



**The Effects of Scope Definition and Planning  
on Creativity Management**  
Best Practices in Architectural Offices

Rafael Cao Romero Millan

Thesis of 10 ECTS credits  
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Supervisor:

Ph.D Þröstur Guðmundsson  
Reykjavík University, Iceland

# **The Effects of Scope Definition and Planning on Creativity Management**

## Best Practices in Architectural Offices

Rafael Cao Romero Millan<sup>1</sup>  
Reykjavík University<sup>2</sup>

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### **ABSTRACT**

Globally, architectural practices are moving from traditional services concentrated on architectural design to a multiservice, becoming in that way more relevant for their customers in a competitive industry. It is worth emphasizing that these diversions induce changes in the management of the architectural firms. Therefore, architectural design and the creative process involved in it have to be managed very carefully and professionally throughout this reorganization, since they are essential ingredients for business success. Otherwise, creativity is at risk of playing just a secondary role.

At the same time, the competitive industry asks for efficiency in the process, that mainly relies on the project managers. In architectural firms, project managers face an interesting challenge of scheduling and controlling the creativity process. The design team faces the same challenge by being asked to deliver ideas and concepts within restricted time limits.

The scope definition and time planning have been defined as potentially crucial factors of influence on the creativity process, therefore they represent a starting point of this investigation. The purpose of this paper is to gain insight in the complexity of their interrelation, and to lead both architects and project managers to understand each other's challenges, in order to achieve a common goal, working collaboratively and harmoniously. Furthermore, taking into consideration that professionals can benefit from others' experiences, this investigation has an aim of gathering best practices than can bring new solutions to their professional environment. Companies from different countries participated in this research sharing valuable information that is summarized in this paper.

**Key words:** Project management, creativity management, planning, scope, time management, client and user needs.

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<sup>1</sup> Rafael Cao Romero Millan. Email: [t11cao@gmail.com](mailto:t11cao@gmail.com) Tel.: +354 8480494

<sup>2</sup> Reykjavík University, School of Science and Engineering, Reykjavík Iceland. Email: [mpm@ru.is](mailto:mpm@ru.is)

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## 1. INTRODUCTION

*“Creativity is putting your imagination to work,  
and it's produced the most extraordinary results in human culture”  
– Ken Robinson*

Nowadays architectural firms face different challenges and within these challenges is the proper management of creativity, the core of design process. The design process has the function to create the concept that fulfills customer needs. In order to achieve this purpose, designers must have a clear panorama where to focus and explore ideas that subsequently will become tangible.

The author of this paper as a creative professional himself, has experienced that sometimes within the architectural practice, the creativity process is undermined that consequently leads to standard solutions. The interests in discovering the causes of this situation and finding ways that can prevent it, have been the starting point for this investigation. The scope and time planning have been defined as potentially crucial factors of influence on the creativity process.

The aim of this research is to gain a deeper insight into the effects of scope definition and time management on design and creativity management in architectural design projects. This investigation provides an overview of common practices in different architectural offices in relation to scope, time and creativity management. Beyond recognizing the common situation, the purpose of this paper is to identify best practices regarding these aspects, especially during the first stages of a project.

In order to achieve this objective, the following research questions have been determined:

***Research question 1:*** *What are the effects of the scope definition on the creativity process?*

***Hypothesis 1:*** *A detailed and well-defined scope fosters creativity while the poorly and inaccurately defined scope obstructs the creativity process.*

***Research question 2:*** *In the situation in which the time frame assigned for a project is tight, what are the effects of time management on the creativity process?*

***Hypothesis 2:*** *The tightness of the time constraints creates pressure that can have positive and/or negative effects, it can stimulate creativity or it can hinder it.*

Appendix 4 contains a fishbone structure of the present research.

## 2. LITERATURE REVIEW

The following chapters give a theoretical background for understanding the relationship between scope definition, time planning and creativity management in an architectural design project.

Firstly, the importance of the project scope definition is explained, the understanding and expectations of the client. In addition, several methodologies are presented that can be used for that purpose.

Secondly, there is a brief description of a project life-cycle in general terms followed by the explanation of the architectural design process in particular. Differences between the project managers' and design managers' objectives in this process give rise to a specific tension that is the one of the topics discussed of this paper.

Finally, the attention is placed on the effects that the scope definition and time management potentially have on the creativity process within the architectural design project.

### 2.1 Scope Management

Throughout this chapter, the scope and its processes are defined in order to create a foundation to understand its importance for the project. Since the project's scope definition is a complex process, there are techniques and methodologies of project's scope definition that are presented.

Rory Burke (2003) states that:

effective scope management is one of the key factors determining project success. Failure to accurately interpret the clients' needs or problems will produce a misleading definition (*scope of work*). If this causes rework and additional effort, there may be project cost and time implications. Therefore, project success will be self-limiting if the *scope of work* is not adequately defined... Since most projects seem to be riddle with fuzzy definitions, scope management takes on a greater importance to avoid scope creep, and avoid adding features and functionality to the product that were not part of the original project contract without an appropriate increase in time and budget. (p.103)

Kraus & Cressman (1992) agree with Burke by remarking that "if the scope of a project is inadequately or inaccurately defined, not properly documented or communicated, or misunderstood, then the outcome of the project is in jeopardy" (p.16).

A practical approach for scope management, according to Kraus & Cressman (1992), is as follows:

- **Formulation:** the narrowing of possibilities to a realistic, agreed-upon concept from which a scope is derived;
- **Documentation:** the written description explaining the range of actions a project will entail; and
- **Control:** the monitoring and management of a project as it relates to scope.

#### 2.1.1 Understanding the Client

Clients today must choose (or create) one of a growing number of project delivery processes according to which to plan, design, finance, build, occupy, and operate their facilities; and choose someone to guide them through the maze (Green, 2001). In addition, the guide they look for needs to be trustworthy, honest and experienced. Top principals, in facilitating strategic direction for clients, have discovered that the demand is not only design, drawing production, or project management, but high-level, knowledge based help to clients who are

hungry to acquire specific guidance on improving efficiency and productivity at their sites (Stasiowski, 1996).

In order to start this close relationship with the client, the Project Manager must have the ability to work with clients wishes, to a large extent, and determine the firm's ability for meeting the project objectives. The first step in working successfully with clients is learning as much as possible about them and their organization asking the following questions (Demkin, 2001):

- Who makes and influences project decision?
- Who is responsible for scope, quality, schedule, and budget?
- Who has the authority to modify the contract?
- Who will approve the firm's services and evaluate the firm's performance?

Scott Braley (2006) states that during this early stage, the architect and the client must agree on design quality, to have reasonable expectations of one another, and understand the other's expectations. As the party providing the service, it is incumbent upon the architect to facilitate a dialogue that fosters consensus. Truly successful design managers will repeat "design dialogue sessions" frequently—before the work on the project begins and continually refining the balance expectations and agreements at key points throughout the design development process. Basic questions can foster a revealing discussion during the "design dialog sessions".

