

RAPPORT
MTR 871 – LECTURES DIRIGÉES

by

Tais SCHERER

GÉNIE DE LA CONSTRUCTION
PROGRAMME MAÎTRISE AVEC MÉMOIRE
DIRECTEUR DE RECHERCHE: DANIEL FORGUES

ÉCOLE DE TECHNOLOGIE SUPÉRIEURE
UNIVERSITÉ DU QUÉBEC

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1 INTRODUCTION

This report is the reunion of key elements that pass through the references indicated as mandatory for the course MTR 871 - *Lectures Dirigée*, plus some complementary references added later. The objective was to explore the concepts of BIM and stakeholders, identifying how these concepts influence each other through the investigation of three proposed dimensions: 1) the concept of stakeholder management from a project perspective; 2) the application of this concept in construction; 3) how BIM can affect stakeholder relationships in a project. Another dimension was later added, to establish the link between those key elements found on these readings to the focus of the program research: 4) the airport perspective.

To the first topic, most of its elements were extracted from Pryke & Smyth and Bourne, from the mandatory reading. Besides them, it was added some concepts extracted from PMI, Carroll & Buchholtz and Kerzner & Saladis. At this topic, it is discussed the relationship approach to project management and the importance of project stakeholder management to run project successfully. Concepts like the human aspects of project environment, its relationships and how trust and values can improve it, take place. Thus, are discussed aspects from the relations between project goals and its stakeholders, like expectation, influence, conflict and impact. To finalize this topic, another important point is highlighted: how emotional intelligence can affect communication amongst stakeholders to engage them to project objectives and to deliver successful projects.

To the second topic, the main references were Pryke & Smyth, Ray, Atkins & Skitmore and Azouz *et al.*. The construction industry was reviewed in this topic and how it communicates amongst its multiple stakeholders to engage them on the project goals. Also, it was discussed about the industry performance and how collaborative environment can improve it.

To the third topic, the main source was Ray. After discussing BIM concept, highlighting the benefits BIM can bring to construction industry, he states that it is possible improve its

performance through generating better quality of information. It is argued that a collaborative environment, where the human aspects are considerate, is the best to implement BIM.

The last topic was written considering all elements discussed on the previous topics under the experience of airport projects by the author. After a brief consideration about the characteristics of airport construction projects, was discussed how concepts like relationships, trust and commitment can interfere on it. Besides, communication and information were related to the project success and how BIM can be a strong strategy to deal with this environment to achieved project success.

At the conclusion, all these concepts are joined together and aligned to the idea of how the implementation of BIM can improve stakeholder management, especially at airport construction projects. A deployment is proposed as well, adding another element to this understanding.

2 THE CONCEPT OF STAKEHOLDER MANAGEMENT FROM A PROJECT PERSPECTIVE

2.1 Stakeholder management concept

The project can be a solution for a social or organizational problem, a policy or a strategy, or part of a program. The conceptual approaches to the management of project development are summed as the traditional (techniques and tools), the functional (strategic), the information processing (input-output model) and the relationship (a paradigm of project and client satisfaction) (Pryke and Smyth, 2012).

For the traditional approach, there is an artificial internal separation between organization departments, *“where professional norms and expertise rather than the client requirements guide decisions”*. This traditional project definition *“operates in a dysfunctional way unless a relationship dimension”*, is added (Pryke and Smyth, 2012).

Traditional project management refers stakeholders as separated groups, categorized by its projects roles and without interaction between them. The new approach of relationship considers the relations between stakeholders as strategic (Cova and Salle, 2012). *“A relationship approach offers enormous opportunities for enterprises to invest in the means to be more efficient and more effective, and to differentiate their services, thus achieving competitive advantage or a niche position”*. Then, the project can be part of a wider range of strategic activities, a set of relationships within the project, or a set of social relationships across a network (Pryke and Smyth, 2012).

In practical terms, project management is carried out to meet the needs and expectations of stakeholders towards the product or service of a specific project. Recently, has been noticed an increasingly growing concern in the business world: with whom we do our business, for whom, for what purpose? Became clear that is not enough anymore to analyze numbers and trends to run successful projects. It is urgent to understand the human nature of the project and how it interferes significantly in the success or failure thereof (PMI, 2013).

The concept of stakeholder's management includes the processes required to identify all people, groups or organizations that can impact or be impacted by the project, analyze the expectations of stakeholders and their impact on design and develop appropriate management strategies for effective stakeholder engagement in decision-making and implementation of the project (PMI, 2013).

A project only can exist with the consent of its stakeholder community, which are individuals and groups with different potential to influence project objectives in a positive and or negative manner. Identifying the key stakeholders is the way to target the right ones that must be provided with the right level of information in the right time in the project life cycle. Relationships with all kinds of stakeholders are essential for corporate success as they can be benefited or adversely affected by its activities (Bourne, 2005).

The concept of project as a temporary organization means that it has its own culture and structure. Besides, its stakeholders will have different project visions, both supportive and antagonistic. Grabher states that this *“transient nature and limited duration of project-based endeavor require additional effort to build effective project teams and generate trust, both within the team and between the team and the project stakeholders”* (2002, apud Bourne, 2005). This additional effort makes stakeholder management be conceived as engagement management, where the focus is in understanding the group of key stakeholders and how to manage this relationship throughout the project. *“Managing a project is about managing uncertainty, and managing the resulting resistance of many stakeholder groups due to their anxiety about the consequences of the change”* (Bourne, 2005).

2.2 Human aspects

The engagement processes are carried out by a continuous communication, focused on understanding their needs and expectations in order to manage possible conflicts of interest, and encourage the commitment with the objectives of the project, and contributing to its success. The engagement management is concerned about the human dimension of this element, stakeholders, to understand their role and their needs and how to gain and maintain their support for the project. In this new understanding, we value the role that each person /

group / entity may have in the success or failure of the project, and seeks to suggest good approach to the subject.

Note that the development of project management methodology is not enough to conduct successful projects, nor the acquisition of appropriate tools and technical staff training, since methodologies can increase the chances of success, but its use does not guarantee the successful delivery of a desired product or service. The methodologies are tools and, as such, they do not manage projects. The projects are managed by people in the same way that the tools are handled by people. The methods do not replace the person component in project management. However, they are intended to improve the people's performance (Kerzner and Saladis, 2011).

In a corporate and project environment, relationships are human, organizational and information systems contexts in which personal relations are signed. Relationships can be managed and its quality is a key element in the success of a project, as both behavior and attitude can affect project performance (Pryke and Smyth, 2012).

