams, compete in a common business environment), Passos and Caetano (2005) used the final **share price** obtained by each team to assess team performance. The share price reflects the results obtained by each team and the general financial condition of the company. Higher scores indicated better performance.

In yet another study, De Dreu and Van Vianen (2001) asked teams' **supervisors to rate the group** using five-point scales, on five questions about different aspects of effectiveness.

Proposed definitions and model

As we have seen, the constructs of "efficacy", "effectiveness" and "performance" are ubiquitous in today's literature on team dynamics. Given the utmost importance of these concepts, I believe unambiguous and wide-ranging definitions should be created. Next, I will try to come up with a consistent set of definitions that are:

- Exact, extensive, measurable and comparable;
- Similar to the meanings usually assigned to them in current language and literature.

The following definitions are proposed and used in this study:

Efficacy or effectiveness: the capability to achieve measurable goals (outputs)

$$\text{efficacy} = \text{effectiveness} = \text{outputs} / \text{expected outputs}$$

Efficiency or productivity: the capability to produce a given quantity of outputs by using the minimum possible amount of available inputs (time, money, people, materials, energy, etc)

$$\text{efficiency} = \text{productivity} = \text{outputs} / \text{inputs}$$

For example, if:

- Team A used 6 input units to produce 11 of the expected 20 output units;
- Team B used 5 input units to produce 10 of the expected 20 output units.

Then, by using the abovementioned definitions, team A was more effective and team B was more efficient.

Performance: given the two previous definitions, I believe the concept of "performance" becomes redundant and should not be employed; however, given its generalized use in literature and in common language, I suggest the following definition:

$$\text{performance} = \text{efficacy} + \text{efficiency}$$

But, since efficacy and efficiency are not measured in the same units, two performances (either from different teams or from the same team in distinct moments) cannot be compared if the two components fluctuate in opposite directions and there is no information about the weight (relative importance) of the factors. An example is presented on Table 1.

Table 1 - Evolution of Performance based on the evolutions of Efficacy and Efficiency

Efficacy	Efficiency	Performance
↑	↑	↑
↑	=	↑
↑	↓	?

Of course, if the two components fluctuate in opposite directions but one of the components is clearly dominant, performance variation can be evaluated. For example, in a heart surgery situation, efficacy (patient's survival) clearly outweighs efficiency (duration of the surgical procedure, cost of materials, number of surgeons), therefore performance will depend almost exclusively on the former.

I will now introduce the word "value" to describe the dimension that puts together the notion of "efficiency", "efficacy", "future viability", "member satisfaction" and "external satisfaction", like peer and management opinion about the group. The following equation represents the qualitative relationships among these variables:

$$\text{value} = \underbrace{\text{efficacy} + \text{efficiency}}_{\text{tangible}} + \underbrace{\text{viability} + \text{satisfaction (int)} + \text{satisfaction (ext)}}_{\text{intangible}}$$

This model's novelty has to do with the separation of **tangible** and **intangible** variables into distinct clusters, and the introduction of **team value**, a more encompassing variable that puts together the abovementioned clusters.

The following diagram graphically depicts the proposed relationships among these variables and the traditional input-process-output model.

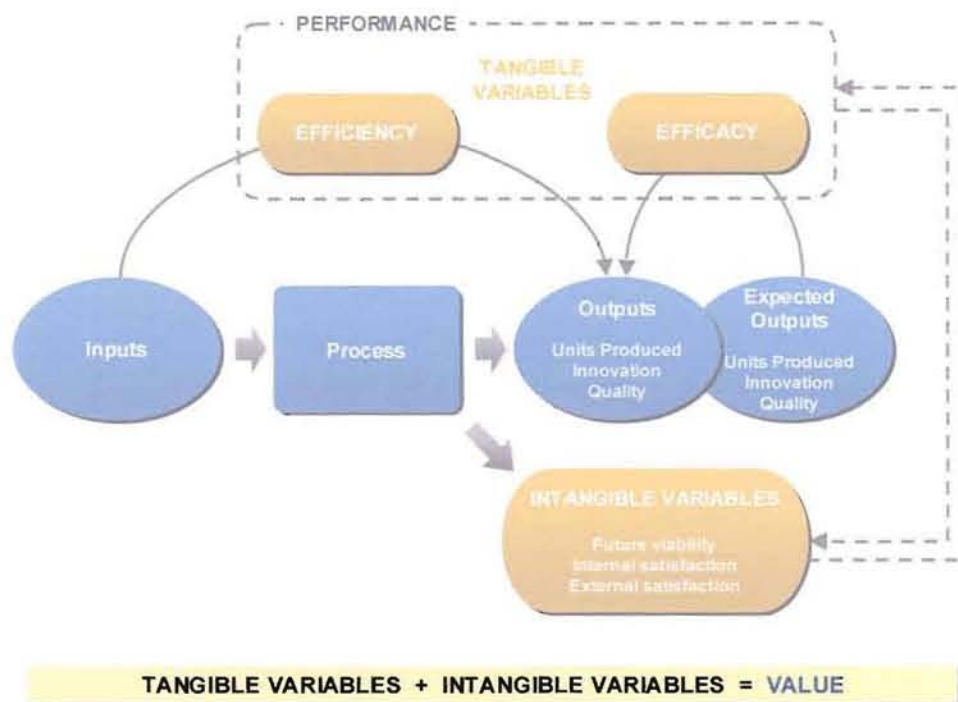


Figure 1 - The value-model

Regarding this proposed model, the following aspects should be noted:

- Variables like product quality, error rate, innovation and the organization standards mentioned by Hackman (1990), cited by Pescosolido (2003), will be included in the "expected outputs".
- Variables like management evaluation, peer opinion and customer satisfaction will be included in "external satisfaction".
- All the other variables traditionally included in the inputs and process stages remain the same.
- Comparison of two "values" is subject to the same restrictions as comparison of two "performances".

Naturally, the model **allows** for reciprocal interdependency (represented by dashed arrows) between intangible variables like "member satisfaction" and tangible variables like "efficiency" and "efficacy". However, an increase in one of these intangible variables (for example, member satisfaction) will **not necessarily** affect team efficacy or team efficiency. But it will **necessarily** increase team value.

The very own nature of some projects (we will see that COHITEC is one of them) implies that, sometimes, tangible dimensions are identical across different teams and, therefore, cannot be used to differentiate them. In order to compare team value, one must bring into play some intangible variables.

Often, team members and their peers are correctly aware of how successful a team is. Members' perception of success includes a feeling of accomplishment; on the other hand, perception of failure is usually associated with a sentiment of dismay. I will use this approach later on, when an evaluation of the COHITEC's teams value needs to be carried out.

2.2.2 Phases of group formation

Tuckman (1965) proposed that small group development could be structured in four stages that he named "**Forming**", "**Storming**", "**Norming**" and "**Performing**". His model was updated in 1977 with a fifth stage, "**Adjourning**". Although his model became famous and has survived for more than 30 years, it is nowadays considered as being too simplistic.

In two consecutive papers, Gersick (1988, 1989) suggested that groups do not develop in a universal sequence of activities or stages. She proposed a **punctuated equilibrium model** of group development, where "groups' progress was triggered more by members' awareness of time and deadlines than by completion of an absolute amount of work in a specific developmental stage" (Gersick, 1988). Thus, periods of inertia alternated with periods of revolution.

Unlike Tuckman (1965), Gersik (1988, 1989) studied exclusively task force groups that existed for the purpose and for the duration of completing a specific task. Additionally, Gersick's work relied on qualitative research and was challenged by several authors.

2.2.3 Leadership and decision making

In the literature, team leadership has been believed to play a critical role on team functioning (Hackman, 1987, cited by Denison et al, 1996). House (2004) defines "leadership" as "the ability of an individual to influence, motivate, and enable others to contribute toward the success of the organizations of which they are members".

More specifically, a leader can help a team perform by defining tasks, allocating people, keeping track of deadlines, motivating the team, resolving disputes, ensuring the contribution of all members by avoiding "free-riding", promoting communication inside and outside the team, etc.

Some of the leader's powers are delegated by the organization and include the authority to punish and reward. Others are intrinsic to the leader and include charisma and knowledge.

Despite the multiplicity of books and papers published on this subject, there isn't a consensual definition of the "leadership" concept, boundaries between leadership and management are fuzzy and there isn't a definitive set of rules on how to be a capable leader. However, it is clear that: leaders do affect the organization; some personal traits, skills and behaviors add to the success of an individual as a leader; leadership is a process that involves leaders, followers and situations; leadership skills can be learned and improved (based on Cunha et al, 2003).

Traditional models of leadership can be structured according to **three different approaches**, based on **trait**, **behavior** and **situation**. These approaches are explained below:

Trait approach

Trait approach is based on the notion that successful leaders have unique personality qualities. Cunha et al (2003) describe seven traits and three broad types of competencies that contribute to leaders' success:

Traits: high energy level and stress tolerance; self-confidence; strong internal "locus of control" orientation; emotional maturity; honesty and integrity; high achievement orientation; socialized power motivation.

Competency types: technical; interpersonal; cognitive.

Although once popular, this approach is controversial.

Behavioral approach

The behavioral approach is based on the concept of how a leader conducts himself or herself. Two broad categories of behaviors have been defined:

Production/task centered behavior: the leader pays close attention to the work of subordinates, explains work procedures, and is enthusiastic about performance.

People/relationships centered behavior: the leader is interested in developing a cohesive work group and in promoting team harmony.

