Final Reflection

michaelsammueller.github.io/eportfolio

Word Count: 1,038

Introduction

The "Software Engineering Project Management" module allowed me to study project management, a field I had limited prior exposure to. Being a simulator engineer, my professional work focuses mainly on programming and data processing, while others manage the projects that I will later integrate into the simulators. To finally learn the methods, theories, and concepts related to project management, and putting them into practice, was a welcome introduction to the world of project management.

Based on my twelve individual reflections for each unit, this final reflection is intended to summarise my experience of studying this module and working in a team for two of the three assignments.

Team Experience

I felt I was well prepared for working in a team, having done so a little earlier as part of the "Secure Software Development" module a few months ago. Based on my positive experience back then, I was looking forward to working in a team again. While there were some hurdles to overcome in the initial phases, with some team members not responding to messages or missing meetings unexcused, the team experience changed for the better a few weeks into the process.

Following the agile methodology, we formed our plans, assigned tasks to each team member, and began working on our project, revisiting our plans whenever necessary. As a team, we stressed the importance of meeting regularly to review progress and support each other. We met at least once per week, and sometimes up to three times, to polish our submissions until each one of us was satisfied with the final product. Being spread all over the globe was certainly still a challenge, with some team members living in the Middle East, one in the UK and the other one in Canada.

Personal Involvement

As part of the first assignment, my efforts were focused on Gherkin statements, as well as on the hardware and software configuration of our proposed system. After we had gathered the requirements for our system, I began studying them to craft Gherkin statements that would describe these requirements. Although Gherkin's syntax is meant to be easy and allow non-technical users to understand requirements, the fact that it is meant to be used as part of "behaviour-driven" development made it somewhat difficult to apply it to hardware components.

It appears to me that Gherkin would be more applicable to describe the behaviour of software, rather than describing RAM or a computer case.

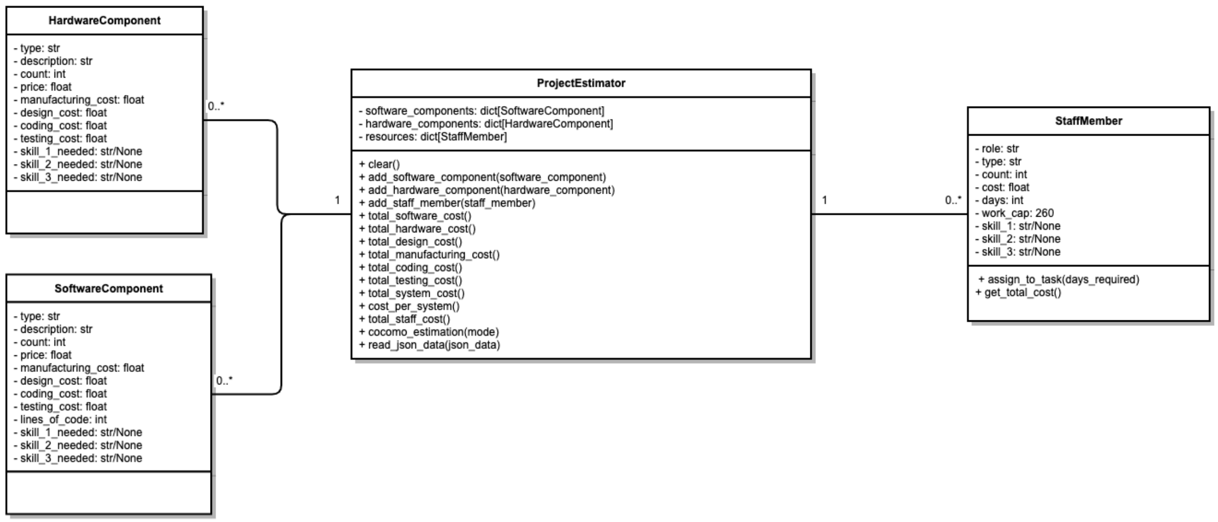
1. Feature: CPU with forward compatibility
Scenario: New software is released
Given that the system has a CPU When new software is released in the future Then the CPU should support that software
Scenario: New hardware is added to the system
Given that the system has a CPU When a hardware component is added or changed Then the CPU should recognise it
Scenario: The CPU fails to run new software
Given that the CPU is forward-compatible When the system experiences compatibility issues Then it should be fixable by patching CPU drivers
2. Feature: Industry-standard storage
Scenario: Data is stored on the system
Given that the system has storage When the user attempts to save a file in an industry-standard format Then the system should store it on its storage successfully

