Reflection [1]Report for Product-Based Assignments

The Title of Your Project Assignment

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Group Number: 23

[1] Reflection is “the practice of periodically stepping back to ponder the meaning to self and to others in one's immediate environment about what has recently transpired” Raelin, J. A. (2001). "Public Reflection as the Basis of Learning." Management Learning **32**(1): 11–30. A reflective practitioner is a person capable of learning, acting and adapting to environments, someone who is constantly seeking to widen their experience and knowledge by adapting their manner of work in the profession. Someone who always learns through what they do, and who continually combines action with reflection on what has been done.

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Introduction

Dear customer,

At the beginning of the fall semester, your company "Medicare Corp." called on our engineering department to design, source and subcontract a new model of a cutting board for people with hemiplegia or having muscular weakness in upper limbs. As promised, the Greenfinch design office, composed of four engineers, delivers its final report on the development of your product.

Description of the wicked problem

It is well established that people with hemiplegia have trouble using the “usual" equipment that we may have at our homes. Since they can’t hold things with their two hands, they can handle less objects and in a different way than non-disabled people.

The problem you have raised is that the equipment on the market is not "all-in-one", and that people with hemiplegia have to invest in a multitude of equipment to perform all the basic kitchen tasks. This problem has several consequences: the lack of space to store all the different equipment and the high cost of investing in it.

Product description

The cutting board is a multi-function product to help disabled people cut, spread, slice, grate and mix more easily and with more stability. It is equipped with a wooden board equipped with non-slip pads so that it does not move when the user uses it on his work surface.

The product has two different cutting boards connected by a hinge. The first board is flat and is used to cut small items that do not require holding. The second one is equipped with a tray with many holes in order to place small rigid pieces to prevent the food from moving while cutting it or to maintain different bowls or plates to mix the food for example. Pointy pieces, to which we can stick the food, are also available, in order to hold the food, to peel it easily. In addition, the cutting board incorporates a part with interchangeable graters.

Finally, our product is also equipped with removable receptacles, which allow the user to store the different pieces and graters or to slide food inside and then grab it to pour it into a pan for cooking food.

Project Team

Greenfinch is an engineering company specializing in mechanical design. Under the direction of a project team, it is responsible for carrying out the project activities as well as

supporting these customers throughout the product development process, which concerns: the analysis of the customer's need as well as future users, the search for solutions, pre-dimensioning calculations, CAD, optimization, prototyping, or even functional testing and compliance for sale on the market, while managing the expectations in terms of planning (deadlines), cost and/or the customer's budget.

The project team will be composed of a project manager, Nazli ERDEM, as well as three collaborators, Jules GRAND, responsible for prototypes, Jérémy FIASCO, responsible for CAD and Marie GUIGUET, responsible for costs and deadlines.

Stakeholders

It is well established that stakeholders hold an important role in a project as they greatly influence it, and no project can succeed without their presence and input. It is essential to know how to identify the stakeholders of a project so that the project won't meet resistance or sudden surprises because of the influence of an unknown stakeholder or their requirement. Below, you can find listed all the potential stakeholders as well as their future involvements during the development of the project.

Stakeholders	Involvements
Project owner (Medicare Corp.)	A project owner creates the project vision, sets objectives, secures funding from a project sponsor, and acts as an ambassador for the project. A close collaboration will be carried out in order to inform on a recurring basis of the progress of the project and to know the expectations for the development of the product whether in terms of needs, budget or deadlines, but also in terms of feedback and approvals concerning choices and deliverables.
Product subcontractors	Once a project team hires subcontractors, it is their duty to fill them in on expectations and employer policies. The contractor must constantly monitor subcontractors and the status of the project in order to be sure everything is running smoothly and subcontractors are meeting expectations. In addition to this, sub-contractors are frequently asked during the product design phase in order to know the manufacturing times, the costs or the possible optimizations according to the means of production.
Suppliers	Including the suppliers in the initial project planning phases, and getting their buy-in for the work plan and schedule is an important phase of the project. It's also important to create effective project performance measurements to estimate the performance of suppliers.
Top Management	Defining the active role top management has throughout the project lifecycle and keeping them engaged is an essential success factor. Maintain close

	communication to top managers, mainly through questions and through red flags if necessary.
The project manager	The project manager has the overall responsibility for the project and ensures that the project is on progress, is within scope, plan and process and takes actions if there are deviations.
Project team	The project team does the planning, analysis and develops the product.
End users	In order to satisfy the users, they will be integrated in certain parts of the project like the analysis of the need, the research of pre-concepts, the design or the functional tests.
Financing and banking	Will allow the realization and concretization of the project thanks to a budget.
Public Authorities	They will only participate at the end of the project in order to validate that the product complies with the standards for use (ISO standards) and sales (CE marking for example), no information will be transmitted.

1. Evaluation of Project management effort

Organization of the project group

The hardest part of organizing the group was to define and estimate the duration of the tasks in order to reconcile both the working time required for each step and the total duration of the project. Another difficulty was also to define a budget for a prototype of a product that was still unknown to us. Indeed, being Erasmus students, we had very little information and knowledge concerning the manufacturing means and materials available to NTNU for the production of a prototype. This is why we have created a role concerning the management of deadlines and costs.

However, we were able to notice that the distribution of the roles of the members of the group and the distribution of the tasks had been done very easily thanks not only to the good initial organization (WBS, GANTT, plan driven) which made it possible to anticipate and know the different stages/deliverables/tasks to be carried out, but also thanks to a very good group cohesion which made it easier to know the desires of everyone in the project. Another positive point of our organization was to hold weekly meetings chaired by the project manager in order to animate the meeting, allowing us to inform each member of the group of the progress and work of each one.

Effectiveness of the risk management plan of the project

In order to successfully conduct a project, it is crucial to manage the risks surrounding it. This helps the project team to foresee them, be careful about them, take measures to avoid them and do not lose resources because of these risks by implementing preventive solutions.