“People are certainly one key focus because the human relations between them are important in the effective and efficient delivery of a project or projects”. As the same time people are wonderfully creative in create complex tools and systems, they behave in difficult and unpredictable ways, because of their character traits. *“Behavior in a project setting is seen through interaction – a social activity. Interaction that is more than a brief encounter, or that is longer lived, is a relationship”* and this approach should be recognized as the basis of strategy for managing projects because the project success depends on it (Pryke and Smyth, 2012).

2.3 Relationships

Since *“stakeholders are very varied and act differently throughout the project cycle phases”*, after recognizing who the stakeholders are, the dominant idea about when starts communicating with them is on the very project beginnings (Cova and Salle, 2012). *“In principle, no party affected by a given decision should be excluded and all participants*

should have equal possibility to present and criticize validity claims. Participants should be as representative as possible” (Flyvbjerg *et al.*, 2003, apud Cova and Salle, 2012).

The common goal-oriented focus of team members rises advantages as the value of its relationships and how it can be developed naturally, besides the high degree of trust in each other they must get to achieve their objectives (Kumaraswamy and Rahman, 2012). Amongst other factors, an effective teamwork should be a result of good leadership, commitment, shared vision, a sense of common ownership, an open exchange of information, honesty, frankness and trust. Successful teamworking will present a wider range of ideas, more effective response does change and more efficient use of resources (Construction Excellence, 2004, apud Kumaraswamy and Rahman, 2012).

The different challenges that every new project present cannot be known or anticipated, which will be difficult to overcome without constructive relationships between customer, team and other stakeholders (Druskat and Druskat, 2012).

Project manager, despite being the leader of the project team, may have no formal power over stakeholders and must rely on an ability to cultivate relationships and use influence strategies to achieve project objectives (Bourne, 2005). Then, *“create an environment in which quickly building relationships and trust with a diverse group of people is fundamental to job success”* and *“it is particularly useful when actions and decisions involve others”* (Druskat and Druskat, 2012).

2.4 Values and Trust

To understand how worth a relationship can be to client and contractor, it must be understood how it can add value to a service for the client and how this value is transformed into profit for the contractor. Value added is the value created through the production process and delivery. Added value is the value that exceeds values added, it is what arises through competition addressed by a differentiated strategy market approach, in opposing to the low cost marked approach. *“It is people who add value, and people working together are more effective. People and teams are assets, their value realized through relationships at many levels of operations”* (Pryke and Smyth, 2012).

If people add value, the trust between them can also *“adds value through incentives or governance, increases the value of personal or corporate relations, adds value through all forms of scarce knowledge, and through the perceived reliability of corporate systems in the exchange process”* (Korcynski, 2000, apud Smyth, 2012). Besides, *“it is demonstrated that trust is linked to financial issues through better business performance from working in teams across organizational boundaries”* (Swan et al., 2001, apud Smyth, 2012).

There is no agreement amongst all different trust definition, but they agreed that trust arises from all the relationships experienced, pointing out that each one of that are different. However, it is known that to manage trust as competency, two steps should be achieved: if one of the parties is ready to trust, even unknowing the other party's intent (it means, with willingness to be vulnerable) and the reaction of the second party about taking advantage of trust given or be trusting as well (Smyth, 2012).

Also, *“trust is a disposition and attitude, giving rise to a belief, concerning the willingness to be vulnerable in relation to another party or circumstance”*. In a business-to-business relationships concept, *“trust is a disposition and attitude concerning the willingness to rely upon the actions of or be vulnerable towards another party, under circumstances of contractual and social obligation, with the potential for collaboration”*. The lack of willingness to be vulnerable is the primary obstacle to trust development, and it arises *“from fear that other will not look after your best interests and will selfishly pursue opportunistic behavior”* (Smyth, 2012).

The project relationships that incorporate trust are vital to meet stakeholder expectations, create an effective communication, team work and perception of the authority of the project manager (Hartmann, 2002, apud Bourne, 2005).

2.5 Expectation, conflict, influence, impact

If *“stakeholders are individuals or groups who have an interest or some aspect of rights or ownership in the project, can contribute in the form of knowledge or support, or can impact or be impacted by, the project”*, then they have a stake on projects that could be an interest (when they are affected by the project's decisions), a right (a legal or moral right) or

ownership (legal title to an asset or a property) (Carroll and Buchholtz, 2000). *“It is mandatory to consider what a stakeholder’s stake actually is when trying to define expectations or project impacts”* (Bourne, 2005).

The salience is how to manager prioritize competing stakeholders' demands, which means, who deserve or require attention (Mitchell *et al.*, 1997, *apud* Bourne, 2005). Network of influences is the relationship between stakeholder and dyadic tie is the relationship between an organization and each of its stakeholders (Rowley, 1997, *apud* Bourne, 2005).

“The relationship between the project organization and its stakeholders are essential for success (Leana et al., 2000, apud Bourne, 2005) and are the most appropriate way of coping with environmental turbulence and uncertainty” (Bourne, 2005). Stakeholders can contribute with knowledge and support project execution, but demand negotiation to achieve consensus about what should be done and how (Savage *et al.*, 1991, *apud* Bourne, 2005). *“The need to balance the conflicting interests of the organization and stakeholder interests will be inevitable”* (Frooman, 1999, *apud* Bourne, 2005).

The relationships amongst stakeholders and the organization is essential for the success of the project organizations operating within in (Post *et al.*, 2002, *apud* Bourne, 2005) and they need to meet stakeholders’ needs and expectations (Savage *et al.*, 1991, *apud* Bourne, 2005) by identifying groups or individuals that can supply the project with resources, accept risks and affect the project outcomes (Post *et al.*, 2002, *apud* Bourne, 2005).

Identifying the right stakeholders and understand their power and influence on impacting the project or be impacted by it to formulate strategies to maximize stakeholders’ positive influence and minimize the negative ones, is part of the project planning process (Bourne, 2005). At the early stages, the uncertainty of project or product causes different and changing views of it and it may be difficult to them verbalize concerns because the outlines are still relatively vague. *“At this stage, members of the project team must manage their own emotions, and demonstrate empathy and awareness towards the verbal and non-verbal signals of other stakeholders”* (Druskat and Druskat, 2012).

2.6 Emotional Intelligence

“Project managers usually have very little formal power over stakeholders outside the project organization”. To be effective, they must develop ongoing relationships with stakeholders and focus on influence others, specifically when there is no ability to force action or behavior because there is no different power between parties (Lovell, 1993; Verma, 1996; Pinto, 1998; Gadekan, 2002; *apud* Bourne, 2005).

