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**Committee for Student Affairs**

Univerza v Ljubljani, Fakulteta za računalništvo in informatiko  
Večna pot 113, 1000 Ljubljana

**The master's thesis topic proposal**  
**Candidate: Marko Prelevikj**

I, Marko Prelevikj, a student of the 2nd cycle study programme at the Faculty of computer and information science, am submitting a thesis topic proposal to be considered by the Committee for Student Affairs with the following title:

Slovenian: **Vodenje projektov na podlagi analize podatkov**  
English: **Data Driven Project Management**

This topic was already approved last year: ***NO***

I declare that the mentor listed below have approved the submission of the thesis topic proposal described in the remainder of this document.

I would like to write the thesis in English with the following reason: I am a foreigner and more experienced with writing in English.

I propose the following mentor:

Jure Demšar, doc. dr.  
University of Ljubljana,  
Faculty of Computer and Information Science  
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Ljubljana, 17. november 2019.

# **Proposal of the masters thesis topic**

## **1 The narrow field of the thesis topic**

English: agile project management, task workflow analysis, data analysis

## **2 Keywords**

English: agile project management, project management support tool, quantitative data analysis, project success, performance metrics

## **3 Detailed thesis proposal**

### **Past approvals of the proposed thesis topic:**

The proposed thesis has not been submitted nor approved in previous years.

### **3.1 Introduction and problem formulation**

Project managers (PMs) have the role of leading the team towards the achieving of the project objectives [1]. Project Management Information Systems (PMIS) are used by PMs to assist their decision making for planning, organizing and controlling projects [3]. PMIS keep the state of the organization's projects and are visualizing it with Burn-Down Charts, Gantt Charts, or other basic visualisations which provide merely a high-level overview of metrics such as work completed, story points completed, deliverable status [1], etc. As such, PMIS do not provide enough useful information to PMs [3].

The value of PMIS drops due to their elementary reporting abilities. This leads to PMs having to do double the work: keeping the PMIS up to date and analysing the data separately to support the decision making.

### **3.2 Related work**

The use of PMIS is a common and widespread practice across enterprises. It has been shown that they have a direct impact on the project success [4], as they provide a structured overview of the project state and support the decision making process of PMs.

Contemporary PMIS provide organization-wide transparency and their usage is not limited to only PMs, but it is instead widespread over the majority of the organization's members. This is especially important within agile [2] environments where every member is tracking their own progress. Agile project management has been gaining momentum ever since the appearance of its manifesto [2] because it has been shown to work in practice [5].

Our aim is to improve the general usability of contemporary PMIS which are used within projects which have applied agile project methodology. An example of such PMIS is Atlassian's JIRA, where we have the unique advantage of observing the users' habits of using the PMIS by examining the history of their usage: how often they interact with the PMIS, what do they edit, which workflow element are their tasks most often in, etc.

By examining the history of the user's interactions with the PMIS we expect that we will be able to perform an analysis of the causality of each user's actions. A similar research has been performed within [6], where they were able to classify how each of the performed actions influenced on the project: whether it had a positive or a negative effect.

Having the causality of the users' actions is very valuable for PMs in their task of performing risk management, which has been an issue for projects with agile methodologies. A concern has been brought up by [7] that SCRUM projects are susceptible to potential risk due to the fact that they do not have a specific process of risk management application, even though it is vital for the success of the project.

### 3.3 Expected contributions

We hypothesize that applying modern data analysis techniques to PMIS data will help us extract insights, which PMs can use to identify the bottlenecks of their PMO flows.

The final outcome of the research is expected to be a *Project Management Support Tool* (*PMST*) which offers targeted benefits to both project managers and developers which are not yet offered as such. *PMST* helps project managers in optimizing the enterprises' projects' workflows, identifying outliers within the organization, and identifying implicit shift of priorities of tasks. On the other hand, the *PMST* offers developers a tool for maximizing the productivity within their existing workflow.

### 3.4 Methodology

This is pretty vague as well, I am having difficulties identifying the things I can do with the data, let alone identifying the methodology of how I'm going to do that. The goal is

to achieve some degree of **life-cycle analysis of the tasks**.

For example, there are a couple of ideas of what we can do to achieve it:

- analyse the time spent in a certain state of the workflow
- identify the people that are halting the process and recommend replacements
- create distributions of different meta-data of the tasks: #comments, #changes, #labels, .... All in order to find the correlation of some of the attributes (meta data fields): e.g. high priority cards have a high rate of state change in a very narrow time span.
- ...

All of these are ideas which seem like they do not require any complicated analysis in order to achieve.

The approach should be iterative: first do some "shallow" analysis in order to find something interesting, and then once we verify we bring out the "big guns".

### 3.5 References

- [1] P. Institute, A Guide to the Project Management Body of Knowledge (PMBOK® Guide)–Sixth Edition, PMBOK® Guide, Project Management Institute, 2017.  
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- [2] A. Alliance, Agile manifesto 6 (1).  
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- [3] M. C. Caniëls, R. J. Bakens, The effects of project management information systems on decision making in a multi project environment, International Journal of Project Management 30 (2) (2012) 162 – 175. doi:<https://doi.org/10.1016/j.ijproman.2011.05.005>.  
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- [5] P. Serrador, J. K. Pinto, Does agile work? — a quantitative analysis of agile project success, *International Journal of Project Management* 33 (5) (2015) 1040 – 1051.  
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- [6] T. M. Toole, A project management causal loop diagram, 2006.
- [7] B. G. Tavares, C. E. S. da Silva, A. D. de Souza, Risk management analysis in scrum software projects, *International Transactions in Operational Research* 26 (5) (2019) 1884–1905.