We started by identifying the major risks for a product development project and more specific ones concerning our product and targeted market. Then, we assessed the importance and the priority of the risks listed above. This classification according to the probability and the impact of the risks can be found in the risk assessment chart below. Finally, once the risks are identified and classified, strategies are decided and implemented in order to prevent these risks. The main risk mitigation strategies are to accept, minimize, share and transfer them.

Our team has been successful in applying the method learned, allowing for effective project risk management. A good definition of specification with all the stakeholders' requirements, as we did before, helps define and guide the project and keep track of the purpose and the output of it. Research and discussions with end users also specifies the details of the outcome.

On a more organizational level, concerning the commercial, legal and organizational aspects of the project, transparency and quick communication is helpful in the evolution and the monitoring of risks and phases of the project. For example, timed check-lists helped us keep track of the work to be done and the responsibilities of the team members.

In addition, the project team members were motivated and invested in the project at all times to ensure reactivity during the project. Early planning of the project and a clear division of responsibilities maintains the team members aligned and invested. Thorough project planning also ensured the respect of the deadlines for example, by providing extra time for each task, in order to absorb delays.

Lastly, as described above, risks should be monitored throughout the project to keep track of potential risks and react before it is too late, by decreasing the response time and the impact of the issue. In that sense, we have defined indicators for the major risks of our project and a team member responsible for tracking it and warn the others in case of a bad evolution of the indicator. However, thanks to our good management of the project, we did not have to deal with any risks, and our risk management plan was effective enough to help us avoid the most critical risks.

Effectiveness of the communication plan in the project

The success of a project also depends on the effectiveness of the communication plan [1], whether internal or external. Indeed, the goals of the communication plan are multiple. First of all, it

allows stakeholders to be kept informed of the progress of the project in terms of deadlines, costs and even needs. The communication plan provides structure in the organization of stakeholder feedback and also provides a clear overview of all decisions, issues and needs.

Regarding the internal communication, we have established very regular meetings as well as emails in case of questions, which has continuously made it possible to move the project forward, to be productive and active for the successful completion of the project. However, we were not able to expand our communication plan more than that since we were not able to find an end user of our product, or we did not have a real project owner or suppliers.

Project results

We can evaluate the output and the outcome of our project by first studying the project success criteria. We can classify these elements in two different lists depending on whether it is a project success or a project management success criteria.

We can classify as project success all the elements allowing a project to achieve intended transformation or to create a business. In this category, we can cite the criterion of customer and stakeholders satisfaction, necessary for the success of the project, as well as that of value creation. The other criteria to be met for the project to be a success concern the quality of the product, its price and its aesthetics.

We can classify as project management success all the constraints of the project that must be satisfied. We can cite in particular project completion, completion date, cost, constraints satisfied or zero defaults, which are recurring criteria when we evaluate the project management success, but also food and marketing standards respected without which the project cannot succeed.

Having carried out a good initial analysis of our success criteria, these did not change between the start and the end of the project.

We evaluate our project management effort as successful:

Scale	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Your response				X	

2. Evaluation of the impact (Project success)

Target audience

The people we target with our project and who will be able to benefit from the results of our work are all those affected by hemiplegia, or with muscle weakness in the upper limbs and their entourage. Indeed, our project is directly built around their needs and we have tried, throughout our project, to put ourselves in their shoes in order to create a product totally adapted to their handicap. However, we are also targeting associations concerned or helpers whose work could be reduced thanks to the gain in autonomy offered by our product. Indeed, the purpose of our product is also to bring autonomy to the people mentioned above, and the associations and other aid put in place can use our product as a daily tool to lighten their work.

In order to get closer to our target, we decided to establish a G-Form in order to question people about our product. It emerged that a product combining all the features necessary to improve the autonomy in the kitchen of a person with hemiplegia in particular is highly useful (96% of responses), and many people who responded to our questionnaire have one of these features at their home. We also sought to contact associations and we were able to discuss with a French association which does not have this type of product but would be interested in installing these devices in some of their patients. For reasons of distance, we were unable to have them test our prototype and we were unable to contact any associations of this kind in Norway.

Quality of the final product

In order to evaluate our final product, we need to review three points: what to improve, theory and practice.

Regarding areas for improvement, our final product is a prototype which, by definition, will not be the marketed product. Indeed, the materials will have to be reviewed, in particular the wood of the boards to be treated in order to be able to come into contact with food, or the plastic pieces, must be made of a material compatible with the food industry. We can also mention the hinge between the two boards which is a classic steel hinge, not at all suitable in this area where water can cause it to rust in particular.

However, omitting this fact, and focusing on the theory, we can first see that our product includes all the functions mentioned before, i.e. a first board with removable pieces for placing and holding food, interchangeable graters, another board without holes (for the removable pieces) so that small food does not get stuck, and two compartments for storing utensils and putting food cuts

to transfer them to another dish. This therefore meets our main need: to improve the autonomy in the kitchen of people affected by hemiplegia or whose upper limbs have muscle weakness. Therefore, in theory, our product is completely satisfactory.

Regarding the practice, it is first of all difficult to address our main target directly, that is to say to address people affected by hemiplegia or other muscular weaknesses of the upper limbs, so that they test our product and give us constructive feedback. Indeed, this target of people is very specific and we do not have any in our entourage. In addition, as explained previously, our research to get in touch with our target was unsuccessful. Therefore, we decided to put ourselves in the shoes of a person with this disability, and test the different facets offered by our cutting board. We have drawn up a list of daily actions to be carried out:

- Block a food then spread something on it
- Block a food then cut it
- Grate food
- Change grater
- Cut food into small dice on the board without a hole
- Place the cut food in the compartment
- Block a saucepan or other to mix food

All the items on this list could be done with one hand and almost without problems, and these tests allowed us to establish new areas for improvement. First of all, we can talk about the weight of the set which is quite heavy to carry in one hand, which is a disadvantage as soon as the person needs to change the place of the board or even wash it. In particular, we are thinking of reducing the thicknesses of the boards. By mentioning the washing of this one, it would be necessary to set up a real system to separate the two boards and not simply a hinge, so that the washing is carried out more simply.