From the combination of these two dimensions, Blake and Mouton (1964), cited by Cunha et al (2003) identified five essential management styles, that can be organized in a matrix, also known as "The Managerial Grid".

Also, according to the functional leadership model, leadership is based not on an individual but rather on a set of behaviors that help teams attain their goals. Any member can perform these functions and therefore participate in leadership.

Situational/contingency approach

The situational/contingency approach is based on the principle that there is no "best leadership style" and that effective and successful leadership depends on the relationship between organizational situations and leadership styles. Therefore, several models were developed to identify which leadership styles will be most effective under specific conditions.

For example, **Fiedler's** situational theory identifies effective leadership styles under changing situations (Fiedler, 1967, 1970, cited by Cunha et al, 2003). In Fiedler's model, leadership effectiveness (group success) is a result of interaction between the style of leadership and the favorableness of the environment.

The **Vroom-Yetton** model (also known as Vroom-Yetton-Jago model, or **Normative** model) identifies five decision making styles ranging from autocratic to group-based. By answering a series of questions about the nature of the problem, availability of information, subordinates commitment, importance of the outcome, etc, the leader follows a decision-tree that will

eventually lead him/her to a recommended decision-making type, stating how much involvement team members should have in the decision. (Cunha et al, 2003; Vroom, 2000). According to Vroom (2000), "people do support what they help to build. Under a wide range of conditions, increasing participation leads to greater "buy-in," commitment to decisions, and motivation to implement them effectively".

In the **path-goal** theory of leadership, developed by House and Mitchell, leaders will guide team members on their way toward objectives, remove obstacles and manage their rewards. The weight that the leader grants to each of these factors will define one of four styles of leadership: directive, supportive, participative and achievement-oriented. These four leadership styles are fluid and, consequently, leaders can adopt any of them according to the situation needs. (House and Mitchell, 1974 cited by Cunha et al, 2003).

The abovementioned models, and many others, assume that there is a leader. But what if the leader is not well defined in the first place?

On the subject of self-managed teams, Hackman, J. (2004) said:

*A "truly self-managed performing unit" is one where the team as a whole has responsibility not just for doing work, but also for monitoring and managing how that work gets done. In a **self-managing team** there is scope for all members to participate in accomplishing the critical leadership functions.*

[...] If the leadership "wheel" can rest on multiple shoulders, so much better. This increases the chances that the group will be effective in monitoring its environment and any changes in this, and in assessing how it is doing internally, and where corrections need to be made. It will then be more likely to develop and refine a performance strategy that is well attuned to requirements.

[...] I am not saying that shared leadership is what defines a self-managing team. What defines it is the amount of authority it has for managing and monitoring its own performance.

2.2.4 Conflict – good or bad?

One of the many process factors affecting group value is **intra-group conflict**. De Dreu and Weingart (2003) define intra-group conflict as "the process resulting from tension between team members due to real or perceived differences".

There are several types of conflict that may be present in the functioning of groups. Jehn (1995) described two types of intra-group conflict: **task conflict** and **relationship conflict**.

Task conflict, or cognitive conflict, is a perception of divergence among team members about the content of their decisions and involves differences of opinions, ideas and viewpoints. Relationship conflict, or emotional conflict, is a perception of interpersonal incompatibility and typically includes tension, irritation and hostility among team members (Passos and Caetano, 2005).

Another important aspect related to the impact of conflict on teams' ability to perform is the tendency to have escalation. Conflict escalation occurs when there is an increase in the level or intensity of the conflict, as time goes by.

Cunha et al (2003) describe three phases and nine stages that range from a slight tension, caused by different points of view (but still in a rational and controlled atmosphere) to an utterly irrational final stage where the destruction of the opponent is sought after, even at the cost of self-destruction.

Pruitt et al (1994), cited by Maiese (2003), describe three broad models of escalation: the aggressor-defender model, the conflict-spiral model and the structural-change model. These models are described in more detail below:

Aggressor-defender - One of the parties, "the aggressor" starts with soft tactics and moves on to heavier tactics if these don't work. The other party, "the defender", reacts proportionally to the aggressor attack. This model suggests that escalation moves simply in one direction, with the defender always reacting to the action of the aggressor.

Conflict-spiral - This model describes conflict escalation as a vicious circle of action and reaction. Each reaction is stronger than the action that instigates it, and, therefore, both action and reaction grow in intensity and severity. Also, conflict issues proliferate quickly.

Structural-change - According to this model, the conflict process produces "residues" that affect and enduringly change the parties involved. As the fight goes on, conflict moves away from the actual issues that originated it. Permanent psychological changes in the involved parties explain conflict persistence and recurrence.

According to De Dreu (2006), in a paper appropriately named "When Too Little or Too Much Hurts [...]", work teams are more **innovative** when the level of task conflict is moderate instead of low or high. This effect exists for task conflict, but not for relationship conflict.

It has been stated that moderately intense conflict can also increase team **performance** (in its traditional sense) and **quality** of decisions (Cunha et al, 2003). However, one study by De Dreu and Weingart (2003) maintains that for team performance, both task conflict and relationship conflict are equally disruptive. They state that “whereas a little conflict may be beneficial, such positive effects quickly break down as conflict becomes more intense, cognitive load increases, information processing is impeded, and team performance suffers.” (De Dreu and Weingart, 2003).

Jehn (1997) cited by Passos and Caetano (2005), introduced a new type of conflict: **process conflict**, a disagreement over how things should be made, including task distribution among team members. However, there is no consensus among authors on whether process conflict has a positive or negative impact on teams.

Conflict management strategies

Based on the combination of two dimensions (desire to satisfy one’s interests versus desire to satisfy other’s interests), Cunha et al (2003) describe five individual strategies of conflict management: avoidance, accommodation, competition, compromise and collaboration. They are graphically represented in Figure 2 and described in more detail below.

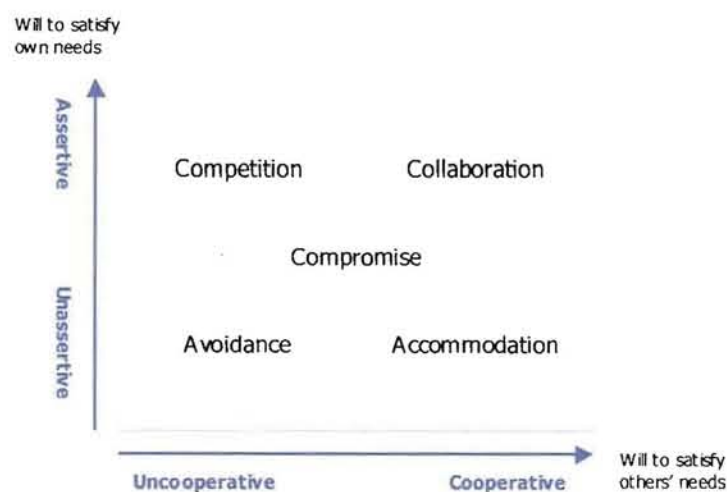


Figure 2 - Strategies of conflict management

Competition (assertiveness, no cooperation) - By using this strategy, one pursues his/her interests without taking into account other party's needs. It can be used when goals are very

important, time is short, or the relationship with the other party is not important. However, this strategy can foster conflict escalation and retaliation.

Accommodation (no assertiveness, cooperation) - Allows the other part's interests to be met at the expense of one's own interests. It can be useful to preserve the relationship, if used occasionally or if the issue is unimportant. However, being too accommodating or using this strategy too often can undermine one's credibility in future decisions.

Collaboration (assertiveness, cooperation) - This is the most integrative solution of all, where the parties share their inner needs, explore alternative solutions that satisfy everyone and search for ways of increasing the "size of the cake" before dividing it. It should be used when issues are important to all, when there is a high level of trust, when someone wants the others to also have "ownership" of solutions or when the parties are willing to change their thinking as new options are suggested. However, this process can take a lot of time and energy, and it requires specific skills.

Compromise (some assertiveness, some cooperation) - Compromise is a less integrative strategy than collaboration and it lays between competition and accommodation. Each party gives up certain aspects in order to gain elsewhere. This strategy is useful if there isn't much time available, goals are moderately important, or one party cannot impose the solution in a competitive way. However, important values and long-term goals can be disregarded.

Avoidance (no assertiveness, no cooperation) - Issues are ignored and conflict is avoided by withdrawing, sidestepping, or postponing. It may be used when the conflict is small and relationships are at stake, but may make matters worse and is not a useful long term conflict management strategy.

The type of conflict management used by the members of the CFTs is one of the variables that were analyzed in the interviews.

2.3 The special characteristics of CFT's

CFTs share several characteristics with conventional teams, but also differ in fundamental ways. For example, **each member may have obligations in a hierarchy exterior to the team** and the **team is often temporary**, which may lead to the experience of **high levels of pressure and conflict**. (Denison et al, 1996). The vast majority of existing studies focus on new product development teams (also known as PDTs, NPDTs, CFPDTs, etc), but results from these studies can be applied to CFTs in general.

There are many types of CFTs, but most are task teams, formed to accomplish specific tasks in a limited time-span, comprising members from distinct organizational functions (and sometimes, as in the present case, from different organizations as well). They are integrative and often creative, thus **conventional analysis using traditional variables such as efficiency, team cohesion and member satisfaction may be too narrowly focused** (Denison et al, 1996).

