

Project Management in Large-Scale with International Settings: Challenges Faced with Multiculturalism

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Abstract: Managing large-scale international research projects involving multicultural teams poses multifaceted challenges requiring a nuanced and adaptive project management approach. This article explores the strategies employed to manage a multifaceted research and innovation initiative within the "ELLAS - Equality in Leadership for Latin American STEM" Network, focusing on gender gap reduction in STEM fields across Latin America. Combining elements from PMBOK® and agile methodologies. The project integrates a diverse array of institutions and stakeholders from multiple countries. Our study delves into the project's objectives, team structures, deliverables, and the unique challenges encountered, including multilingual communication, bureaucratic complexities, managing multiple currencies, and ensuring data quality. We detail solutions applied to navigate these challenges, such as tailored communication strategies, hybrid project management methodologies, and proactive stakeholder engagement. By delineating these challenges and solutions, this article brings insights into managing complex international research projects while fostering cultural diversity and achieving project objectives.


1 INTRODUCTION


Project management is the application of knowledge, skills, tools, and techniques to project activities to meet project requirements. By effectively applying these elements, project managers can significantly increase the likelihood of project success, leading to greater efficiency, cost-effectiveness, and value creation for organizations (Project Management Institute, 2017). In multicultural teams each member provides a different view through its diverse way of thinking and, in total, a variety of skills are offered (Earley and Mosakowski, 2000), but an essential aspect of project management involves effectively handling both positive and negative risks through a proactive and consistent approach from the project's outset. Although every successful project demands effective project management, the approach varies significantly from one project to another. The efficiency of project management holds critical importance for both research in project management

and for managers in real-world practice (Thomas & Mullaly, 2007). However, the literature lacks coverage on crucial facets of project management's influence (Kaufmann & Kock, 2022).

The research and innovation project entitled "Latin American Open Data for gender equality policies focusing on Leadership in STEM" is an initiative within the network affectionately known as "ELLAS" acronymically representing "Equality in Leadership for Latin American STEM" (IDRC, 2022). This network comprises seven institutions located in three different countries: UFMT - Federal University of Mato Grosso (Brazil), UFSC - Federal University of Santa Catarina (Brazil), UFF - Fluminense Federal University (Brazil), UTFPR - Federal Technological University of Paraná (Brazil), UCB - Catholic University of Bolivia (Bolivia), UMSA - Major University of San Andrés (Bolivia), and University of Lima (Peru), besides being funded by an important international institution, IDRC - International Development Research Centre, from Canada. Apart

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from the nations and institutions forming the ELLAS Network, CalPoly - California Polytechnic State University, from Los Angeles (USA), plays an advisory role in the Project (Maciel et al., 2023)

Given the magnitude of the involved team, the temporal nature, the social and geographical differences among the participating institutions, and the fact an Open Linked Data Platform is to be developed within the project, effective project management and the necessity to handle the bureaucratic requirements inherent in a research project led by a Brazilian federal university demanded the adoption of a combined approach between the knowledge areas of PMBOK® (Project Management Body of Knowledge) and the fundamentals of agile project management.

The current article explores and describes (GIL, 2018) the strategies used to manage this research and innovation project executed by the "ELLAS" Network in the STEM field. It also discusses some of the methodological and technological solutions adopted to make this project feasible, considering the development of a system within the research.

As a general objective, the study aims to identify the challenges and solutions for managing a large-scale international project, particularly considering its multicultural nature.

2 THEORETICAL FRAMEWORK

To comprehend how prior research projects addressed the challenges inherent in a research project encompassing information systems development, a Qualitative Systematic Review was carried out (Grant & Booth, 2009). This review utilized a specific string to identify reports from other multicultural projects that encountered similar challenges and how the ten areas of knowledge were applied to avoid or potentially resolve those issues.

2.1 PMBOK® Knowledge Areas

The PMBOK® Guide encompasses all project management areas and aims to suggest best practices for all stages of a project, from initiation to completion. It is an excellent guide; however, it is not a project management methodology. With the 6th edition released in 2017, the PMBOK outlines ten knowledge areas critical to project management. Here's a brief overview of each area:

1. Project Integration Management coordinates processes for smooth execution, involving creating a management plan and directing,

managing, monitoring, and controlling project work.