After carefully selecting individual hardware and software components to fulfill the requirements, the team realised that we would not be able to stay within budget in doing so. Due to this discovery, we decided to build two systems, one that we could sell to the public, and one that we would send to EDC to fulfill our contractual obligations. Although we worked hard on this assignment and spent countless hours going over the requirements and the resources provided to us, we all were somewhat unsure whether our assignment would be satisfactory - mainly because we exceeded the strict page limit of two pages - a limit that seemed impossible to uphold. Contrary to our concerns, our hard work paid off, as the awarded grade reflected the positive feedback we were given.

For the second assignment, I volunteered to work on the Python application, specifically focusing on the class structure, methods, and attributes. Creating a cost calculator as such is not a difficult task - however, we were asked to employ cost estimation algorithms as part of this software. Being familiar with these methodologies only in theory, it was on me to convert them into code to be used as part of our application. After conducting some research, I decided to use the COCOMO methodology to estimate the costs involved based on lines of code (LOC), as this seemed to be the most applicable. Looking at various implementations online (GeeksforGeeks, N.D.) allowed me to develop my own implementation of COCOMO.

```python
def cocomo_estimation(self, mode):
    '''Estimate the cost of the system using the COCOMO model.
    It takes a mode parameter which can be one of the following:
    - Organic
    - Semi-Detached
    - Embedded
    Based on the mode, the model will use the appropriate values for the
    effort multipliers and scale factors.'''

    # Creating constants we can access based on the mode.
    constants = {
        "Organic": {"a": 2.4, "b": 1.05, "c": 2.5, "d": 0.38},
        "Semi-Detached": {"a": 3.0, "b": 1.12, "c": 2.5, "d": 0.35},
        "Embedded": {"a": 3.6, "b": 1.20, "c": 2.5, "d": 0.32}
    }

    # Step 1: Validate user input to avoid errors
    if mode in constants:
        a, b, c, d = constants[mode].values()
    else:
        raise ValueError("Invalid mode. Please use one of the following: Organic, Semi-Detached, Embedded")

    # Step 2: Iterate over all software components and calculate the total lines of code
    total_lines_of_code = 0
    for component in self.software_components:
        total_lines_of_code += (self.software_components[component]['Lines of Code']
                                * self.software_components[component]['Count'])

    # Step 3: Calculate the scale factors
    # COCOMO II assigns values between 0.6 to 1.4 for each scale factor, with 1.0 being nominal.
    # We will assume that "moderate" is 1.0.
    #
    # Based on the case study for Synful, we will assume the following factors:
    # 1. Precedentedness - Moderate (Experience with indidivual components
    # but not building an entire system to this scale)
    # 2. Development Flexibility - Moderate (Some flexibility, but clear
    # requirements and a fixed deadline)
    # 3. Architecture/Risk Resolution - Low (Risks and their mtigations
    # have been identified)
    # 4. Team Cohesion - Low (Part of the team has worked together, some
    # are agency hires)
    # 5. Process Maturity - Moderate (Some processes are in place, but
    # new ones are being developed for this project)
    # 6. Required Software Reliability - Moderate (Consumer product, not
    # mission critical. Can be patched if bugs are found)

    scale_factor_values = {
        "Precedentedness": 1.0,
        "Development Flexibility": 1.0,
        "Architecture/Risk Resolution": 1.2,
        "Team Cohesion": 1.1,
        "Process Maturity": 1.0,
        "Required Software Reliability": 1.0
    }
```