Donnellon (1995), cited by Denison et al (1996), suggests that CFTs are often "co-acting" work groups composed of independent, **highly competitive individuals who pursue their own goals over those of the teams.**

Webber (2002) supports the abovementioned theories by stating that CFTs pose a variety of unique challenges. She points out three distinctive aspects of CFTs: **members, despite working together, have quite different goals and values;** people sometimes work on multiple teams simultaneously, resulting in **differential time allocation to the team;** and individuals are often subject to **multiple reporting, for example to a team leader and to a functional manager.**

Regarding leadership, sometimes CFTs function as **self-directed teams**, responding to broad objectives, but not to specific directives. **Decision-making may depend on consensus** or, more often, be performed by a **leader**. Also, power can be shared equally on all issues, or a rotating leadership can be used.

In short, we have seen that traditional theories and models are mostly focused on traditional groups, with long durations, distinct phases of development, single lines of reporting, well-defined methods of decision-making and easily measurable results. CFTs are spreading quickly across organizations, but empirical research on this type of teams - which display a set of particular characteristics - is lagging behind their rate of adoption (Knight, 1976, cited by Denison et al, 1996).

My participation in the COHITEC 2005 program, where I was faced with high levels of conflict, clashes among participants who pursued individual goals and, ultimately, failure, presented the opportunity to perform the present study and shed some light on the dynamics of CFTs.

Next, I will proceed with a description of the methodology used to gather and process data on this study.

3 Methodology

3.1 Case description

Several studies have shown that knowledge generated in Portuguese academic research environments is growing, but is not having a significant impact on the economy. Therefore, programs that stimulate the conversion of technologies into businesses are needed.

The COHITEC initiative is a cooperation project among universities, financial institutions and managers, meant to promote value creation from knowledge developed at Portuguese universities, by founding technological start-ups with high-growth potential.

Teams include researchers from Portuguese universities, managers and management students, and business executives. Venture capitalists and entrepreneurship tutors also work closely with the teams.

Each team analyzes a set of technologies, developed in participant investigators' research centers, and, building on its members' complementary skills, must produce a viable business plan.

Involved parties:

Several organizations, Portuguese and American, have contributed to this project by supplying coordinating capabilities, entrepreneurial know-how, new technologies, technological people, management people, physical facilities and money. Specifically:

- COTEC is a not-for-profit Portuguese organization committed to promote entrepreneurial development. COTEC was the main organizer of the COHITEC program and has contributed with logistic and coordinating support.
- University of North Carolina provided know-how and a self-developed methodology for technology assessment and startup creation. It has contributed with teaching personnel and training materials.
- Universidade Nova de Lisboa allowed for some of its students or alumni to participate in the teams, contributing with their managerial knowledge. The School of Economics and Business of UNL has also contributed with the MBA facilities and space for both the classes and group work and meetings.

- Several technological universities provided the technologies and some of the researchers involved in their development.
- Several Portuguese companies also participated as sponsors and provided some of their top managers to coach the teams on an occasional basis.

Team formation and structure:

Technologies and their corresponding development teams were initially selected by COTEC from a pool of applications submitted by Portuguese universities. To each team, one or more MBA students or alumni from Universidade Nova de Lisboa (UNL) were allocated.

Each team consisted of:

- One or more subgroups of investigators from one or more universities, each contributing with one or more technologies;
- One or more MBA students or alumni from UNL;
- One "tutor", consisting of a top-manager from one of the sponsor companies (not involved in the teams on a permanent basis).

The participants' background diversity in each team is also reflected in the participants' motivations. As such,

- Investigators participation was suggested by their university's management. As we will later see, some investigators were pressed to participate by the top levels of the academic hierarchy;
- MBA students would participate on a volunteer basis. As compensation, they would get curricular credits depending on the assessment of their accomplishments;
- MBAs (alumni from UNL) were invited to participate as volunteers, with no compensation (besides what they would be able to learn from their participation).

In this paper, I will use the acronym MBA to designate both MBAs and MBA students.

Timeframe

The COHITEC 2005 program can be divided in two main phases.

Phase 1 started in March 2005 and ended in June 2005, with a formal public presentation. During Phase 1, each team worked on a pool of technologies that were considered to have

some business potential, in order to select those that were indeed viable. Most of the work performed during this stage consisted of eliminating unfeasible or flawed technologies and producing sound business plans for the remaining ones, that were to be presented on the final public session.

Phase 2 started a short time after the aforementioned presentation and is still taking place. In Phase 2, teams that reached the end of Phase 1 (not all of them did) were to find investors, set up a management team and officially create the company.

The present study was initially planned to cover only Phase 1. But early results from the interviews' analysis suggested that it might be interesting to include also the initial period of Phase 2. Therefore, some results from Phase 2 were also included, whenever they were available.

Seven teams were initially formed and six of them reached the end of Phase 1. After the end of Phase 1, all teams eventually split apart and MBA's left. This separation process was swift for some teams (for example, teams B and D) and gradual for others (for example, team A). In each team, the remaining investigators continued into Phase 2, either alone or with some new members proposed by COTEC.

3.2 Data gathering and processing

In a similar study, Denison et al (1996) proposed a two staged methodology where: first, informal interviews with a small sample of people were conducted and potentially interesting issues were raised; second, complete questionnaires, based on these issues, were designed and applied to larger samples. The second stage was done in a recurring and iterative way, so that a refinement process could take place. (Denison et al, 1996)

In this research, a decision was made to perform only one round of interviews. Therefore, an interview script was developed to be as wide-ranging as possible, trying to encompass many of the putative problems/variables that affect team dynamics.

The interviews had closed-end questions, e.g. "Was there a formal team-leader?" and open-ended questions, like "Please describe a conflict situation in your group". The script was divided into five broad sections: team structure; decision making; conflicts; goals; and comparison with other teams (both in the same project and in the past).

Emphasis was given to the interviewee's opinion on leadership, team success, completion of team goals, the way personal conflicts affected the attainment of team's objectives and differences between MBAs and investigators.

All interviews were recorded and transcribed. They allowed for more spontaneous answers than a questionnaire would and permitted the analysis of the interviewee's behavior during the interview, like "style of language", nervousness, hesitations and, especially, change of opinions during the course of the interview (that was an unexpected result of this study).

Despite having a few "closed" questions, I tried to make the interviews as "conversation-like" as possible, so that the respondents would feel free to talk about issues that I had not previously thought of. There was great care not to "bring the interviewee back to the subject", even when the answer shifted away from the main topic (which occurred quite often). This led to a few unanswered questions in the final data.

It is worthwhile noting that, despite allowing for "new issues" to come up, this approach is more time-consuming and leads to a harder answer systematization process.

All the teams that reached the end of Phase 1 (six out of seven) were analyzed. In each team, at least one MBA and one investigator were interviewed and interviewees were selected based on the following criteria: availability; relevant role in the group (members that had little participation in the daily work were not considered); functional balance (the initial **MBAs/investigators** ratio was maintained in the sample); gender balance (the initial **male/female** ratio was maintained in the sample). All participants had at least one university degree and several had PhDs or post-doctorates. The age range was quite wide (approximately 25 to 60) but the exact ages are not known. In the end, 17 interviews were performed, with an average duration of one hour and fifteen minutes.

The following table presents a comparison among the percentages of people that were selected to participate, those who reached the end of Phase 1 and those belonging to this study's sample, divided by gender and function.

Table 2 - Percentage of interviewees per gender and per function

	Applications	Reached the end of Phase 1	Sample
MBAs	33%	41%	47%
Investigators	67%	59%	53%
Males	71%	76%	82%
Females	29%	24%	18%

The interview phase started six months after the events and lasted for two months. All the interviews were carried out in Portuguese language (only the quotations made in this text were translated to English).

As previously mentioned, the interviews were recorded and the subsequent transcription was made as accurately as possible, including pauses, hesitations and slang use, so that language type could be used as a dimension in the analysis.

Subsequently, the text from the transcripts was broken up into "semantic units" (answers, spontaneous statements, etc) and organized into a master table.

Also, a section covering participant's behavior/language during the interview, as seen from the interviewer's perspective, was included. Six variables were considered: use of slang words; use of emotive statements (not to be confused with reasoned descriptions of emotional behaviors during the project); use of racist, sexist or depreciative expressions; frequent use of "us" and "them"; how investigators refer to MBAs and how MBAs refer to investigators; effort in articulating clear and concise answers to the interviewer's questions.

Next, relevant data from the master table was summarized into smaller tables, with different types of organization. Data that was considered irrelevant to this study was discarded.

Finally, results were visually inspected and patterns were identified and highlighted.

To ensure the anonymity of the project participants, all the names in the transcripts were replaced by a four characters code. Since interviewees sometimes referred to people external to the teams, it was necessary to code their names as well. The meaning of each character is as follows:

1st: Team [A-F] or Organization [O]

2nd: Intra-group sequential number [1-9]

3rd: Function [I: investigator / G: manager (MBA) / P: principal / S: staff]

4th: Gender [M: male / F: female]

Examples:

C2(IF) - Team C; #2; investigator; female

O1(PM) - Organization; #1; principal; male

As we can see, the first two characters, together, uniquely identify each person. The third and fourth characters were added to ease the data analysis and understanding.