2. Project Scope Management defines and manages required work, ensuring completion.
3. Project Schedule Management ensures timely completion by defining activities, estimating resources, developing, and controlling the schedule.
4. Project Cost Management plans, estimates, budgets, finances, funds, manages, and controls costs for on-budget completion.
5. Project Quality Management covers planning, assurance, and control for stakeholder-aligned project outcomes.
6. Project Resource Management includes planning, acquiring, developing the team, and managing resources.
7. Project Communications Management plans, manages, and controls project communications for timely information flow.
8. Project Risk Management identifies, assesses, and responds to risks for project success.
9. Project Procurement Management involves planning, solicitation, source selection, contract administration, and closeout.
10. Project Stakeholder Management engages stakeholders for their needs throughout the project lifecycle.

2.2 Related Research

The increasing trend of globalization has led to culturally diverse teams becoming more prevalent. This trend has resulted in the emergence of multicultural teams of diversified team members (Nnaji, 2023) and multiculturalism has become core for project management success in the 21st century (Deshpande et al., 2010; Kappagomtula, 2017).

Multiculturalism entails assembling a project team comprising individuals from varied cultural backgrounds, encompassing differences in ethnicity, religion, and nationality (Heldal et al., 2020) enabling teams to comprehend and honor cultural distinctions is crucial, particularly in the development of products or services intended for a diverse global audience encompassing various cultural backgrounds (Heldal et al., 2020; Vigier & Spencer-Oatey, 2017) such as an Open Linked Data Platform that the Project aims to generate.

Aligning the input from culturally diverse teams can present challenges. These cultural disparities have been recognized as a major factor contributing to divisions within project teams, often resulting in detrimental interpersonal conflicts among team

members (Ayega & Muathe, 2018) where diversity in ethnic, religious, or national traits often leads to disagreement and confrontation among individuals, which can impede team productivity (Krawczyk-Bryłka, 2016; Lima & Patah, 2016). Cultural disparities within software development teams can also lead to underperformance and misunderstandings (Ogbodo, 2014)

Effective communication is deemed vital in meeting project expectations, under the belief that it cultivates robust working relationships. (Ochieng and Price, 2010). Furthermore, the literature review highlights instances of miscommunication stemming from limited linguistic abilities. (Vignovic & Thompson, 2010, Saidoun 2016; Luckmann & Farber 2016).

This paper aims to show how the Project Management team, composed by a Project Manager and a Project coordinator of a multinational research Project, has dealt with all these cultural differences and the bureaucraties of a Federal Project in Brazil in a large-scale project.

3 PROJECT MANAGEMENT APPROACH

This section discusses the project and how its knowledge area is addressed and managed within the project framework.

3.1 The Project

This section delves into the project's structure, operational framework, objectives, timeline, milestones, and team roles. The goal is to offer transparency and clarity on the project's strategic direction and implementation plan. Additionally, a Qualitative Systematic Review (Grant & Booth, 2009) was conducted, integrating and comparing results from selected qualitative studies through an intentional sampling of relevant references.

3.1.1 Project Objectives

Recognizing that part of the problem concerning gender gaps in STEM in Latin America is related to the lack of recent and reliable data, the project aims to contribute to the generation of cross-country comparable data to assess policies and interventions to reduce the gender gap in STEM, especially by increasing the number of female leaders at universities, industries, and public institutions. We plan to map out the factors that influence the career

development of women in STEM, as well as document and analyze successful and less successful initiatives and learn from them.

The main overall objective is to contribute to the generation and use of cross-country comparable open data in order to assess policies and interventions to reduce the gender gap in STEM, to promote public discussion aimed to increase the number of female leaders at universities, industries, and public institutions, and to foster the development of mobile and web applications based on open data to increase the awareness of the importance of women in STEM (Maciel et al., 2023).

The Specific Objectives (SO) intrinsically related to the objectives are:

- SO1: To map out the factors, actors, and policies that influence the career development of women in STEM, collect related data, and analyze this data.
- SO2: To build and deploy an open data platform that integrates primary and secondary data about career growth of women in STEM;
- SO3: To promote the use of open data about women in STEM leadership to increase public awareness of gender issues in the field.
- SO4: To provide recommendations for policymakers in Latin America to increase the female representation in STEM with a focus on gender equality and diversity.