Examples of this question are:

- What do we *hope* we can achieve together?
- What *must* we achieve at a minimum?
- What is it *possible* to achieve?
- What are the *boundary limits* of 'difficult,' 'improbable,' and 'impossible'?
- What are the *most to least* important variables affecting the project?
- What *really* gets us excited—in both the positive and negative sense?

### 2.1.2 Client and User Research Methods

"Not everything that counts can be counted  
and not everything that can be counted, counts"  
– Albert Einstein

The goal of the architect is to achieve the best possible value from the client's and user's point of view. Huovila et al. (1997) suggest that the quality of design can be improved by increasing the amount and quality of information (customer needs and requirements available, for instance, through rigorous requirement analysis, systematized management of requirements, and collaborative iterations for improvement).

A thorough understanding of clients and stakeholders can make an architectural firm more responsive to client needs and differentiate it from competitors that way. From the proposal phase throughout the post occupancy phase, architects can use a variety of research methods to identify and assess client needs (Lawless and Pound, 2004). However, there might be communication gaps between users, clients, owners and designers (Barrett and Stanley, 1999). Clients and users may have difficulties in expressing their needs, especially in terms of intangible requirements (Cooper and Press, 1995) and this may hinder an appropriate definition of requirements (Tzortzopoulos et al., 2006).

Although not trained as researchers, architects ask questions and evaluate data, particularly during predesign and programming phases. This experience gives them skills that they need to carry out their research. Thus, developing their research skills and expanding their repertoire of research methods can give them the essential information they need for an effective design (Lawless and Pound, 2004).

Lawless and Pound (2004) present the values of seven methods of client and user research and the phase of the project where they could be used:

1. *Business intelligence*
2. *In-depth interview*
3. *Surveys*
4. *Behavior observation and mapping*
5. *Guided walk-throughs*
6. *Envisioning*
7. *Facility performance evaluation*

<b>Client and User Research Methods</b>				
<b>Research Method</b>	<b>Value</b>	<b>Proposal and presentation</b>	<b>Predesign and programming</b>	<b>Post-occupancy</b>
<b>Business intelligence</b>	Gives insight into a prospect's organization and industry.	X		
<b>In-depth interview</b>	Uncovers how people experience, understand.	X	X	X
<b>Survey</b>	Measures user's satisfaction with the facility and identifies key drivers of effectiveness.		X	X
<b>Behavior observation and mapping</b>	Provides data on how people use space. Shows graphically how a space is used.		X	X
<b>Guided walk-through</b>	Shows the space through users' eyes		X	X
<b>Envisioning</b>	Gives insight into the daily experience of the building's users. Stimulates user involvement.		X	
<b>Facility performance evaluation</b>	Assesses how well the facility meets the design objectives. Identifies effectiveness of design solutions. Measures user satisfaction with the facility.		X	X

Figure 1. Client and User Research Methods. (Lawless and Pound, 2004, p.58)

These authors affirm that “client research can help engage stakeholders, generate cooperation and enthusiasm for a project, and reinforce the credibility of the architect. Most important, client research results in places and spaces that fulfill both the expressed and unexpressed needs of the client and building users” (p.70).

An architect, during phases and processes, should be focused on searching for better insight to the client's expectations in order to meet the needs. In addition, teams should be configured for integral design in which the sharing and accumulation of knowledge, communication, negotiation and visualizing ideas, tuning of design, and team stimulation is essential for successful results (Emmitt & Gorse 2007; Goossens 2008).

## **2.2 Project Time Management**

Project Time Management includes the processes required to manage the timely completion of the project (PMBOK). In this regard,

the planning of the design activity is fundamental to design management. A different approach must be considered for each stage of the design. At the outset there is a need for a strategic overall plan which considers all stages of the work, the interface to the construction process, and the activity of the key contributors to the design, including the works, specialists and trade contractors. [...] Once the agreed scheme design stage is reached, the planning becomes very detailed and should include every significant interaction between all designers, including every works and specialist contractor. [...] At the finest level is the requirement for a schedule of all drawings to be produced by each designer, which must reveal the linkages to other, interrelated, design work (Gray & Hughes, 2001, p.135).

One way to think about the process is through a project lifecycle. The project lifecycle can be summarized into four major steps, as defined by Lewis (2002):

1. Understanding the project (problem definition)
2. Planning the project
3. Executing, tracking, and controlling the project
4. Closing the project

### 2.3 Architectural Design Process

In order for any new facility to be created, architects must first go through the architectural design process. The process itself contains many complex phases which are constantly evolving to meet the needs of the new facility and their clients. The core creative process takes place in the Conceptual and Schematic design phase.

The time frame to complete each phase varies depending on the scope and timing for completion of a project. At the end of this process, two important documents are created which include: the architectural designs (drawings) and the construction bid documents (Vo-Tran, 2010).

The Figure 1 shows a visual representation of the four main stages within the architectural design process.

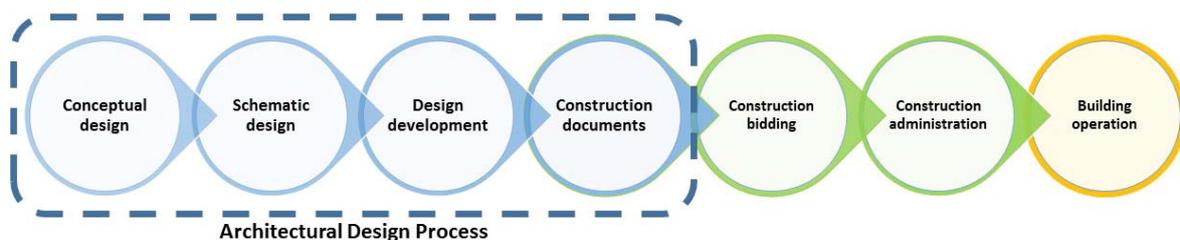


Figure 2. Typical Design Process of Buildings

Project management tend to lower uncertainty and risks in the beginning of the design process, by planning in order to get a clear view on the results, while design management and coordinators in general deal with iterative design processes searching for the best opportunities and increasing architectural values (Prins 2009). The objectives of these teams are different and that situation creates a tension between them, the project management that controls the linear time planning and the team responsible for the iterative design process (Emmitt & Gorse 2007; Goossens 2008), as shown in Figure 2.

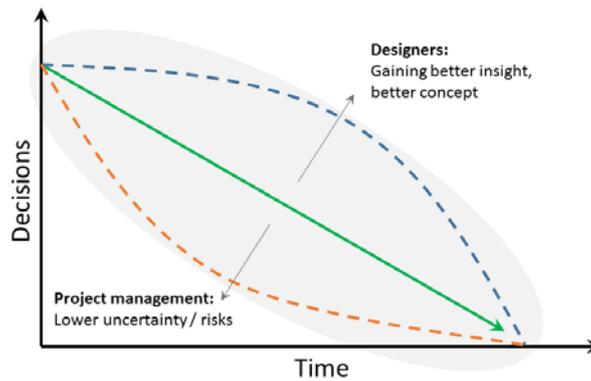


Figure 3. The Area of Architectural design management (Ad F. den Otter & Stephen Emmitt, 2009, p.249)

Clients need to understand the project process phases, the timescales and the type of input they need to provide to professionals before getting involved in a project (Barrett and Stanley, 1999). It is important for both sides to agree and to sign-off at different stages, because of the effects of later changes that can affect the time and budget (Shein et al., 2004). Figure 3 is a HMH Architecture + Interiors firm graphic representation of the milestones, architect and client involvement, the importance of each element and timeline of the project lifecycle.

