Quaestum

DOI: https://doi.org/10.22167/2675-441X-20210565
Quaestum 2021; 2 e26750565
ISSN: 2675-441X

Article

Use of project management techniques and methods in design management

Emprego de técnicas e métodos de gerenciamento de projetos na gestão de design

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Received: jan. 01, 2021
Accepted: nov. 11, 2021

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Abstract: Design is a synonym of project. This work aimed, based on the meaning of the word and the recognition that the term currently has on Brasilian market, to identify which ones, and how much are used the traditional project management techniques and methods disseminated by the PMI in design projects. For this, a questionnaire was applied to professionals in the area, inserted in several sectors such as interiors and products design. It was concluded that although these techniques and methods are used, they have a medium frequency in the projects and there was a tendency where it is customary to plan the use of the techniques rather than follow their development in the projects, which may indicate a point for action for project managers in the area.

Keywords: design projects; performance of design management; design methods.

Resumo: "Design" é um termo estrangeiro que etimologicamente, em um sentido puro, significa projeto. Este trabalho teve como objetivo, a partir do significado da palavra e do reconhecimento que o design tem no mercado, identificar quais são, e o quanto são utilizadas as técnicas e métodos de gerenciamento de projetos tradicional difundidas pelo PMI em projetos de design. Para isso utilizou-se um questionário aplicado à profissionais da área compreendidos em diversos setores como interiores e produtos. Concluiu-se que embora estas técnicas e métodos são empregadas elas tem uma frequência mediana nos projetos e observou-se uma tendência onde se costuma planejar o uso das técnicas mais do que acompanhar seu desenvolvimento nos projetos, o que pode indicar um espaço para a atuação de gestores de projetos na área.

Palavras-chave: projetos de design; desempenho da gestão de design; métodos de design.

Introducion

For the World Design Organization (WDO, 2020), design is a strategic problem-solving process that fosters innovation, establishes business success and leads to the improvement of life quality through products, systems, and innovative experiences and services. The use of the word management, linked to design is relatively recent and is related to the fact that companies observed that the corporate world was beginning to encounter management challenges, as the scenario was increasingly uncertain and complex. Contemporary to the term management, the current WDO established its relationship with design as a way to mitigate the risks that governance challenges can bring, assisting in the areas of strategic planning, logistics and marketing (Avendaño, 2011).

This approach also begins to influence the development of curricular grades for design courses, which no longer have a character focused only on the technicality of the area and start to address management concepts such as sustainability and marketing, for example.

Still for Avendaño (2011), among the most commonly accepted definitions of design management is that of Tomas Maldonado, a member of WDO, who emphasizes the multifaceted nature of projects in the area, in which, although it may seem based on a freewill to design a product or service, it is the role of the designer to always analyze the context in which this will occur in order to deliver the best possible solution both aesthetically, functionally and economically.

Several methodologies are presented to designers during their graduation process, the approaches can be more didactic, in which each part of the development process is expanded and subdivided and then presented in a consistent way, as stimulated by Munari (2017).

On the other hand, in this area of knowledge, there are authors who summarize the creative process at first and then list relevant actions to each phase of the projects, leaving it up to the professional to establish which item is an indispensable requirement for each part of the project according to the intrinsic and particular need of the product or service under development. Lobach (2001) is an example that brings design management closer to project management as to the congruence of some concerns during development, dividing projects into 4 main phases that are subdivided into small activities. These phases are: 1 preparation phase, in which the scope and needs of the project stakeholders are defined and identified and data are collected for the development of the project; 2 generation phase, in which it begins to elaborate and search for alternatives for the solution of the problem indicated by the project; 3 evaluation phase, in which the selected alternatives are evaluated and components are sought to execute them; and 4, the implementation phase, moment to generate the project, evaluate it and document it.

At the same time that we can find consolidated methodologies in the design market, there are also authors who, due to the high creative level of the area, risk to develop experimental methodologies according to the particularities of the projects using parts picked within the theoretical and practical framework developed by the professional experience of the company or the designer. In this way, Bonsiepe (1994) describes the experimental methodology exploring at least four different ways to solve the same problem, including some similar to the agile methods.