To be successful, the project manager needs both hard and soft skills. *“A successful project manager must be able to balance the requirements of art and craft, of management and leadership within the environment of the project and its stakeholders”*. Hard skills are part of the craft of project management and are the 1st Dimension. The 2nd Dimension is responsible for the soft skills, is described as the art of project leadership and is required to facilitate the application of the hard skills. But there’s a 3rd Dimension skill that requires competencies beyond managing and leading. These skills comprehend the ability to read the power structures of the organization to managing the political environment surrounding the project. *“Part of this skill set is understanding the organizational culture, the power bases operating within them, the expectations and perceptions of important stakeholders, and the development of strategies to ensure their support”* (Bourne, 2005).

“The proactive management of relationships, for example using relationship management or emotional intelligence, can be used to develop trust. Proactive management can increase the level of trust in the relationship” (Smyth, 2012).

The emotional intelligence abilities of read one’s own and others’ emotions can be used to guide thinking and action. In a project environment, because its temporary and progressively elaborated nature, emotional intelligence is even more important than in traditional business environments. These abilities are so important especially because *“projects are generally conducted by coalitions from different organizations, industries and disciplines, each with its own culture”* what makes trust swiftly a constant part of the project manager roles, in order to establish relationships quickly (Druskat and Druskat, 2012).

“Similarly, the project manager needs to facilitate swift and relationships amongst relevant stakeholders in a project. Emotional intelligence competencies such as self-confidence, emotional self-control, transparency and empathy can help a project manager develop trust swiftly and create a working environment that becomes quickly productive” (Druskat and Druskat, 2012).

Transparency is one of the self-management competencies that a successful manager should present. *“Transparency results in trust that increases employees’ willingness to cooperate, collaborate, and engage themselves in their work”* (Goleman, 1998, *apud* Druskat and Druskat, 2012). It is an ability to maintain integrity and to behave authentically and congruently with someone’s values. Manager who presents such competency is seen more trustworthy and can build a productive and emotional environment which presents trust, group identity, emotional capability, group efficacy and networks (Druskat and Druskat, 2012).

These aspects that are not methodologies of project management are part of the 3rd Dimension and can be understood as politics. *“Without formal power, the project manager must to be able to influence people and outcomes; through optimizing coalitions of support”* (Boddy and Buchanan, 1999, *apud* Bourne, 2005).

To influence stakeholders that are not under his or her authority, the project manager needs build trusting relationships that *“requires constant reinforcement of ethical behavior and trustworthiness. Balancing the needs and expectations of a diverse group of stakeholders and managing any conflicts could raise issues of ethics and trust for the project manager”* (Bourne, 2005). To resolve conflicts amongst different stakeholders’ interests, *“the guidance of ethics is particularly effective”* (Carroll and Buchholtz, 2000).

2.7 Communication

It is communication that support a bridge between various project stakeholders and to be effective, the elements of it should be handling (PMI, 2013). The content of the message, the transmitter and receiver of it should be understood and manage properly. *“Poor information*

put in and poor management of the information will lead to problems, hence an information processing approach to project management” (Winch, 2000, apud Pryke and Smyth, 2012).

Communication is a vital component of building and maintaining relationships by stakeholders’ support and commitment. It is a process of information exchange and an activity that consist in defining how, when, what and to whom the information will be exchanged, based on the stakeholder’s requirements (Bourne, 2005).

There are three phases for stakeholder communication: project generation (there is still no project), project inception (project definition phase) and project purchase (the officially exists). *“It is possible to have even more foresight and seek to communicate with certain stakeholders even when it is not yet any project” (Hadjikhani, 1996, apud Cova and Salle, 2012).* This communication approach put focus on the independent phase, when there is no project at all (Cova and Salle, 2012).

Stakeholders communication is an action throughout all three project phases with the large milieu group of actors. Project stakeholder communication is a work done by the relationships of all company members with several socio-economic players acting either direct and indirectly (Cunningham and Turnbull, 1982, *apud Cova and Salle, 2012*). Communication with project stakeholders starts with interpersonal relations and all the members of the staff have a part to play in the company’s communication process, even extended staff (friends, families, groups) also participate in the project stakeholder communication. *“Indeed, interindividual relationships in a professional context are controlled less by opportunism for short-term egoistic interest than by confidence for a mutuality of long-term interest” (Cova and Salle, 2012).*

2.8 Engagement

The key project management are soft skills, like stakeholder identification, management and engagement, because it requires both intuition and a strong capacity of analysis (Atkins and Skitmore, 2008). Those skills can be developed through the emotional intelligence from the 3rd Dimension stated by Bourne (2005). Through it, an *“improved stakeholder engagement can help with managing their expectations, reducing unforeseen risk and unleashing positive*

energies or reducing negative actions or reactions that have potential impact upon project success” (Rowlinson and Cheung, 2008, apud Atkins and Skitmore, 2008).

The management of engagement is also an essential part of a risk management plan, identifying the stakeholder’s risk tolerance, levels of support and expectations of the project. Risk management understood as a behavior and its different risk tolerance positions, is an important aspect for developing appropriate stakeholder management strategies since *“unmanaged risk is a major cause of project failure which can impact any or all of the project’s stakeholders” (Bourne, 2005).*

“The project manager must exhibit exceptional leadership qualities to establish an environment that engenders trust, and therefore commitment, between all members of the team and, also, between the project team and its stakeholders” (PMI, 2011, apud Bourne, 2005). Commitment is an essential ingredient for success. It's about involvement, loyalty and a belief in the values of the organization. It’s the application of trust and implies a sense of obligation and responsibility to do the right thing (Burgess and Turner, 2000; Etzioni, 1961; Meyer and Allen, 1997; *apud Bourne, 2005).*

2.9 Success

Project is a temporary effort to do or to create something unique, with specified duration, cost and performance, which lead to uncertainty and complexity. Project management needs to balance all relations between project and its parts, other projects, even with the organization. This uncertainty turns project environment so complex and deal with this is what defines successful project management (Turner and Muller, 2003, *apud Bourne, 2005).*

Managing the needs and expectations of project stakeholders, within an environment of uncertainty and ambiguity is one of the influences on project success. On temporary knowledge organization, such a project organization, there’s no predictability and success can be understood as the ability to manage within a complex and chaotic environment. The project's success or failure depends on the project manager capability to manage the stakeholders’ expectations and perceptions of project’s success. When projects fail,

stakeholders will be impacted negatively, as the performing organization as well, once the project objective are part of its strategic (Bourne, 2005).

