

Proposal, Verification, and Implementation of a Methodical Cycle for Small-Scale IT Projects

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Introduction

- The research objective is to **propose, verify, and implement a methodical cycle** for **small-scale IT projects**.
- The research **is carried out in an IT company within a project whose output is an e-shop implementation**.
- The **reason** for this project is **to increase small-scale contracts** as well as the profit with respect to long-term stagnation and a decrease in profits from projects during the pandemic.

Critical factors of SW project success

- Implementing the agreed extent.
- Respecting the budget.
- Respecting the plan.
- Client satisfaction.
- Achieving strategic advantages.
- User satisfaction.
- Adequate cost-benefit ratio.
- Compliance with quality requirements.
- Efficient implementation.
- Reasonable resource planning.
- Eliminating capacity overload.
- Extensive preparation.
- Perceived usability.

Project observation

The post-implementation project on which the proposed methodical cycle was applied was of the eshop type. This shop project was a typical example of e-commerce implementation with:

- Planned budget: 95 000 CZK
- Planned cost: 34 000 CZK
- Planned profit: 61 000 CZK
- Planned total implementation time: 135 hours
- Planned implementation period: two months
- Project methodology: waterfall model
- Project Team: Project manager, web front-end developer, web back-end developer, graphic designer, system administrator and tester

Project observation

During the execution of this project, the following were identified:

- The project was not divided into sequential phases from the beginning.
- Inappropriate planning that was not in line with the methodology used.
- Project management was not documented, and the phases were not formally approved.
- Requirements were not precise at the start of the project, and the product specification changed during development.
- The project was reverting to previous phases.
- Time estimates were not entered in the project tool for individual tasks or units, and thus developers were not aware of the time.
- The developers created their own tasks in the project tool according to their judgement.
- There was no testing phase in the project.
- The client was not fully informed about the type of project management methodology, its basic principles and the rules to be followed by all parties.
- The client did not agree to pay for additional work because the instructions on entering the specification had not been made clear to the client before the project started.

Project observation

Project outcome

- budget: CZK 95 000 (plan: CZK 95 000)
- cost: CZK 51 000 (plan: CZK 34 000)
- profit: CZK 44 000 (plan: CZK 61 000)
- implementation time: 204 hours (plan: 135 hours)
- implementation period: three months (plan: two months)
- project methodology used: incorrectly used waterfall model
- project team: project manager, web front-end developer, web back-end developer, graphic designer, and system administrator
- client's evaluation of the project implementation: negative
- client's evaluation of the final product: positive

Proposal of the methodic cycle

Criteria

- To cut costs of project implementation. Keeping to the budget. Tolerance of 120% to the plan.
- To cut the time of project implementation. Keeping to the time estimated to implement the project. Tolerance of 120% to the plan.
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Proposal of the methodic cycle

Objectives

- Inexpensive and fast implementation of the methodology into practice and complex training of the staff.
- Transparent and effective project environment for both the staff and customer.
- Project management complying with the used methodology.
- Unified and standardised project management methodology for all projects.
- Implementation of unified rules, principles, processes and tools of project management.
- Creation of formalised, approval, and control rules.
- Unification of project tools.

Implementation of the methodology

To validate the proposed agile SCRUM methodology and its customised processes, rules and principles, an e-shop for a client that sells a complete range of products for bathrooms and wellness was selected as the first pilot project.

- Planned budget: 139 000 CZK
- Planned cost: 40 000 CZK
- Planned profit: 99 000 CZK
- Planned total implementation time: 198 hours
- Planned lead time: 9 weeks
- Project methodology: agile SCRUM methodology
- Project team: Project manager, web front-end developer, web back-end developer, graphic designer, system administrator and tester.

Implementation of the methodology

Project outcomes

- Budget: 139 000 CZK (plan: 139 000 CZK)
- Cost: 45 000 CZK (plan: 40 000 CZK)
- Profit: 94 000 CZK (plan: 99 000 CZK)
- Total implementation time: 225 hours (plan: 198 hours)
- Total implementation period: 10 weeks (plan: 9 weeks)
- Project methodology used: Correctly applied agile SCRUM methodology
- Project team: Project manager, web front-end developer, web back-end developer, graphic designer, tester, and system administrator
- Client's evaluation of the project implementation: positive
- Client's evaluation of the final product: positive

Results

Criterion 1: Reduction of project implementation costs. Compliance with the planned cost of the project implementation. Tolerance of 120 %.

In the case of the pilot project, costs were kept within 112.50%.

Criterion 2: Reduction of the project implementation time. Compliance with the planned project implementation time. Tolerance of 120 %.

In the pilot project, the resulting project implementation time was 113.64% of the plan.

Criterion 3: Reduction of the project implementation time. Delivery of the project within the estimated time. Tolerance 120 %.

In the case of the pilot project, the implementation time was 111.11% of the plan.

Results

Objective 1: Cost-effective and rapid implementation of the methodology in practice and complete staff training

The implemented methodical cycle did not require any additional resources, tools, certifications, or licenses. The training was efficiently distributed to the project managers during the actual implementation of the project in terms of cost savings. The implementation required three two-hour meetings of project managers to explain the processes, rules, and principles.

Objective 2: Transparent and efficient project environment for employees and the customer

A transparent environment for the client resulted in regular increments of functional software that were implemented to the client's stage environment at the end of the sprint.

Results

Objective 3: Project management in accordance with the proposed methodical cycle

In this project, 27 of the 31 defined rules and principles supporting the agile SCRUM methodology were thoroughly followed. The result of applying the methodical cycle was evaluated very positively by the company's executives. The non-compliance with some rules was due to the imperfection of the designed processes, which did not take extreme cases into account.

Objective 4: Uniform and standardised project management methodology for all projects

The proposed project management methodical cycle for all projects was implemented in the company's project management environment.

Objective 5: Establishment of unified project management rules, principles, processes, tools, and techniques

Uniform rules, principles, processes, tools, and techniques were introduced in the company's project management environment.

Results

Objective 6: Creation of formalised, approval and control rules

Formalized, approval, and control rules were established at the level of each process phase of projects in the company's project management environment.

Objective 7: Unification of project tools

After analysing the project management in the company, it was found that most employees think that the company realistically needs one project management tool instead of the four used. Together with the company directors and project managers, it was agreed to use only one project tool, which ultimately covers all the relevant needs of the company.

Conclusion

Our motivation for presenting this research was to improve almost a critical situation in project management in a selected company during the pandemic as well as to increase the overall project success rate.

The proposed methodical cycle has been implemented within the company and evaluated on three pilot projects (this paper only presented one due to the extent of the project outputs).

The results of the implementation have shown an overall positive impact and improvement of project management.

The project contribution can be divided into two main parts. First of all, it increased the value of the company which profited from the remedy of the critical situation. Another contribution is the developed methodology that can help other companies solve their problems of similar nature.