Design projects can relate to different fields such as services, physical or virtual products, graphic identity, interiors and even architecture (Mozota, 2003). According to the Project Management Institute (PMI, 2017), through the guide entitled “Project Management Body of Knowledge” (PMBOK), one of its characteristics is the creation, after a certain period, of an exclusive product, service or result. Therefore, it is with design practices in general, however, it can be said that no design methodology addresses project management tools in a pure way although in PMBOK (PMI, 2017) design appears as an auxiliary tool in some processes. It is believed that project management topics end up being used by designers in an intuitive way or inserted into a corporate culture to which the professional is a part of.

This work aimed to identify the project management process groups applied in design management since; in general, design and project are interrelated, either in the meaning of the word or in the exclusive nature of the final objectives of their performances. This analysis can assist in identifying possible gaps in design management, paving the way for project managers to act (with more methodological management knowledge) in order to improve the performance of design projects in parts or as a whole.

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Material and methods

For Gil (2002), when elaborating a research, one must define its level according to the type of study and analysis that is intended, and this level can be: exploratory, when the data obtained are more flexible and empirical and their results aim for further studies, which happens a lot in case studies; descriptive, when the intention is to obtain a description of phenomena or populations through standardized tools for data collection that lead to quantitative results, here are the field studies and; explanatory, research at this level is rarer and tends to be more experimental.

In this article, the appropriate level is the exploratory one, so, following some steps proposed in the publication of Gil (2002), for the data collection, a survey was prepared virtually using the tool "Google Forms".

For Freitas et al. (2000), when basing his article on studies by Pinsonneault and Kraemer (1993), among others, a survey can be classified as descriptive or exploratory. For this work, the category that best fits is the last one, as it seeks to identify whether an event, or situation, in this case the presence of groups of traditional project management processes in design projects manifests itself in a specific population.

The questions in the survey sought to assess how effectively traditional project management is present in design projects and mostly relied on information obtained from PMI (2017) which presents managers 10 key areas of knowledge for project development.

The use of these areas and their tools are recommended, according to PMI (2017), to increase the chances of success and the progress of projects in general, especially in projects with a more traditional execution characteristic. According to PMI (2017), these areas include integration management, scope management, time management, cost management, quality management, human resource management, communications management, procurement management, stakeholder management and risk management.

In addition to the questions related to PMBOK, the research sought to identify the respondents' profile regarding how long, which area and type of activity within the design market, with the type being whether the designer is freelancer or hired in a company.It also sought to detect the presence of methodologies in the daily lives of professionals, whether they are design management or project management methodologies disseminated by the academy that respondents could use, since in a survey made by the article by Andrade and Bernardes (2009), the authors report that although there is recognition of project management disseminated by PMI as an aid in project execution, the production of content related to design management does not even mention the first.

Once the structure of the questionnaire was defined, it was pre-tested, from February 18th to 26th of 2020, applying it to some professionals who were as close as possible to the target population of this project, to assess whether the wording of the questions was clear, the response time, and to collect any other suggestions that could improve the final survey. With the test, changes deemed necessary were made and professionals were sought for the final data collection. For this a non-probabilistic sampling was used, as it is a specific group, using the method called "snowball", which assumes that the initial respondents forward the survey to other respondents of similar. These professionals were found mainly in design discussion groups on Facebook and LinkedIn and among the author's professional contacts and the answers were collected from 5 March. to Apr 10 2020, through the Google Forms platform. The structure of the questionnaire, ensured that some respondents were promptly directed to the "thank you" section, if they were not designers or did not agree with the consent form in order not to answer the other questions and tarnish the quality of the acquired data.

To present the items that composed the questionnaire the Table 1 below was elaborated, where are presented: the researched variable, that is, the aspect that can be interrelated with project and design management or factor that helps to delimit the research focusing on the objective such as qualifying questions, for example: the operational definition of the variable; and the theoretical reference that supports it.