There are three elements of project's success: delivery of value, management of risk and management of relationship. *"Delivering value requires managing project relationships and managing risks by ensuring that the expectations of all stakeholders are met with regard to what is delivered as well as when and how"*. The triangle of dependence focus on the human aspects and the variety of stakeholder success perception, that *"are not necessarily based on logic, but often on the quality of the relationships between the project and its stakeholders"* (Bourne, 2005).

The project success depends on the three categories, delivering value, managing relationships and managing risk, but in the center of them are the stakeholders. One of the three categories of project success is building and maintain project relationships, which is to provide accurate, timely and focused report to project stakeholders, balancing conflicting their needs and wants. The perceive project value should be understood by the project team to be align with project management *"and the performance metrics to the expectations generated from these perceptions or to negotiate within the relationship to align expectations with feasible project outcomes"* (Bourne, 2005).

3 THE APPLICATION OF STAKEHOLDER MANAGEMENT IN CONSTRUCTION CONTEXT

3.1 The industry

The true core of the construction industry is the projects, it is where the big changes are made. The overall complexity of buildings tends to increase with the size, and with more companies joined to the project, more complicated to manage it. Consequently, innovations also tend to happen more often in larger projects than in smaller ones (Ray, 2013).

In the last 50 years, the industry has modified its image of resistant to change and after IIWW starts to standardize, reduction the use of craft-based working and replaced it for low-skilled but very specialized workers. The main contractor became a manager of many sub-contractors and its specialist really do the work, growing conscious of health and safety for workers. The architect became focus on the design, with the design for craft work disappearing and manufacture and assembly became predominate. The construction site will become in the future highly controlled, industrial assembly site, that will look like more a factory. As *“the role of the main contractor continues to be procured, facilitate and coordinate the subcontractors”*, the emphasis of management *“will be on maximizing production rates and on optimizing the productivity of individual work crews, enabling “the individual specialists to perform as efficiently and as productively as possible”* which will be the measure of project success (Ray, 2013).

3.2 Multiple internal stakeholders

In the past, the major contractors were responsible for the great majority of work, but today, they simply coordinate subcontractors, this means, manage stakeholders. It is a return to the past, when the constructions were made by smaller contractors and their relationship between organizations was based on a trust network. This large number of separate trades and its complexity interface between them demand very high levels of skill to organize and coordinate (Ray, 2013).

The definition of stakeholder management for the construction industry is evolving to integrate issues as uncertainty, risk, ethics, empowerment and sustainability. *“We are dealing with a key concept in construction project management today”* (Atkins and Skitmore, 2008) and deal with such a complex environment evolving many stakeholders is the biggest concern to run successful construction projects.

Construction project has *“clear objectives - high definition of output, and clearly defined processes to achieve them, demonstrated by a high level of structured role definition and the application of knowledge based on previous experience”*. To manage such a project, *“the project manager must integrate the work of many specialist team members, and maintain procedures for measurement and control throughout the project”* (Bourne, 2005). The result is that *“managing stakeholders is thus a critical skill for construction project team”* (Vintenn 2000, *apud* Atkins and Skitmore, 2008).

Stakeholders can be divided in internal (those directly involved in the decision-making process) and external (those affected by the project activities). *“In construction, there has traditionally been strong emphasis on the internal stakeholder relationship”* (Atkins and Skitmore, 2008) and much of this emphasis derives the important need for understanding how to manage such a complex workflow, as *“the construction industry is formed by fragmented teams and its multi-disciplinary nature”* (Latham, 1994, *apud* Kumaraswamy and Rahman, 2012).

The social dynamics of a typical project team are complex and subtle and its member's attitude is almost always positive. Respect and status in modern project teams must be earned and every member knows that their success depends on the performance of others. They know that they need to collaborate to succeed. The key challenge is the creation of a complex, dynamic organization, which must become capable of managing safely big amount of money in its very beginnings. Once the project starts and the project team is running, they're responsible alone for every decision on the project and they will report to the head office weekly or monthly. This discontinuity of communication between head office and the project team is the cause of the lack of company learning from its projects, just because there's no structured information form to save all data from projects (Ray, 2013).

3.3 Communication / Information

The industry multiple cycles of repetitive data distribution are poorly coordinated, fragmented and distributed throughout a project network. The poor managing information flow is one of the keys amongst the communication problems between team members in construction projects. The complex web of links amongst the firms and disciplines engaged in the project is *“too difficult to manage in an effective and efficient manner”* (Azouz *et al.*, 2014). This is the biggest problem about managing internal stakeholders.

Another issue about information concerned to external stakeholders is the content and quality of it, because many of them *“are like to have conflicting interests in a decision’s outcome, adding a strong political/bargaining dimension to the decision as to how much information to provide”*. Some of the cause of construction industry poor record of stakeholder consultation on its decision process (Moodley and Preece, 1996, *apud* Loosemore, 2012) could be the vast number of stakeholders involved, the difficulties to them in participating effectively and decision makers’ lack of resources for meaningful consultation or knowledge about how to do it. Then, without any positive signal from stakeholders, decision makers only see problems in involving them (Loosemore, 2012).

If neither focus on contracts, neither on people worked to improve predictability and profitability of the industry, it's time to attend to the third component of communication: the nature and quality of the information used in construction. Higgin and Jossep focus on organizational structures and information exchanges, suggesting the reverse of Latham hypothesis: *“projects don’t fail because people are defensive and confrontational; people are defensive and confrontational because projects fail”*. This means that the industry fails because its insistence in doing complex achievement using incredibly poor quality and untrustworthy information (Ray, 2013).

3.4 Engagement of Stakeholders

“Of particular importance in securing stakeholder acceptance was information relating to the goals, hazards, alternative designs and risk mitigation strategies being considered” (Burby, 2001, *apud* Loosemore, 2012). The stakeholder beliefs are as important as data

related to risk, because people have a stress respond to risk even if they just think they were exposed to it. Then, it is not *“just the perceived level of danger that is important but the perceived degree of control over the danger. A lack of control over a situation is enough in itself to initiate a seemingly irrational behavior response”*. Poor quality and untrustworthy information leads to an unreal risk perception by stakeholders, which can lead by itself, a negative response. *“Access to adequate and appropriate information is essential to empower stakeholders and enable them to contribute effectively to the risk management process”*. With more types of information provided by planners in the development phase, easier would be for the community to accept projects prepositions (Loosemore, 2012).

The conflicts between organizations and its stakeholders are not eliminated by the understanding of how people think about risk, what shapes their perception and how best to manage them. But it offers an opportunity for people became part of the solution rather than the problem. *“... in a democracy society, all stakeholders affected by a development have a right to be considered in the decision-making process affecting their interests”*. The failure to understand the public perception of risk turns the manage risks ineffective and can even magnify it (Renn, 1996, *apud* Loosemore, 2012). *“The project management team needs to understand and manage risk as perceived by project stakeholders”* (Loosemore, 2012).