The following diagram sums up the data processing workflow:

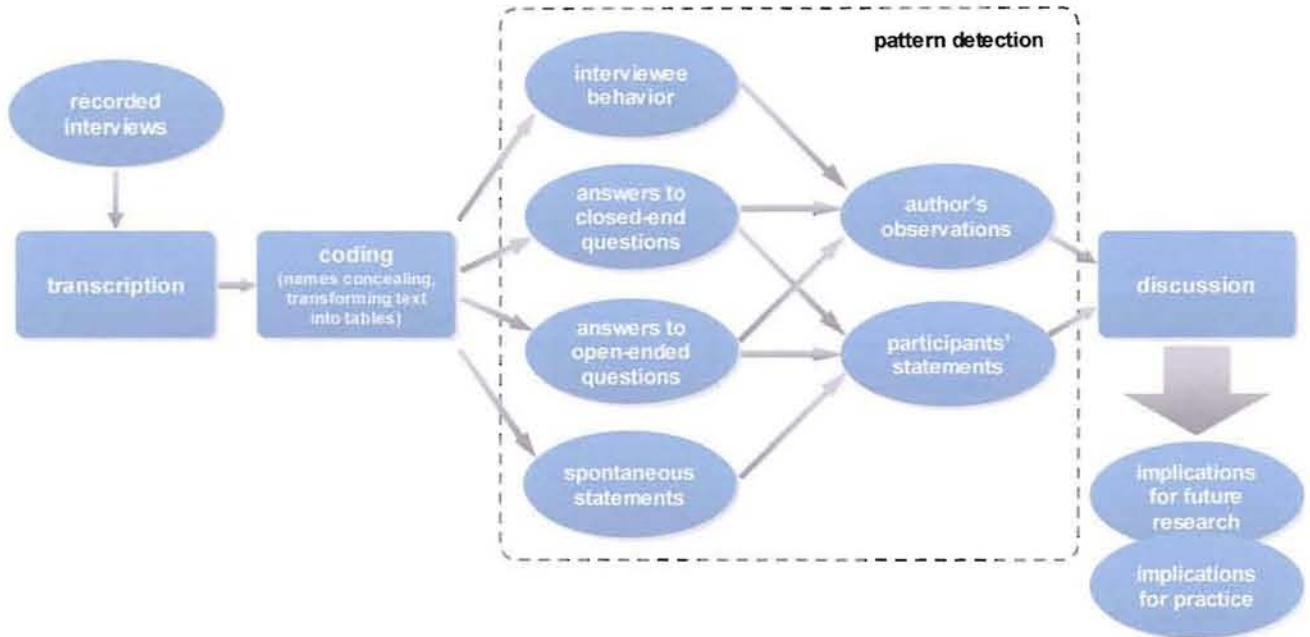


Figure 3 - Data processing workflow

4 Results

The next three tables summarize the most relevant results. These tables derive from the master table that was developed from the transcripts, with all the data from the interviews.

Table 3 has the data that concerns the teams, as a unit of analysis. It includes results on perceptions of efficacy and success, structure, leadership and decision-making, attitude, conflicts and goals. Table 4 and Table 5 hold the data that concern team members, arranged, respectively, by team and by function. They include results on expectations, class differences, and interviewee behavior.

Initially, I had planned to study only Phase 1, but interviews' analysis suggested that it might be interesting to include data from Phase 2, as well, in the research. Unfortunately, information from this second phase was not available for all the teams. Therefore I have decided to include results from Phase 2 only for team E, which revealed totally different structures, processes and results in each of the program phases. More specifically, relationship conflict showed up during Phase 2, after a new investigator joined the group.

For presentation clarity and easier pattern detection, I split team E into two columns, as if we were dealing with distinct teams. Thus, column E1 will refer to team E during Phase 1 (with MBAs and no relationship conflict) and column E2 will refer to team E during Phase 2 (without MBAs and with relationship conflict). The consequent asymmetry in the data organization does not affect the results.

		Phase 1				Phase 2		
Teams:		A	B	C	D	E1	F	E2
Efficacy and success	Was considered a success by selfs and others	yes	no	no	no	no	yes	no
	Was considered a team failure by selfs and others	no	yes	no	yes	no	no	yes
Team structure	There were group structure changes	no	no	yes	yes	yes	yes	no
	Participants showed confusion about team's structure and number of members	no	no	yes	yes	yes	yes	no
	There were investigators' subgroups	no	yes	yes	no	yes	yes	yes
Leadership and decision making	There was a formally elected team leader	yes	yes	yes	yes	yes	yes	N/A
	Members agreed on who the "the facto" team leader was	no	yes	yes	no	no	no	no
	There was a "de facto" team-leader	?	yes	no	?	?	?	?
	Decisions were taken mostly by discussion and consensus	yes	no	yes	no	yes	yes	no
Attitude	Arroganca (investigators)	no	yes	no	yes	no	no	yes
	Arroganca (MBA)	no	no	no	yes	no	no	N/A
Conflicts	Task conflicts	yes	yes	yes	yes	yes	yes	yes
	Relationship conflicts	no	yes	no	yes	no	no	yes
	Conflict escalation	no	yes	no	yes	no	no	yes
	Conflicts' responsibility is attributed to a single, problematic, person	no	yes	no	yes	no	no	yes
Goals	There was a common goal, beyond producing the final presentation	yes	no	no	no	no	yes	no
	There were personal goals	yes	yes	yes	yes	yes	yes	yes
Others	Teams with forced participation members	no	no	yes	no	yes	no	yes
	External influences / hierarchies	yes	yes	?	yes	yes	yes	yes
	Intellectual property problems	yes	?	yes	?	yes	yes	yes

Table 3 - Results per team

Success Average Failure

		Phase 1												Phase 2						
Members:		A1(GM)	A2(IM)	D1(GM)	D2(GM)	D3(IM)	C1(GM)	C2(F)	D1(GM)	D2(GM)	D3(IM)	D4(IM)	E1(GM)	E2(F)	E3(F)	F1(GM)	F2(IM)	F3(IM)	E2(F)	E3(F)
Leadership and decision making	A strong leader is good?	no	?	yes	yes	yes	yes	no	?	?	yes	yes	yes	?	?	yes	no	yes	?	?
	Expectations	yes	yes	yes	yes	?	yes	?	yes	yes	yes	yes	yes	yes	yes	?	yes	?	yes	yes
Goals	Personal goals changed	?	?	yes	yes	?	yes	yes	?	?	?	?	yes	?	yes	yes	?	?	?	yes
Conflicts	Conflict management style	comprom	avoid.	collabor	collabor	compet. avoid.	?	?	compet.	comprom	compet. avoid.	compet. avoid.	?	avoid.	avoid.	collabor	avoid.	comprom	avoid	compet.
	Class differences	Forced participation	no	no	no	no	no	yes	no	no	no	no	no	yes	yes	no	no	no	yes	yes
Language and attitude (Interview)	9 to 5 work hours	?	?	no	no	yes	no	no	?	no	?	yes	no	yes	yes	no	yes	no	yes	yes
	Poor project management skills	no	yes	no	no	yes	no	no	no	no	yes	yes	no	?	?	no	?	?	?	?
	Poor social skills	no	yes	no	no	yes	no	yes	?	no	yes	yes	no	?	yes	no	yes	no	?	yes
	Poor global vision	no	yes	no	no	yes	no	yes	no	no	yes	yes	no	?	?	no	yes	?	?	?
Language and attitude (Interview)	Use of slang								yes		yes	yes				yes				
	Display of emotional behavior during interview								yes		yes	yes			yes					yes
	Use of racist, sexist or deprecatve language				yes				yes		yes	yes								
	Frequent use of US and THEM	yes	yes	yes	yes		yes	yes	yes	yes		yes	yes	yes	yes	yes			yes	yes
	How MBAs call investigators	technologists		investigators	investigators	investigators	investigators	scientists	investigators	investigators			scientists			investigators	technologists			
How MBAs call MBAs	MBA		MBA	MBA		MBA		MBA	MBA			MBA			MBA					
How investigators call investigators		technologists			investigators		investigator				investigator	technologists			investigator	investigator		investigator	investigator	
How investigators call MBAs		MBA / Miranda			MBA		MBA				MBA	MBA economist			MBA	MBA		MBA	MBA	
Display of difficulty in articulating clear and concise answers											yes	yes			yes					

Table 4 - Results per member, grouped by team

Success Average Failure

Members:		A1(GM)	B1(GM)	B2(GM)	C1(GM)	D1(GM)	D2(GM)	E1(GM)	F1(GM)	A2(IM)	B3(IM)	C2(IF)	D3(IM)	D4(IM)	E2(IF)	E3(IF)	F2(IM)	F3(IM)
Leadership and decision making	A strong leader is good?	no	yes	yes	yes	?	?	yes	yes	?	yes	no	yes	yes	?	?	no	yes
	High initial expectations followed by frustration	yes	yes	yes	yes	yes	yes	yes	?	yes	?	?	yes	yes	yes	yes	yes	?
Expectations	Personal goals changed	?	yes	yes	yes	?	?	yes	yes	?	?	yes	?	?	?	yes	?	?
Goals	Conflict management style	comprom.	collabor	collabor.	?	compet.	comprom	?	collabor	avoid.	compet. avoid.	?	compet. avoid.	compet. avoid.	avoid.	avoid.	avoid.	comprom.
Conflicts	Forced participation	no	no	no	no	no	no	no	no	no	no	yes	no	no	yes	yes	no	no
	9 to 5 work hours	?	no	no	no	?	no	no	no	?	yes	no	?	no	yes	yes	yes	no
	Poor project management skills	no	no	no	no	no	no	no	no	yes	yes	no	yes	yes	?	?	?	?
	Poor social skills	no	no	no	no	?	no	no	no	yes	yes	yes	yes	yes	?	yes	yes	no
	Poor global vision	no	no	no	no	no	no	no	no	yes	yes	yes	yes	yes	?	?	yes	?
Class differences	Use of slang					yes			yes				yes	yes				
	Display of emotional behavior during interview					yes								yes		yes		
	Use of racist, sexist or deprecatve language			yes		yes							yes	yes				
	Frequent use of US and THEM	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes		
	How MBAs call investigators	technologists	investigators	investigators	investigators	investigators	investigators	scientists	investigators	technologists								
Language and attitude (interview)	How MBAs call MBAs	MBA	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs									
	How investigators call investigators	technologists	investigators	investigators	investigators	investigators	investigators	scientists	investigators	technologists	investigators	investigators	investigators	technologists	investigators	investigators	investigators	investigators
	How investigators call MBAs	MBA / Mbanda	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs	MBAs
	Display of difficulty in articulating clear and concise answers								yes				yes	yes				
MBAs										Investigators								

Table 5 - Results per member, grouped by class

The major results from the research project will now be divided by theme, to make the presentation more understandable.

