NTNU
Norwegian University of
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MECHANICAL ENGINEERING

TPK5100 APPLIED PROJECT MANAGEMENT

Reflection Report for Product-Based Assignment:

Watch Winder

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1 Introduction

The purpose of this project is to learn and experience the management of a project, using relevant product management theory presented during this course. This consist of forming a project management group, assigning roles, and planning the execution of the project. To do this, the group has to identify different success factors and risk factors relevant to the project, as well as the stakeholders in the project. The outcome of the project is the development and production of a deliverable. The deliverable should have value for the end-user, meaning it should be a product that someone actually needs.

The deliverable chosen was a watch winder, a complex device that keeps an automatic watch running while it's not being worn (LIV Watches, 2019). An automatic watch collects kinetic energy from the movement of the person wearing it, and this energy keeps the spring wound, keeping the watch running. A watch winder uses an electric motor to keep the watch in continuous motion, simulating the movement the watch would experience if it was worn. This keeps the watches' spring wound and the watch running. This is necessary because a prolonged stop could damage the mechanism of the watch.

The end-user of this product will be the owner of one or several automatic watches. The end-user is also likely to be interested in keeping their watches in good condition. Automatic watches are often products with significant value, and they are very popular among collectors. They are also used by many as fashionable pieces. Knowing this, it is clear that there is a solid base of end-users potentially interested in our product.

The idea to make a watch winder came from a group of friends who were in need of an affordable watch winder for their automatic watches. Using our background in engineering studies, we saw an opportunity to use computer-aided design software (CAD) to design the product on our own, and access to workshops through NTNU to laser cut and produce the product.

2 Evaluation of project management effort

Overall the project management went well. There is a consensus that the management was productive and efficient, as planned.

During the project, the organization of the group went well, though to get a good organization we had

to reorganize about two weeks in. Initially, we did not issue roles to the different group members, and we planned that everyone should have the same amount of responsibility to complete the project tasks. This revealed itself to not be the most efficient approach as none of the group members felt any ownership of the different tasks, and became apathetic to the work needing to be done. To combat this, the group appointed a group member to be in charge of the planning and production of the deliverable. Additionally, the group met up weekly to do work related to the course as a collective effort.

When the group met up, the roles became more natural as each member has different strengths, and took it upon themselves to complete the tasks they master the best to waste the least amount of time. When writing the reports everyone was involved, and when anyone was unsure of where they could contribute, they asked the rest of the group where their efforts were needed. This structure fits the group well, but it was clear that if the group members had not been as proactive, a more structured distribution of tasks would be beneficial.

The biggest issue surrounding the organization could be that the weekly sessions sometimes became fairly long. There was a defined starting point, but no defined endpoint to the sessions. This led to perhaps a little too laid-back atmosphere leading to many breaks, and less productive work sessions.

The risk management plan worked well, and the risks identified were handled well. However, there were some unforeseen situations in the production phase that could have been thought of in the early risk management. The first was that the use of a lathe to make axles for the watch winder was neglected. This should have been included in the risk evaluation and matrix due to the high-risk possibilities in the use of a rotating machine. A risk evaluation was conducted before the use of the lathe, but should really have been included earlier in the project.

The second situation occurred during the assembly of the watch winder. One of the group members got a wood chip in their eye. It was easy to remove and caused no damage to the eye. Otherwise, no other situations occurred thanks to good risk management and good precautions. The precautions included having courses in the use of the machines, asking for help or troubleshooting, and always having situational awareness. In total all went well according to the risk management plan.

When it came to the communication within the group, it went well after a “production manager” was appointed, and the weekly meetings were established. Each individual in the group completed their tasks and followed up through the meetings. The meetings established a platform where it was easy

and natural to ask questions, and when questions did come up, the group had a discussion if necessary, and came up with a solution. Having physical meetings where everyone had put off time in their week to work on this course helped increase the ownership of the project, and decreased apathy. Although not every group member could attend every meeting, the tasks were completed as planned. Since some of the members have different courses, it was impossible to avoid collisions.