3.5 Performance / Collaboration

“Successful completion of construction projects is dependent on meeting the expectation of stakeholders throughout the project life cycle” (Cleland, 1995, *apud* Atkins and Skitmore, 2008), and on the other hand, *“the fail of the project management teams to address the concerns of construction project stakeholders has resulted in countless project failures”* (Bourne and Walker, 2005, *apud* Atkins and Skitmore, 2008), *“primarily because construction stakeholders have the resources and capability to stop construction projects”* (Lim *et al.*, 2005, *apud* Atkins and Skitmore, 2008).

As an important sector of the economy, the construction industry performance is a matter of national importance. Some aspects that affect negatively the industry performance are the dislocation between design and construction, the strategy by short-termist thinking, the design information bad quality, lack of management skills (Murray and Langford, 2003, *apud*

Ray, 2013). The most important recommendation to face industry poor performance is to reduce confrontational attitudes amongst its players – stakeholders – and instead embrace collaborative methods of working (Construction task force, 1998, *apud* Ray, 2013).

The defining characteristics of the modern construction are its inability to completing projects predictability (on time, budget and expected quality) and the chronically low level of profitability. Some small improvements had been made in certain areas of the industry's performance, but not on cost and time. It's the case in any company, regardless of project size or mode of procurement (Ray, 2013).

Unpredictability effects are: schedule overruns result in direct loss of profit to the contractor and this process disrupted good relations with clients and can be downright confrontational; distressed clients that became reluctant to repeat the experience. These two effects hit the industry twice: first, by direct impairment of margins caused by overrunning projects, and second, by the loss of business volume caused by disaffected clients (Ray, 2013).

Much of the poor performance on construction industry can be addressed on the tradition form of contract, which waste time and energy on the inter-organizational interface management and the many disputes between various contracting parties. *“Collaborative working in design and construction can reduce waste, cut cost, rationalize processes and promote a working culture of trust and high performance”* (Kumaraswamy and Rahman, 2012).

On the other hand, news forms of procurement as Relational contracting (RC) include common objectives, more collaborative approaches and a healthy dose of joint risk management (JRM) (Kumaraswamy and Rahman, 2002a, *apud* Kumaraswamy and Rahman, 2012). RC principles and JRM practices can empower proactive procurement and project delivery strategies, aiming at a long-term vision, and a more holistic teamworking mindset. RC can also reduce *“transaction cost in the longer term, and promoting cooperative relationships that in turn facilitate joint risk management, and thereby improve productivity and reduce disputes”* (Kumaraswamy and Rahman, 2012).

“Multiple stakeholders are involved at different stages of a project, and deliver multiple pieces of information across the project network. These temporary project networks are seen as continuously transformed (Linderoth, 2010, apud Azouz, et al., 2014). This results in multiple issues around collaboration, which has been identified as one of the main factors for the low productivity and ineffectiveness of the construction industry (Keruso et al., 2012; Hensel et al., 2006; apud Azouz, et al., 2014). Consequently, there are problems in finding affective means for communication and coordination of activities to support collaboration in the AEC industry that are seen as essential for project realization” (Kocaturk, 2013, apud Azouz, et al., 2014).

4 HOW BIM CAN AFFECT STAKEHOLDER RELATIONSHIPS IN A PROJECT

4.1 Low performance of industry

Problems using drawings and conventional design communication tools arise when requires judgment or interpretation of the recipient: client and his stakeholders, design team and construction contractors. The client and his team do not have the ability to read the drawings and by not understanding the documents, both architectural details and spatial arrangements, causes an uncertainty that introduce delays and revisions which reverberate throughout the entire design effort. The efficiency of the design process is undetermined, and the potential profitability of all firms is impaired (Ray, 2013).

When architectural design needs to go to the supporting disciplines, the common errors of re-entry data or even when it's used a shared CAD drawing, have a huge impact on efficiency of the design process and impairing the profitability of the overall design effort. Besides, another problem with drawings in design production and administration is the waste of time for senior designers by checking the drawings made by the team, it's a burden for the members of the design team and it does not add value (Ray, 2013).

The problems with the design phase cause disruption and delay to the design program which has its consequences on the subsequent procurement and construction phase. Besides, if the object understanding relies on visual observation, everyone can obtain a different understanding, causing errors in interpretation of the content of the design documents and consequent inefficiencies in the basic operations of the industry (Ray, 2013).

Poor information in project management is the cause of the industry's strategic, predictability problems. Projects overrun budget and schedule because their target is incorrect or their progress assessments are done inaccurately, leading to misread trends and inappropriate corrective actions. The main problem here, considering construction projects, is that the inputs to planning cost and schedule are imprecise, which lead us to dependence on individual subjective judgment of planners. There's nothing standardized or systematic, that gives some

consequences, for example, the scope of a given activity is difficult to verify independently from the planner who plans the activity, making difficult to control as a management tool. The meaning of the activity is not determined and fixed, it can be changed during the project then comparison between different moments during the project will be misleading. The consequent verification of these activities tends to reflect planners' personal response, which make very difficult for other people analyze it (Ray, 2013).

The planning model cannot be both a short-term guide to action and a reliable tool for consistent longer-term forecasting, because of its actualizations with new information during the project, which became impossible to compare the model in different points in time. Besides, it is difficult to integrate top-down structured projects with detail of operations at the production level, in how to translate the planning contents into task schedule. This difficulty can be evaluated to deficient productivity report, where the planning system does not capture useful information to detecting sequences or trends that can lead the project to fail (Ray, 2013).

Inability to establishing targets (cost and schedule) accurately because firms do not use actual performance data from their projects lead them to an inability to learn. Companies learn by gathering structured data that can be analyzed, stored, evaluated and reused in future activities. Projects fail because project management methods and systems depend too much on intuitive and subjective definition of work scope, uses top-down with poor systematic connexions between levels, poor trend detections and analyses, have no effective framework for use data (Ray, 2013).

4.2 BIM model

The model created with BIM tools is powerful, clear, flexible and a rich representation of the designer's intentions, improving the way ideas can be shared with the rest of the team and offering enormous benefits to all stakeholders (Ray, 2013).

The main benefit of BIM during the design phase is no more be dependent on drawings to communicate its ideas. For the design production and administration, the advantage of BIM is that all relevant information is contained in a firm's single design model or database, the

need for detailed documents on by on is reduced, as checking reviews as well. Besides, BIM brings the peak of design effort to the beginning when the cost of change is lower, as it also helps to move high-value man-hours to the front of the project. The main benefit from using BIM at the design phase is the designer being able to delivery detail documentation for procurement and specialist trade contractors (Ray, 2013).