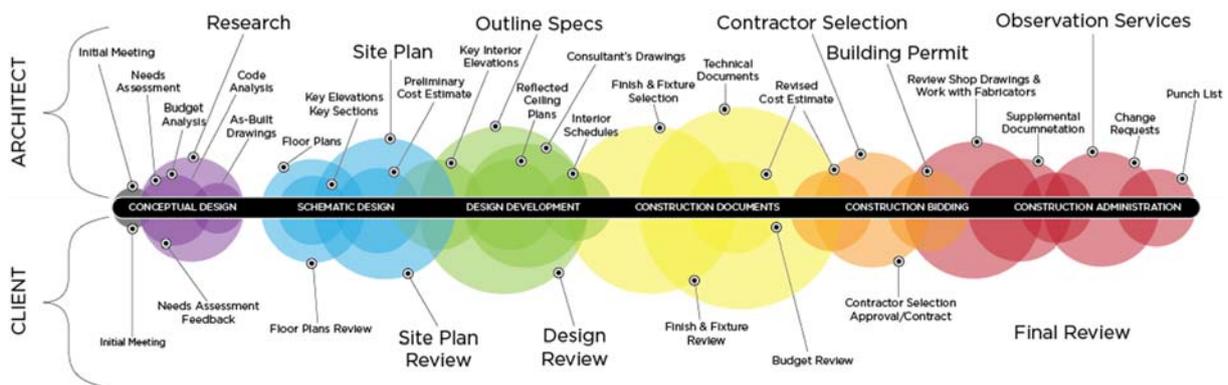


Figure 4. The project lifecycle (HMH Architecture + Interiors)

## 2.4 Creativity in the Work Environment

The value generation in design depends not only on the information available, but also on the work conditions for the design team. This means that if the process is poorly managed, the final product tends to be inadequate, even if all necessary information is available. Problem solving in building design is strongly related to creative work. Thus, managing the design process should be concerned with removing obstacles to creativity, such as insufficient time, evaluation of pressure, reluctance to change, etc. (Cooper and Press, 1995). Moreover, value generation also depends on the level of qualification of the design team. Due to the nature of design process, the design team should be capable of transforming complex, uncertain and conflicting requirements into solutions (Tzortzopoulos and Formoso, 1999).

Considering creativity as an essential ingredient of social and business success (Torr, 2008), and one of the core skills of designers, it is crucial for project managers to understand the factors that stimulate and obstruct it.

Amabile et al. (1996) define creativity as the production of novel and useful ideas in any domain, and innovation as the successful implementation of creative ideas and other

sources within an organization. In this view, creativity by individuals and teams is a starting point for innovation; the first is a necessary but not sufficient condition for the second.

The studies on creativity within organizations from the social-environmental point of view conducted by Amabile et al. focused on employees' perceptions and their influence on the creativity work. The factors that influence creativity are divided in this research in five conceptual categories of work environment.

1. Encouragement of Creativity
  - a. Organizational Encouragement
  - b. Supervisory Encouragement
  - c. Work Group Supports
2. Autonomy or Freedom
3. Resources
4. Pressures
  - a. Challenging Work
  - b. Workload Pressure
5. Organizational Impediments to Creativity

### **Encouragement of Creativity**

Creativity research has shown that there is a direct relation between the increment of creative idea generation and the increment of the exposure to other potentially relevant ideas. Therefore, team member diversity and mutual openness to ideas may operate on creativity by exposing individuals to a greater variety of unusual ideas. Such exposure has been demonstrated to positively impact creative thinking. In addition, the project managers contribute to this synergy by defining clear goals that orient creative thinking into the right direction.

### **Pressures**

The evidence of the effects of pressure on creativity in organizations implies paradoxical influences. Some research has found that, although *workload pressures* that were considered extreme could undermine creativity, some degree of pressure could have a positive influence if it was perceived as arising from the urgent, *intellectually challenging* nature of the problem itself. Similarly, previous studies found that time pressure was generally associated with high creativity in research and development departments, except when that pressure reached an undesirably high level. Thus, excessive *workload pressure* would be expected to undermine creativity, especially if that time pressure is perceived as imposed externally as a means of control. But time pressure that is perceived as a necessary concomitant of an important, urgent project may add to the perception of *challenge* in the work that positively correlates with intrinsic motivation and creativity.

### **Organizational Impediments to Creativity**

The research suggests that internal strife, conservatism, and rigid, formal management structures within organizations impede creativity (Kimberly, 1981).

## **2.5 Design Management**

Design management concerns itself with the design content of project outcomes and effective management of the design process. In broader terms, it is responsible for the beneficial "capture" and effective utilization of the potential to be realized by design expertise and skills. A basic point in design management is to get your definitions right; accordingly, Bernsen

(1987) states that: “*Design* is a name for both the outcome and for the creative process itself. *Design* is problem-solving process” (p. JB 2).

As a part of the project planning, design also has to be time framed, but it is hard to answer to how long it takes for the creativity process to be completed, in this regards Lewis (2002) states that creativity cannot be scheduled. The ability that produces a design from a blank sheet has to be translated into a predictable, carefully composed and staged process (Allinson, 1997). Furthermore, according to Olins (1987), design is difficult; it is creative and complex to manage – probably unmanageable because it crosses too many traditionally separate and potentially adversarial structures within the organization.

### 3. RESEARCH METHOD

The research presented in this paper focuses on the effects of *scope definition* and *planning* on *design* and *creativity management* in architectural offices in order to define *best practices*. As described earlier, the purpose of this study is to investigate the effects that the scope definition and time management potentially have on the creativity process within the architectural design project throughout the first phases of the design process.

When choosing a method for this research, it had to be kept in mind the difference between processes: planning is a linear process and creativity is a holistic process. However, both should be part of the scope definition.

#### 3.1 Research approach

A Case Study could have been an appropriate method for observing and measuring the design processes. However, the projects available for the research were already in an advanced stage, therefore they could not be considered.

The other two methods suitable for this research were questionnaire survey and in-depth interview. Therefore, the questionnaire survey method was chosen to collect the quantitative data. Its advantage is that large amounts of information can be collected from a large number of people in a short period of time and in a relatively cost effective way. In addition, they can be analyzed more 'scientifically' and objectively than other forms of research. In-depth interview was utilized to investigate the qualitative aspects of the research in order to gain insight into the experience of the interviewees. The primary advantage of in-depth interviews is that they give more detailed information than other collection methods and permit the evaluator to enter into an understanding of situation/context.