To conclude on the evaluation of the quality of our product, we can say that it is completely satisfactory. Indeed, our product clearly and fully meets our specifications and, after our tests, we can conclude that our system works as desired. However, we can make some improvements to this cutting board, in particular by studying the materials to be used in the culinary environment, but also by reducing the weight of the whole.

We evaluate the quality of our final results as outstanding:

Scale	Strongly Disagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Your response				X	

3. Factors that have contributed to failure / success

From all the previous analysis, we can conclude that overall the project was a success. We can therefore ask ourselves what factors could have made our project a success. First, we need to identify our success factors. Below is a list of these success factors in order of importance, with the top five being our critical success factors [2]:

- Skills, knowledge and competence of the group members
- Trust in the project and between team members
- Clarity of project purpose
- Interesting and motivating subject for the project group
- Adequate early planning
- Minimal change orders
- Stakeholder's approvals given
- Experience on similar projects of the team members
- Stakeholder's communications sufficient and on time
- Project team works well together and is motivated
- Suppliers maintain relationship with stakeholders
- Clarity of roles of the project members
- Major risks did not materialize
- Client, end-user consultation, involvement
- Project avoided unnecessary disruption to the business
- Project avoided unwanted changes to the corporate culture

This list is based on the factors listed in Hussein 2018 [3], however, these factors are reviewed, modified and adapted to our project and our team to meet our needs.

To detail the five critical success factors, we can say that without our knowledge, our skills and our cross-functional skills thanks to our different backgrounds, the project could not have gone so well. Indeed, everyone was able to highlight their achievements to move the project forward in an efficient and productive way. In addition, the subject proposed was clear enough to have direct confidence in the process of realization but also in the members of the team, due to the nationality but also by the fact that certain members of the group knew each other before starting the project. This greatly facilitated and streamlined internal communication, as did our interest and our motivation to carry out this project, which were a key factor in its success. Planning the tasks to be

carried out in a very detailed way and very early on helped us to be very organized and very efficient since we had a guideline, objectives to achieve.

4. Most important lessons from your project

This project has been resourceful and helpful to all of us regarding our teamwork and project management skills. We have learned a lot along the way since we have had issues that we have faced and solutions that we have found, in order to successfully finish our project.

We have chosen to develop a new product and fulfill an existing need in the society. For such a product development project, we would first advise being prepared to invest one's self to the project and be interested in the topic. The investment and the implication of the whole team is a must in a project where every member has a big amount of responsibility. The motivation of the team comes first from finding a good idea for the product development. An issue or a need that everyone sees important and interesting helps keep the team going. A product that is useful is always better than a product no one needs. The necessity and the utility can be proven by discussing with concerned people like the potential end users or the targeted clients.

Moreover, finding a good idea early is also essential. Time is essential in a project. It is a huge constraint that the team management has to keep in mind and on track. Being efficient and planning the project very quickly and as early as possible helps monitor the time, the tasks. For this, an early project planning phase where the project characteristics, the project work, the tasks, the time planning and the responsibility of the team members are detailed is crucial. This helps have an overview over the project and we can set the milestones of the project. We have learned that Gantt and WBS charts are helpful tools that all projects require in order to present the work and the timeline to the whole team and refer to.

We have learned that designating responsible team members by aspect of the project and the project management helps divide the project work equally and excel in this area.

Our experience suggests that there may be times where the settled ideas may be questioned and be changed. In regards to some constraints (foreseen or not), the project may change in its course. The team should be in control of these changes but still be flexible and adaptable to the situation.

Concerning project team work, we held regular (weekly) meetings and set goals for the next week in order to see the progress of all the tasks and not fall behind on schedule. If a team member needed help, the others came to rescue and thus the project was not delayed.

To sum up, this project along with this course has enabled us to understand challenges of different project lifecycle phases and adapt management strategies according to their needs. We have also understood the needs of a project as seen with different case studies and how to apply the adequate policies and working methods to the ongoing project.

5. Reflection on learning and unlearning

In order to succeed in this project, we had to learn and put in practice a lot of project management skills. Here is a short list of knowledge, practices or attitudes that we have gained during this project:

- Theoretical knowledge of project management to write the report;
- Research on existing products in the hemiplegic equipment market - in other words, we learned to benchmark;
- Empathy to imagine the daily life and needs of people with hemiplegia in order to make a functional product that really meets a need;
- Carrying out an effective brainstorming focused on "product development", where the challenge was to invent a new and multi-functional product;
- Focus on effective communication and make sure we are all on the same page;
- Work as a project team: make a schedule, follow it and make sure that everyone does the tasks that have been assigned to them (without putting pressure on them - transversal management)
- Use the material resources at our disposal in an autonomous and secure way.

We faced different situations where the knowledge acquired was critical for the success of our project. For example, without having learned what we had the opportunity to learn during our courses, we would not have been able to establish a schedule and stick to it in order to work effectively. We could also have misassigned the tasks to the team members, which could have created discord and therefore affected the quality of the project. Another critical point would have

been the stakeholder analysis: without this task, it is almost impossible to succeed in carrying out a project taking into account all the constraints and paying attention to all the real stakeholders.

On the other hand, in order to succeed in this project, we had to unlearn the knowledge and foundations that we had long adopted to face problems and challenges. Here is a short list to illustrate our point :

- No longer confine ourselves to our convictions and ideas to integrate and project ourselves into the ideas of other people in the group;
- Not wanting to be a leader by imposing your choices and ideas;
- Not working alone but in cohesion with a group, not knowing how to do everything and delegate tasks;
- Most of the time a project never really goes as planned, so we had to unlearn that building a guideline does not mean that we will actually stick to it;
- Perfection does not exist, it is subjective and it can block and paralyze certain actions;
- Planning is not the most important thing to focus on, at the risk of exploding budgets, losing sight of the real stakes of the project or forgetting its purpose;
- Do not rush headlong thinking you have understood the subject but take time to reflect, take a step back and temporize our actions.