Regarding the project management efforts, there were only one defined success criteria, which was having efficient and productive project management. In the beginning, the project management was not the most efficient because of the belief that not having specific roles and responsibilities would work in this project. Eventually, with the change in the organization, the project management became efficient. The management would have been more efficient with appointing roles and responsibilities from the start, but this did in its way contribute to fulfilling another success criteria, which was "having a productive learning experience". The group did learn from the experience and is now better equipped to manage future projects even more efficiently.

We evaluate our project management effort as successful:

Scale	Strongly Dissagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Your Response				X	

Table 1: Evaluation of the Project management effort

3 Evaluation of the project success and impact

For the evaluation of the success of the project, we need to look at the success criteria that we set in the pre-report:

1. Create a product that has a demand: The project group based the product on a request from acquaintances that was in need of a watch winder, and thus the goal for demand was reached.

2. Create a product with a total budget of 0 NOK: The total cost of the project was 0 NOK, and therefore the budget was kept without any problems.

3. Produce a functional watch winder: The watch winder is fully functional, and the design allows for the product to fulfill its purpose, which is keeping automatic watches wound if not worn on a wrist. The winder allows for a total of four watches to be kept wound by rotating them around their own axis and letting the watches collect the kinetic energy from the rotating motion.

4. Produce a project report: The report that you are reading right now, along with the pre-report, is evidence that the criteria for producing a project report were met.

5. Produce a 5-minute video presentation of the project: The 5-minute video was delivered delivered on time with a good standard, and summarized the project well.

6. End-user satisfaction: The end-users were satisfied with the product and it fulfilled the demands they had. Which was keeping their automatic watches running while it's not worn, and keeping the watch in good condition.

7. Complete production of the watch winder, project report, and video within November 3rd, 2022: The time schedule went according to plan, and the watch winder, project report, and video was completed within the given time frame.

8. Have an efficient and productive project management: As mentioned in *Evaluation of project management effort* the efficiency was not the highest in the beginning, but changes to the organizational structure eventually led to efficient project management. Seeing that the project met all of its success criteria within the established time frame, the project management can be defined as productive as well.

9. Have a productive learning experience: All of the group members learned something about how to approach a project purely from a project management point of view. Additionally, the project made the group reflect on their initial approach, and what could be improved about it.

Based on these points, the project has been a great success, since all the criteria were reached and all involved parties of the project were happy with the outcome.

Whether or not the project was a success can also be defined by how well it matched the needs of the target audience. The target audience of our product could be anyone with an automatic watch or with a desire to purchase an automatic watch in the future. The product would be appropriate for anyone who is considering buying a watch winder but doesn't want to spend a fortune. In addition, watchmakers could benefit from this product as well, as there could be more potential buyers for automatic watches when there is a cheap and easy way to maintain their life. In this project, we are mostly interested in the group of acquaintances that requested the watch winder as the target audience. The entire product was designed to their liking, and their opinions decided whether the design was good or not.

The final product functions as intended, and according to the scope of this project, it meets all its requirements. The end-users provided oral feedback that it was a good product that satisfied their needs. If the product was to be brought into mass production for commercial sale, it would potentially require further revisions and changes. However this was not the intention, and we evaluate the product as outstanding as it met all of the end-users requirements, and they reported exclusively positive feedback.

We evaluate the quality of our final result as outstanding:

Scale	Strongly Dissagree	Disagree	Neither agree nor disagree	Agree	Strongly Agree
Your Response					X

Table 2: Evaluation of the quality of the final product

Figure 1: The final product

Figure 2: The final product

4 Factors that have contributed to failure/success

The first obvious success factor in this project would be that there existed a **demand in the market** which the group managed to identify. Without a demand for the product, the product would in itself be useless. Mostly there was a demand amongst the acquaintances of the group, and even though it is a small group of people, it is still a demand that the group can satisfy.