3.1.2 Project Timeline and Milestones

The project was segmented into three distinct phases planned for execution over three years, not necessarily aligned with calendar years, for example, Phase 1 started in February of 2022 and it was concluded mid-2023. Notably, each phase comprises specific activities with individual timelines, some of which are continuous throughout the project.

While aspects of agile project management have been incorporated, the decision to retain significant elements of the waterfall methodology underscores its continued relevance in specific contexts. As noted by Adenowo (2020), this structured approach is particularly suitable for projects with well-defined requirements and predictable scope. By adhering to a structured framework, the project ensures clear communication, organized development, and efficient resource allocation, ultimately contributing to its success.

Phase 1 signifies the formal initiation of the project, set to occur in all participating nations. This phase aims to convene a wide array of stakeholders, encompassing policymakers, academic institutions, local and governmental representatives, as well as

civil society initiatives. The project launch will be succeeded by a sequence of awareness seminars specifically targeting distinct stakeholder groups, fostering their understanding of the project's objectives, encouraging active engagement, and potential adoption of the data platform. The primary focus during these seminars will be on policymakers and the academic community, including both public and private universities in each participating country. The activities of Phase 1 have had their results published in: Activity 2 (Guzman et al., 2024; Rodríguez et al., 2023; Casagrande et al., 2023); Activity 3 (Frigo et al., 2024); Activity 4 (Drummond et al., 2023); Activity 6 (Fritoli & Berardi, 2023); Activity 7 (Martins & Ribeiro, 2023; Michelon & Berardi, 2023; Souza & Berardi, 2023); Activity 8¹. Activity 9 was conducted following ethical principles that ensured the safety, confidentiality, and care of the participants (Batista; Andrade; and Bezerra, 2012). The project and survey protocol were submitted for review by specific ethics committees in Brazil, Bolivia, and Peru, with Brazil as the coordinating center, and received the Certificate of Presentation for Ethical Review No. 66296922.6.0000.5690.

Table 1 includes all the activities associated with Phase 1 with their respective descriptions.

Phase 2 will encompass the collection, structuring, and examination of data, underlining the paramount importance of socializing this information (Lima et al., 2023; Berardi et al., 2023). Socialization efforts will focus on disseminating the gathered information and interpreting it within the various contexts where the project operates. The project team will actively engage in academic forums and other public domains conducive to sharing, conversing, and deliberating on STEM-related subjects. Concurrently, a sequence of instructional workshops will be arranged to facilitate stakeholders and interested community members' access, exploration, and utilization of both the data and the established platform. All of it is distributed among activities 10 to 16 (Maciel et al., 2023).

Phase 3, that ranges from activities 17 to 22 (Maciel et al., 2023) will center on the dissemination of the open data platform and the application derived from the available data, along with the policy recommendations. This dissemination effort will encompass academic settings (such as conferences, seminars, and analogous gatherings) as well as events arranged explicitly by STEM leadership to engage the wider public. Academic papers will be prepared at two distinct levels. Firstly, a country-specific analysis

Table 1: Phase 1 – activities.

Phase 1	
Activity 1: Make strategic alliances with interest groups	Creating partnerships with non-profit organizations, universities, government, gender equality, diversity, inclusion, and/or ethnic and race organizations.
Activity 2: Mapping of policies in each country	Mapping of existing government and private organization policies to promote gender issues in STEM.
Activity 3: Mapping Women STEM Initiatives from stakeholders by country	Mapping of existing initiatives to promote gender issues in STEM.
Activity 4: Mapping context aspect that influences women in STEM	Investigating how universities and schools encourage (or not) the inclusion of girls in Computing;
Activity 5: Research design for each country	Implementing an extensive multi-country to test the hypothesis explaining the low participation of women in STEM in general and in leadership positions in particular
Activity 6: Data modeling considering the social and cultural aspects of each country	Collecting and filtering the data previously collected by the surveys and workshops. Data must be present in the platform to be shared by the consortium partners and other interested groups.
Activity 7: Design Ontology: metadata & governance.	Defining how to describe the data collected in the Survey.
Activity 8: Launch Project website	Developing a website that describes the project, universities, partners, sponsors, project progress, productions and contacts.
Activity 9: Obtain approval of ethical committees.	Elaborating ethical protocols for the project describing all activities that collect human data. Submitted to an ethical committee of each country.

