Portfolio Management of Social Projects: A Case Study in IFSP - 2021

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Abstract

Since 2020 there has been a continuous study of Portfolio Management in the Technical High School Course of Electronics in IFSP Sorocaba in the course of Integrated Project. In 2021 the second stage was developed with the participation of Non-Governmental Organizations (NGOs), that often do not possess the knowledge, the manpower nor the techniques to bring to life their projects. This paper continues the research of 2020, with the lessons learned on that case study cycle presenting new ideas to overcome the difficulties and obstacles noticed by the project teams during that year and by the portfolio management team, with the purpose to increase the overall performance by meeting the NGOs expectations and to achieve better results focusing on solving the 2 biggest issues of 2020 – communication and NGO selection. At the end of the year the objectives were achieved, however new issues arose during the 2021 cycle – both new problems and new variants of existing problems – that were not expected. As a conclusion the 2021 edition showed an increase in performance of the individual projects and the portfolio management.

Keywords

Portfolio Management; Project Management; Social Project Management; Projects & Portfolio

1. Introduction

Since the 3rd industrial revolution, in the 1950's, the attention for the fields of scientific knowledge and productions engineering methods has been intensified (Slack et al, 2009). As it in the production side, management is found in several areas of knowledge, being of supreme importance the level and efficiency of education in this particular subject (Dias, 2000).

This study is a continuation of a three-year project based on PMI's (Project Management Institute) PMBoK (PMI, 2018) that will finish in 2022 with Social Entrepreneurship. With previous results showed and discussed by Lima and Caldana (2020), there has been positive and successful results in 2020 with several lessons learned in that year and the main objective of the second stage of the project that this paper will cover is to use that knowledge from the previous research cycle and build the knowledge to improve the efficacy by doing the necessary literature review on the failures and issues faced by the students in the last cycle and providing new methods to overcome and eliminate those problems.

According to Link (2020) working with public projects needs constant attention to critical factor to achieve the necessary success, which normally means that they are susceptible to risk, both internal and external during its planning and execution, and as such the Project Manager and the Portfolio Manager roll is to find solutions for such obstacles.

It is necessary to note that the execution of the 2021 projects and the Portfolio management still occurred using remote teaching and the technologies that would allow for communication in that format due to the pandemic of COVID-19 and the known restrains it brings due to social distancing.

1.1 Objectives

As stated before, this paper has the objective to implement and observe the changes made in the both the planning process as well as the execution and monitoring stages of a project development as defined by PMBoK (PMI, 2018), especially considering the lessons learned during the execution of the 2020's projects. The main issue found by Lima

and Caldana (2020) that needed correction was the "follow-up" procedure followed by the necessity of a better screening process of the NGO's to validate their subscription to be a part of the study. For that the literature review will be focused on stablishing criteria and information that are pertinent to the subject and propose a model document for all student groups to follow to answer the following questions:

- What should be the model for reporting Follow-up activities to the stakeholders?
- How can the selection criteria of the NGO's be improved?

2. Literature Review

In the Portuguese language, a literature review is the process and comprehension and understanding of a text of literary work, such as a story, using textual analysis. However, for Portfolio Management it is the research the engulfs the gathering of information on the related topics of Project Management (Watanuki et al, 2014). There are some forms of literature reviews. For this paper, unlike what was done in the previous study of a narrative and systematic review, the paper will focus on an integrative literature review (Lima and Caldana, 2020).

The "systematic review" is a type of scientific investigation. These reviews are considered a critical analysis of the literature and their purpose is to find, evaluate and synthesize the results of several studies to answer a clearly formulated research question, selecting and evaluating the results from relevant studies. The "integrative review" is used to review and combine studies with different methods. This method enables the combination of data from the practical and theorical literature that can be used to define concepts, identify research gaps, review theories, and analyze the study's method on a specific topic.

As this paper needed a stronger basis to solve the issues from 2020, both review methods were combined. The research string was inserted into Google Scholar (<u>https://scholar.google.com.br/</u>) with the same keywords listed for this article - Portfolio Management; Project Management; Social Project Management; Projects & Portfolio

2.1 Selection Criteria

As seen on section 2, we will use a Systematic Review that is defined by categorizing the methods, parameters and criteria of the search string and will put their results through an integrative review. The method requires a very clear search string defined by the Keywords of this paper to answer the research question defined in section 1.1. For the systematic review 3 criteria were selected as shown in Table 1 below:

Criteria	Description
Publication Date	10 years or less
Number of Citations	At least 10 citations
Project Management Theory	Articles must use the PMBoK guidelines