4.1 Efficacy and success

In this study, there are not many measurable variables we can use to assess and compare team efficacy and team efficiency. All the six teams that reached the end of Phase 1 have produced roughly the same deliverables, including a business plan and a public presentation, in the same time period. Also, regarding team continuity and future viability, all the teams split up after the end of Phase 1, although for different reasons.

However, by looking at participants' statements, it appears that there is a somewhat subjective feeling of success or failure, both by team-members and by external people. As I stated in section 2.2.1, intangible variables like people's **perception of success** can be used to assess **team value**, as long as tangible variables like efficiency and efficacy are constant across teams.

Thus, before we can start asking why some groups were successful and others were not, we need to define **success** and **failure**, in the scope of this study.

Failure includes a sense of disappointment, a sense of wasted time and group dismemberment before the end of the project. As one of the participants stated,

F1(GM) [talking about team X] - At some point, [...] there were fights, screams, total hysteria... the group broke up and it was over.

Refusal to participate in another project with the same team, as shown in the following excerpt, is also considered a sign of failure:

Interviewer - If you had to work with them again, how would you try to overcome the conflicts? D1(GM) - I would never work with them again!

Last but not least, one common characteristic of failed groups is the perception, by both its members and external people, that the team was unsuccessful. For example, one participant said:

F1(GM) - I noticed those who were clearly the worst – group D. And there was another one, which collapsed: team X.

Success, in the context of this project, is characterized by a feeling of accomplishment, of a job well done; both team members and external people regard the group as successful, as we can see in the following statement:

A1(GM) – [...] I felt that we were probably the best team.

According to the abovementioned criteria, groups A and F were considered as successful; groups B, D and E2 were considered as failed. The remaining teams were considered as **average**.

The only group that didn't make it to the end of Phase 1 (group X) is also an obvious example of failure. However, its members could not be reached for interviews, and so it was not included in this study.

4.2 Team structure and phases of formation

Several teams could not be plainly divided into merely MBAs' and investigators' subgroups. On the contrary, they had a number of subgroups, even in the investigators' side, as mentioned by one investigator from a successful team:

F3(IM) – This was not a homogeneous team. There were three different universities. There were three distinct groups with distinct ideas.

By observing Table 3, it becomes clear that members from teams that suffered significant changes in their structures, during the project, showed an unexpectedly high level of confusion about the team's constitution. That confusion is palpable in the following statement, made by the aforementioned investigator:

F3(IM) - We were six investigators and two MBAs... [pause]... no, we were ten... there were two more investigators from the other... three more.... no, we were ten or eleven.

Participants often talked about a feeling of uneasiness and discomfort regarding group fuzziness. However, no relationship between this discomfort and team failure was observed in this study.

Two specific moments in the groups' life were more notorious: the initial and the final periods of the project.

The initial phase, in most groups, was marked by uncertainty about members' roles. The investigators' discomfort is exemplified in the following quotations:

C2(IF) – In the first place, we had never met before. We didn't know each other and we had to elect a leader! I believe those things should be done later on!

F2(IM) – The chosen team leader was a MBA; we had no idea who he was.

In many groups, the separation process was not smooth. Even participants who had excellent personal relationships during the project lost contact with each other. Some of the investigators felt reluctant about discussing the subject openly, choosing silence over dialogue, which led to significant levels of investigators' distress and MBAs' resentment. This is manifest in the following testimonies:

E1(GM) – I didn't talk to anyone again, after the presentation. Not even a phone call just to say "Thank you"!

E3(IF) – The MBAs left right after [the final presentation]. They were discarded, the poor guys. They were ignored, we never talked to them again. And that was horrible, it was a hideous attitude.

The abovementioned periods correspond, roughly, to Tuckman's "Forming" and "Adjourning" phases. Behaviors related to the other three phases, "Storming", "Norming" and "Performing" were not observed. As we have seen before, CFTs usually exist in a limited time-span. Therefore, we can expect their evolution to abide by different rules.

4.3 Leadership and decision-making

All the teams had a formally elected team leader. This was due to the project's methodology requirements, and had no relationship with day-to-day leadership and decision-making process.

Since there was no real leader imposed by an organizational hierarchy (the elected leader was just an inconsequential character), "de facto" leaders (often temporary) emerged from a complex set of team dynamics. Some of the relevant criteria mentioned by participants to explain the leader's emergence include subject knowledge, age and good social skills. Next, some pertinent quotations are presented:

E1(GM) – Then, there was a change in leadership... not a formal one... it happened gradually. Because E6(IF) detained the technology knowledge. Since she had the knowledge, she started to act as leader.

C1(GM) – Being a leader is very hard. Sometimes people started to [assume the leadership] here and there, but soon they understood they would have to deal with a lot of issues... and so they quit.

D4(IM) – In that clash, D3(IM) prevailed almost every time, because he was old enough to be our father.

A2(IM) – It was the gray hair, in particular mine, that made me assume the leader role.

F1(GM) – [To earn the investigators' respect] we have spent some time explaining things. We never had an arrogant attitude that could foster rejection. Then, they would check everything we said with the American coaches, to see if there was a match; usually, there was. After two or three matches, we gained some credibility.

As we can observe in Table 3, the members of four out of six groups did not agree on whether there was a “de facto” team leader, but there is no visible relationship between this variable and the type of decision-making process.

However, it is possible to detect a correlation between team failure and decisions not being made by discussion and consensus. Why did this happen?

As we have seen before, the leader's roles should include task functions and maintenance functions, namely, promoting team harmony and ensuring the participation of all the members in the discussion. In two of the three failed groups, members did not agree on having a “de facto leader”. Members from team B, also a failed team, agreed on having a “de facto” leader, but this person was one of the few who were described as having an arrogant behavior, which means that: 1) the other team members did not trust or follow this leader; 2) the leader did not pay attention to the “maintenance” functions (part of the process stage in any of the team three-stage models).

Therefore, none of the failed groups had a leader whom the other members would trust and follow, and who would care about fostering open and participative discussion in the team. So we might be tempted to conclude this lack of proficient leadership was responsible for the lack of consensus and consequently for team failure.

Then again, other groups that also did not agree on having a “de facto” leader were able to reach consensus and perform satisfactorily.

This strongly suggests that other factors were responsible for team failure. Next, we will see how conflict played a decisive role in the teams' outcomes.

4.4 Group conflicts

All the teams experienced a certain level of conflict, which ranged from minor divergences over project tasks to extreme personal quarrels.

Task conflict, i.e. disagreement over everyday decisions, was ubiquitous in all the teams. But unlike members from teams where conflicts escalated and became personal, members from successful teams were able to contain disagreement within the scope of the subject being discussed. One of the MBAs from team F described his group's differences in the following way:

F1(GM) – [...] This conflict lasted for a couple of meetings, while we were trying to explain why it couldn't be done that way. They contested us every time. But whenever we changed the subject, [...] a "reset" was performed. I believe it was a characteristic of people's personalities. We changed the subject [...] and people were nice to each other again.

Members from unsuccessful teams soon let conflict move away from task-related subjects and become personal. One of team D's members mentioned how dispute subjects included individual matters, like dressing style, on the following terms:

D4(IM) - The guy was such a jerk that he complained to professor D3(IM) about me not wearing a tie. Professor D3(IM) came to me and said "so the guy criticized your tie... did you see his boots?" I mean, the guy was wearing yellow boots and he had the nerve to condemn my tie! So I behaved like a dog: in the next [formal] meeting, there I went again dressed all in black, with a shiny yellow tie! Professor D3(IM) laughed until he cried, later that day.

The above situation is a clear example of conflict escalation, and it can be explained by either the conflict-spiral or the structural-change models.

Conflict's responsibility is often attributed to a single, problematic, element:

E3(IF) – [E6(IF)] is an extremely problematic person. Everybody agrees on a particular subject and she doesn't. There had been no conflicts, either with the MBAs or with the other investigators, until the moment she came in. Every time she was there, meetings went wrong.

However, it should be noted that, in group D, the two members engaged in a deep relationship conflict mutually blamed each other of being the sole responsible.