The what you see is what you get model is the biggest benefit of using BIM for clients. This method of representation enables the client to fully understand the design and enable early decision with more certainty, growing the client's confidence. BIM allow the client to see all the solutions, what it will look like, its quality, how much it will cost and how long it will take to get done. It turns possible to the client interact with the solution. The changes during the execution gets lower, but if necessary, it can be made quickly and precisely, lowering the impacts on the relationship between client and contractors (Ray, 2013).

BIM provide a much more efficient design production, as the documents can be done with no mismatches or internal contradictions, which increase in clarity and consistency of its documents. It's easy to coordinate different design contributions of different disciplines, with shared reference model. This precisely structured data exchange models between different disciplines are the most powerful benefit of BIM to the design teams. The consequence is much less integration cycles and a much more efficient overall design process, lowering the misinterpretation and growing accurate reading of the design symbols used for each designer. On the other hand, contractors need high-quality information in a programed stream to procure specialist and to manage the construction. BIM is available to delivery such type of information, as the model is constructed earlier with all the elements, enable earlier client decisions and closer communications amongst members of the design team (Ray, 2013).

In a BIM model, every physical component has its digital equivalent, in a powerful database which contains a definitive and verifiable statement of the scope of work and its components can be identified and comparable to each other at a detailed level. In delivering a detailed design that derive a complete bidder, there's no space to claims. Contractors will compete based on their competence on execution the most efficiently at the lowest price. It leads to a competitive market changing the focus from win projects to deliver it (Ray, 2013).

4.3 Quality of information

Each discipline uses its own language to create, describe and analyze the project, and tends to have its own view of the scope and status of the project. Sometimes, this language is based simply on a user's personal judgment, which means that the *"data used ends up meaning whatever the user wants it to mean"* because each person talks their own's language. The result is inconsistent models of all sorts. This is a reality for all stakeholders, from the client to subcontractors. *"It is almost impossible for any two people to be entirely sure that they fully and accurately understand each other"* (Ray, 2013).

The information generated with BIM models has higher quality and its exchange protocols improve significantly communications between firms, by enabling this well-structured information to be used directly in different computer systems (Ray, 2013). Consequently, BIM reduce the loss of information through the exchange during all facility's lifecycle (Eastman *et al.*, 2011, *apud* Azouz *et al.*, 2014). *"In other words, BIM allow users to be more efficient in their information exchange through its centralization"* (Azouz *et al.*, 2014).

The lack of project predictability and low industry profitability, both fundamental problems of construction, *"results directly from the industry's excessive use of low-quality, unstructured information and the degree of dependence on human judgment that this necessitates"*. A model-based design improves quality information and the standards-based interchange improve communications amongst the project team – both provoke consequences at the operational level, where BIM has its benefits (Ray, 2013).

The data produced with BIM is clean, well specified and computable and removes the need for human intervention between the architect idea to the application on the field. Verifying constantly the amount of information generated during a construction project takes time and required a significant level of skill, discipline and judgment. BIM comes to improve the quality of the building, by improving the way the project team communicate and share information, lowering errors from decodifying and re-enter the information in a drawing-based information project. The transformative power of BIM is the high-quality design information BIM can produce and more efficiently communication amongst the systems for the project team members (Ray, 2013).

Information management on BIM is very similar to project information management and its success depends on the same principles: structure of the project organization and type of procurement, agreed exchange files formats and content, implementation on agreed information exchange protocols, specifying the level of detail of each point of the project. Despite of this similarity, *“BIM approach to the management of project information depends heavily on the commitment of the main firms to ensuring that information flows on the project should be as efficient and as responsive as possible”*, which means to create information thinking about the people that will receive it, facing the challenge of identify the *“flows of technical information around the project: who provides what information, to whom, and when? In that sense, the flows encountered on a BIM project will be essentially similar to those on any well-organized, conventional, collaborative project”* (Ray, 2013).

4.4 Collaboration

To win the challenge faced by the project team in sharing information on agreed formats and protocols, they need achieve a difficult level of collaboration. The five guidelines to do so are: get commitment at the very beginning of the project; be realistic and select manual interventions then automatic processes; establish levels of permission to edit files; any firm is responsible for the information published, even when based on others' firm information; use of information standard should have the same level of quality that one used by the firms individually (Ray, 2013).

“BIM is an innovative approach to construction, which requires a degree of collaborative intent on the part of the client, consultants and main contractor to work successfully”. A competitive environment is less favorable to do so. BIM does not change any legal aspects of contracts or insurance, it's just the same information generated in a paper world, but digital. No special forms of contract are required. Each firm is responsible for accuracy and completeness of any information it publishes, and doesn't matter if it was made by digital or paper ways. All documents should be prepared for many proposes in a paper world, but with BIM this is not an issue. In a collaborative environment, the contractor will assume that the model is the finalized document and will use it as the basis of construction (Ray, 2013).

BIM is much easier to be implemented in a collaborative environment contract form, as IPD (integrated project delivery). The IPD is one of the most collaborative approaches to project organization where the designer, contractors and subcontractors enter into an agreement with each other to deliver the project as an integrated virtual organization. The relationship between partners can be arranged by various types of contracts and its objective is to achieve a sharing of goals and close collaboration amongst the main project team and the targets are agreed amongst the main project team. From the beginning, the principals and project managers from each of the key organizations involved on the project should agree explicitly to make information management a strategic on it (Ray, 2013).

Price competition is the driving force of the market economy: it gives to buyers goods and services as best as possible for the lowest price. However, for competition works effectively, the buyer should provide requirements clear enough and be able to compare offers equally, but the documentation used in construction procurement does not enable this to happen. For example, incompetent bidders working on BQ (Bills of quantities) procurement who fail to see what's involved, bid low, get the work and lose money. Predatory firms see the claim opportunities, bid low, get the work and make their profit from claims. Competent and non-predatory firms, bid higher and lose the job or bid lower and lose money. This process is responsible for the high risk/low profit combination that characterizes the industry. This dysfunctional competition is not about technical competencies, but between the capabilities of estimating and claims departments. The failure process to get the best bidder, the best firm most capable of performing the construction requirements is the industry biggest problem (Ray, 2013).

Competition in construction fail twice: it does not provide low prices either better performance and it seems that in the construction, competition for price or performance is not a survival matter. As the documentation used to contract have low quality, customers are not able to choose between them properly and contractors know that they always have a chance with claims during the construction phase. Then, *“there's no competitive pressure on contractors to deliver projects economically, or to improve their methods of production.”* (Ray, 2013).