These points can be illustrated by examples, especially during the pre-concept and design phase of the product, where each member of the group had to, during the brainstorming, unlearn to be close-minded and to impose only their own ideas. This allowed not only to increase creativity in the project but also to identify and choose solutions that meet the requirements and objectives, and not personal desires that could lead to the failure of the project. All this made it possible to obtain a final product that fully met the specifications. Another example we can mention is thinking before acting. Indeed, in our case, the desire to go directly to a phase of finding a solution, concept or design was tempting.

However, the success of the project can be partly due to the good organization of the beginning of the project which allowed us to frame it, by knowing the objectives, the stakes, the needs, the expectations and therefore not to lose time by going into unnecessary and inefficient work, and meeting deadlines.

6. Acknowledgments

We would first like to thank our teacher Bassam Hussein and the student assistants of the course TPK5100 Applied Project Management at NTNU - Norwegian University of Science and Technology for enabling us to do such a project and guiding us through it. We value their help and their precious advice.

We also thank the people who have answered our survey on our project, as well as the Disabled People Association in France that we have contacted for this project. Their answers and their feedback have been critical in the course of this project.

We thank the project team for staying motivated and invested in the development of this product. Every team member has fulfilled their responsibilities, while helping others and offering new, helpful, innovative ideas. The knowledge everyone has put on the table and the experience shared is appreciated.

7. References

[1] Natalie Semczuk (2018), Project Communication Plan Examples, Template, & How To, https://thedigitalprojectmanager.com/how-write-project-communication-plan/

[2] Bernie Roseke (2016), 39 Project Success Factors, https://www.projectengineer.net/39-project-success-factors/

[3] Bassam Hussein (2018), The Road To Success

8. Appendix

Appendix.1: Your pre-report (see below)

NTNU

Norwegian University of Science and Technology

PROJECT BASED ASSIGNMENT

Project Plan

22/09/2022

Group 23

Nazli ERDEM
Jules GRAND
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Dear customer,

As promised, the Greenfinch design office delivers its report on the development of your product.

Last month, your company "Medicare Corp." called on our engineering department to design, source and subcontract a new model of cutting board for people with hemiplegia or only one upper limb.
In fact, people with hemiplegia or with only one upper limb have trouble using the “usual" equipment that we may have at our homes. Since they can’t hold things with their two hands, they can handle less objects and in a different way than non-disabled people. The more the objects are fixed or secured, the easier it is to do daily tasks for them. The problem you have raised is about the lack of appropriate kitchen equipment for hemiplegic people, especially for preparing the food by cutting it and mixing it in a bowl. Therefore, you have sought our help to design a product that will help hemiplegic people easily cut food (vegetables, meat, dairy…) and put the cut goods in a container to regroup or move them.

To answer your call, we have done research about the cases of hempilegic people, in order to understand the need. We have come up with a concept, a functional cutting board, that will help them for this purpose.

Product description

The cutting board is a wooden board equipped with suction cups so that it does not move when the user uses it on his work surface. A secure removable knife will be fixed on the basis of two mechanical links: a slide and a pivot. This allows the user to cut food with strength and freedom. To prevent the food from moving while cutting, small rigid spikes are present on the board. Finally, our product is also equipped with a removable receptacle, which allows the user to slide food inside and then grab it to pour it into a pan for cooking food.

Project description

The rationale: the product partially solves the problem of autonomy in carrying out daily activities for people with hemiplegia, especially for a basic need such as making food and eating.
The purpose: allow people with hemiplegia to prepare meals by cutting their ingredients more easily.
The outcome: increase autonomy of the user and reduce the risk of injury.
The output: a cutting board that stays put/stuck on a surface while a person cuts food on it, with the attached knife.
The time restriction:15th of September - 3rd of November 2022
The budget: the product should cost the production a maximum of 100 euros/product.

The resources: hardware (Solidworks, Office, Adobe Photoshop) and software (Guide du dessinateur industriel, Chevalier, Hachette), office space.

Role of the Greenfinch company

Greenfinch is an engineering company specializing in mechanical design. Under the direction of a project team, it is responsible for carrying out the project activities as well as supporting these customers throughout the product development process, which concerns: the analysis of the customer's need as well as future users, the search for solutions, pre-dimensioning calculations, CAD, optimization, prototyping, or even functional testing and compliance for sale on the market, while managing the expectations in terms of planning (deadlines), cost and/or the customer's budget.

The project team will be composed of a project manager, Nazli ERDEM, as well as four collaborators, Marie GUIGUET, Jules GRAND, Jérémy FIASCO and Nabeel Ahmed KHAN.

The expected benefits of the product

Our design office has developed an innovative product to improve the daily life of people with disabilities. We have listed below the expected benefits of the product :

- increased autonomy: the user will be able to cut food and pick it up in a receptacle without the assistance of an external person.
- Reduced risk of injury: the secure knife is equipped with plastic protections to prevent the user from cutting himself while using the product with his valid limb.

Stakeholders

Below, you can find listed all the potential stakeholders as well as their future involvements during the development of the project.