Another success factor in this project has been **access to free use of equipment**. By only using production methods delivered by NTNU, we were able to uphold the goal to create the watch winder

with a budget of 0 NOK. Adding to this factor, the end-user already owned the electrical equipment needed, like the Arduino and motor that was needed to make the product work.

Experience with production methods helped keep the time frame and also design a product that was possible to make by the restrictions set by the production methods. Experience also helped keep to the budget, since there was no need to outsource any part of the production.

The design process was made easier due to **experience with the skills needed**, such as 3D modeling and coding, to plan and produce the product. It also allowed the designer to efficiently visualize the end-users vision and ensure end-user satisfaction. This factor also applies to writing reports, as experience with this has helped writing the final report.

Knowledge about the applications of the product from both the end-users and the project groups' side contributed to seeing the need for a watch winder and understanding how the winder best could be designed.

Additional to the pre-existing knowledge, **research** before and during the design phase, as well as the production phase ensured a well-designed and produced product.

Project management experience helped us work more efficiently, as all group members have done projects before through school or work. This means we already have an understanding of how to run projects, what is expected from us and how to write reports.

Having an **open mindset** to be able to have a productive learning experience, as well as letting the group be open to changing our initial plan, was important to have a successful project. Especially considering that "having a productive learning experience" was a success criteria. This is the *most significant* success factor because it helped us have more efficient project management, as a closed mind would hinder us from being susceptible to constructive criticism.

Good communication allowed for the tasks to be coordinated and completed on time.

A vital success factor in this project has been **continuous dialog with the end user** to ensure that the end-users were satisfied and content with the design and quality of the product. The end-users were heavily involved during the design phase and during any big iteration to ensure that the final product did not derail from the initial request. By having a high involvement of the end-users in the design and function of the product, the project group made a fully operational watch winder with high end-user satisfaction.

To have **defined success criteria** in the project can in itself be considered a success factor, as this gave the project a clear path and a concrete objective

Considering this was a project management project, **wrongful focus** led the project more in the direction of a production and design project, rather than the goal of a project management project. So in the case of failures, we can consider this a factor towards failure.

A potential failure factor is the **lack of plan B** in the execution of the project. In the case of problems in production, a second product with fewer external production methods and fewer steps would in hindsight be a good idea. The product made in the project included a lot of machining with different machines. If one of these had been down for maintenance, delivery of the product would be postponed as well as the report.

Comparing these factors to the success factors listed in (Hussein 2018) pp-92 we see that we have several success factors in common and some uncommon.

A few of the success factors that are listed both earlier in this report, and in the provided literature was having the skills, knowledge and competence needed to design and produce the watch winder within the group. Also having a clear objective (we have listed this as having defined success criteria), as well as what is described as honesty in the literature. We would say that honesty and what we have listed as good communication is just about the same thing, as good communication for us entailed being honest about your progress, and being honest about whether or not you understand the task at hand.

Another success factor we have listed that is in common with the literature is experience. The group has experience with writing reports together, as well as the fact that everyone has completed projects before, giving us some experiences to draw lessons from. Flexibility is another success factor that we would consider as common, though we have described it as having an open mindset. Without it the project could have stagnated when we met challenges. A final success factor we listed and have in common with the literature was involving and having good communication with the end-user/stakeholders.

As for the success factors we didn't list, we failed to mention mindfulness about biases. Becoming aware about our bias to focus on the production rather than the management was really important for the success of the project. Trust was another success factor we didn't list, but we had complete trust in each other within the group. We trusted that the group member responsible for the production

of the watch winder to come through or report if they encountered any problems. We also didn't specify having adequate early planning as a success factor, but throughout the project we had weekly meetings and kept our schedule. One last factor we failed to identify was being loyal to the decision made. We did as a group exhibit loyalty to decisions made, and met up when we were supposed, we did our tasks and helped each other to complete the project.