Using BIM, the contractors will have to compete directly on their competence on delivering what the client requires. And clients require guaranteed buildings, which is provided with using BIM. The moment that firm discovered how to do so, the other firms will have to do the same, to compete and survive. The construction scope of work will be accurate, complete and verifiable, then there will be no opportunities for claims. Thus, BIM will force contractors to compete based on their operational capabilities and it will very quickly eliminate predatory bidders and risk junkies (Ray, 2013).

“The management of construction projects is a problem in information, or rather, a problem in the lack of information required for decision-making”. The danger about collaborative contract form is that company put aside contracts, claims and litigation, that help them to deal with problems that poor information cause. Before truly collaborative, trust-based forms of relations can be developed, the industry must have high-quality information, which means, material that can be trusted (Winch, 2010, *apud* Ray, 2013).

Unpredictability and low profitability are fundamental threats to the survival of construction firms and there are caused by the poor quality of information. This is where BIM gets its place. The industry involves many people and documents in a very high speed of circulation. But very little of the information generated in construction is structured, systematic or trustworthy. To interpret all this material, it's required a very high level of human judgment and intuition skills that are both rare and largely unteachable (Ray, 2013).

4.5 Human aspects

BIM is appropriated to storing and sharing knowledge, but not support design choices. *“The solo reliance on BIM technologies limits the capabilities supporting informal communication and dialogue that are required to discover solutions and knowledge during decision-making activities”* (Azouz *et al.*, 2014).

Indeed, *“information technology may dispense with humans as information containers”*. By implementing news technologies like BIM, the industry will eliminate job positions by mechanical automation and computerization that will derive from BIM prefabrication elements. When the community becomes more comfortable with the use of BIM, it will start

a disruptive period for industry, especially for those that manage big projects, and abrupt changes of operational mode will take place. The input for these changes will come: from clients and the opportunity to get the building on a competitive price, the design firms that will see the opportunity to regain influence on the building market and from contractors who will see the opportunity to create and own this new market. Most form of knowledge will be codified and embodied in systems that only few professional skilled will be required to maintain and the skills required of this new role will be that which computers cannot do yet: intuition, judgment, interpersonal communication and imagination (Ray, 2013).

All conscious human action is preceded by a decision and it depends on the quality of the information used and the judgment, a slippery combination of intuition, instinct, training, experience and, above all, imagination, all applied in the decision-making process. The conventional construction system provides poor quality information, then people must compensate this with high levels of judgment. *“Judgment is an erratic, human, attribute; when it fails, decisions go awry and projects fail”*. Information generated and communicated using BIM is of better quality than with traditional methods. Judgment required on the decision-making process using this information is lower, then less decision goes wrong and fewer projects should fail (Ray, 2013).

However, BIM approach *“does not support the full extend of communication flows within the project network, and does not take into account how the team organizes itself as well as the individual cognitive factors elated to each team member”* (Emmitt, 2010, *apud* Azouz *et al.*, 2014). *“There is a growing need to understand individual needs and how individuals communicate across temporary projects organizations”* (Gorse and Emmitt, 2009, *apud* Azouz *et al.*, 2014). *“This is a fundamental issue in how different actors construe meaning and develop understanding”* (Miranda and Saunders, 2003, *apud* Azouz *et al.*, 2014) *“that goes beyond BIM. For instance, a large part of the coordination and planning on the project occurred primarily in the engineers’ heads and was not supported by IT, as their decisions are based primarily on human and personal interpretations of information.”* (Fisher and Kunz, 2004, *apud* Azouz *et al.*, 2014)

“There are other human faculties, such as judgment (incorporating attributes like instinct, ethics and intellect) and persuasion (intuition, empathy, communication) whose owners can take advantage of BIM techniques without any threat of being substituted by BIM systems”. All of these attributes are important to decision makers and are required to negotiation and doing deals, then people with these skills will prosper (Ray, 2013).

4.6 Industry Benefits of BIM

The model created by BIM is powerful, non-cryptic, flexible and rich, translating exactly the designer's intents, offering benefits to all stakeholders. The use of BIM models and supporting techniques lower the problems created with the use of drawing-based designs: the difficulty for clients understand the design, the difficulty to coordinate all different multidisciplinary projects and limited constructors' visualization of the designers' intent (Ray, 2013).

The best way to optimize the BIM effectiveness is using it since the beginning of the design phase, but it's still cost-effective if BIM model is constructed during the procurement and construction phase. During the construction, BIM can be used for clash detection and visualization for solving constructive problems. Besides, BIM provide trustworthy information that enable project teams to use it directly without supervision or another check (Ray, 2013).

BIM can help with project management issues as well. The project overruns their cost and schedule because targets are set incorrectly or the status assessments are made inaccurate all because of bad information that is inadequate and untrustworthy. Project planners and engineers must apply their person experience to correct them, what lead to excessive subjective planning, lack of real connections between plans and reality at the production level. BIM can transform this scenario lowering the guesswork because information is precisely and the planning based in accurate historical data (Ray, 2013).

The BIM effects on production management are similar from project management: lower subjective definition of work scope, connects it directly to events at the work face, improve forecasting and trend monitoring, provides a comprehensive framework (Ray, 2013).

Besides, as the “*as built*” model of BIM is generated automatically, continuously during the construction phase, it “*allows the owner/occupier to simulate, test and generally optimize the functionality and performance of the building throughout its lifetime*”, maximizing its investment (Ray, 2013).

5 AN AIRPORT PERSPECTIVE

5.1 Airport construction projects

Between the four conceptual approaches for management projects (traditional, functional, information processing and relationship), the relationship approach might be the most appropriated to the airport construction projects, because in this case, more important than the engineering scope, the relationships amongst stakeholders and their approval or not to the project objectives is what really matters.

At an airport project, the client is not the government, or the operational area that demands infrastructure improvement. The person or group interested can be everyone that uses the infrastructure, related to a passenger, or to any service offered, or to the governmental authority, air companies, etc., even the public in general, the city where the airport is located, or the country. With such huge different kinds of stakeholders, it is not difficult to realize that this nature of project is affected by many conflicting interests, which make the relations between them and project team, as each other, so important.

5.2 Relationships / Trust / Commitment

Thus, stakeholder management should be considered strategic to any airport project. If a project can only exist with the approval of its stakeholders, this task gets another dimension considering the stakeholders scenario in an airport. Engage them, despite the resistance of change, demand a continuous and efficient communication to really understand their needs and expectations and to gain their support for the project.