#### 3.2 Research structure

The choice of the companies for questionnaire survey and interviews were according to availability of colleagues connected to the researcher and architectural firms' typology. The structure of respondents is presented below:

Structure of respondents	
<b>Countries</b>	Iceland, Mexico, Germany and United States of America.
<b>Typologies</b>	Architectural design, Architectural design specialized in Industrial Facilities, Landscape design, Construction development
<b>Company Sizes</b>	3 Companies with 6-10 employees 2 Companies with 21-30 employees 2 Companies with 31-50 employees

<b>Interviewees</b>	1	Director & Project Manager
	1	Head department and Project Manager
	1	Project Manager
	2	Architects
	1	Construction Architect ( <i>with experience as contractor and as part of design team in an architectural firm</i> )
	1	Project Manager in construction development ( <i>Client of an architectural firm</i> )
<b>Respondents to questionnaire survey</b>	7%	Directors
	19%	Project Managers
	7%	Senior Architects
	15%	Design Team Leaders
	37%	Architects
	7%	Construction architects
	4%	Landscape architects
	4%	Engineers

Figure 5. Structure of respondents

## The questionnaire survey

It was structured in 5 sections:

1. Personal profile and general information
  - a. A short introduction to the research
  - b. Participants were asked about: Gender, Age, Nationality, Occupation, Position within the company, years of professional experience, size of the organization, years of experience and location of the company, studies and experience as project manager.
2. Scope management
  - a. Project scope management that is related to the development and definition was examined as well as the tools and techniques that are part of this process.
  - b. The relation between client's definition of the project and the understanding of it by the design team developing the project.
3. Searching client and user needs
  - a. In this section the questions were related to the common practices within the organization.
4. Time management and planning
  - a. In this section the purpose was to analyze the common practices of the organizations in regard to the relation between the time frame and scope definition; specifically, whether the time frame requested is in accordance with the project scope.
5. Creativity management
  - a. This section investigated how the architectural offices commonly manage their creativity process and which are the mechanisms and methodologies that support creativity within conceptual design.

## In-depth interview

Each interview took approximately one hour and was confidential. A list of questions was classified into the same five sections as in the questionnaire survey. The questions were used as a discussion guide which facilitated the exploration of details related to the research's subjects.

In the appendix can be found the list of the interviewees and profile for reference in the research. The results are presented in the following part of this paper.

## 4. RESULTS

This chapter explores the most important findings from the questionnaire survey and the seven interviews. The questionnaires provide quantitative information to obtain a general picture of the practices, while the interviews are used for identification of common scenarios and best practices within it. Thus, the information from the interviews is summarized.

### 4.1 Scope management

This section of the questionnaire examined the methods that are used by the companies in order to understand the client and user needs as well as the relevance of the information provided by the client, such as feasibility studies, that evaluate whether a proposed project is technically feasible or feasible within the estimated cost and profitable.

#### Questionnaire survey results

The question related to the methods that the architectural firms use to obtain information about the clients and users needs revealed that 21% companies use 1 or 2 methods, 43% use 3 to 4 methods and 36% use 5 to 7 methods. The question listed eight methods and gave the participants a possibility of adding extra methods as well.

The following pie chart presents what is the percentage of existence regarding feasibility studies for design-build projects.

- *Feasibility Study is requested by your organization during the early stages of a project*

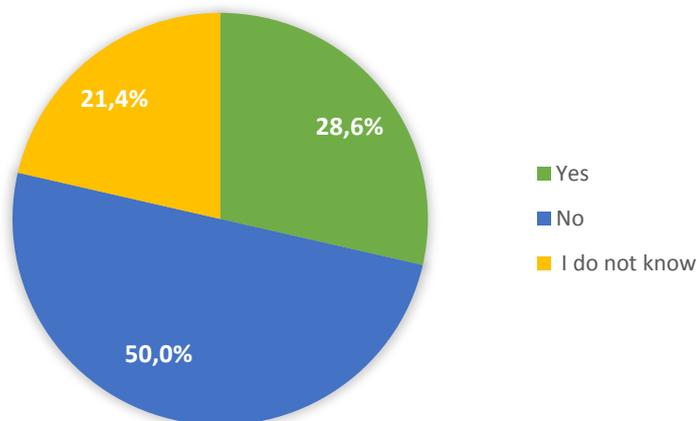


Figure 6. Existence of feasibility studies

Furthermore, the respondents were requested to express to which extent they agree or disagree with the statements related to the information gathering.