¹ <https://ellas.ufmt.br/pt/inicio/>

will utilize the data platform and address the specific themes identified in the preceding phases. Secondly, a comparative analysis will be conducted, providing an opportunity to explore and scrutinize STEM-related issues from a comparative and interdisciplinary standpoint.

In addition, there were certain ongoing activities planned as continuous. Table 2 includes some of those activities, accompanied by their respective descriptions.

Table 2: Continuous activities.

Activity 23: General meetings amongst consortium partners	Periodic virtual meetings to direct, monitor, evaluate the ongoing activities.
Activity 25: Awareness workshop/seminar in each country	Workshops to share experiences and knowledge promoting integration, engagement and alignment, called WELLAS
Activity 27: Scientific divulgation	Technical reports and scientific articles to be published with the results of the project activities.

3.1.3 Team Roles and Responsibilities

The project structure includes a general coordinator, project manager, local managers, local leaders, consultants, interns, and volunteers. Local managers attend meetings, revise project details, oversee budgets and staffing, communicate updates, address issues, and ensure team engagement. Local leaders attend meetings, provide progress reports, guide interns, maintain focus on objectives, and evaluate prototypes.

The General Coordinator and General Project Manager collaborate closely, overseeing all project activities. They are responsible for orchestrating the execution of each phase and identifying a leader for each activity. The Coordinator's duties encompass mediating conflicts within the entire team and the responsible institution, UFMT. Additionally, the Coordinator serves as the project's representative and is authorized to approve anything beyond the predefined scope. They also liaise with the project's funder, IDRC, when their approval is required.

On the other hand, the General Project Manager handles the bureaucratic aspects of the project, involving communication with the project's financial overseer, the Uniselva Foundation. Given that the project is associated with a federal university and receives external funding, every transaction requires a detailed process to justify the expenses incurred.

The roles and responsibilities within the project framework can be seen on Figure 1.

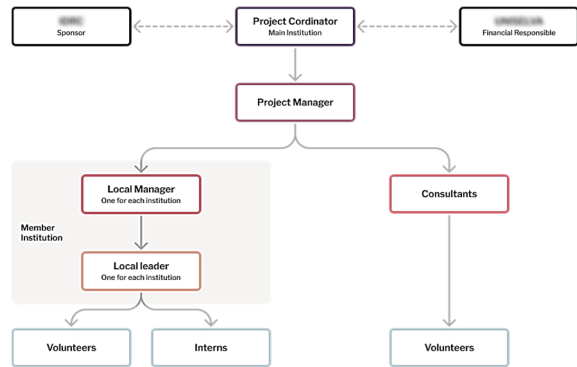


Figure 1: Project's organogram.

3.1.4 Project Deliverables

Contribution to the generation and utilization of interconnected and comparable open data (OpenData) across countries, aiming to evaluate policies and interventions in reducing the gender gap in STEM, fostering public discourse to increase the presence of women leaders in universities, industries, and public institutions, and to promote the development of a web application based on open data. This is intended to raise awareness regarding the significance of women in STEM.

The project targets the following key outcomes directly associated with the Open and Connected Data Platform as our primary resulting product:

1. Policy-makers leverage the open and interconnected data platform and project suggestions.
2. Stakeholder collectives utilize the open data platform for crafting applications that advocate for women in STEM.
3. Accessible academic outcomes for the public.
4. Dissemination of gender-related STEM concerns to the broader populace.
5. Unified structure for organizing data.
6. Augmentation of scientific insights into gender-focused STEM subjects.

Both main discrete outcomes, the open data platform and the policy recommendations for Women in STEM-Leadership, require researchers and collaborators to keep a close collaboration at the different project stages.

3.2 Application in the Project

As mentioned, given the project's nature and involved institutions, a hybrid management style was deemed necessary. This approach integrates elements from

waterfall and agile methodologies. The following outlines these approaches based on the knowledge areas from PMBOK.