To achieve such a goal, besides the methodology, the quality of relationship amongst the team project and all stakeholders is a key for the project success, mainly because the project manager will have no power over them and its relations will constitute the only way hi or she can conquest their engagement. This relation should be based on trust to create effective communication, a vital element to meet stakeholders' needs and expectations.

The power structure of the organization in an environment so complex such an airport is not easily recognized. There are different power structures that compete between them to specify the priority of needs and expectations. The abilities required to read assertively the power structures involved in an airport project and consequently develop engagement strategies to ensure stakeholder support comes from the team project emotional intelligence, which develop trust in the relationships.

In an environment which trust is present, the communication become more effective and a collaborative work can take place, where the commitment of stakeholders on the project objectives can arise. In airport projects, there is always, at least, one objective that goes beyond commercial interests. Airport infrastructure involves strong limits of safety that must be respected, no matter what. Besides, this is a public service, which means it responds by roles that are beyond the passenger trip. It has a big impact in the economy, it is also a matter of government security and it is even important to save lives. Then, to any airport project, which can impact those roles, the commitment of its stakeholders is fundamental to the success of it. It is not about power, it is about to do the right thing, being committed to something that goes beyond your interests.

In a general construction project, the lack of continuous relationship with stakeholders after the “selling” phase is a problem that leads the project team to do not fully meet the needs and expectations of them at the end of the project. In an airport construction project, this is a reality. Any airport infrastructure improvement takes a long process to come from the client requirements to the final product. There are many approval phases that the project needs to pass through before any concrete action takes place. Then it is not unusual that, in such a dynamic environment, the requirements change a bit during all this process. Construction projects are plenty of changes and to deal with that is inevitable. The key to do so is to build consistent relationships with stakeholders and maintain it during all project phases.

5.3 Communication / Information

The construction industry is naturally fragmented and project teams are constituted mainly by groups that never worked together. On the other hand, construction project in airports can intensify this characteristic of being formed by multidisciplinary teams and its diversity.

Besides adding the complexity that is to manage different work fronts in many areas at the same time inside an existent infrastructure, which will not be totally available for it in many cases, sometimes those work front will be done by different companies at the same time, even in the same area. Those elements amplify all possible conflicts amongst stakeholders and to manage it, communication with the right information to the right person or group in the right time is fundamental.

Another problem well known by the industry is the quality of the information generated during a project. The poor quality of information in construction projects is one of the causes of its bad performance. This is a problem that construction projects in airports do not have space to deal with. There are so many interests involved in such a project that any detour of the planning could make the entire project fail.

So important to project success then identify the main stakeholders is to communicate with them properly, which means, with whom, when, why, about what. Poor quality of information leads the project to a distrusted environment and all effort made by the project team in engaging them will fail. To maintain the commitment, all main stakeholders should be confident in the actions of the project team and all involved. Their perception of risks and their behavior concerned about that depends on it. If they feel insecure, they will respond to it negatively and their support will be turned by resistance. In a complex project such in an airport, this situation could lead the project to fail.

5.4 Project success / BIM

To increase the chances of success by airport projects, the attention should be redirected to stakeholders and their relationship amongst themselves and project team. As poor information is on of the causes of stakeholder engagement rupture, improve the way the team communicate and the quality of this information is another element that should be improved. The BIM implementation might help with all those elements because it can improve the way ideas are shared.

If stakeholder management needs trust to build commitment and to gain support to the project objectives, if the poor quality of information generated during construction projects is the

main cause of conflicts between stakeholders, mainly because this bad quality decreases their trust in the team, the adoption of ways to improve the quality of information will increase trust, which leads to stakeholders' engagement.

With good quality and trustworthy information, the time required to verifying the correctness of documents will be used to make decisions more accurately. Internal stakeholders as design and construction team for example, and external, as airport administration, air companies or regulatory agencies, will be able to communicate with each other in an efficient manner, because all those conflicts generated by misunderstandings will get lower.

BIM can provide information of good quality. With documents that can be trusted, decision-makers will become confident and the trust on it will improve the engagement on the project's goals. This is a virtuous circle that helps construction projects productivity and predictability. Airport construction projects are so delicate and involve so many factors that it must present as productivity and predictability as possible in reason of its complex and uncertainty nature.

BIM models can help decision makers to be more assertively using less time of analyses by containing all information is needed and in a detailed level. For example, to remodeling construction projects in an airport that is operating, this assertively and celerity of decision-making is fundamental to maintain the operations in the right level of security and comfort to its passengers. The reliable information that BIM models can generate impact positively on project teams, creating a trustworthy environment where all stakeholders feel confident to take the information as correct and use it without the need for verification. This scenario increase trust and a collaborative work can run, improving engagement.

The trustworthy and precisely information contained in BIM models is important for all project phases. It helps to get design aligned to the client requirements because of its visualization tools, it helps the construction phase, improving control, but it still helps the operation phase because it contains all information needed to maintain the infrastructure with its "as built" model generated automatically during the construction phase. As airport infrastructure might need to be remodeled all long its life-cycle to support the industry changes, to the airport administration possess all information needed to get any part of its infrastructure improved quickly, it is a significant advantage.

6 CONCLUSION

The construction industry lacks its performance mostly because communication issues, especially when dealing with large and complex projects, as airport construction projects. New technologies, like BIM, has been developed to improve the quality of it, modifying the work flow and proposing a collaborative way of work. This new environment demands skills and behavior that goes beyond those abilities that project management traditionally uses to run projects successfully. Concepts like trust, commitment and share has been added to this new environment to create a positive atmosphere where the collaborative work can arise.

Airports deal with a large number of elements that impact on its efficiency. Its industry changes a lot and it must be able to adjust itself quickly and efficiently to respond to those demands. To do so, it will be necessary join the client requirements, regulatory laws and technical documents all together to get the best response to it. Amongst all these issues could arise different interests between the large number of stakeholders involved and gain the commitment of all of them would be important to achieve the project goal as good and as quickly as demanded.

In such scenario, are present some elements to deal with: many stakeholders with different interests, a complex infrastructure considering technical and functional issues, a dynamic environment which can add an extra concern. To run construction projects that will deal with all these elements is fundamental build trustworthy environment where commitment can emerge. BIM implementation can add a security element to it, where trustworthy documents will be generated, commitment will arise and the conflicts between all those many stakeholders will lower, increasing project success.

Get better communication between stakeholders and project team is one of the answers to improve project performance. Communication needs trust, which is improved by BIM and its higher quality of information. But how to achieve such level of relationships amongst stakeholders? What is necessary to people trust and cooperate? This could be the next step of this research: how people build significant relationships in a project environment.

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