Table 1 – Selection Cr	iteria
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2.2 Results

The Keywords produced over 300 articles, books and thesis. After the selection criteria was applied 9 studies were added to the existing base of knowledge already used in the project in 2020. The new articles added to the database are shown in Table 2:

Authors	Title	Year
Andrade	Conflict Management in Projects	2010
Carvalho et al	Portfolio Management: contributions and literature tendencies.	2013
Ensslin et al	A case study on portfolio management of products and multicriteria decision	2012
Farias and Almeida	Defining success in Projects	2010
Link	Critical Factors in Sustainable Public Projects Management	2020

Table 2- New articles ad	dded to the	database
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PMI	Managing Change in Organizations: A Practice Guide.	2013
PMI	Project Manager Competency Development Framework	2017
PMI	The PMI Lexicon of Project Management Terms	2021
Watanuki et al	Management of international projects: a bibliometric study	2014

Due to the failure of P2 and P5, as detailed in section 5, a separate literature review was conducted to better understand the factors that led to that outcome. According to the authors in Table 2 there are 15 critical factors for project management, and the factors that were listed to understand the failure of those projects are:

- Project Leadership
- Project Communications
- Stakeholder Management
- Project Team Management

3. Methods

When searching in the literature review for methods to improve the "follow-up" procedure and the selection criteria, the following strategies did stand out as they were related to the issues that were faced in 2020 as well as the feasibility to implement them in 2021. To measure the effectiveness of the changes, 10 criteria were selected as described below:

- 1. Initiating Process Group
- 2. Planning Process Group
- 3. Executing Process Group
- 4. Monitor & Controlling Process Group
- 5. Closing Process Group
- 6. Meeting the Stakeholders expectations
- 7. Delivery of the project on schedule
- 8. Delivery of all scope items planned
- 9. Risk Management
- 10. General grade of the project

Criteria 1 through 5 are based on the PMBoK Process Groups (PMI, 2018) and the remaining criteria are based on the new results from the literature review described in table 2.

3.1 NGO's Selection Criteria Issue

AHP (Vargas, 2020) was selected again as the method for selection and classification. However, with the lessons learned changes were made in both the aspects of choice and the format of enrolment. In 2021 the NGOs would have to fill a form on Google Forms with more detailed information on the needs and expectations as well as appointing someone inside the NGO to be our counterpart in the project. This form had 6 mandatory sections:

- 1. NGO's name
- 2. NGO's size and legal status
- 3. Describe your organization, its mission statement and values.
- 4. Supply a name and e-mail address for a contact person within the NGO that will have at least 1 hour per week to follow-up with the project group, answer e-mails and attend remote meetings.
- 5. Describe the work performed by the NGO and the population affected by it
- 6. What are the issues that our team can help you with (For example: Objective 1; Objective 2). Be clear on your objectives and goals, describing them as detailed as possible.

Once the questionnaire was filled by the potential NGOs, the following grading criteria was used to stablish classification:

- 1. Introduction: Was able to clarify the mission and vision of the project (point 3)
- 2. Project Structure: The size and availability to attend meeting (points 2 and 4)
- 3. Objectivity: clear and well-defined project (point 6)
- 4. Complexity: How realistic and feasible are the goals (point 5)
- 5. Strategic Planning: Established objectives (point 6)

3.2 Follow-up issue

Since this was the biggest issue faced in 2020, the solution was based on integrating three different methods found in different aspects of the literature review. The first method described by the PMBoK (PMI, 2018) is to create performance indexes to plan and follow-up on your goals. For this to happen each group must gather the necessary information and share it properly and timely with the stakeholders. The second method, as described by Camargo (2019), is to stablish a routine for communication and control methods to keep track of the work being performed by the project team, always considering the necessary changes that happen during the execution and monitoring phases. The third observation came from Espinha (2021) and replies from the students of the 2020 case study, were both described the need to have meetings to analyze the defined scope and the actual scope, the tendencies of the outcomes of current paths being undertaken based on previous results. The comparison of different strategies could be used for correction activities or to better monitor risk.

To implement the solutions seen in the literature, the Portfolio management team decided to stablish two new activities for all projects:

- 1. A weekly report was introduced (as detailed in section 4.1.1) and a weekly meeting of 10 minutes with the Portfolio Management team. This report dealt with the day-to-day activities of the projects and focus on communication and scheduling.
- 2. A monthly report was introduced (as detailed in section 4.1.2). This report would focus on Scope, Quality Control and Integrated Change. For this a fifteen-minute meeting with mandatory presence from the NGOs personnel was schedule to present the report.
- 3. A monthly calendar with the activities of the several projects was assembled so the Portfolio Management team would have a better view of the work being done by all groups.