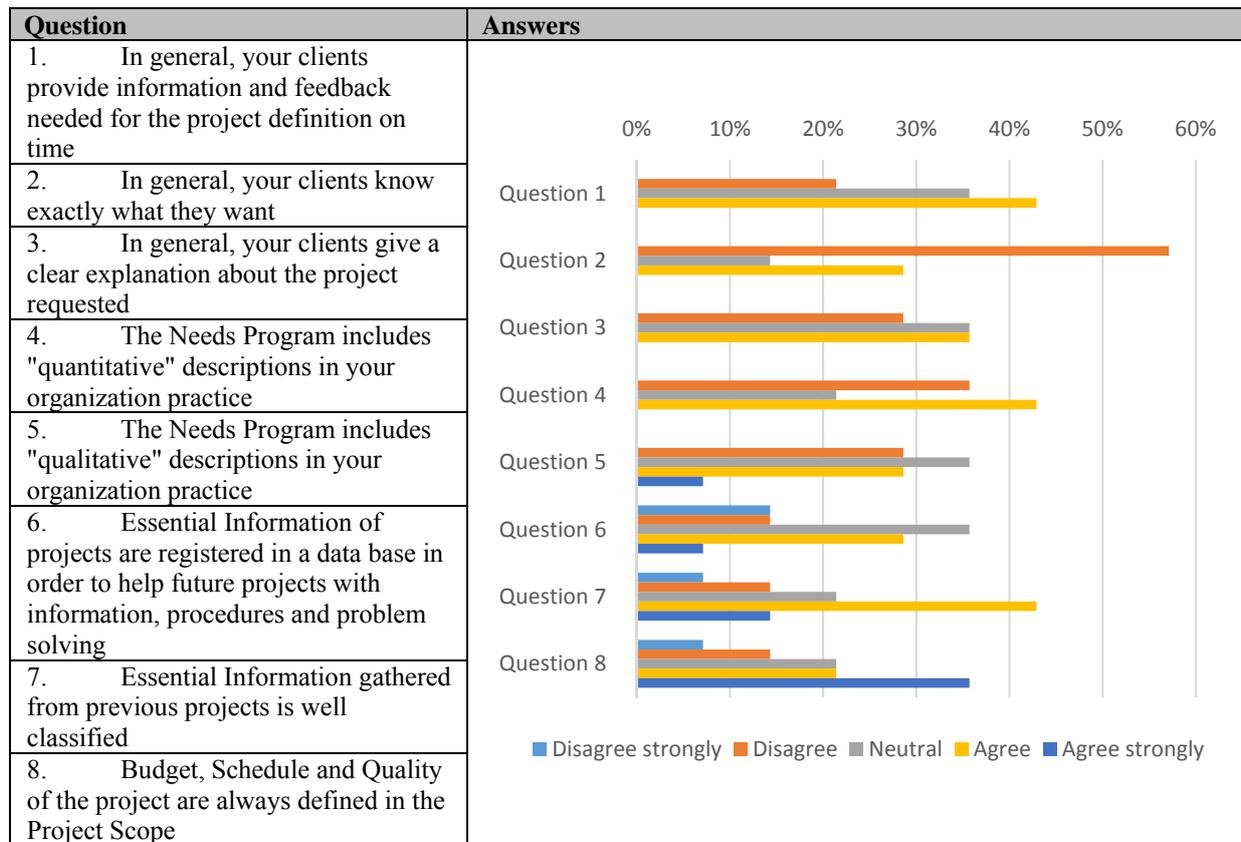


Figure 7. Question about scope management

### Summarized results from the Interviews

The interviews revealed that the architects obtain essential information on the base of their previous experience. They rely as well on well-organized database with the work they do, that includes: graphic documentation, all meetings, experiences, brainstorming process, etc.; practice well-structured In-depth interviews with clients and users; do internet research; travel abroad every 2 years for field trips to get new ideas and improve knowledge; invite specialist in different fields to discuss points of view and have brainstorming sessions to define the project.

In some cases, the architectural offices often participate in feasibility studies by the request of their clients because they understand that is a part of their service and by doing that they take care of their client's interests. In the cases in which they do not have the possibility of participating, the architectural offices might request the results of a feasibility study from the client before starting the project.

In order to acquire relevant information from the client, considerable energy is put into building up a strong relationship with the client with the purpose of establishing an effective communication. In addition, the importance of the client's involvement into the process is emphasized, that is, the client should feel that the project is conducted in cooperation with him but not only for him.

Budget, Schedule and Quality of the project are always defined in the Project Scope. The whole process is carefully documented in a project scope statement.

## 4.2 Time management and planning

In this section of the survey the respondents were placed in hypothetical situations, related to the time management and planning, and requested to choose the strategy they would follow.

### Questionnaire survey results

Moreover, the respondents were requested to give information about the common practices in their company related to the topic.

- *If the time frame for a project is too tight and you need to shorten some phase(s) of the project, in which order would you do it?*

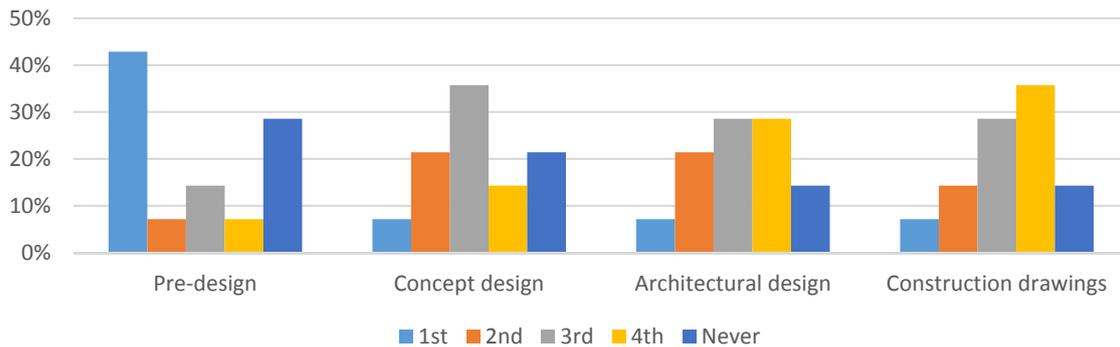


Figure 8. Strategy for dealing with tight time frame and project phases

Additionally, they were asked to express their opinion on the influence of the scope definition and time management on the creativity process in the first phases of the design project.

- *If the time frame requested by a client cannot be achieved, what would you do and in which order?*

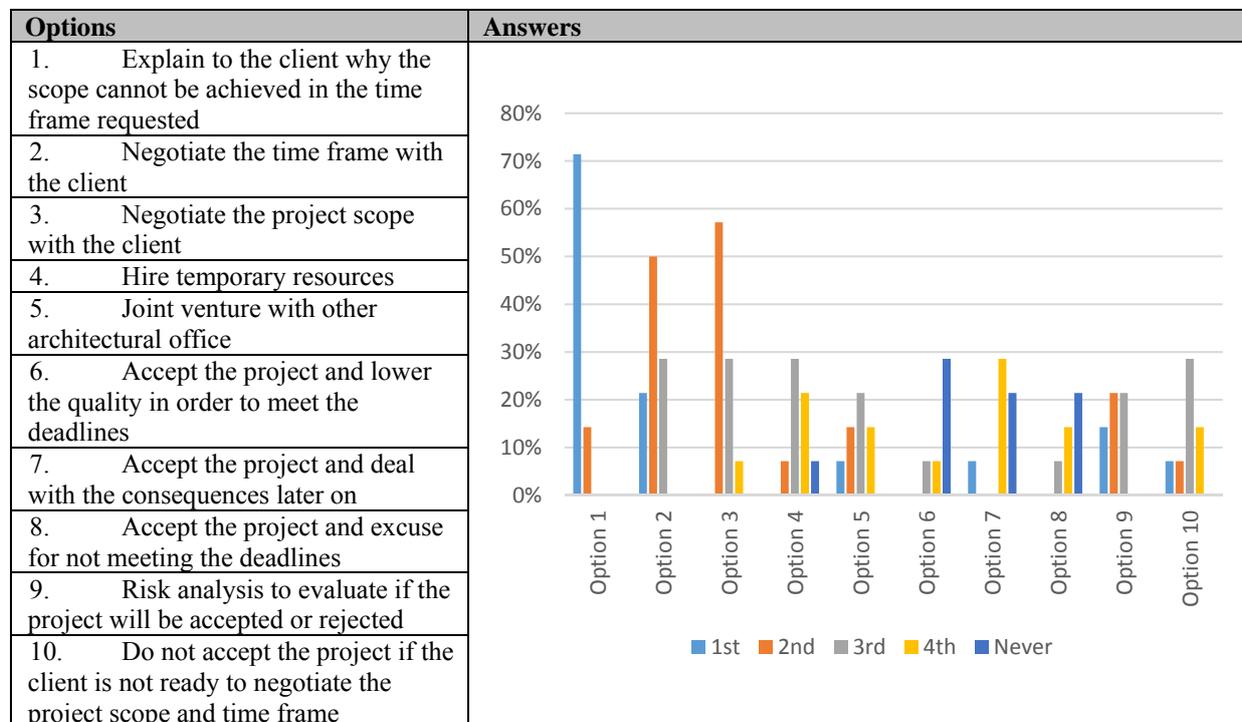


Figure 9. Strategy when the scope does not fit the time frame requested by the client.

In the following questions the respondents were requested to express to which extend they agree or disagree with the statements related to the time management and planning.