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Table 1. Variables used in the research

Variable	Definition	Reference
Professional identification	If the respondent is in fact a designer and if he works for a company or as a freelancer	Qualifying question
Time of experience in the function		Qualifying question
Design area where you mainly act		
Role within the project	If the respondent is an owner, if he manages part, if he has a support function, etc.	Qualifying question
Presence of some methodology when developing the project	If the respondent use any methodology and from which area it comes from	Munari (2017); Lobach (2001); Bonsiepe (1994)
Scope	Identification and monitoring / control of the scope or briefing	PMI (2017)
Risks	Identification and monitoring / control of risks	PMI 2017
Schedule	Establishment and monitoring / controlling of schedule	PMI 2017
Costs	Survey and monitoring / controlling of costs and budget for the project	PMI 2017
Documentation	Documentation of project activities (records of planning, controlling and monitoring of project progress)	PMI 2017
Knowledge management	Use of tacit or explicit knowledge in projects	PMI 2017
Stakeholder management	Identification and monitoring / controlling of interested parties (people or organizations that will be impacted and / or that have an interest in the project)	PMI 2017
Procurement management	Definition and monitoring / controlling of procurement / contracting needs (people, materials, facilities and / or equipment)	PMI 2017
Quality management	Planning and monitoring / controlling of quality management (of project activities and / or products).	PMI 2017
Communication management	Planning and monitoring/controlling of communications (meetings, reports, communications, presentations, demonstrations, disclosures, etc.) of the project	PMI 2017

The next one, Table 2, shows the structure of the survey with the analyzed variable, the question that was asked to collect the data, the way of measuring and analyzing the data.

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Table 2. Questionnaire structure and data analysis method

Research variable	Questions	Measurement method	Form of data analysis
Professional Identification	Are you a freelance designer or work for a company? If you perform both functions, answer the one with the greatest weight in your career	Nominal scale	Descriptive statistics
Professional Identification	What is your experience as a designer?	Nominal scale	Descriptive statistics
Professional Identification	Which branch of design do you operate with the most emphasis (or frequency)?	Nominal scale	Descriptive statistics
Professional Identification	What is the predominant role you play in design projects?	Nominal scale	Descriptive statistics
Presence of some methodology when developing the project	Considering the design projects in which you worked more recently (if possible in the last two years), answer how often were each of the approaches listed below used:	Likert scale	Descriptive statistics
Use of project management tools and methods according to PMI. Among them the scope, risk management, cost, communications, stakeholders, quality, knowledge and procurement.	Considering the design projects in which you worked more recently, (if possible in the last two years) answer how often were each of the techniques and methods listed below used:	Likert scale	Descriptive statistics
Efficiency of project management methods. Among them the scope, risk management, cost, communications, stakeholders, quality, knowledge and acquisitions.	Considering the design projects in which you worked more recently (if possible in the last two years), answer how often the results below were obtained:	Likert scale	Descriptive statistics
Professional Identification	Identification (not required) if you want to receive a summary of the search results. Please provide your name.	Open question	

Source: Research original results

After the collect, the results were organized in tables and graphs and the mode and mean calculated were the main indicators taken into account to identify the presence of the studied variable in the ordinary process of design projects.

Results and discussion

A total of 73 valid answers were collected. Among the respondents, 78% work in companies and 22% perform the function as freelancers. This result was a surprise, because if we take into account a study by Centro Brasil Design (2014), when establishing a diagnosis about design in the country, the document concludes that, at the time, they had registered in the CNAE 7410-2, " national classification of economic activities" only 3,101 jobs in design and that this would be due to the fact that there are a very large number of informal professionals working nationally. However, there may be a caveat, where employed persons are not necessarily registered in accordance with the appropriate classification. Figure 1 shows data on the time of respondents in the area.

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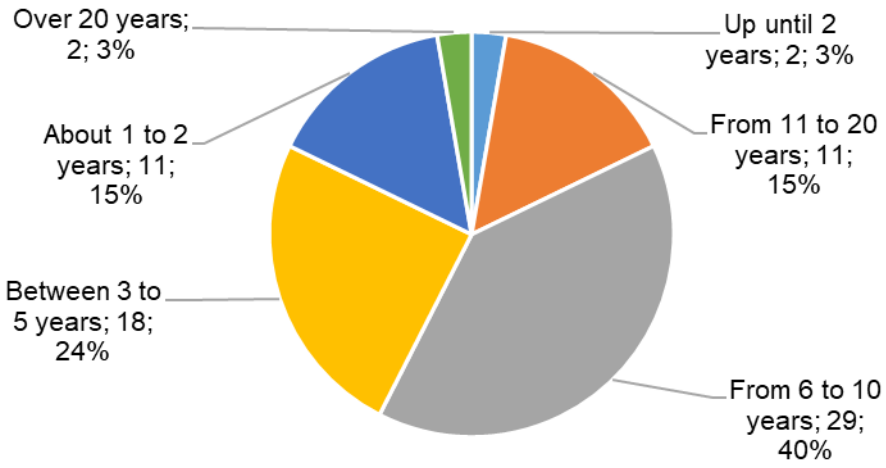