4. Data Collection

The projects selected for the 2021 year were the ones that had the higher AHP points according to the methods and criteria described in section 3. The answers were collected via Google Forms with the questionnaire described in section 3.1. Results, shown in Table 3 below, are of the seven selected projects. P5 was selected even without a high grade as it was an initiative from the students themselves.

Projects	Introduction	Project Structure	Objectivity	Complexity	Strategic Planning	Total
P1	10	10	10	10	10	50
P2	9	9	10	10	10	48
P3	10	10	8	8	9	45
P4	10	9	10	10	10	49
P5	6	7	5	5	7	30
P6	10	8	10	9	10	47
P7	10	8	10	9	10	47

Table 3 - Projects Selected

All projects had a predominant aspect with the students to draw their attention, as shown in Table 4 below. As in 2020, all 26 students were told to select 3 potential projects to work with. Seven groups were created (between 3 and 4 students) for each project. All goals were clear and fitting with the capabilities of the students even with the restrains imposed by COVID-19 and at this stage all were believed to be achievable.

Table 4 –	Student	engagement
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Projects	Number of Students	
P1	22	
P2	5	
P3	15	
P4	8	

P5	5
P6	8
P7	15

4.1 Follow-up data collection

As previously described in section 3.2, the data collection from the follow-up of the activities during the execution phase of the project was achieved via two separate reports: one submitted weekly, and one submitted monthly.

4.1.1 Weekly Report

The first report is composed of a Word document¹ where the participants of the group would indicate the activities being performed in that week, their ID (for control) and if that activity was concluded on that week. There was a section dedicated to the activities that were delayed and behind schedule (as shown in Figure 1 below). This would give the group and the portfolio management team a more accurate view on the weekly performance of the group. This was the response found by the portfolio management team to address the issues of 2020, including engagement of the students and control of the schedule. This report was the basis for the weekly meeting between the groups and the Portfolio team. Other information such as the Risks monitored during the week and the general relationship between the students was also collected.

ID Atividade	Executor	Concluída?

Atividades atrasadas:

ID Atividade	Executor	Data término	Concluída ?

Figure 1 - Weekly Report Detail - Activities

4.1.2 Monthly Report

The second report is also composed of a Word document² where the participants of the group would indicate the activities being performed in that month, their ID (for control), the activities that were delayed and behind schedule and the Quality Indexes – the most relevant part of the report as shown in Figure 2. This would give the group and the portfolio management team a more accurate view on the monthly performance of the group, especially as there were mandatory quality indexes for Scope, Time and Cost. This report was reviewed and sent to all key stakeholders, including the NGOs contact and was the basis for the monthly meeting between the group, the NGO and the Portfolio team. Other information such as the Risks monitored during the week, the requested and the approved Integrated Changes and the general relationship between the students was also collected.

¹ The complete report in Portuguese can be accessed at: <u>https://drive.ifsp.edu.br/s/5YEtp5kFWssa8L3</u>

² The complete report in Portuguese can be accessed at: <u>https://drive.ifsp.edu.br/s/jp26kSMvjWkyFny</u>

Indicadores de Qualidade:

ID Atividade	Indicador de Qualidade	Valor Medido	Atendeu?

Figure 2 – Monthly Report Detail – Quality Control

4.1.3 Detailed Schedule

A detailed schedule with all the starting dates of the activities was made by the Portfolio Management team with the intent to follow-up closely the activities that were supposed to be initiated in each week and (as shown in Table 5) the monthly activities for the meeting with the NGOs. It is important to note that P5 is not shown in table 5, as the project was terminated before the end of the planning phase, and this will be detailed in section 5.1.

Draigat	Month			
Floject	September	October	November	December
P1	A1, A1.1, A2, A2.1,	A3.1, A6, A6.2.	A6.1, A6.3.	A6.4.
	A3, A4, A4.1, A5.			
P2	A01, A02, A04,	-	A03, A05, A06.	-
	A07.			
Р3	A01, A02, A03,	A10.	A11, A12.	A04, A05, A06.
	A07, A08, A09,			
	A13, A14, A15,			
	A16, A17.			
P4	0A1, 0A2, 0A3,	A03.	-	-
	0A7, 0A8, 0A9,			
	0A10. 0A11, 0A12,			
	A01.			
P6	E01, E02, E03, E04,	E06, E07, E08.	-	E09, E10.
	E05.			
P7	006-1,008-1,004	-	012 -2, :012 -3.	010 –2.
	-1, 005 -1, 013 -,			
	011 -1, 011 -2, 009			
	-1, 014 -1, 013 -2,			
	014 - 2, 012 - 1, 010			
	-1.			

