MORE FUN, FEWER RISKS: DEVELOPMENT OF A GAMIFIED WEB APP FOR RISK MANAGEMENT

STUDIENARBEIT

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von

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Abstract

Erklärung

(gemäß §5(3) der “Studien- und Prüfungsordnung DHBW Technik” vom 29.09.2017)

Ich versichere hiermit, dass ich meine Studienarbeit mit dem Thema: “More Fun, Fewer Risks: Development of a Gamified Web App for Risk Management” selbstständig verfasst und keine anderen als die angegebenen Quellen und Hilfsmittel benutzt habe. Ich versichere zudem, dass die eingereichte elektronische Fassung mit der gedruckten Fassung übereinstimmt.

Ort, Datum

Unterschrift

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Glossary

Item Name description

1. Introduction

context, motivation, aims, purpose, ..

Latex Cheat Sheet: Bildquelle mit Seite:Quelle normal:

Bilder normalerweise: Bild über den Seitenrand vergrößern und mittig ausrichten:

ABB. 1.1.: *Title*
[bibkey]

Fancy quotes:

> *cite*
>
> TEXT []

Tabelle:

ABB. 1.2.: *Title*
[bibkey]

Spalte1Titel	Spalte2Titel	Spalte3Titel
1	3	5
2	4	6

TAB. 1.1.: *Unterschrift*

LISTING 1.1: *Title*

```
1 print("Hello world")
```

2. Theoretical background

text...

2.1. Risk Management

There are plenty of reasons for projects to fail and frequently even large companies and organizations experience costly failures of big projects [2]. Projects are often defined as failed, when they cannot meet time or budget constraints or do not fulfill the pre-defined requirements. However, this definition is not useful in every context [1]. IT projects often follow agile management techniques allowing for changes in the pre-defined scopes [5]. To allow for a wider understanding of what IT-project failure means Lyytien and Hirchheim group such failures into four different categories [6]:

- Correspondence: Not meeting the pre-defined objectives
- Process: Exceeding time or budget restrains
- Interaction: Lack of end-user engagement
- Expectation: Inability to meet stakeholder's expectations

Analogous to the variety of ways in which a project can be defined as being unsuccessful there are many reasons which can lead to any such failure. Plenty research has been done to investigate the causes of project failure [3]. Events that lead to project failure can be understood as risks. Islam [4] provides the following definition for risks in an IT context:

> *"Software risk, is defined as, the possibilities of suffering a loss such as budget or schedule over-runs, customer dissatisfaction, poor quality and passive customer*

> *involvement due to an undesirable event and its consequences during the life cycle of the project"*
>
> "
>
> TODO: UNTERSCHRIFT [**TODO: Quelle**]

Many such risk factors have been identified in the literature by now. The following risks are an excerpt from lists collect via literature reviews by Whitney and Daniels [7] and Tesch et al [8].

Whitney and Daniels

- Lack of top management commitment to the project
- Failure to gain user commitment
- Misunderstanding the requirements
- Lack of adequate user involvement
- Lack of required knowledge/skills in the project personnel
- Changing scope/objectives
- Introduction of new technology
- Failure to manage end user expectations
- Insufficient/inappropriate staffing
- Poor project management
- Excessive schedule pressure
- Lack of technical specifications

Tech et al.

- Personnel shortfall and straining computer science abilities
- Unrealistic schedules and budgets
- System functionality
- Requirements management
- Resource usage and performance
- Personnel management
- Unrealistic project goals and objectives
- Poor project team composition
- Project management and control problems
- Problematic technology base/infrastructure

To counter such risk factors risk management practices can be integrated into the overall project management. Risk management serves to identify risks, analyze them and to address them to minimize the damage these risks could do to project [8].

Risk management is a process that should be initiated early in the project lifecycle to enable proactive handling of threats [6]. In general the cycle of risk management involves the following steps: Identification, Analysis, Response/Treatment and monitoring and control [6], [8], [9], [10]. The steps should be undertaken at the beginning of the project and updated whenever changes occur. There are different and more detailed variations [8], however for the purpose of this paper the general model will be assessed in more detail.
The different steps of the process serve different purposes and have different side effects. Risk identification helps to create awareness and to initiate action in general. It is also a phase during which the project team and stakeholders can share their concerns regarding the project and clarify their expectations to form a common view [9].

To actually perform the identification different techniques can be used. Two commonly used ones are the checklist and brainstorming [6], [9]. Checklists rely on past experience to identify known risk factory which are applicable to the project at hand. Another variant of procedure is to use a questionnaire instead which covers characteristics of the project to find specifically corresponding risks. Brainstorming is ideally done together with project stakeholders to gain different perspectives. Risk identification techniques are not mutually exclusive and combinations may result in more comprehensive results [6].