Figure 1. Respondents' career length time (n = 73)
Source: Research original results

Most of the interviewees are experienced in the job, which favors the second part of the questionnaire, which analyzes the presence of the bodies of knowledge of project management in design projects prioritizing the last 2 years of the careers of the professionals.

In Figure 2, we can see with regard to the area of design that operates, most respondents are in the graphics area (50%), followed by products (18%), interiors and UX / UI, user experience and user interface with 7% each, industrial (5%), services (4%) and others that had 2 or less responses and represent 5% of respondents.

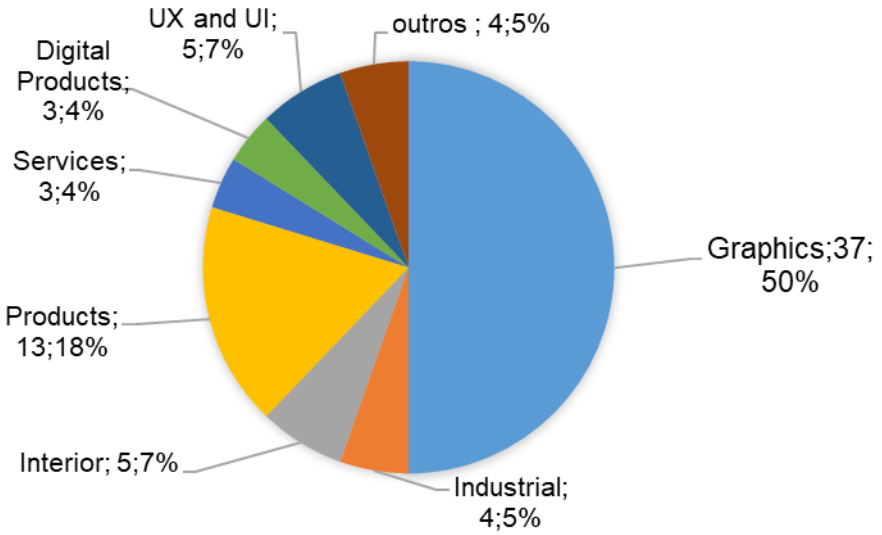

Figure 2. Design area that respondents work with (n = 73)
Source: Research original results

This result, the majority being a graphic designer is in line with that of Centro Brasil Design (2014), that is, the majority of designers and design offices are represented by workers inserted in this area or in related areas, like advertising and marketing.

Still on the question of identifying respondents, 34% exercise the function of project manager as a whole, and 34% are managers or responsible for parts of the projects that are inserted. Then there are those who carry out activities to support projects (22%) and project owners (10%). Figure 3 shows that the sample was composed mainly of managers of design projects, which generally favors the quality of the data obtained here.

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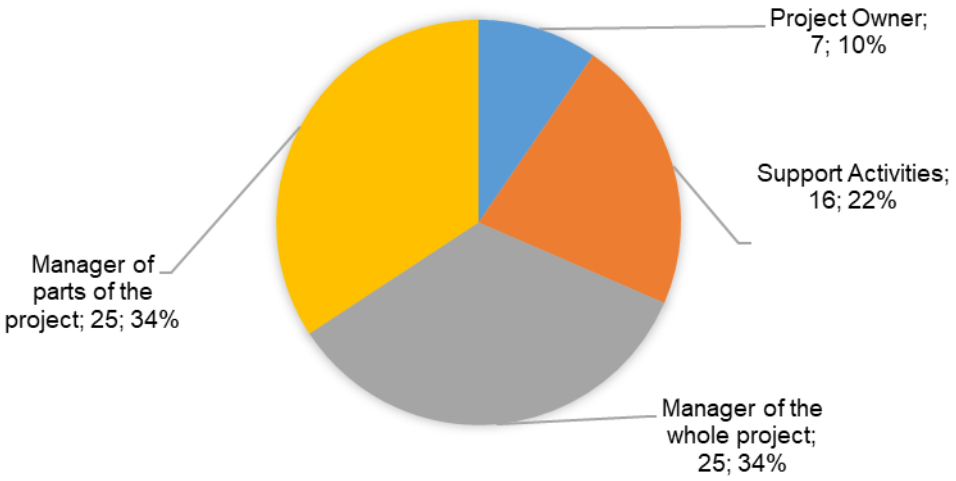