Table 5 – Monthly A	Activities	Calendar
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5. Results and Discussion

During the 2021 cycle of projects two major issues resulted in the termination of the groups original proposal. These problems were in P2 and P5. The remaining projects maintained a steady outcome of deliverables and, at the end of the semester, were considered to have achieved – and in some cases surpassed – the expectations of the NGOs. It was important to notice that the reasons why both P2 and P5 where terminated had no relation to the issues faced in 2020, and as such a new opportunity arose to understand those problems and to improve the knowledge base.

5.1 Failed Projects

In P2, due to the lack of communication on the NGO side the project had to be cancelled in November, as the students would've been penalized if the project continued. They were offered a different path to complete the Integrated Project course subject. It was clear that there was a lack of leadership by the NGO, as the person responsible for the communications with the students appointed at the time of the submission of the project was replaced during the execution phase. The reports from the student group also showed a difficulty in getting a consensus from the NGO board on the priority of the goals and what should be performed first, with that information changing during the execution phase. On November 26th the project was terminated by the Portfolio Management team.

The students of P2 presented a start-up plan of action to get the necessary credits in the course. The start-up model is the next phase of the Global 3-year research project, and the Portfolio team took the opportunity to begin observing the dynamics of that situation to improve the chances of success of the start-ups in 2022.

In P5 the issues happened during the early planning phases due to the group dynamics and the internal relationship between the members. The project, that was envisioned by one the students in group, had issues with the management of the student group and their expectations and roles. This reflected the scores of P5 during the AHP criteria, however the strong engagement expected by the Portfolio team did not manage to overcome the obstacle and the opposite effect was triggered with the students being unable to communicate to each other. The project was terminated on June 28th and the students were relocated to other groups where they continued in the execution phase for the necessary credits in the Integrated Project's course.

5.2 Successful Projects

Apart from P2 and P5 all projects met their respective goals, with some of them even going beyond the initial scope of supply since the synergy between the group and the NGO was extremely good. The issues faced by both P2 (lack of response from the NGO) and P5 (internal relationship) did not exist on the other projects. Groups were able to maintain and manage all stakeholder's expectations and communicate effectively.

Of all the successful projects, P4 and P7 were partnerships with NGOs that were also present in 2020. P4 was a special success case as we got very positive feedback from the NGOs managing partner regarding the methods to solve the communication problem and that the actions of the Portfolio team showed a significant improvement on the ability of the groups to report performance and keep track of activities.



5.3 Follow-up Results

Figure 3 – Activities and Delays based on follow-up

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To measure the effectiveness of the follow-up procedure, the Portfolio management team decided to investigate the number of activities that were delayed during the execution phase due to communication issues. The results are showed in Figure 3, with both the number of activities started each month and the number of delayed activities on that same month. From the results of figure 3 we can see that only 4 activities were delayed of a total of 75, thus providing and index of 5,33%.

5.4 Empirical Global Results

Since there were 7 projects on total, if a simple average was made based simply on the final delivery of the projects, then each project would represent 14,28% of the total portfolio success rate. However, to better understand the results including the partial outcomes, specially from P2, the average of the success of the Portfolio was determined by the success of each project as described in the equation (1) below, where SR_P is the Success Rate of the Portfolio, SR_i is the success rate of the individual projects and n is the number of projects.

$$SR_P = \frac{\sum_{1}^{n} SR_i}{n} \tag{1}$$

To establish the Success Rates of each project, the criteria describe on section 3 was used and the results from 2021's projects are showed in Table 6 below. The maximum grade for each criterion was 10 and a simple average was used to determine the SR_i .

Criteria	P1	P2	P3	P4	P5	P6	P7
1	10	10	10	9	10	10	10
2	10	8	10	10	0	10	10
3	10	10	9	9	0	8	10
4	10	8	10	10	0	10	10
5	10	10	10	10	0	10	10
6	10	0	10	10	0	10	9
7	10	10	10	10	0	8	10
8	10	10	10	9	0	10	10
9	10	10	10	10	0	10	10
10	10	8	10	10	0	10	10
TOTAL	100%	84%	99%	97%	10%	96%	99%

Table 6 – 2021 Results

The values from P2 were considered to be optimal expect on criteria 6, as the team could not meet the expectations of the NGO, even though the NGO themselves was having problems communicating their desires after the person responsible for the project was replaced. It was important for the Portfolio team to distinguish these values as the work performed by the group was exemplar and the project failed and was terminated for reasons beyond their control very near the delivery date.