After creating the initial class structure described in the UML class diagram, as well as the calculation and estimation methods, we had a meeting to demonstrate my code, as well as the GUI code developed by one of the other team members. Since he was also in charge of developing the JSON structure, I had to make some adjustments to my code to make it work properly with his code. After working on it for several days and patching some bugs, we were able to successfully integrate both code blocks with each other and produce a working cost estimation software.



Module Structure

Although the module itself appeared well structured and planned, the resources which we were given as part of our assignment work were confusing and sometimes did not seem to make sense at first glance. This is something we struggled with for both team assignments until we decided to contact our tutor who helped us understand what we had to do. We were told that, as long as we would clearly state our assumptions, we would be graded accordingly. This helped us to move past the initial confusion and get started with working on our second submission.

As I have come to expect with these models, the “Software Engineering Project Management” module provided an introduction into the world of project management, and slowly grew in difficulty and complexity, whilst making sure to give us some breathing space towards our assignment deadlines.

Throughout studying this module, I made sure to participate in all of the forum discussions, and to complete all formative activities such as Codio and article reviews, and record my work in my e-portfolio.

Unit 8: Artefacts

DISCUSSION FORUM 2

Part of this units e-portfolio tasks was to write a summary post in the second discussion forum, based on what we have learned since the initial post and peer responses.

Summary Post

by Michael Sammueller - Tuesday, 31 October 2023, 5:36 AM

After reading through my peers' posts, as well as continuing to read about other user experience lifecycle models, my opinion remains the same, albeit padded with additional information.

Firstly, I am still of the opinion that the CUE model would have to be modified to include some sort of feedback loop that accounts for a user's changing experience over time. This would not only compensate for the halo effect but also give a more complete picture and more accurate data. As all of us will have experienced, our opinion of a product may change over time. This may range from a software product to a movie, or even something like a car. A car may look stunning and be advertised as having many cutting-edge features, leading us to believe that it will be an amazing product to use. However, over time, once the halo effect passes and we have driven the car for a few weeks, we may find that the features don't work as advertised and that the car itself is actually somewhat difficult to drive. This is just one example of why I believe that, because it is such a dynamic process, this has to be captured somewhere in the model we use.

One of my peers suggested the ContinUE model proposed by Pohlmeyer et al. (2009), which includes exactly such a loop and accounts for several phases in the user experience life cycle. Comparing the two, I would strongly favor the ContinUE model. However, as proposed by one of my other peers, the CUE model may provide a unique view by not taking into account the dynamism of user experience. As mentioned in one of my responses, I would propose to use the CUE model by either adapting it to account for change over time or using it together with another model, such as the ContinUE model, to provide a more encompassing and complete picture, as well as more accurate data.

References

Pohlmeyer, A., Hecht, M. & Blessing, L. (2009) User Experience Lifecycle Model ContinUE [Continuous User Experience]. Available from: https://www.researchgate.net/publication/268288740_User_Experience_Lifecycle_Model_ContinUE_Continuous_User_Experience [Accessed 31 October 2023].

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Conclusion

The experience gained whilst studying this module have helped me to grow not only as a student, but also as a member of a project management team. It has helped me to further develop my communication, planning, and programming skills by challenging me to create the Python application described above, assembling a computer system, and creating a delivery plan. I expect that this will help me in my studies and my professional life. Working in an ever-changing environment brings with it integration and implementation projects which need project managers, and this module has certainly ignited an interest in me to do such work in the future.

References

GeeksforGeeks (N.D.) Software Engineering | COCOMO Model. Available from: https://www.geeksforgeeks.org/software-engineering-cocomo-model/ [Accessed 30 November 2023].