In the groups that experienced relationship conflict (B, D, E2), several phases of conflict escalation were identified, as follows:

Table 6 - Conflict escalation

Group	Conflict escalation phases
B	personal clashes between MBAs and investigators → MBAs tried to lessen conflict by proposing more social interaction (not accepted by investigators) → MBAs apathy and laziness → final presentation (end of Phase 1) → separation
D	personal clashes between one MBA and one investigator → increase in conflict intensity: decisions became impossible and quality of work suffered → investigators' apathy and laziness → two new members (MBAs), with a conciliating personality, entered the group → conflict diminished → final presentation (end of Phase 1) → separation
E2	everything fine → entry of a new, disruptive element → personal clashes between the new member and all the others → meetings to address the problem (the conflict was discussed and addressed, with the new member crying and promising she would change her behavior) → no change in the new member's behavior → general apathy → one member left the group → work progress stopped (as to date)

In all the cases, the lack of ability to resolve relationship conflicts led to members' apathy and reluctance to perform. Both MBAs and investigators were affected by this situation, as we can see in the examples below:

B3(IM) [Talking about the MBAs] - There was a gradual decrease in dedication to the project

D2(GM) [Talking about an investigator] - After a certain point in time, he gave up arguing with us and said "let the kids do whatever they want"

The entry of new members with a conciliating personality, did sometimes lower the conflict level, which is patent in the following statement:

D4(IM) – When they came in, things got a little better, not only because there were two more people working, but also because D1(GM)'s personality was more diluted. D2(GM) always tried to be the mediator element. He always tried to stay neutral.

Nevertheless, the presence of those mediators was not enough to prevent team failure.

Individual differences were expected to appear in conflict management, since this is an individual competency. However, I did not expect these differences to be related to functional background, which in fact appears to be the case.

Patterns identified in Table 5 were graphically represented in Figure 4, below. As we can see, most of the investigators in the sample employed **uncooperative** strategies, with the level of assertiveness ranging from **unassertive** (in average and successful teams) to **assertive** (in the teams that experienced the highest level of relationship conflict and were considered as failures)

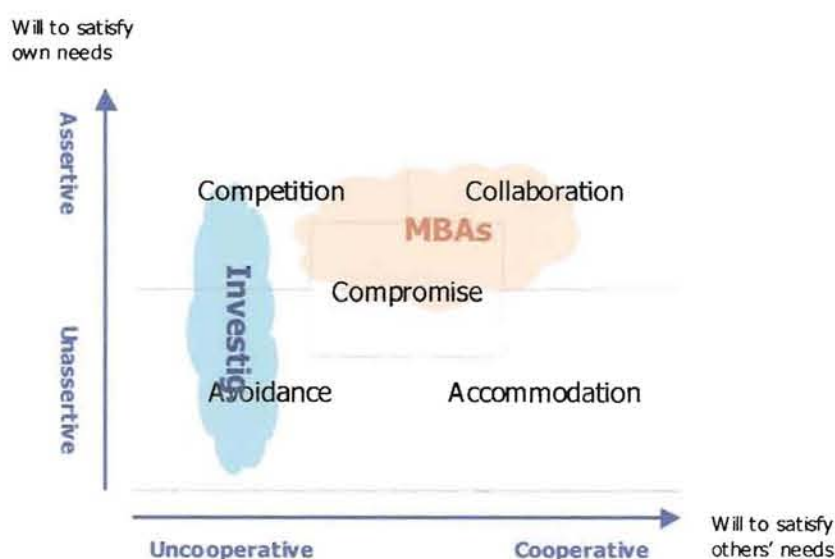


Figure 4 - Conflict management - MBAs vs. investigators

As we can see, many investigators were very reluctant to start an argument, and behaved according to an **avoidant** strategy. That way, they often prevented turning task-conflict into a clear relationship-conflict, but they left many problems unsolved. The following statements, both by MBAs and investigators, clearly reveal how investigators are averse to personal disagreement:

E1(GM) – [...] was not the way they wanted to go. But they were politically correct. They didn't say "no".

A2(IM) – And we had the prudence not to start a conflict, we used to say "we must examine this situation some other time". And things, little by little, went back to normal without confrontation.

Interviewer – Did you discuss with them your disapproval of their performance? E2(IF) – No. And that was wrong. Interviewer – Were there any attempts to solve the problem? E2(IF) – No, there were not.

MBAAs always displayed **assertive** strategies and did not show avoidant behaviors.

Data from Table 4 reveal that, in failed teams, the majority of the investigators alternated competitive with avoidant behaviors. Comparing successful to unsuccessful teams, other interesting patterns emerged. These patterns are graphically depicted in Figure 5:

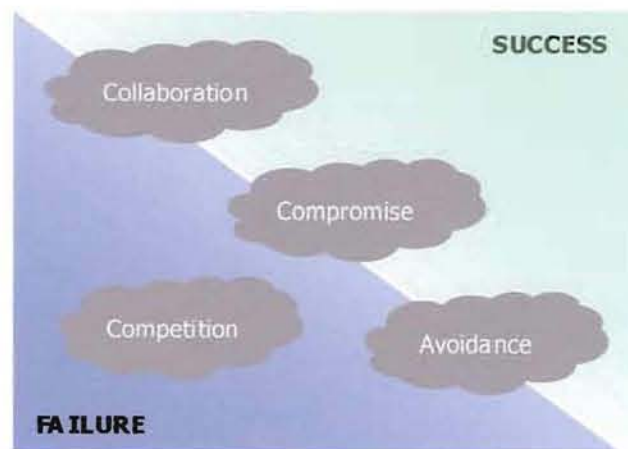


Figure 5 - Conflict management - Success vs. failure

By looking at Figure 5, it becomes clear that only members from unsuccessful teams used competitive strategies to deal with conflict. Avoidant strategies were equally used by both unsuccessful and successful teams, while collaboration and compromise strategies were mainly employed by the successful teams.

4.5 Goals and expectations

The literature on teams stresses the importance of having clear goals, as a determinant of achievement. It also stresses that the existence of goals that are shared by all members of the team is crucial and, in fact, is part of the definition of team.

However, in this situation, teams had different perceptions regarding goals. In Table 3, we can clearly observe that only successful teams had a common goal, which is manifest in the assertions of two members from one successful and one unsuccessful team, respectively:

A1(GM) – From the beginning, goals were clear and shared among all – to convert technology into something viable. A subsequent goal would be [to create] the company. That has joined everyone together.

B2(GM) – [The other members] were too selfish. [Our team] missed a common goal. They acted in a cold and egotistical manner, thinking only about what they would gain, not pursuing a common benefit.

On the other hand, all teams, even the successful ones, had members that pursued personal goals. As one participant says,

B3(IM) – Certainly, there were individual, private, goals.

Personal goals changed during the project. In some cases, participants raised their objectives, pursuing more demanding goals; in other cases, participants lowered initially challenging aspirations. Two examples of either case follow:

E3(IF) – It would be exciting to create a company and to have my own business. But I didn't start the project with that objective in mind. It gradually grew up.

C1(GM) – After a certain point in time, we lost faith in the project... [...] we didn't keep that goal up to the end. In the project's final stage, our goal was nothing more than producing the presentation. And after that, we would re-evaluate the situation ...

Differences were also detected in what concerns the motivation and drive of individual participants. In particular, I must emphasize that some investigators were pressed to participate by their university's leaders.

C1(GM) – Clearly, someone had told [the investigators] that they would have to [participate in the project]. That [person] approached them and said, "you will do this". One of them confessed that they had been pushed to be there. This did not generate lack of work dedication, but it generated lack of interest in the results.

E3(IF) – I was pushed by the "upper hand". [She said] "Go. Do it. Apply. And this, and that". I think E5(IM) was also pushed.

In the same line as individual motivation, different expectations were also present. MBAs had high expectations about their share in the future company. Investigators had high expectations about MBAs knowledge, experience and capability to help them. In both cases, the decrease of those prospects led to frustration and dissatisfaction with the project. Two examples of both perspectives are presented below:

A1(GM) – We [the MBAs] had high expectations [about being part of the future company], and suddenly we realized that they would never be fulfilled. The decline of those expectations frustrated us and we abandoned the project [in Phase 2].

E3(IF) – Maybe our [the investigators'] expectations were too high. We were hoping to find people that would be able to fully help us. They tried to help, but I think they didn't have enough knowledge to do it.

4.6 Class/culture dissimilarities – MBAs versus Investigators

According to participants' own statements, there were clear differences among MBAs' and investigators' values. While goals can be considered more or less immediate aspirations, values are deeper, moral principles that, for a given person, are mostly stable over time. As can be seen in the following quotations, MBA's tend to value profit and efficiency, while investigators appreciate the advance of science, the "investigation for the sake of investigation":

D1(GM) – They [the investigators] did not understand, and they still don't, that this is, primarily, about making money. To them, it's about technology, technology, technology, technology!

A2(IM) - Most of the technologists looked at that project, not as a business, but as the continuation of a research work where profit was never a goal. It was their personal satisfaction and curiosity, investigation for the sake of investigation. It's not only

money. We want to see in the market the product of many years of hard work. [We have] pride in our work, but also an educational intention. If we do it, our colleagues next door will also be able to do it [...].

Since each person had a tendency to think that his/her values were the right values, this differentiation affected teams' cohesion and the definition of common goals.

Also, it was noted that academic investigators had, on average, less developed social skills, because the nature of their work does not propitiate a significant number of contacts with people outside their field of knowledge. In CFTs, investigators often feel uncomfortable in communicating with their teammates and they have poor diplomatic skills when dealing with interpersonal conflicts, as it stands out from the statements below:

E1(GM) – Scientists didn't show much interest in talking to no-scientists. They don't feel comfortable with that, they don't have the talent, they are not capable of discussing subjects other than those they dominate.

D1(GM) – He can't maintain a dialogue about trivial subjects. It's raining, it's not raining. He can't discuss any of those things.

A2(IM) – When we are in groups with people from other areas, we don't feel at ease dealing with them.

C2(IF) – To us, it is very difficult to explain [to people from other fields of knowledge] even our simplest things. In my opinion, that's a handicap.

This issue affected the communication between investigators and non-investigators, which included MBAs and external people that needed to be contacted during market research assignments.