Figure 3. Function within design projects (n = 73)
Source: Research original results

Table 3 below indexes the responses in a decreasing order of the weighted averages on the presence and nature of the methodologies, both, design and projects, used in the projects that the respondents worked on until the time of the survey. These questions were measured using a Likert-type scale from 1 to 7, 1 being equal to never and 7 being equal to aways and had as enunciate the following: "Considering the design projects in which you worked most recently (if possible in the last two years), answer how often each of the approaches listed below were used:"

Table 3. Presence, use and type of methodology applied to design projects

Question variable, likert scale from 7 to 1 n = (73)	Weighted Mean	Mode
Design methodology based on own experience	5.6	7-aways
Project management methodology based on own experience	5.2	7-aways
Project management methodology developed by the company or client	4.1	5
Design methodology based on project management guides and manuals	3.7	3
Design methodology developed by client or company	3.6	1-never
Design methodology based on renowned publications	3.0	1-never
Project management methodology based on guides and manuals	2.8	1-never

Source: Research original results

This difference between projects where the origin of the design methodologies applied comes mostly from own experience (mean 5.6) and those based on reference publications (mean 3.0) may reflect what Vasconcelos (2009) found as trend for the 21st century when investigating design methodologies. When the author takes Vries (1993) as a reference, he recognizes that due to the often-interdisciplinary nature of design projects, methodologies tend to be adapted or built according to the particularities of each project. This recognition is common to projects in general, not only to design ones as showed in the study by Maximiano et al. (2011). Therefore, the data show that when there is the agreement that each project is unique, companies tend not to use a single methodology to guide their projects and end up feeling more comfortable making their decisions within the framework developed by themselves or their peers.

A curious fact discovered here, is that almost half of the design professionals are opting for a design methodology based on project management guides and manuals. While when talking about a project management methodology based on guides and manuals, although the mean is similar to the previous data, the highest frequency of responses here is 1-never, as opposed to 3, about half.

It can be observed mainly in the first and second line of the table that, in general, the way that the design projects analyzed in this research are mostly developed using knowledge inherent to the

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agents directly linked to the project, prevailing their own experience, and design professionals hardly f directly follow any material or guide published.

This fact reflects, regarding mainly project management methodologies, what was evaluated in the article by Andrade and Bernardes (2009), who studied design agencies with expertise in specific areas of design such as graphics, environments, packaging, products and web realizing that, although these places used management tools in their projects, this was done empirically and without the support of a well-defined method in most of them.

Next, Table 4 shows the questions that assessed the presence of the PMI management process groups (2017) in the design projects. They were organized here from the highest to the lowest average. For these answers, a Likert-type scale from 1 to 7 was applied, and here it was done as follows for the respondents: 1, never used and 7, always used. This question started with the sentence: "Considering the design projects in which you have worked more recently, (if possible in the last two years) answer how often were each of the techniques and methods listed below used:"

Table 4. Presence and Evaluation of aspects of project management in design projects