3.2.1 Integration Management

To ensure integration among project members and activities, various tools have been incorporated into the project's daily operations.

To enhance organization and oversight of project activities, all tasks have been integrated into a Trello board. The team operates using the Pull system and utilizes Trello's comprehensive functionalities, including comments on activity cards, ensuring the team and managers remain informed about ongoing activities.

On Trello, all project activities are categorized by color based on their respective execution phases, as can be seen on Figure 2.

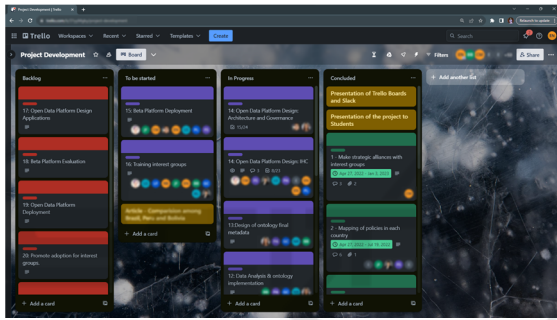


Figure 2: Project's Trello Board.

Moreover, for organizing and centralizing all generated content, the project employs Google Drive. Each activity possesses its designated space within Drive, facilitating the addition, editing, improvement, and storage of documents. This system enables remote access to documents from any location and promotes collaborative work among team members on shared documents.

3.2.2 Scope Management

Given that the reference project is a research and innovation initiative funded by an external institute, the project scope underwent approval from the funding entity prior to its commencement, and minimal alterations are permissible thereafter. To maintain focus on our established scope, two artifacts were developed during the project's conception phase (prior to approval), and these artifacts are continually reviewed and amended as deemed necessary throughout the project lifecycle. These artifacts include the Theory of Change, and the Project Plan,

detailing the division of phases along with activity descriptions.

As previously outlined, the structure encompassing phases and activities was clearly defined initially. Presently, we primarily track these elements using Trello. Additionally, bi-weekly status report meetings are conducted—one session involves managers and leaders, while the other involves the entire team, including volunteers and interns. These meetings serve to communicate our progress and address any challenges encountered by the team.

3.2.3 Schedule Management

The project's schedule, encompassing all its distinct phases and activities, was devised during the project's conceptual phase, before receiving approval from our financier, and was transformed into a Gantt chart. Since its inception, the Gantt chart has undergone several updates as the project progresses. Managing the schedule of a research project poses a significant challenge due to the endeavor's nature of addressing predominantly open-ended inquiries. In our case, this is further complicated by bureaucratic processes mandated by the laws of one of the three countries involved, the requirements of one of the seven institutions, and even those stipulated by the Uniselva.

The timetable of a research project is also subject to influence by the involved researchers. This is attributed to the rotation of individuals engaged in the project, akin to what is commonly observed in the private sector and development projects, primarily involving volunteers. Furthermore, it differs from corporate settings where individuals are designated to specific projects.

To ensure comprehensive team and project management in adherence to the schedule, pivotal tools include status report meetings and the Kanban Board.

3.2.4 Cost Management

Cost management in an international project spanning multiple countries with diverse currencies presents considerable challenges. Initially, the funding provided by our supporter, IDRC, is in US dollars but is calculated using the Canadian dollar, as our supporter is based in Canada. Subsequently, when these amounts arrive in Brazil, they are converted into Brazilian Real, the primary currency used for all project-related expenses.

When making payments to other involved countries, the amounts once again need to be converted. However, the Brazilian National Bank

prohibits these transfers in the recipient country's currency. Consequently, these transfers are conducted in US dollars, and upon receipt, they are further converted into the respective country's currency.

Factors not initially accounted for in the project's initial budget include the taxes involved in currency conversion and international transfers, as well as the volatility of exchange rates, which can fluctuate significantly from day to day.

Managing these dynamics proves to be challenging as they are unpredictable, and the economic conditions of each involved country can either improve or exacerbate the situation.

3.2.5 Quality Management

Quality assurance has been distributed across various facets of the project. As the project culminates in the development of an open linked data platform, it became imperative to not only ensure the credibility and accurate collection of data derived from the survey application but also validate other data obtained from existing sources, ensuring its coherence with the survey data. To accomplish this, a team of ontology specialists was required. Their role encompassed not only the creation of the ontology model but also the validation of all incoming data within it.