Most MBAs and some of the investigators stated that, nowadays, academic research is causing investigators to become extremely immersed in their technology and gradually unaware of "the outside world":

A1(GM) – They are people from the technological world, unaware of what goes on beyond their technology; they focus too much on their own little world. They are experts on their little creatures, but everything that goes beyond that is unreal; they were stunned at what we used to say and do.

A2(IM) – Investigators are becoming more and more illiterate [about] everything [outside their area], due to the intense specialization that forces them, in order to be good on what they do, to have a lack of global vision. Many scientists, including some

senior professors, don't understand the world where we live in; all they know is the university.

As before, this characteristic affected the communication between MBAs and investigators, and made investigators' understanding of business reality more difficult.

According to MBAs and investigators themselves, academic investigators are less likely to use project management methodologies, including definition of deadlines, resource planning, cost control, etc. Also, their time schedules are less flexible than that of managers. Working overtime hours or during weekends is not an option to most investigators. Examples can be found below, that cover the aspects related to project and time management:

D1(GM) – They [the investigators] are not used to work within a team, they are not used to be held responsible, they are not used to meet deadlines.

D3(IM) – Often, we [investigators] work without a specific target, aiming at everything at the same time. But [to achieve] a product and [complete] a project, we need to revise a series of operations that we used to perform in a "naïf", childish, immature way.

F1(GM) – By 5:30 PM, [the investigators] started to get itchy, longing to go home. Work during the weekends, no way!

E2(IF) – They had a different working methodology... they worked late hours into the night, and we are not used to work like that.

Although these differences had an influence in day-to-day work organization, no link could be found between them and team failure.

One of the most significant and strong patterns that emerged from the analysis of the qualitative data is related to what I named **attitude**. There is strong evidence that unsuccessful groups had one or more members whose attitude can be defined as "**arrogant**". For a number of reasons, most of them related to some previous experience, these members believed that they had little to gain from other participants' skills and knowledge. Two main reasons for this behavior were mentioned:

- These members had some prior experience in the other team members' field and they believed they "knew it all". It was pointed out that the existence of some knowledge was worse than having no knowledge at all;

- These members' personality was defined as "obstinate" and with little compromise capability.

Examples of this issue can be found in the following statements:

D2(GM) - I had belonged to another group [in COHITEC 2005] and the other two investigators, D6(IM) e D8(IM), were extremely humble in everything related to marketing. They would make questions... slowly beginning to understand things... But not these [investigators]! They thought they knew everything, they had the power and the market would perform as they believed.

B2(GM) - In the other groups, there were disagreements, but in ours the atmosphere was more serious, in a negative way. Because they [the investigators] already had some knowledge, unlike [those from the] other groups, who were completely unacquainted with the corporate reality. They already had created a company and made a market research. There was some knowledge. So they felt at ease to set us aside [the MBAs].

4.7 External factors

Several external factors influenced teams outcomes and, in some cases, undermined the teams future viability. Two of them stand out as the most relevant: existence of external hierarchies and ownership of intellectual property.

We can identify two types of external hierarchies that had an impact on teams' behaviors and on teams' outcomes: universities' management and COTEC.

In the following quotations, universities' leaders are presented as majestic, revered personages:

E1(GM) – There was a lady, of 60 to 70 years old, who was a director of their department [at the university]. [The investigators] all followed that lady. Sometimes she showed up at meetings, but she was like a "parental character". [She used to say] "I am here to give [this project] some credibility"

E3(IF) – We had our boss. She was a professor at our university. I was one of her servants.

E3(IF) – [The decision to set the MBAs aside] was taken by our boss. [She said] "No way. We will not keep them". Why was that? Because someone, I believe it was O1(PM), saw our Business Plan and said it was very poor, very childish. So [the MBAs] were immediately dismissed.

This observation clearly supports Denison et al (1996) view that, in CFTs, loyalty can be oriented toward outside leaders and/or organizations.

COTEC also played an important role, by suggesting that investigators should let MBAs leave the teams right after the end of Phase 1, as one can see in the statements below:

F1(GM) – In some other groups, COTEC was very firm by saying "MBAs, now leave".

E1(GM) – There was an external influence that [changed the investigators' minds]. It was O1(PM).

D4(IM) – [Team A's project] went very well. The guys put together the company. But the MBAs were dismissed, not because of internal divisions, but by those who came next [COTEC].

A1(GM) – There was some pressure from COTEC so that [the project] wouldn't go on with us [MBAs], but with their people instead.

It is interesting to see that, in some teams, investigators erroneously believed that they had the authority to make promises to the MBAs regarding their future participation in the company. In fact, many of them did not own the patents and thus had no real decision power.

Why did this happen? There seems to be some confusion about "technology inventor" and "technology owner". In most companies and universities around the world, technology belongs to the organization that is funding the research, not to the researcher. The fact that many of these investigators were not aware of this may support the theory that researchers contemplated in this study tend to be unfamiliar with the "outside world". Next, I present a few examples of participants' views:

A1(GM) – They didn't have the authority to say "you will belong to the company" because, most likely, they didn't own the patent themselves. That created those conflicts. We had assumed that the company would be ours as well, and that our opinion would count, but after all they didn't have the power to give us the power.

F1(GM) – The so called founding researchers' leader said "if you want, you can stay with us". But in the meantime, the project got stuck, because of patent ownership

issues. Several projects are still stuck due to intellectual property problems. That is unbelievable, that is very bad.

E2(IF) – Noticing their enthusiasm, the professor used to say "they are really nice guys [...] and they will be part of the company". But, of course, the Institute is the patent owner. The Institute defines the strategy. As a matter of fact, the professor is no longer the leader. We can't say anything; we have no decisive role whatsoever.

5 Discussion

This study is a first step towards understanding the dynamics of cross-functional teams. Taken as a whole, the results of this research are consistent with recent studies about CFT's, namely those of Denison et al (1996) and Webber (2002). Many characteristics specific from CFTs, mentioned by these authors, were found in the present study. For example:

- There are high levels of pressure and conflict;
- Members are highly competitive individuals who pursue their own goals over those of the teams;
- Members have different goals and values;
- Each member has obligations in a hierarchy exterior to the team (multiple reporting);
- Members participation on more than one team affects time allocation to the CFT;
- Decision-making is either consensual or performed by a leader.

In this section, I will review the patterns that were identified in the results and I will try to find causes for group failure. I will also discuss how these patterns support or contradict both traditional literature and the proposed value-model. And finally, I will point out a few variables that, unlike expected, did not reveal any patterns

When assessing the teams' outcomes, it was assumed that teams' tangible outputs were roughly the same (the same number of deliverables, of similar quality, in the same period of time). Thus, "success" and "failure", in the scope of this study, were defined based on other dimensions. Noticing that the participants themselves have demonstrated a quite good awareness of how successful or unsuccessful groups had been, I have classified as **successful** the groups that were regarded as such by its own members and members from other groups. Also, I have classified as **failures** the groups that were regarded as such by its own members and members from other groups. The proposed definition of team "value" includes these intangible dimensions, which I named "internal satisfaction" and "external satisfaction".

So why did some groups fail? A few possible causes for failure are presented below.

First, at least one member displayed an **arrogant attitude**, believing he or she knew everything, thus having nothing to learn from other members. It was pointed out by some

participants that these arrogant members usually had some knowledge and prior experience on the other team members' field, which was considered more harmful than helpful.

Second, there was at least one member who would manage conflict in a **competitive** manner. This element was often described as a problematic person and was considered responsible for team dysfunction. Hackman (2004) recognizes the existence of such **destructive people**, which he appropriately names "team destroyers", while advising that sometimes teams unduly pick "scapegoats" to explain failure. As he puts it,

We have to recognize the existence of "team destroyers" – people who will undermine any team you put them in. Such people may be so unskilled in working collaboratively with other people, or so individualistic in their focus, that they should be invited to make what may be an excellent contribution to their organization as solo performers.

However, there are many fewer such people than one might think. The reality is that, when teams encounter problems, or things aren't developing smoothly, team members frequently engage in a process of "scapegoating". They will pick on an individual to whom they assign personal responsibility for the difficulties. That person may then be labeled a "team destroyer".

Nevertheless, considering that the majority of team members agree in what concerns problematic elements, I believe we are not facing a "scapegoating" situation.

Third, an obvious correlation between team failure and relationship conflict was observed. These results are consistent with the general belief (Cunha et al 2003) and with the report of Jehn (1995) who concluded that "relationship conflict is detrimental regardless of the type of task the group was performing".

I observed that all the teams, even the successful ones, experienced significant amounts of task-conflict. This result contradicts the opinion of De Dreu and Weingart (2003), who stated that both task conflict and relationship conflict are equally disruptive, but supports the more generally accepted idea that small amounts of task conflict are beneficial.

The introduction of the value-based model challenges the notion that relationship conflict and frustration always affect team efficacy and team efficiency, since the model allows for situations to occur where a variation in members' satisfaction, although having an effect on team value, does not disturb performance.

This study strongly supports the proposed model, because a set of groups with approximately the same levels of efficacy and efficiency, and with very different degrees of member satisfaction (directly related to team conflict) was identified.

Team success, in the scope of this study, was defined based on people's perceptions and therefore is closely related to member's satisfaction. By applying the value-model to this project, we can say that successful teams displayed the same performance as failed teams, but had a higher team **value**.