Stakeholders	Involvements
Project owner (Medicare Corp.)	A project owner creates the project vision, sets objectives, secures funding from a project sponsor, and acts as an ambassador for the project. A close collaboration will be carried out in order to inform on a recurring basis of the progress of the project and to know the expectations for the development of the product whether in terms of needs, budget or deadlines, but also in terms of feedback and approvals concerning choices and deliverables.
Product subcontractors	Once a project team hires subcontractors, it is their duty to fill them in on expectations and employer policies. The contractor must constantly monitor subcontractors and the status of the project in order to be sure everything is running smoothly and subcontractors are meeting expectations. In addition to this, sub-contractors are frequently asked during the product

	design phase in order to know the manufacturing times, the costs or the possible optimizations according to the means of production.
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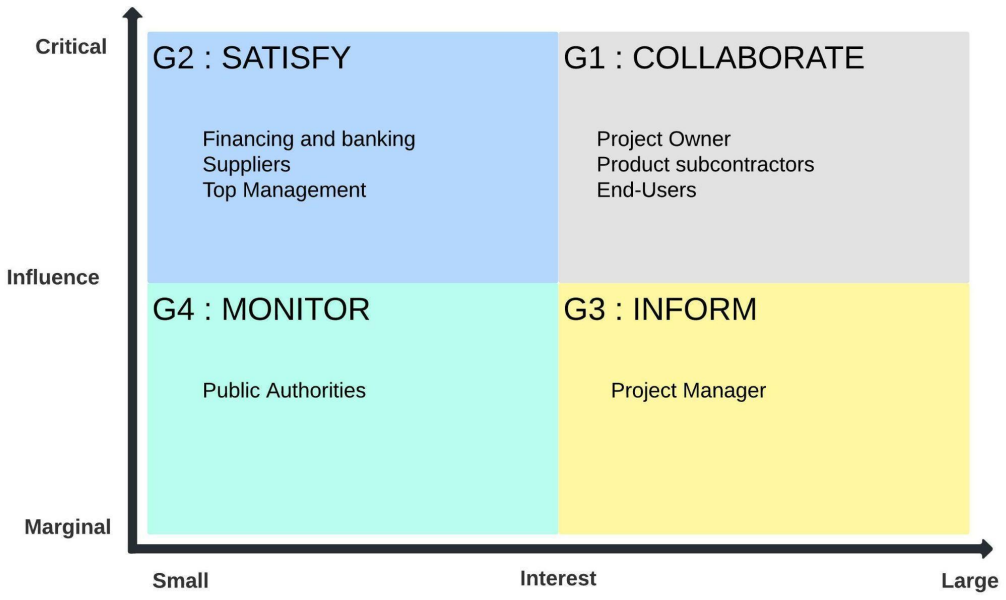
Financing and banking	Will allow the realization and concretization of the project thanks to a budget.
Public Authorities	They will only participate at the end of the project in order to validate that the product complies with the standards for use (ISO standards) and sales (CE marking for example), no information will be transmitted.



Stakeholders mapping

Project risk assessment plan

Main risks: having a product that doesn't correspond to the needs of the end user, or the demand of Medicare Corp.

There are four stages in risk management in projects:

- Risk identification: the list of risks of a project can come from previous experiences, interviewing, research and brainstorming with the team members
- Risk assessment and prioritization: understanding the priority of the requirements from the project stakeholders and translating it into the priority of the risks related
- Risk response planning: Once the risks are identified and prioritized, risk mitigation strategies are developed and put in place to avoid them.
- Risk monitoring: The listed risks are monitored during the project to decrease the time of response in case the risk happens.

For this first part, we have identified the major risks for a product development project and more specific ones concerning our product and targeted market.

Financial Risks

- Lack of financial resources

Technical Risks

- Lack of material resources
- Unavailability of the infrastructure and the tools needed
- Unavailability of softwares (licenses, software capabilities and functions)
- Lack of safety instructions for the infrastructure, thus health risks
- Non-functional prototype
- Lack of coherence and functionality of the product
- Lack of understanding the end user needs and stakeholders' requirements

Contractual/ Legal Risks

- Lack of respect of the legal food and safety standards
- Not respecting the timeline of the project, especially the deadline