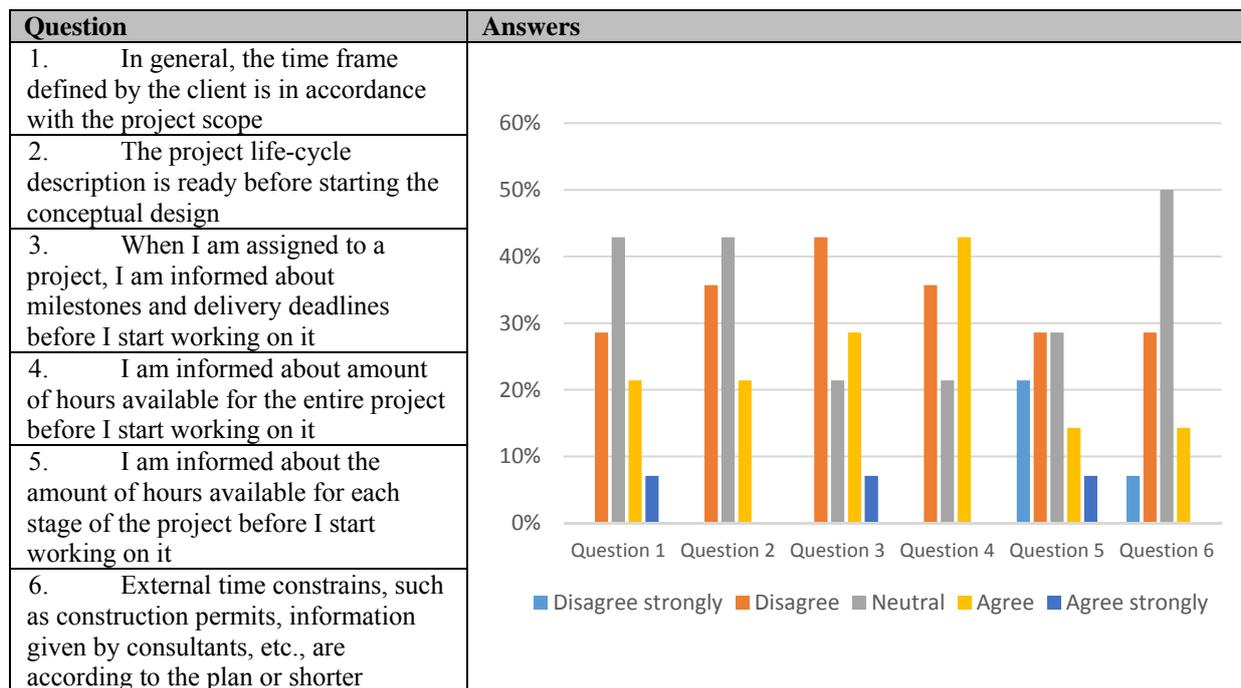


Figure 10. Time management and planning

In the following question, the respondents had the opportunity to give an open answer.

- *How do the scope definition and time frame affect the creative process in the first stages of the design project?*
  - The creative process in the beginning is the foundation of the project. The stronger the concept the clearer the mission.
  - Immensely, lack of time for the creative process can jeopardize the quality of the end product.
  - Less time frame for design.
  - We work mostly on the same building types with very defined programs from the start... there is seldom time or need for pre- or conceptual design.
  - Most of the time a miscalculation of the time frame kills creativity.
  - Not having all the information and short time frame can affect in the end by not being able to achieve results with the quality and value engineering appropriate to provide the best service for the client.
  - Sometimes time pressure creates a rush of creativity, but we seek enough time to develop ideas and solutions to more depth.
  - It depends, there are people who can deal with tight time frames and there is people that cannot deal with that stress, so the first stages can be affected positive and negative.
  - I think the more balance exist between these two, a better solution or ideas could come guaranteeing a better quality.
  - Just adds pressure.

### Summarized results from the Interviews

In the situation in which the client is not ready to negotiate the timeframe he allows for the project, a risk analysis is conducted in order to evaluate if risks can be managed or if the project should be declined. However, if the client has been a customer to the company for a long time, all kind of effort is put into meeting requested deadlines. Best practices include: an increase in working hours under reasonable conditions, increased frequency of meetings, contracting new staff and joint venture with other architectural office.

In the situation that the time frame cannot be achieved the client is immediately notified in order to analyze the status and find solutions. If there is a need for any of the phases to be shortened due to time limits, pre-design is the last to be shortened.

Some interviewees stated that an accurate planning of time, resources and budget give a framework and focus to the creativity management.

### 4.3 Creativity management

In the last section of the survey, the respondents were enquired about their perceptions related to the creativity management in their company.

#### Questionnaire survey results

In the following questions the respondents were requested to express to which extend they agree or disagree with the statements related to the creativity management.