Unsuccessful teams also displayed other common characteristics, although they cannot be considered causes but rather symptoms of dysfunction. For example, only members from failed teams **behaved emotionally** or used **depreciative language** during the interview, which supports the idea of high levels of dissatisfaction. Also, decisions were not taken by discussion and consensus, but rather in an **autocratic way** (or not taken at all). Some participants resented the autocratic leadership style, because it was not backed by an hierarchical organization.

The concept of **leadership** in this project is hard to understand and categorize. On the one hand, the project's methodology required that all the teams selected a team leader. On the other hand, some of the elected leaders were either ignored, or used as nothing more than the team's spokesperson. They had no real power to make decisions. In most groups, either autocratic "de facto" leaders emerged, or decisions were taken in a democratic manner.

Some authors believe there is something paradoxical about a leader being elected. Heinlein (1980) wrote: "A leader leads, he does not ask for votes. He can resign, die, or be defeated in a mutiny and hung. But if he depends on votes, he is not a leader: he is a politician".

Griffin (1997) cited by Sarin et al (1998) asserts that selection of an effective team leader is critical to the success of the team and, therefore, most team leaders are appointed by senior management rather than being elected by the team. I believe the results of this study tend to support this view.

Observed patterns indicate that several external factors, while not directly related to group failure in Phase 1, can be held responsible for undermining team's **future viability**, such as **academic supervisors** or problems related to **patents'** ownership, that thwarted teams' progress toward setting up a company.

Other patterns were detected that point to clear class/cultural differences between MBAs and investigators. Some of them affected the communication between classes and influenced the team's outcomes, others did not.

Among the aspects that have played a role on teams' level of success, I identified **conflict management style** and **level of global vision**. For example, the majority of the investigators employed an avoidant behavior when dealing with inter-personal issues and,

5.1 Implications for future research

The main goal of this work was to provide clues for future research. As such, the proposed value-based model and the final conclusions are nothing more than a basis for further investigation. Their validity must be established by future studies with larger samples and a statistical handling of data.

Given the potential utilization of CFTs in industry, to promote innovation and problem solving in complex situations, the deeper understanding of the dynamics that lead or leverage team value for organizations, is needed.

Some of the research questions to be analyzed include the role of emotions and emotional intelligence in group value. To what extent is emotional intelligence as an individual competence affect success? Is it possible to develop emotional intelligence at group level? What impact may teambuilding activities have?

Another subject of research concerns the constitution of the teams, namely in terms of having a balanced mix of diverse roles, as defined by Belbin (1993) cited by Cunha et al (2003), or even the impact of gender and age.

This diversity of team members is another important question. Should teams be as diverse as possible or should there be 'harmony'? Hackman (2004) seemed to clearly favor the first, when he said:

A team cannot derive the real benefits from being a team if all team members are the same whether demographically, or in terms of their knowledge base or skills repertoire. To derive real benefits you need diversity. One of the most common problems in teams is that people aspire to be "comfortable" with one another, believing harmonious relations are a facilitator of team performance (which they are not).

Finally, the impact of time on people's views of past events may be questioned. Although this has certainly been a significant event in the participants' lives, there appears to be some distortion of the past, and some individuals assume as facts things that are nothing more than perceptions.

5.2 Implications for practice

Most participants believed their participation in the program had been positive. However, all of them were convinced that a few aspects should be improved. Next, I present, in decreasing order of importance, some recommendations for future editions of the COHITEC program.

Intellectual property

In some teams, despite the existence of good relationships among members, work progress eventually got stalled, because patents did not belong to the investigators. That situation was only discovered near or after the end of Phase 1. Moreover, members that had no rights whatsoever over the intellectual property acted as if they did, by promising other members a share in the future company.

Thus, COTEC should ensure, prior to the project's beginning, that the intellectual property of the involved technologies belongs to one or more of the team members. If it doesn't, the owner of the intellectual property or someone who represents the owner should be involved in the project.

Expectations management

We have seen that both MBAs' and investigators' experiences did not live up to their expectations. On the one hand, MBAs were expecting to have a share of the future company; on the other hand, investigators were expecting that MBAs were more knowledgeable and fully capable of helping them to create the business plan. In most cases, the decrease of those expectations led to feelings of resentment and frustration.

COTEC should improve expectations management, by clearly explaining to all participants that: MBAs are in fact MBA students, and thus, with limited knowledge and business experience; MBAs will not be part of the team after the end of Phase 1.

Team-building

In most teams, but above all in CFTs where some members are noticeably short on social skills, it is useful to promote some kind of team-building activity, in the beginning of the project. Team-building is a planned set of activities, with an entertaining side, that improves

communication, strengthens the ties, fosters the notion of common goals and develops trust among team members.

COTEC should promote team-building activities before the project's start. That would also help to reduce the uneasiness some participants felt when, in the first work session, they were required to designate a team leader among a group of people they hadn't previously met. Team-building activities should be mandatory, since, as it can be seen in the statement below, spontaneous initiatives by some team members were considered a waste a time and rejected by others:

B1(GM) - MBAs made a couple of attempts [to improve the team atmosphere], by inviting the investigators to join them in social events, but this was rejected by the investigators. I believe that would have helped a lot!

Investigators approach

Technologies were submitted by universities, under invitation by COTEC. All the contacts between COTEC and the universities were very high-level. The universities' top management then selected a number of researchers, thought to be more available, to participate. Many of these researchers felt unenthusiastic about the project and their attitude affected daily tasks.

COTEC should individually examine all the candidates and select those that have a real drive to participate.

5.3 Limitations of the study

This study was performed on a single project, with a limited number of groups and in a semi-academic environment. Thus, results must be interpreted with caution and some conclusions may not be valid in different contexts.

One of the biggest challenges of the research was on how to manage and systematize a reasonably high quantity of qualitative information, resulting from approximately 24 hours of recorded conversation. After dividing the transcript text into small semantic units, the master table had more than 2500 cells, each containing a piece of information. Whenever possible, similar statements were grouped together, but that still left out many spontaneous assertions that might have provided interesting leads. Also, focus on open-ended questions and "conversation-like" interviews, although useful for raising new issues, left some questions unanswered and made results comparison difficult.

The questionnaire was designed assuming that participants had “static” opinions, attitudes and behaviors in the course of the project. During results analysis, it has become obvious that all these variables changed during the project, which is consistent with existing literature.

The abovementioned limitations suggest that Denison et al (1996)’s approach – an iterative method with several rounds of interviews – is more appropriate to this kind of studies. That methodology was not used in this work because of time and scope restrictions.

Surprisingly, a couple of participants declared that this was mostly an academic project, and suggested they would behave differently in “real life”. Statements illustrating this situation are presented below:

D2(GM) - He [...] said "Let the kids do whatever they want. And later, when the business is authentic, the knowledge is mine!"

D3(IM) - Decisions were [taken] by majority, but that was a simulation... The project was a simulation! In a company, decisions must be taken... it can't be that simple.

This opinion is far from being unanimous and it is possible that these participants were trying to find justifications for their team’s failure. Nevertheless, it might be questioned if all the results of this study can be extended to the outside world.

Also, despite a time gap of no more than six months between the project and the interview, one participant asserted (several times) that two years had gone by. Others showed obvious confusion about their own team’s structure and number of elements. This supports the idea that interviews’ answers are based on recollections of interviewees’ past perceptions, which should not be treated as facts.

Finally, although the work has been peer-reviewed, both by MBAs and investigators, there is the possibility that some results were affected by the author’s bias, due to the mostly subjective nature of the analysis.

6 Epilogue

This study unveils some characteristics of the group process in cross-functional teams, which were created for a special temporary purpose, in a specific academic context. Although the patterns discovered may be difficult to generalize to the life of cross-functional teams in an organizational context, interpersonal relationships emerged as a crucial determinant of failure. For that reason, and as an epilogue, the following quote remains as the last paragraph of this study:

E3(IF) – I said "I quit! I can't go on like this". Then the silly woman started to scream, hysterically, "ahhhhh, but why?". So I grabbed her, because she talked talked talked, and I said "I'm sorry, it's impossible to have a conversation with you!" And she stood there, dazed. "I can't work with you, I can't work next to you!" So I quit! And I left. And that was the end.

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Attachment

A1 - Interview script

The following script was used as a basis for discussion. An effort was made to let the conversation flow naturally, so that interviewees would feel free to talk about any other issues that were important to them. Interviews were performed in Portuguese language.

Group structure:

- Please describe the group structure, mentioning the number of MBAs and investigators, members' roles and structure changes during the project.
- Was there a team leader? If so, was he/she a "de facto" leader? How was he/she chosen?

Decision making process:

- How were decisions taken?
- How were disagreements overcome?
- Do you believe your process was effective (goals were attained)?
- Do you believe your process was efficient (goals were attained in the quickest way)?
- Could your decision making process be improved?

Conflicts:

- Please give examples of the following situations:
 - One problem that was successfully overcome;
 - One problem that was never solved;
 - One conflict situation, its causes and its consequences. How could it have been avoided?
- Do you think conflicts were primarily due to "class" characteristics (MBAs versus investigators) or to members' personality traits? Why?
- Did you try to use socializing events, beyond work sessions, to improve intra-group relationships? Do you think that [helped / might have helped] to enhance the team's functioning?

Goals:

- Do you think there was a common goal?
- Do you think that each member had his/her personal goals?
- In what way did those personal goals affected the attainment of the common goal?
- Were those goals (common and personal) achieved? Why or why not?

Comparison with other teams:

- Did you notice any differences between your team and other teams from the same program? Please explain the observed differences.
- Did you notice any differences between your team and other cross-functional teams where you have participated in the past? Please explain the observed differences.