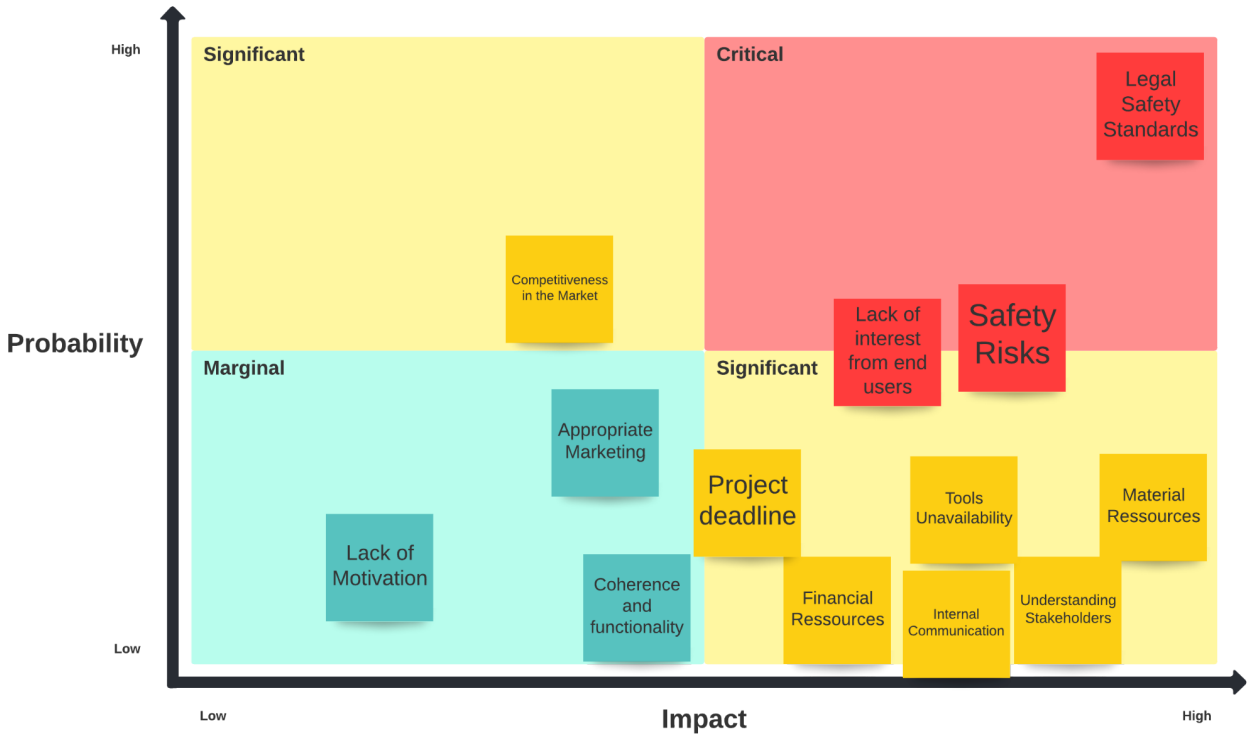
Commercial Risks

- New competitors and products in the market
- Falling behind in competitiveness compared to similar products (price, quality, functionality)
- Lack of appropriate marketing and communication to the end users
- Lack of interest from the end users and the related associations

Execution

- Bad internal communication in the project team
- Lack of motivation, availability and loyalty to the project by the project members

For the second step of risk management, we assessed the importance and the priority of the risks listed above. This classification according to the probability and the impact of the risks can be found in the risk assessment chart below.



Risk Assessment for our project

We have defined indicators for the major risks of our project and a team member responsible for tracking it and warn the others in case of a bad evolution of the indicator.

Risk	Responsible	Probability of risk/ risk impact (L/M/H)	Consequences (time, quality…)	Measures: when	Measures: what
Safety standards	Jérémy	H/H	Quality	At every task, especially planning	The respect of the legal standards
Safety risks	Jules	M/H	Time, health	Everytime in the production laboratory and during transportation, execution	The use of proper and adequate safety equipment and the respect of safety rules
Lack of interest from end users	Nazli	M/H	Quality, sales	The initiation and close-out phase	The adequacy and the utility of the product developed
Availability of all	Marie	L/H	Time, cost, quality	Every step of the life-cycle,	The cost/budget, the respect of project

resources, deadlines and costs				especially initiation, planning and execution	time planning, resource planning

Skills needed for the project

The skills we will need for this project are:

- basic mechanical knowledge
- product design knowledge (conception, 3D drawing)
- production
- presentation of the product to the customer
- communication skills
- project management
- product development and management

Some of these skills are already mastered by the team members, whereas others need to be acquired or be improved by the team members in order to complete the different stages of the project.

Project deliverables, subdeliverables, work packages

Major deliverables: selected concept, prototype, final product.

Subdeliverables: quote, compliance file.

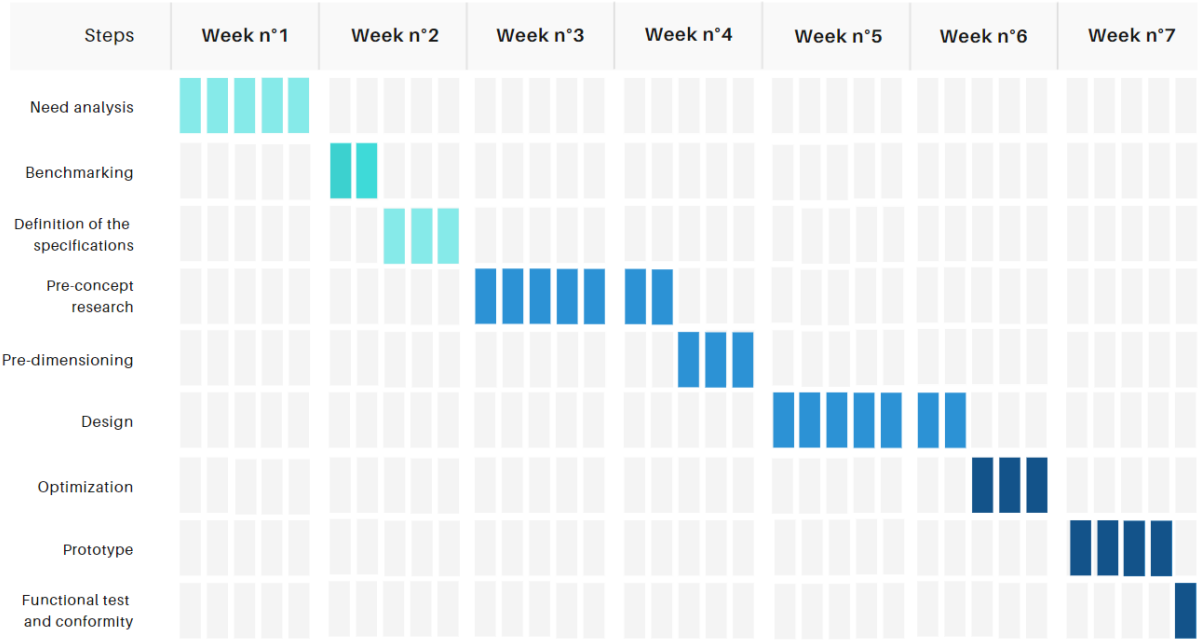
Work packages: product operating test report, solution research report, functional and technical specifications, overall specifications, sizing study, process-material study applied to the product, optimization report with gains, study report and market analysis (patents, competitor innovation)

Project schedule

Please find below the project schedule that will be maintained throughout the project:

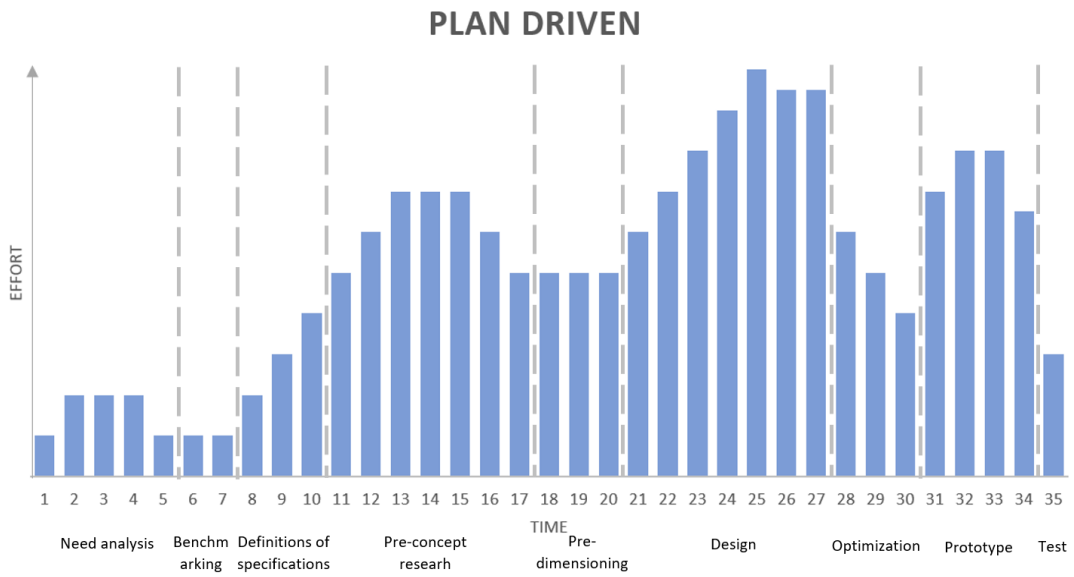
Activity	Index	Duration (days)	Predecessor
Kick off (15st of September)	-	0	-
Need analysis	A	5	-
Benchmarking	B	2	A
Definition of the specifications	C	3	B

Pre-concept research	D	7	C
Pre-dimensioning	E	3	D
Design	F	7	E
Optimization	G	3	F
Prototype	H	4	G
Functional test and conformity	I	1	H
End of the project (3rd of November)	-	0	I

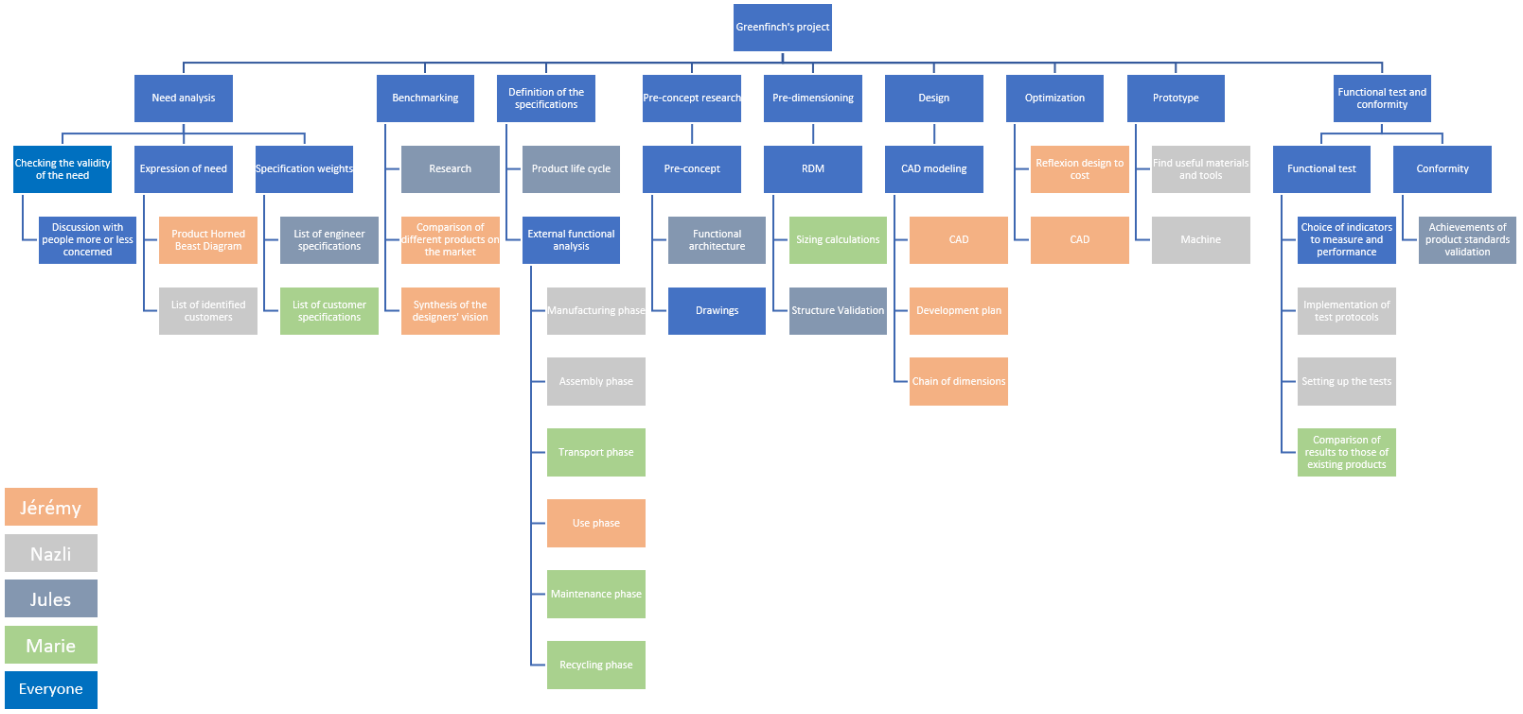


Project schedule in Gantt format

From this GANTT diagram, we first have the piloted plan which allows us to see the stages of the project in a chronological way while estimating the efforts necessary for these stages. We also created the plan driven and WBS diagram to allow us not only to view the important stages of the project, these deliverables, the tasks but also to see the distribution of the tasks between the team members.



