

# Software Analytics in Continuous Delivery: A Case Study on Success Factors

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# 概要

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ING(企業)がソフトウェア解析を行う手法を開発した。何が助けになって、何が妨げになるかを調べた。

【RQ1】CDツールを利用することで開発にどのような影響を与えるか

【RQ2】今後のソフトウェア解析を改善するために何ができるのか

【方法】ステークホルダー15人に対してアンケートを行う

【結果】16の助けになるファクターと20の妨げになるファクターを見つけた

# GAME-project

## Global Agile Metrics

### 開発のメトリクスなど開発の状況を可視化する

Figure 1: Example of a Squad Onepager on the GAME-dashboard.

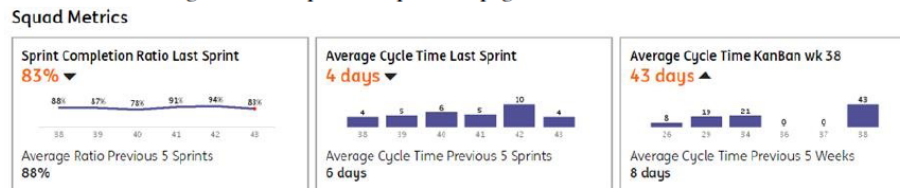


Figure 2: Example of the Number of Squad Members in Sprint Points Breakdown.

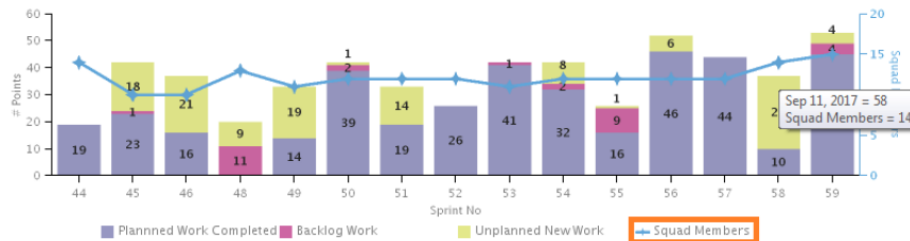
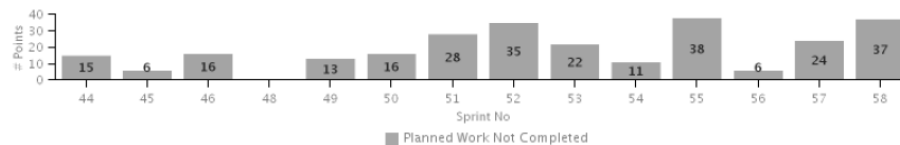


Figure 3: Example of the *planned points not completed*.



# インタビュー












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一部、構造化されたインタビューを行う

1. GAMeプロジェクトの目的
2. データの収集
3. 分析のアルゴリズム
4. 可視化する情報とダッシュボードの実行可能性
5. 共同研究

# インタビュー結果

Figure 4: Overview of the outcomes of the survey questions within the interviews.

Interview Question	Likert Distribution	Number of Respondents	Percent Agree	Top-Box	Net-Top-2-Box	Coefficient of Variance
Q1.1: The purpose and aims of the GAME-project were completely clear to its stakeholders.		12	50%	0%	8%	31%
Q1.2: The GAME-project did achieve its aims and goals.		12	42%	8%	-8%	41%
Q2.1: The data that we used within the GAME-project was of good quality.		12	50%	17%	42%	30%
Q2.2: Getting the data that we needed for the GAME-project was easy.		13	15%	8%	-31%	45%
Q2.3: Preparing the data for further use within the GAME-project (e.g. combining data from different sources, shaping of the data) was easy.		10	30%	0%	-10%	41%
Q3.1: When analyzing the data within the GAME-project, scale (e.g. size of the data) did not cause problems.		7	100%	43%	100%	11%
Q3.2: When analyzing the data within the GAME-project, machine learning (e.g. building predictive models) did not cause problems.		4	75%	0%	50%	40%
Q4.1: The GAME-dashboard contains the right metrics for the squads to steer on.		7	86%	14%	86%	13%
Q4.2: The GAME-dashboard is useful for our squads.		11	73%	9%	55%	30%
Q5.1: Performing research on the analytics behind the software delivery processes will help solution delivery teams.		14	100%	57%	100%	11%
Q5.2: Collaboration with (technical) universities will help to improve research activities.		13	100%	38%	100%	11%

Column Likert Distribution shows a graph of the distribution on a 1-5 point Likert scale for each question with from left to right the values Strongly Agree, Agree, Neutral, Disagree and Strongly Disagree.

# RQ1

# CDツールが与えた影響

Table 2: Codes related to Aims and Goals

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*Helped to achieve goals*

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Management attention (8)  
Different stakeholders involved (multi-disciplinary) (5)  
Focus on cycle time reduction (5)  
Frequent (weekly) team meetings (3)

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*Hindered to achieve goals*

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Lack of time and priorities (5)  
Customers do not see added value (5)  
Project was not a joint effort (3)  
Focus on performance instead on innovation (3)  
Squads work in different ways (2)  
No trust in the project approach (2)

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Table 3: Codes related to Getting the Data

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*Helped getting and preparing the data*

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I4C Data warehouse as a solution (9)  
ServiceNow data was of good quality (7)

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*Hindered getting and preparing the data*

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Difficulties with availability of data (11)  
Lack of standardization (10)

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Table 4: Codes related to Analyzing the Data

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*Helped analyzing the data*

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Use of R for analyzing (5)  
Collaboration with academia (1)

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*Hindered analyzing the data*

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Use of R for analyzing (2)  
Lack of statistical knowledge (2)

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Table 5: Codes related to Building Dashboards

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*Helped building dashboards*

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Dashboard contains only a limited number of metrics (5)  
Infrastructure for building dashboards (3)  
Dashboard helps, but users need to be convinced (3)  
Agile Way of Working (1)

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*Hindered building dashboards*

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Dashboard is not used by the squads (7)  
Dashboard is not user friendly (6)  
Unclear goals of the dashboard (4)  
People's opinions are in the way (3)  
Accessibility of dashboard is too low (2)

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Table 6: Codes related to Research Collaboration

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*Helped to improve research*

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Understand the way of working of squads (8)  
A scientific (evidence-based) approach (7)  
Expectation that universities are ahead (6)  
Real data to explain performance (6)

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*Hindered to improve research*

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Research did not solve the problem (4)  
Outcomes were not discussed with the squads (3)  
Focus on risk and security of a bank (2)  
Adoption of scientific approach might be difficult (2)  
Too early drawing conclusions (1)

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## RQ2

# 今後のソフトウェア解析を改善するために何ができるのか

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- データを貯める方法、データを集める方法を考える
- CDツールやデータソリューションの標準化に目的をもつ
- 分析にはRを使う
- 実行可能な情報の最適化をする
- 研究を比較する

# まとめ

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ING(企業)がソフトウェア解析を行う手法を開発した。何が助けになって、何が妨げになるかを調べた。

【方法】CDツールを開発し、ステークホルダー15人に対してアンケート

【RQ1】CDツールを利用することで開発にどのような影響を与えるか

16の助け: 管理への意識、データ収集ツール、など

20の妨げ: 時間がない、統計の知識がない、など

【RQ2】今後のソフトウェア解析を改善するために何ができるのか

データ収集を考える、実行可能な情報の最適化、など