Furthermore, to guarantee the comprehensibility and usability of the platform among end-users, we assembled a team of Human-Computer Interaction (HCI) experts. Their expertise aimed to comprehend the needs and preferences of our end-users, thereby assisting in the creation of a user-friendly platform tailored to meet the specific requirements of our targeted audience.

3.2.6 Resource Management

This poses another set of challenges for a multi-country project affiliated with a Brazilian Federal institution. Since the project originates from UFMT, a prerequisite is that at least one-third of the project members must have ties to UFMT. Additionally, as the project aimed to engage students through scholarships, navigating the process of hiring interns from other countries became essential, as this had not been previously executed by Uniselva.

Managing researchers and interns across diverse institutions and varying time zones presents a notable challenge, particularly concerning coordinating meetings or ensuring their presence at in-person events where collective participation is required.

The management of physical equipment and materials within the team also poses a challenge. As

the primary institution responsible for the project is federal (public), any equipment procured during the project must become institutional property, necessitating a donation process if allocated to institutions other than UFMT. Furthermore, as part of the agreement among the seven institutions, each was to provide physical resources for their professors, interns, and volunteers to facilitate their work on the project. However, monitoring the utilization of these resources is beyond what we can actually do.

3.2.7 Communication Management

To facilitate team communication both internally and externally, additional tools were also adopted.

For centralized communication, the adoption of Slack has been instrumental. All project members are enrolled in Slack, utilizing specific channels for sharing knowledge and messages. Each activity corresponds to a dedicated channel, allowing for the creation of new channels as needed, thereby facilitating efficient organization and exchange of information.

For formal communication, such as conveying important reminders or announcements that require significant attention, we maintain the use of emails. This method is particularly employed when communicating with external partners, companies, individuals outside the project working on its behalf, and when corresponding with the Uniselva.

For day-to-day communication, rapid reminders, and queries, we have utilized the WhatsApp platform. A group was established comprising leaders, managers, consultants, and coordination to facilitate swift and readily available communication. The project activity coordinators, as mentioned in section 3.1.2, commonly establish subgroups within this application to streamline communication among the members. This not only enables efficient communication but also facilitates the sharing of project-related findings, such as online events, conferences, and publications encountered during the project.

3.2.8 Risk Management

Risk management is a systematic process involving planning, identification, analysis, response, and monitoring of project risks, encompassing processes, tools, and techniques (Shenhar and Dvir, 2009). The effectiveness of risk management has been a major concern for executives and professionals engaged in project management, particularly after the 2008 crisis (Rabechini Junior and Carvalho, 2012), and while significant literature exists concerning risk management in various domains, particularly in IT

(Information and Technology) and computing, there is relatively limited discussion related to its application in research and innovation projects, like ELLAS. However, implementing robust risk management in research endeavors is crucial to guarantee project success and yield effective outcomes.

In addition to the routine risk management involved in successfully executing a project within the set schedule, a research project faces challenges related to ensuring the credibility of the content it generates within the community. Moreover, the development of an application intended to showcase our findings and impact the audience entails enabling users not only to access the information but also to contribute further data, fostering its growth.

Verifying the reliability of both the platform and its data is a significant challenge, given their diverse origins. However, an even greater challenge lies in ensuring that the platform, aside from being user-friendly, remains adaptable for easy manipulation, expansion by adding new data and updating the ontology itself.

3.2.9 Procurement Management

Procurement management poses a complex challenge in the context of research projects within public institutions. In Brazil, regulations mandate that any procurement by a public institution must undergo a competitive bidding process. Consequently, the process of hiring a company or procuring any items within the project tends to be considerably time-consuming.

A recent instance exemplifying this challenge was the hiring process for a company tasked with conducting the survey developed by the project team across all three countries. This involved consulting 11 companies, a procedure that extended over a period of slightly more than six months.

While this bureaucratic process is compulsory, it not only has the potential to impact costs but can also significantly influence schedule management.