Risk analysis serves to create acceptance of the previously identified risks as well as to indicate their impact [9]. During this phase the likelihood of risk occurrence and the impact are estimated. This can be done in a qualitative manner by assigning ordinal values for both dimensions. The scales for likelihood can for example go from rare to almost certain. Impact can be described from low to catastrophic. Such estimates are subjective and my produce unclear results however trying to apply quantitative techniques can be unreliable as well since estimations based on

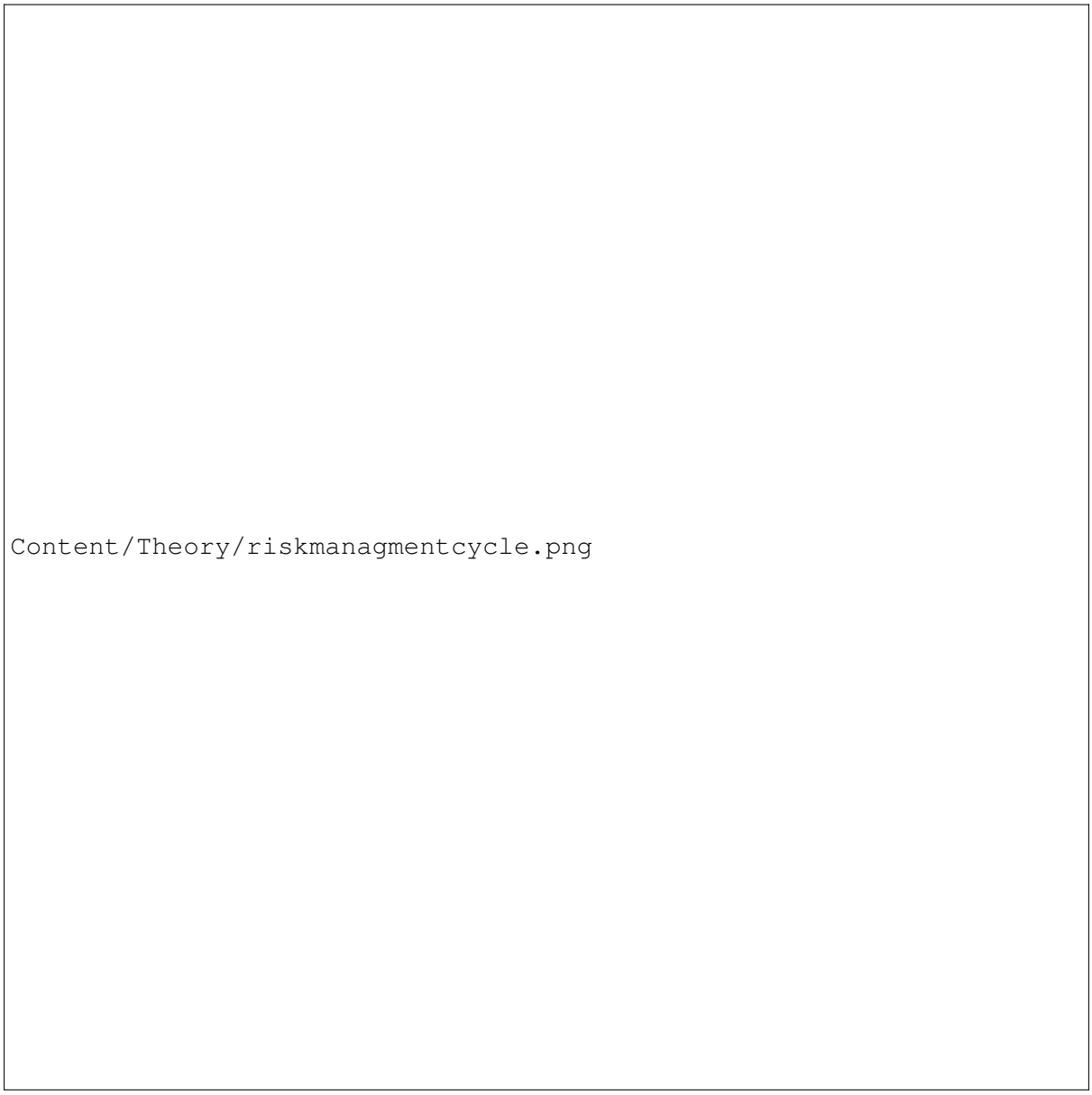

ABB. 2.1.: *Title*
[bibkey]

past data may not be applicable anymore in a rapidly changing environment such as IT [6].

Risk response planning serves to reduce threats and to enhance opportunities [8]. Dealing with risks can be approached in different manners. Measurements can be defined to either avoid or prevent the risks or to deal with the impact should the risk occur. Another alternative can be to simply accept the risks or to outsource the risks [6]. Another practice used is to assign risk owners to establish clear responsibility for later control efforts [11].

Risk control serves to initiate action on the monitored risks and to direct action [6]. Monitoring the risks enables responding to changes via new cycles of the risk management process as well as triggering the measurements defined during the previous phase if necessary [8]. Techniques employed during this phase can be risk audits, trend analysis or regular status meetings [6].

2.2. Gamification

text.. [7]

2.2.1. Unterkapitel

2.3. PWA

text..

2.3.1. Unterkapitel

3. Domain description

text...

3.1. Survey

3.1.1. Unterkapitel

3.2. Domain Model

3.2.1. Unterkapitel

3.3. Gamification concept TBD

3.3.1. Unterkapitel

4. Software Specifications

4.1. Technologies

4.2. Requirements

4.3. Use Case Specifications

4.4. Architecture

5. Implementation

5.1. Unterkapitel -> Design, Evaluation, Methodisches, PM, ...

5.2. Unterkapitel2

6. Discussion

7. Conclusion and Outlook

List of references

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Appendix

A. Anhang1