Plan Driven Project Planning



Work Breakdown Structure of our project

Success factors

The factors allowing our project to be a success are a good planning of it beforehand, effective communication with all partners, the customer and within the company itself, and there must be a good understanding and compliance with the specifications. In addition, risks and impacts must be anticipated, analyzed and controlled thanks to a competent and rigorous project manager. Finally, there are many easily accessible resources.

Communication plan

The success of a project also depends on the effectiveness of the communication plan [1], whether internal or external. Indeed, the goals of the communication plan are multiple. First of all, it allows stakeholders to be kept informed of the progress of the project in terms of deadlines, costs and even needs. The communication plan provides structure in the organization of stakeholder feedback and also provides a clear overview of all decisions, issues and needs. We therefore imagined below a communication plan with, firstly, information about our key stakeholders who are the project owner (Medical Corp.), the end users (a potential contact whose product would be of great use), and the members of the team (in particular Nazli ERDEM, project manager).

Stakeholders information

Person	Role Title	Frequency	Format/Channel	Notes
Michel GROIND	Project owner	Major Milestones	Emails	Wants to know the major elements but prefers to see only the final product.
Arthur DUPONT	End user	Weekly (after prototype's creation)	Meetings / emails	Propose modifications and improvements until the product is perfectly suitable.
Nazli ERDEM	Project manager	Daily / Weekly	Daily meetings, weekly emails	Do not hesitate to see her for any question or need.

Types of communication

Major Milestones emails

Inform at each important stage passed (finalization of plans, launch of the prototype, tests, etc.), or at each significant problem encountered (potential problem of deadlines, costs, etc.). Take the opportunity to take stock of the agenda, the deliverables and the next steps to be taken. Propose and schedule a meeting if desired by the stakeholder.

Weekly meetings / emails with the end-users

Weekly meetings to test the product to propose improvements. After each meeting, the end user can, orally or by email, provide feedback on his tests. Once the cutting board seems operational, these appointments are no longer useful.

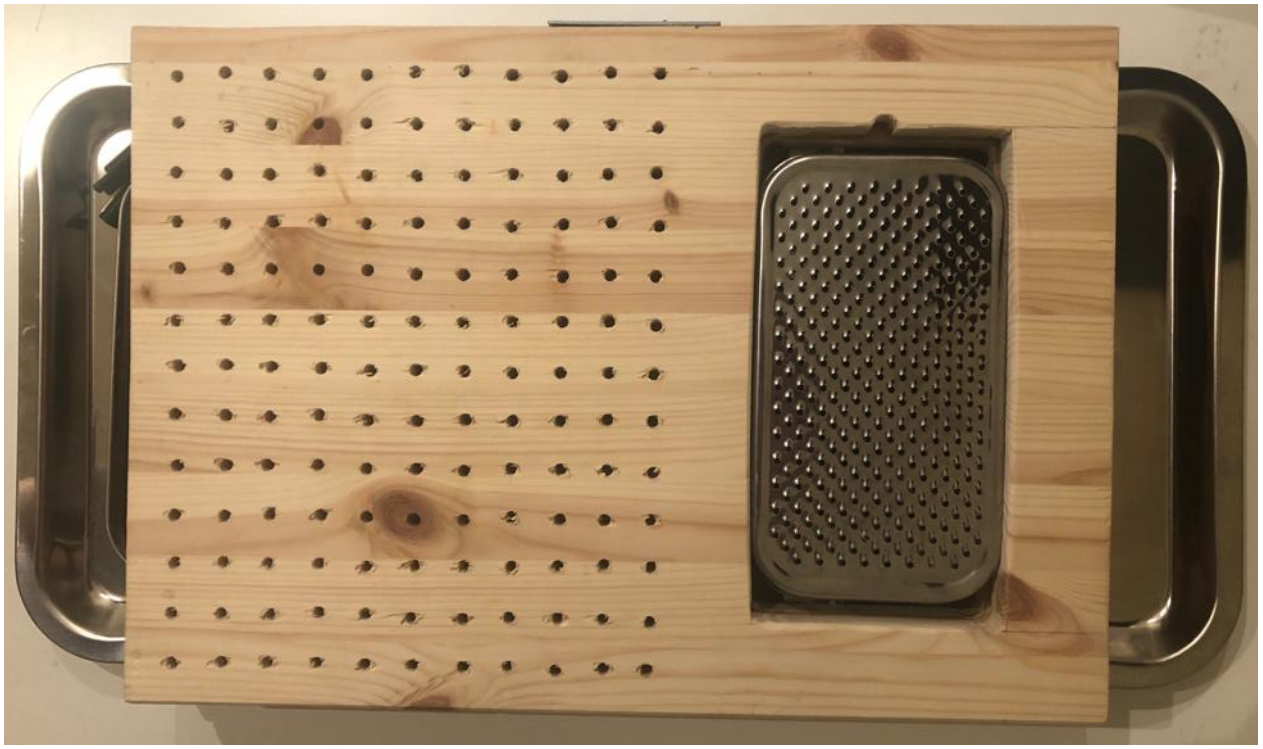
Daily meetings / Weekly emails from the project manager

Regarding the daily meetings, it is a question of being able to exchange the various necessary points of the project. These meetings are not compulsory but allow the team time during

the day to inform directly and verbally of the positive or negative progress of the project. It also allows project members to have the approval of non-deliverable minors.

The weekly emails come at the beginning of the week in order to organize the work for the coming week. A point on the agenda is attached to it, with specific deadlines, links to see the deliverables, the next steps planned on the list or even announcements concerning the budget.

Appendix 2 Photos of your product



Appendix 3. Link to your video presentation

Here is the download link of our video :
https://drive.google.com/file/d/1eR1XrsOvdpkRXEY7_zr7m5Gi6pb_FCnl/view?usp=share_link