5 Most important lessons from your project

To future students of this course we would recommend identifying the learning objective before choosing the type of product. For example, in case we considered making several other products before the watch winder. However, we identified very few potential stakeholders with the other products, which would lead to a less productive learning experience. Keeping the learning objectives in mind when choosing the project is important to get the most out of this project.

We learned that the market is charging way too much money for this type of product. The product doesn't have to be so expensive. The cost of producing the product is low, therefore it should be much cheaper than current products in this segment.

We also learned that good communication between us and the end-user at the start of the project was crucial for a successful product. Defining the product and its functionality in the early stages also contributed positively to the project. In retrospect, we learned that not assigning each member a specific responsibility was a mistake.

So our advice on this matter would be to; assign a project manager, and give each member tasks and responsibilities so they feel more engaged in the project. Our advice would also be at you should not forget that this is an applied project management assignment and not a product development/production assignment.

Our experience suggests that because of our background as mechanical engineering students, the product development/production went relatively straightforward, we didn't really face any demanding challenges along the way. But on the other hand in our experience, we didn't really consider the fact that our main objective should be learning about applied project management and not so much producing a watch winder. But in writing this final report we were able to get a better understanding of what the purpose of this project was all about.

6 Reflection on learning and unlearning

What we learned

In this project, it has become apparent that having an assigned person to arrange meetings/work sessions and make sure everyone is en route with their tasks is highly beneficial. Having "everyone" be project managers, ironically enough, increases apathy in the group. This phenomenon is called the *bystander effect* (Emeghara 2020), and it is a known phenomenon that having more people with the same responsibility diffuses the responsibility, leading to a lower likelihood of anyone stepping forward and taking lead in a situation.

For the completion of this project, it then became critical to at least appoint someone to be in charge of the production and assembly of the product. It also became critical to establish weekly meetings to do work related to the course. After this was done, the productivity of the group went significantly up.

One of the biggest challenges we faced in this project actually took place after the product was produced and assembled. We struggled to reflect on our own management skills. As a group composed of purely engineering students, we are used to approaching a project with a very "matter of fact" attitude, with little regard to the interpersonal aspect of a project. The whole group was initially very pleased with the opportunity to complete a product-based project, as this is very specific and easy to do with our background. Realizing that this project actually revolved around the management of the project, rather than the product took some time, and we found it very challenging to look at it from a pure project management point of view.

This change in mindset lead the group to reflect more on project management, and we gained some new tools for reflection.

To summarize we learned:

- The value of assigning roles and areas of responsibility
- Acknowledging the inter-personal aspect of a project
- Reflection

What we unlearned

To complete this project, and reap the full benefits of what we learned, we had to put away old ways of thinking. One of these ways of thinking was thinking everything would go smoothly without defining clear roles, but as described in the section before, this only lead to increased apathy in the group. Therefore this belief had to be scrapped.

As mentioned before, we were struggling with seeing the project from a project management point of view because we already had a vision in our minds of how such a project should be completed. Therefore we had to put away this rigid way approach, and rather be open to other ways of viewing a classic product-based product.

This was extremely critical in the process of writing these reports, as the old mindset simply would not allow us to produce reports that reflected the applied project management course.

To summarize we unlearned the following practices:

- Thinking that everyone could manage one project without clearly defined areas of responsibility
- Only thinking of the product in a product-based project

7 References

Hussein, B. (2018). The Road to Success: Narratives and Insights from Real-Life Projects, Fagbokforlaget.

Emeghara U. (2020) "Bystander Effect and Diffusion of Responsibility" SimplyPsychology Accessed October 21, 2022 https://www.simplypsychology.org/bystander-effect.html

LIV Watches (2019) "Everything you ever wanted to know about Watch Winders" Accessed on October 24, 2022 https://www.livwatches.com/blogs/everything-about-watches/everything-you-ever-wanted-to-know-about-watch-winders