Question variable, likert scale from 7 to 1 n = (73)	Weighted Mean	Mode
Requirements identification (briefing or scope)	6.2	7-aways
Setting of deadlines (estimated deadlines - schedule of activities)	5.9	7-aways
Knowledge acquired in previous projects, but not documented (tacit knowledge)	5.5	7-aways
Monitoring and / or controlling of deadlines (schedule of activities)	5.4	7-aways
Monitoring and / or controlling compliance with project requirements (briefing or scope)	5.3	7-aways
Estimated costs - budget for monitoring the project	5.2	7-aways
Identification of stakeholders (people or organizations that will be impacted and / or that have an interest in the project)	5.2	7-aways
Communications planning (meetings, reports, communications, presentations, demonstrations, disclosures, etc.)	5.0	7-aways
Monitoring and / or controlling costs (budget)	4.9	7-aways
Setting of procurement / contracting needs (people, materials, facilities and / or equipment)	4.8	7-aways
Monitoring of interested parties (obtaining engagement)	4.8	4
Monitoring and / or controlling the quality (of project activities and / or products)	4.8	7-sempre, 5
Documentation of project activities (records of planning, control and monitoring of project progress)	4.7	7-sempre, 6
Documented knowledge acquired in previous projects (explicit knowledge)	4.7	7-aways, 6
Monitoring and / or controlling of communications (meetings, reports, press releases, presentations, demonstrations, disclosures, etc.) of the project	4.7	7-aways
Risk identification (in the execution of the project)	4.6	4
Quality management planning (of project activities and / or products)	4.6	6
Question variable, likert scale from 7 to 1 n = (73)	Weighted Mean	Mode
Monitoring and / or control of the acquisitions necessary for the project (people, materials, facilities and equipment)	4.5	4
Monitoring and / or control of risks present in the project	4.3	5
Project carried out without communication deficiencies (contacts with staff and customers, meetings, memos, internal or external promotional material, etc.)	4.2	3

Source: Research original results

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We have that the means for the scope variable are at the top of Table 4 indicating that it is generally well-identified (mean 6.2). This was expected, since a good part of the design methodologies presupposes the existence of such a tool as a starting point for projects (Lobach, 2001; Munari, 2017; Bonsiepe, 1994). Probably the majority of respondents had contact with some of these methodologies during their academic studies or that the experience of the respondents' through work ends up leading to the identification of best practices, which are the focus of the guides.

Then, in the order of the table, we have the setting of deadlines, that is, the estimation of deadlines and preparation of the activities schedule, is also a predominant variable with an mean of 5.9. This data denotes that, as in most cases, projects arise out of the will of the designer, it has other stakeholders who demand for the execution of the projects, so the component "schedule" is indeed present. Different from what could be assumed of design projects that, perhaps, may come from an individual will of the professional. This high mean for the setting of deadlines was also expected, since this variable is inherent to projects in the labor market when we analyze it, even empirically.

The third line of this table shows that a little more than half of the projects analyzed are made with tacit knowledge acquired from other projects, with a mean of 5.5. This mean is very close to the means in Table 3 when it was noted that the projects were carried out using design methodologies (mean 5.6) and project (mean 5.2) based on empirical experiences of the designers who responded to the questionnaire. Therefore, this positioning here is consistent with the data collected in Table 3.

Continuing the order of the table, information about the monitoring of the schedule (5.4) and scope (5.3) appears. With this, we can identify that these two areas are the ones that have the most attention of the designers within the projects they have worked on. However, this difference of almost 1 point in the mean for the scope and 0.5 for the schedule, between the monitoring and identification of the same, indicates a gap that may be better addressed in design projects in general, looking for the minimum the equivalence between identification and monitoring.

Regarding costs, there is also a concern with it, with responses below the Likert scale being rare, we have the mean for identification to be 5.2 and mode 7. Looking at the distribution profile of the responses, it can be seen that the majority were between 4 and 7 which resulted in this difference of almost 2 points between mode and mean. Due to what was identified in figure 4, where the data shows that 68% of respondents are design managers at some level, it was expected that the most common variables and "common sense" in projects, would be more prevalent. Even though if this majority of design managers ignored all other management variables due to the lack of any academic contact or experience of cause, empirically the attention regarding deadline, scope and cost, are inherent to projects of different scales.

For the variable related to stakeholders there is a gap between the averages between identification (5.2) and monitoring (4.8). This evaluation of the average puts the concern with the stakeholders in a frequency of little more than half of the projects that the respondents worked on.

When comparing this with the collect on the use of specific tools used by project managers evaluated by Maximiano et al. (2011), it must be said that, although this last article focuses on specific tools, design projects tend to have a greater contact with the interested parties than those of the construction area.

