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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
jure.demsar@fri.uni-lj.si

Ljubljana, 17. november 2019.

# Proposal of the masters thesis topic

## 1 The narrow field of the thesis topic

English: project management, task workflow analysis, data analysis

Slovene: vodjenje projektov, analiza poteka dela, podatkovna analiza

## 2 Keywords

English: agile project management, project management information system, quantitative data analysis, project success, performance metrics

Slovene: agilno vodjenje projektov, informacijski sistemi za podporo vodjenje projektov, kvantitativna podatkovna analiza, uspeh projekta, meritve uspešnosti

## 3 Detailed thesis proposal

**Past approvements 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 [2]. 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 [2].

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 [3], 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 environments where every member is tracking their own progress. Agile project management has been gaining momentum ever since the appearance of The Agile Manifesto [4] because it has been shown to work in practice [5], i.e. the success rate of projects with agile methodology is greater than traditional projects.

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 the users actions and try to identify the possible bottlenecks which are preventing the projects from moving forward. A concern has been brought up by [6] that SCRUM projects [7] 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. A similar research has been performed within [8], 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.

## 3.3 Expected contributions

Our first contribution is the validation of our hypothesis

**H1**: Applying modern data analysis techniques to data generated by a contemporary PMIS can help us extract insights from which the underlying enterprise will benefit.

Under the assumption that our hypothesis is confirmed, our second contribution would be a prototype of a Project Management Support Tool (PMST) which offers benefits in optimizing the workflows of the projects and identifying the outliers of the parties involved.

## 3.4 Methodology

In order to achieve our expected contributions we need to analyse the data from a contemporary PMIS, in our case that will be Atlassian's JIRA. Our plan is consisted of firstly performing ECTL processing on the data, in order to prepare the data for analysis. And then applying a variety of predominantly, but not necessarily limited to, statistical methods on the data to validate **H1**. In the case of confirmation of our hypothesis, we would continue to generalize our analysis in a form of prototype of a PMST.

## 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.
URL https://books.google.si/books?id=Rzc2DwAAQBAJ

[2] 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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[3] L. Raymond, F. Bergeron, Project management information systems: An empirical study of their impact on project managers and project success, International Journal of Project Management 26 (2) (2008) 213 – 220. doi:https://doi.org/10.1016/j.ijproman.2007.06.002.
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[4] A. Alliance, Agile manifesto 6 (1).
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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. doi:https://doi.org/10.1016/j.ijproman.2015.01.006.
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[6] 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.

[7] J. Sutherland, K. Schwaber, The scrum guide, The definitive guide to scrum: The rules of the game. Scrum. org 268.

[8] T. M. Toole, A project management causal loop diagram, 2006.