3.2.10 Stakeholder Management

Stakeholder management encompasses a diverse array of companies and entities vested as interested parties, such as:

Sponsor management - In the capacity of a research project, comprehensive expense and progress reports must be furnished to the supporting institute. These reports are separately drafted by the groups overseeing each activity and subsequently consolidated by the Project Manager into a

comprehensive technical report submitted in its entirety.

Uniselva Foundation - Serving as the project's financial custodian, close coordination with Uniselva is pivotal. In addition to processing all payments, contracts, and acquisitions, Uniselva facilitates student recruitment through its call for interns. Nurturing an open and positive relationship with them remains fundamental.

Educational Institutions - The ELLAS Network encompasses seven educational institutions forming the agreement. Given the direct involvement of professors from these institutions as researchers in the project, maintaining robust relationships is essential for mutual benefit and alignment.

Partnerships - Activity number 1 focuses on establishing alliances across all three countries between the project and companies and institutions associated with gender equality, women in leadership, IT, STEM, or those supportive of the cause. While several potential partners across the three countries were engaged, cultural differences posed significant barriers, with one country exhibiting more initiatives in this domain than others. As a way to reach more people who could become our partners, an online form was added to the ELLAS Website, so anyone can register to be an ELLAS' partner.

4 CHALLENGES AND SOLUTIONS

Managing a substantial project presents its own set of challenges, particularly when multiple individuals are working toward a common objective but at different paces and with varying perspectives. However, when cultural and social differences are added to this scenario, the challenge becomes more complex.

This research project navigates a complex terrain of interconnected challenges. To successfully develop and implement the Open Data Platform, we've actively employed the 10 knowledge areas of the PMBOK® guide, tailoring their application to our unique context, and like that, the main Challenges can be listed as:

Challenge 1: Multilingual Communication and Cultural Diversity:

- **Communications Management:** Implementing a primary language (English) for communication while accommodating varying language proficiencies among team members (Portuguese, Spanish, and English) necessitates efforts to

ensure mutual understanding, especially involving interns and volunteers.

- **Scope Management:** Addressing bureaucratic challenges related to official documentation required in Portuguese for a federal institution while needing signatures from parties unfamiliar with the language; a solution involves dual-language document creation and signing.
- **Stakeholder Management:** Managing diverse stakeholders with varying language preferences and proficiencies demands tailored communication strategies to ensure effective engagement and understanding.

Challenge 2: Managing a Multi-Country Project:

- **Integration Management:** Utilizing Trello and Google Drive facilitates centralized communication and document sharing across teams and countries.
- **Scope Management:** The Theory of Change and Project Plan serve as guiding documents, reviewed and amended as needed.
- **Schedule Management:** The Gantt chart, bi-weekly meetings, and the Kanban board aid in tracking progress and ensuring adherence to deadlines.
- **Cost Management:** Currency fluctuations and international transfers require close collaboration with Uniselva and proactive budgeting.
- **Communication management:** As mentioned, Whatsapp is one of the communication platforms adopted in the project, and managing it when each country is in a different time zone also becomes a personal challenge.

Challenge 3: Managing Multiple Currencies and Financial Complexity:

- **Cost Management:** Handling currency fluctuations impacting the budget allocated in Canadian dollars, converted to Brazilian Reals, and utilized across multiple countries (Brazil, Bolivia, Peru, USA) poses financial complexities.
- **Procurement Management:** Dealing with foreign transactions incurs additional taxes affecting the project's budget, especially concerning payments to one-time service providers in different currencies subject to exchange rate volatility.
- **Resource Management:** Currency fluctuations affect project members' income in other countries, leading to income uncertainties due to varying exchange rates for payments received in their respective currencies.
- **Risk Management:** Negotiating the bureaucratic procedures, obligatory public procurement processes, and additional regulatory requirements mandated for research projects within Brazilian

federal institutions poses a significant challenge, hindering agile project management methodologies' seamless implementation.