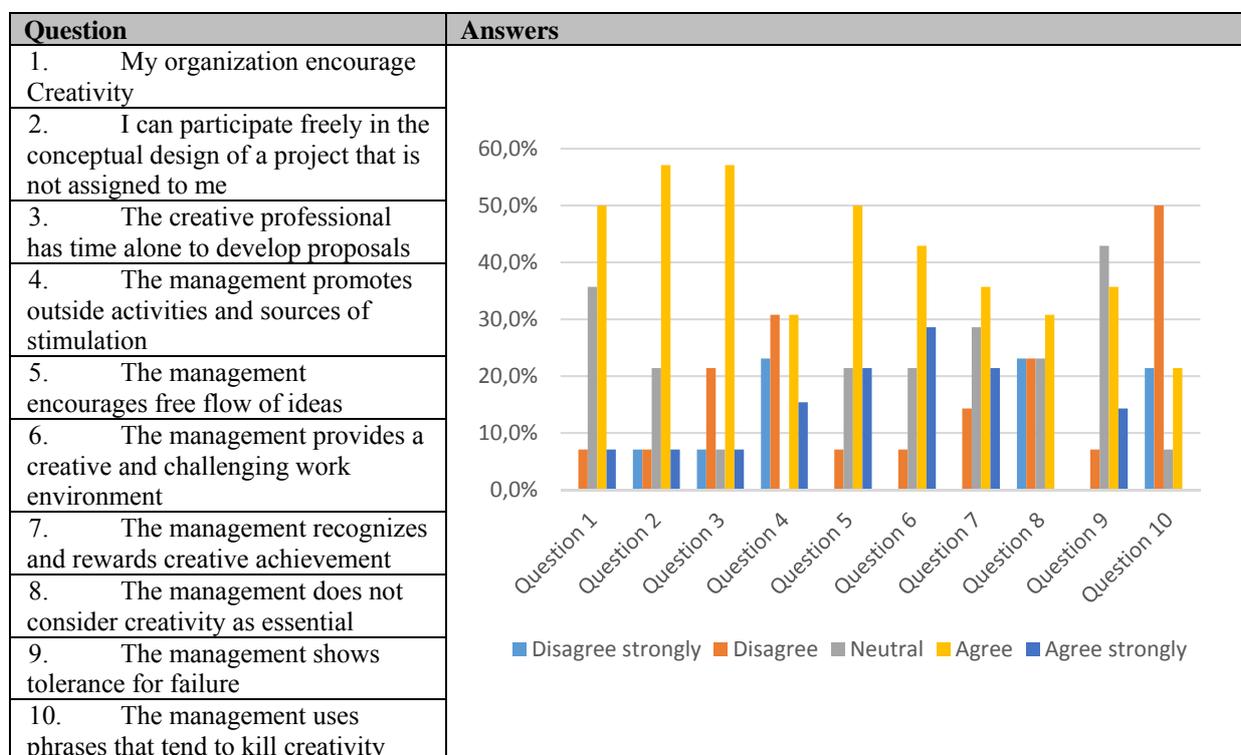


Figure 11. Creativity management

#### Summarized results from the Interviews

In order to encourage creativity some firms organize informal lunch meetings (“Brown bag meetings”), in which the employees come and give short presentations to share their ideas on projects in progress and common interest. Another practice is inviting different artists to awake the creativity of the employees. Moreover, field trips to other countries are organized with the intention of getting new ideas and improve knowledge. Furthermore, brainstorming sessions are held with professionals from different areas, within and outside the company, for project scope definition. In addition, some companies organize workshops that represent experimental exercises in which employees are challenged to deliver a simulation of a design project, the task can be developed alone or in teams and deadlines within short periods of time that could go from hours to one or two days.

The same methods that are used for encouraging creativity within design team members, are used for fostering creativity in other company departments.

## 5. DISCUSSION

The aim of the research was to gain a deeper insight into the effects of *scope definition* and *planning* on *design* and *creativity management* in architectural offices in order to define *best practices* especially during the first stages of the design process.

From the project manager's point of view, the scope definition plays a crucial role and it is one of the first steps that has to be done. Without it, other parts of the project are difficult or impossible to define, and even if they are defined, surely, the information from which they are built is incomplete and therefore inaccurate and probably based on suppositions and assumptions.

The services and product specifications may range from being defined very precisely to very loosely, depending upon the information available. This information is gathered during the initial stage of the conceptual design phase by means of different methods, techniques and sources. According to the obtained results, the majority of the companies that participated in this research, use a variety of methods in order to obtain valuable information that gives a solid start point for the scope definition.

The survey results show that clients generally do not know exactly what they want, nonetheless they manage to explain their needs in most cases. That may suggest that the professionals involved in the scope definition know how to guide them. The results related to the *Needs Program* show a tendency of it to cover both quantitative and qualitative descriptions. Moreover, a high percentage of the companies gather and classify essential information from previous projects. All mentioned above may contribute accurately to the scope definition. Related to this topic, best practices identified through the interviews emphasize the importance of the strong relationship with the client, with the aim of profound understanding of client and user needs.

However, it is perceived that half of the companies that took part in the survey do not require feasibility studies and almost 30% of the participants do not know if their company requests this information from the client. Best practices show that architectural firms may request results of a feasibility study from the client or, even take part in the feasibility studies to assure success of the project, beyond their design services.

In the author's opinion, feasibility studies are essential for design-build project success evaluation. The lack of these kind of studies may lead to delays in time, extra costs or even more serious consequences, like total failure.

Taking into consideration that the scope is the heart of each project, the information contained in it is the starting point for the design team to begin the creative process. Therefore, the scope definition necessarily affects it. The starting hypothesis for this paper was that *a detailed and well-defined scope fosters creativity while the poorly and inaccurately defined scope obstructs the creativity process*. The author has obtained diverse opinions and experiences in regard to this topic. On the one hand, professionals believe that an accurately defined scope facilitates the design process, while the lack of information in the definition affects the results of the design team and the quality of the final product. On the other hand, the respondents provided examples of situations in which an *accurately defined scope* does not stimulate creativity. As they stated, this had happened when the client knows exactly what he wants and he defines project constraints so, that conceptual and schematic design phases are practically omitted.

The author identified best practices under activities related to the scope management that encourage creativity, such as: brainstorming sessions for project scope definition in which professionals from different areas, within and outside the company, are included; lists of quantitative and qualitative requirements based on previous experiences; building up

knowledge through field trips, meetings and conferences in different fields as well as well-organized databases.

The shared task of project manager and design manager is project planning that intrinsically includes time planning. In the case of an architectural project there are predefined phases with specific outcome objectives for each one. The creativity thinking is needed in all phases, nonetheless the first two stages are fundamental for creativity process because the concept development by itself requires creative skills. There are several factors related to time management that can affect this process.

According to the results obtained by the survey, there is an average trend regarding the accordance between time frame and scope requested by the clients. With respect to time management of the companies, the results show that some of them have control over the time planning while others show a lack of some of the basic organizational practices. For example, around 40% of respondents claim that they are not informed about the milestones and delivery deadlines before they start working on the project. In addition, it is perceived that there are some external factors that affect the time planning that possibly add more pressure to the design team.

In the situation in which the time frame requested is not in accordance with the time expected for the project completion, some phases have to be shortened. On the basis of the author professional experience and according to the results of this research (more than 40% of respondents of the survey), the phase most affected is the pre-design, which means that the creativity process is shortened. However, almost 30% of respondents claim that they would never shorten this phase which goes in accordance with best practices.

The most used strategy for time management in this kind of situations is, in the first place, explaining to the client why the scope cannot be achieved in the time frame requested. It is followed by the negotiation of time frame and scope with the client and subsequently there are some alternatives practiced by the companies that tend to meet the deadlines. It is worth highlighting that around 30% of the respondents would choose as an option to accept the project with its constraints and deal with the consequences later on.

The factors mentioned above indicate that time frame and time management greatly affect the phase in which the creativity process is conducted. Creativity process by nature is holistic, therefore cannot be scheduled (Lewis, 2002). If it is difficult for creative professionals to define a time frame they need to complete a creative process, it is even more understandable that clients, and especially less experienced ones, cannot anticipate its duration.

Regarding our starting hypothesis that postulates that *the tightness of the time constraints creates pressure that can have positive and/or negative effects*, the research demonstrates different tendencies. On the one hand, professionals find that the time pressure stimulates their creativity, even though they would like to have more time to better develop their ideas. On the other hand, some participants definitely see the lack of time as a source of pressure that undermine the creativity process.

In addition, some professionals state that in the scenario in which the time assigned for the project is in accordance with the time expected for it, that is, not too loose and not too tight, better ideas and solutions can arise and lead to a better quality. However, the participants of both the survey and the interviews pointed out that in the same situation of time pressure, people are affected in a different ways, that is, pressure can be perceived as positive or negative depending on personalities.

The questions in regard to the creativity management, located in the last part of the survey, inquire whether the companies follow best practices according to Alomar, (2003). The results show a positive trend, highlighting the existence of challenging working environment in which the management actively encourages creativity. The interviews reinforce this by

stating that an accurate planning of time, resources and budget give a framework and focus to the creativity management. Furthermore, workshops that are conducted in companies, train professionals in the art of combining creativity and planning. In the author's opinion, this experimental practice significantly benefits a company because the employees have the possibility to learn about different elements involved in a design process, as well as about their personal and team skills, in a short period of time and without any possibly negative consequences for the company or a client. Moreover, the experience gained through workshops can be utilized for the real projects.