For P5, on the other hand, only the Initiation Phase was considered, as they failed to produce any acceptable documents during the Planning Phase and the subsequential phases. Even though the students from P5 were allocated in different groups and they did help the execution and conclusion phases, as well as having a positive impact on the groups they were inserted into, the Portfolio Team did not add their individual scores to the results as the project itself failed and the impact of those members was already reflected on the evaluation of the groups they were inserted into.

The same results of Table 6 are presented in Figure 4 below, as general from of comparison between the projects and their performance. The bar graph shows the individual grades by criteria stacked up to reach the individual Success Rate (SR_i) of each project.

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Figure 4 – Projects Performance in 2021

Based on the individual results shown in Table 6 and using Equation (1), it was possible to determine that the overall success of the Portfolio in 2021 was 84%. The results can be seen in Figure 5 below.



Figure 5 – Success Rate.

5.5 Proposed Improvements

In view of the results described in this section, the main point of concern is now feedback and NGO engagement, that eventually led to P2 being terminated early. Other projects also showed some difficulties in this point; however they were able to overcome them. The NGO engagement was a common factor in both editions (2020 and 2021). As P2 already changed into the Start-up model for Social Entrepreneurship because of their issues, in 2022 all projects will follow the same line of research. This decision is supported by the literature as removing a risk factor (Flick, 2007; Pereira et al, 2018). With this improvement we expect that in 2022 the communication issues are solved. If the social

entrepreneurship was not going to be adopted, the next set would be to select students for the groups based not only on their individual interests but also on social and interrelationship factors.

Another proposed improvement for 2022 will be a reference guide for opening an NGO, as the documentation is diverse and will vary depending on the type and size of the proposed organization.

6. Conclusion

Regardless of the situation, change or preparation the management of Portfolio will always experience new and unexpected problems and issues as showed in section 5.1. The human factor cannot be isolated nor ignored from the decision-making process and the longer a Portfolio Manager has contact with the problems the more experienced and better planner he or she will become. This is an important lesson learned in the two years this project has been running so far and has helped the Portfolio Management team to develop. The lack of communication caused by a lack of leadership (in project 2) and the lack of the ability to get all students to embrace P5 were the major factors that contributed to the failed individual projects.

The new research conducted in 2021 proved effective in solving the follow-up issue, with only 5,33% of activities facing delays. As for the selection criteria of the NGOs the scores were better considering the 2020 cycle, showing improvement, however it was possible to determine that even though it did improve in 2021 it is still one of the major obstacles in the 3-year project and thus this is the risk factor that will be removed from the 2022 cycle when the students and the Portfolio team will face a new challenge of Social Entrepreneurship as described in section 5.5.

In the face of the adversities in 2021, the roll of the Portfolio Manager when considering projects with NGOs should be to plan focused not only on the theory of PMBoK (or other project management theory), but also in organizational structure and especially in the human factors and relationships between the members.

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Biography

Anne Karolyne de Almeida Lima graduated in 2021 from Federal Institute of São Paulo (IFSP) in the High School Administrative Technical Course. Began her course in 2019 and worked two years under Prof. Vitor M. Caldana on his Project of Portfolio Management for Social Projects as a scholarship student. She is currently working in the administrative field while attending the Psychology undergraduate course at UNIP.

Vitor Mendes Caldana began the academic career with a technician course in Electronics from Liceu de Artes e Oficios (1999) followed by an undergraduate degree in Electronic Engineering from Universidade Presbiteriana Mackenzie in 2004. In 2016, finished his Master's course in Industrial Engineering with Quality of Engineering Education and its Relation to Regional Development as his area of research. As a technician started in 1999 at Caltronic Automação Industrial, a service-based company in Brazil that represents American and European automation equipment for the printing industry, serving not only Brazil but the whole of South America with services performed also in USA and China. During the professional career took several courses in USA and Europe to Automation and dedicated equipment maintenance. In 2014 began his teaching career in FIEB as a substitute teacher and after as an associate professor for the Technical Course of Electronics. In 2016, whilst holding the position of Service and Projects Manager at Caltronic, left the company for full-time dedication in teaching in IFSP, moving to IFSP Sorocaba to implement the Electronics Technical Course. In 2018 began his Research Group in Industry 4.0 and between 2019 and 2020, along with his colleagues, designed and implemented the first Post-Graduate Program in Industry 4.0 of IFSP. He is currently beginning his PhD research in the fields of IoT and Industry 4.0.