Challenge 4: Overcoming Bureaucratic Complexities in Federal Institutions:

- **Risk Management:** Navigating the extensive bureaucratic procedures, obligatory public procurement processes, and additional regulatory requirements mandated for research projects within Brazilian federal institutions significantly hinder the flexibility and agility of project management methodologies.
- **Procurement Management:** Strict adherence to bureaucratic protocols and procurement procedures within federal institutions lengthens the procurement process, delaying the acquisition of necessary resources or services vital for project execution.
- **Integration Management:** Aligning project timelines with bureaucratic timelines becomes crucial due to the rigid framework of federal regulations, often causing delays in project milestones and integrated change control.
- **Stakeholder Management:** Engaging and managing stakeholders within the constraints of bureaucratic processes requires tailored communication and engagement strategies to ensure continued support and cooperation.
- **Scope Management:** The regulatory framework necessitates detailed and comprehensive documentation, adding complexity to defining and managing project scope, as well as incorporating any scope changes within the strict bureaucratic guidelines.

Challenge 5: Ensuring Data Quality and User-Friendliness:

- **Quality Management:** Ontology specialists validate data accuracy and coherence, while HCI experts ensure platform usability.
- **Resource Management:** Collaboration with educational institutions provides access to expertise and resources.
- **Communication Management:** Slack and email facilitate internal and external communication, fostering transparency and collaborative problem-solving.

Challenge 6: Overcoming Bureaucratic Obstacles:

- **Procurement Management:** Navigating public procurement processes requires careful planning and adherence to regulations.
- **Stakeholder Management:** Maintaining open communication and building strong relationships are crucial for project success.

Challenge 7: Adapting to Cultural and Linguistic Differences:

- **Communication Management:** Employing English as the primary language while accommodating diverse proficiency levels, but always being open to letting the team speak in their mother tongues (Portuguese and Spanish).
- **Risk Management:** Proactively identifying and mitigating potential cultural and linguistic barriers.

Challenge 8: Balancing Agile and Waterfall Methodologies:

- **Integration Management:** Employing hybrid methodology necessitates clear delineation of responsibilities and communication channels.
- **Schedule Management:** Regularly updating the Gantt chart and maintaining flexibility while adhering to key milestones.

Challenge 6: Engaging Volunteers and Interns:

- **Resource Management:** Providing clear expectations, mentorship opportunities, and recognition for contributions.
- **Communication Management:** Utilizing a variety of communication channels to ensure inclusivity and engagement.

Challenge 9: Organization of international events:

- **Resource management:** Ensuring that all managers, consultants and leaders are present and managing to bring interns and volunteers within the budget.
- **Integration Management:** Balancing the languages spoken across the team, so the event is understandable to everyone.
- **Risk Management:** Dealing with international connections, different departure and arrival times, jet lagging of the participants and cultural differences of participants to the event location.
- **Schedule Management:** Working out the whole team's agenda to bring them all together presentially for each event.
- **Communication Management:** Proving clear communication not only to the participants of the event but also to all parties involved such as services, IDRC and Uniselva.

5 FINAL CONSIDERATIONS

The ELLAS project, a collaborative effort across three countries, aims to bridge the gender gap in STEM fields. Its main goals include gathering data for comparison, assessing policies to narrow the gender divide, and supporting women's leadership in

STEM through open data and applications. This initiative maps out factors impacting women's STEM careers and suggests policy improvements.

Handling a project of this size across different cultures and within a Brazilian federal institution presented various challenges. Communication issues due to diverse languages and cultures were significant obstacles. Dealing with multiple currencies, bureaucracy, and strict regulations added complexity. Sustaining data quality, creating user-friendly platforms, and engaging stakeholders faced ongoing hurdles. Creating solutions for managing a large-scale international project, particularly considering its multicultural nature is, by itself, a complex task.

Creating an article summarizing the operational aspects of such a complex project, especially at the intersection of research, multiculturalism, and Brazilian bureaucracy, is challenging. The lack of specific literature on these topics complicates presenting practical project management experiences in academic writing. It's challenging to balance detailed operational aspects with scholarly expectations for theory and background literature.

Despite numerous challenges, the project demonstrates effective hybrid project management, combining elements from waterfall and agile approaches. Overcoming these challenges offers insights into stakeholder management, resource allocation, and navigating cultural and bureaucratic complexities. Future work might involve documenting project conclusions, achievements, or discussing management strategies for broader knowledge sharing.

In order to achieve greater gender equity in STEM, it is of utmost importance to finance and execute large-scale projects. In these endeavors, project management plays a fundamental role. Through scientific and technological research and development, we can progress further towards a more equal and just society.

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