Communications planning obtained a mean of 5.0 and the monitoring of the same variable had 0.3 points less with a mean of 4.7. When observing what was evaluated by Maximiano et al. (2011), as for some specific communication tools such as: letter of acceptance by the client, follow-up meetings and reporting, we have that the use of these tools in the above mentioned are below 70% in construction projects, and below 60% in other projects evaluated in the article. In other words, design projects tend to have practically the same presence of communication planning as civil engineering projects even though they are of such a different nature.

Then in the table, the budget control replicates what happened with the scope and schedule

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variables. In all of them, the identification came first, but the monitoring variable was preceded by another identification or planning variable. Demonstrating that planning tends to have greater relevance in projects than monitoring.

For costs, it was identified that although the mean is lower when compared with scope and time, the difference between identification and monitoring is smaller, which denotes a greater concern about this variable. This highlights the essential importance for the viability of the projects in general that this variable has. In projects with more agile methodologies, for example, it is possible to have projects without a well-defined or strictly controlled scope or schedule.

The data on the need for acquisitions obtained a mean of 4.8, this fact may indicate some failure in planning the scope of the projects or evidencing that design projects tend to discover acquisition needs during the process, which can affect other variables such as cost and schedule. (PMI, 2017)

Regarding the process group dealing with quality, Table 4 shows a small discrepancy where the weighted mean of planning (4.6) is less than that of monitoring (4.8), the reverse of what happens with the other variables. This indicator may be showing that this variable is critical to the objectives of the projects and is therefore more closely monitored. However, this difference between planning and monitoring indicates that action points are discovered during the projects, which demands more attention to quality management in design projects.

Table 4 below shows a tie with a mean of 4.7 between the documentation and the use of documented (explicit) knowledge, which is the most consistent process within the survey. However, the use of tacit knowledge has almost one point more in the mean (5.5), reinforcing that due to the often innovative nature of design projects (SEBRAE, 2015), professionals resort to this type of knowledge more frequently.

Regarding to risks, most responses are concentrated in the middle of the spectrum of the Likert scale for both, identification (4.6) and monitoring (4.3). Being different from what predominates in the table, the mode here was not 7-always. In the case of risks, the mode was 4 (about half) for identification and 5 (slightly more than half) for monitoring. The depth of the data here does not allow a clarity as to why this variable presents an average situation in the table. It can be outlined that the data collected in Table 3, as the use of methodologies both for project management and for design, mostly from their own experience, influences risk management. Perhaps the professionals have very insipient familiarity with the risk variable, the professionals lack the tools to identify and monitor them, which according to Rabechini Junior and Carvalho (2013) can negatively influence the success of the projects.

Most of the variables studied tend to be more planned than monitored and this may be due to a lag in the communication variable. This variable has an mean of 5.0 for planning and 4.7 for monitoring, a small difference, as well as that observed for costs. However, the average of 4.2 for the variable "project carried out without communication deficiencies" exposes a deficiency in this variable.

As 78% of the respondents sample works in a company, according to Figure 1, another factor that can influence this relationship between planning and monitoring is some characteristic of the organization chart of companies where, by chance, it is not up to designers to monitor these variables.

After collecting data on the use of project management process groups according to PMI (2017), the questionnaire followed up with another question, also using a Likert scale with the same weights as the previous question (1 equal to never and 7 equal to always). At this moment, it was sought to know how these projects were concluded under the perspective of the adopted performance indicators. These data help to identify how the weight of the presence of some of the process groups matches the way that the design projects considered by the respondents were completed.

Table 5 below organizes the mean and mode of these responses in order of magnitude from highest to lowest. The question stated the following: "Considering the design projects in which you have worked more recently (if possible in the last two years), answer how often were the results below obtained:"

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Table 5. Frequency of results according to project management area

Question variable, likert scale from 7 to 1 n = (73)	Weighted Mean	Mode
Project completed with customer / requester satisfaction (quality)	5.9	7- aways
Project completed accordingly to planned schedule.	5.5	7- aways
Project completed within the scope (meeting all requirements)	5.5	7- aways
Project completed within planned costs (budget)	5.4	4
Project completed with no need for post-delivery adjustments	4.2	7-aways, 6

Source: Research original results

With an mean of 5.9, the projects analyzed usually ended with customer satisfaction. Design projects have, in general, a creative and innovative characteristic that differs from other projects, which favors the presentation of unexpected solutions (SEBRAE, 2015). That is, the project requester often has an idea of what he wants, but the final product surprises him, which can influence satisfaction with the project. Even if the other management variables, such as quality, stakeholders and communication, are impaired to some degree during the life cycle of the project. As seen in Table 4.