## 6. CONCLUSIONS

Upon completion of this paper, the author gained a deep understanding of the close and complex interrelation between the scope, time and creativity management in architectural design projects. The results partially invalidated the initial hypothesis.

It is true that a detailed and well-defined scope fosters creativity, while the poorly and inaccurately defined scope obstructs the creativity process, which means that the scope definition is in relation to the range of possibilities available for a project, therefore a well-defined scope gives direction and focus to the design team in their creative process to find solutions within a certain range of possibilities. However, a very narrow scope reduces the range of possibilities to certain extent, so there is limited need for a creative process to find design solutions.

The author found evidence that is in accordance with the hypothesis that postulates that tightness of the time constraints creates pressure that can have positive and/or negative effects, it can stimulate creativity or it can hinder it. The degree of workload pressure can stimulate creativity or it can undermine it. The challenge relies on finding the degrees of pressure that lead to these effects, in order to tune the workload that suits best the design team. Nonetheless, in the situation in which all team members are under the same level of pressure, the effect depends on the ability of each of them to deal with it and not only on the team as a whole.

The purpose of this paper was not to give a definitive answer or solution to the current situations. It was to gain insight into the experiences and perspectives of professionals involved in the architectural design process in order to gather best practices that can be used by project and design managers as guidelines to understand the complexity of this topic and to be aware of possible solutions that can help them in their professional practices.

Project and design managers should consider the possibility of having less attention in the logistics of planning and linear progress of the design and focusing more in understanding and supporting the synergy created between design team members in order to increase the design values.

It is interesting how the analysis of this topic can be broadened in the field of project management. It is, therefore, an important field for further research to other factors affecting creativity as well as techniques and methods that can be used in creative management to improve the creative thinking process.

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## 9. APPENDIX

<b>PMBOK definitions</b>	
<b>Scope</b>	The sum of the products, services, and results to be provided as a project.
<b>Product Scope</b>	The features and functions that characterize a product, service, or result.
<b>Project Scope</b>	The work performed to deliver a product, service, or result with the specified features and functions.
<b>Project Scope Management</b>	Project Scope Management includes the processes required to ensure that the project includes all the work required, and only the work required, to complete the project successfully.
<b>Project Scope Statement</b>	The description of the project scope, major deliverables, assumptions, and constraints.
<b>Scope Baseline</b>	The approved version of a scope statement, work breakdown structure (WBS), and its associated WBS dictionary, that can be changed only through formal change control procedures and it used as a basis for comparison.
<b>Scope Change</b>	Any change to the project scope. A scope change almost always requires an adjustment to the project cost or schedule.
<b>Scope Creep</b>	The uncontrolled expansion to product or project scope without adjustments to time, cost, and resources.
<b>Scope Management Plan</b>	A component of the project or program management plan that describes how the scope will be defined, developed, monitored, controlled, and verified.

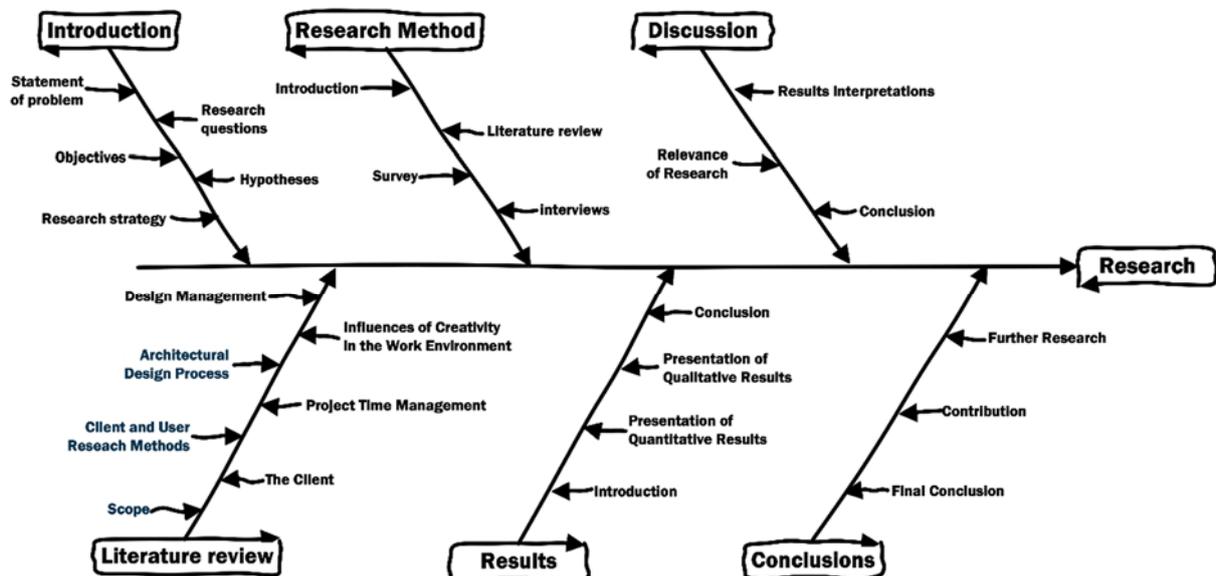
*Appendix 1. PMBOK definitions*

<b>Project Time Management Processes</b>	
<b>Plan Schedule Management</b>	The process of establishing the policies, procedures, and documentation for planning, developing, managing, and controlling the project schedule.
<b>Define Activities</b>	The process of identifying and documenting the specific actions to be performed to produce the project deliverables.
<b>Sequence Activities</b>	The process of identifying and documenting relationships among the project activities.
<b>Estimate Activity Resources</b>	The process of estimating the type and quantities of material, human resources, equipment, or supplies required to perform each activity.
<b>Estimate Activity Durations</b>	The process of estimating the number of work periods needed to complete individual activities with estimated resources.
<b>Develop Schedule</b>	The process of analyzing activity sequences, durations, resource requirements, and schedule constraints to create the project schedule model.
<b>Control Schedule</b>	The process of monitoring the status of project activities to update project progress and manage changes to the schedule baseline to achieve the plan.

*Appendix 2. Project Time Management Processes (PMBOK)*

List of Interviewees					
Interviewee	Location	Position	Years of professional experience	Size of the organization	Organization typology
Interviewee 1	Iceland	CEO & Project Manager	7 years	5 employees	Architectural office
Interviewee 2	Iceland	Office manager & Design team leader	38 years	30 employees	Architectural office
Interviewee 3	Iceland	Construction architect	20 years as Project manager in Construction. 3 years as Construction architect.	60 employees	Architectural office
Interviewee 4	Iceland	Client	27 years	5 employees	
Interviewee 5	Mexico	Project manager	14 years	30 employees	Architectural design specialized in Industrial Facilities
Interviewee 6	Mexico	Design team leader	18 years	60 employees	Architectural office and Real Estate developer
Interviewee 7	U.S.A.	Architect	18 years	30 employees	Construction and Real Estate developer

Appendix 3. List of interviewees



Appendix 4. Fishbone structure of the research