Even with a high level of satisfaction, in general, there is a possible point of improvement here in design projects that can be explored in a second moment. Table 4 shows a gap in relation to quality, stakeholders and communication management that may be preventing design projects from further improving customer satisfaction.

In Table 5 it is noted that different from what was analyzed about scope in Table 4, when the presence of this variable was established at the top and with a mean higher than the schedule, in Table 5, they tied with a mean of 5.5. This mean for the variable scope and schedule is very close to the mean that can be found when we relate monitoring and identification of these variables, which gives an indicator regarding the importance between identifying and monitoring the variables with the result of them at the end of the projects.

From the budget point of view, we have that the weighted mean for the completion of projects within this variable is 5.4. The modes for variables on cost in Table 4 are 7-always, while for the same theme in Table 5 it is 4-about half. Here there is room, in a more targeted and in-depth study, to seek, identify and compare which aspects of the ones collected on Table 4 influences the data on Table 5 regarding monitoring and planning of this characteristic

The result with the lowest mean was the one that identified the need for post-delivery adjustments with 4.2. Due to the high average presented for the satisfaction of the applicants (5,9), this data regarding changes may reinforce the opportunity to study in the future the need for projects to find ways to better identify and monitor their variables, especially in terms of quality, communications, stakeholder and risk management.

The analysis of these data reflects, in a more general way, what was discovered by Andrade and Bernardes (2009). At the time of their article, they were based on PMBOK (2004) and studied the presence of the traditional aspects of project management disseminated by the publication, at design offices in Porto Alegre, RS, Brazil.

In that work, the authors collected data from offices in 5 areas of design, namely: graphics, packaging, products, environments and web design, and found that these offices did use the processes more or less frequently, but not in a systematized or organized way.

Only one of the offices surveyed was more familiar with the management processes disseminated by the PMI (2004), according to the authors, probably because the company is larger and has human and financial resources corresponding to its size. This led the authors to conclude that the use of project management processes probably depends on the structural complexity of the user, in this case design offices.

An important point that converges this work with that of Andrade and Bernardes (2009) is the

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identification of possible points for improvement in design projects, mainly in the field of quality management, and that aways, in a more formal or informal way, the project management groups of process disseminated by PMBOK (PMI, 2017) are present in design projects. A point that differs is that in Andrade and Bernardes (2009), as a case study, the data came from the perspective of 5 predefined companies, not all of which had design as the main function of their performance. Here the perspective is directly from designers, most of whom work in the management of their projects, according to Figure 4.

Conclusion

The research allows, within the sampling mainly of design managers, to conclude the main objective that was proposed, which was to identify the presence of the project management`s process groups in design management. It is possible to observe that most of the processes are identified more frequently than controlled and that the majority of the evaluated projects use the management process groups disseminated by the PMI with an frequency mean of 4.0 approximately. In other words, a majority of projects with a median frequency within the scale indicates the possibility of a project manager acting in order to raise this average to 7-aways. The empirical nature of these projects, where the majority of respondents said that they use design or project management methodologies based on their own experiences reinforces that there is probably space for a project manager, perhaps with a more explicit approach, to act in order to approach the ideal, thus contributing to the design management. Although with a relatively small and non-probabilistic sample with the impossibility of generalization and the possibility of bias because it is based on opinions and perceptions, this work exposed data that can help to identify paths for others who intend to improve design management under the point of view of project management. In addition, this data may serve as a basis for other work that stipulates to outline points of improvement in traditional project management or design management.

How to cite: Silva, V.R.P.C.; Yugue, R.T. 2021. Project management techniques in design. Quaestum 2: e26750565

Author Contributions: Conceptualization: Silva, V.R.P.C.; Yugue, R.T. Data acquisition: Silva, V.R.P.C. Data analysis: Silva, V.R.P.C. Design of methodology: Silva, V.R.P.C.; Yugue, R.T. Writing and editing: Silva, V.R.P.C.; Yugue, R.T.

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