

Analysis

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6. Analysis
- (a) Identify the criteria for interpreting case study findings.
 - (b) Identify which data elements are used to address which research question/subquestion/proposition and how the data elements will be combined to answer the question.
 - (c) Consider the range of possible outcomes and identify alternative explanations of the outcomes, and identify any information that is needed to distinguish between these.
 - (d) The analysis should take place as the case study task progresses.

Overview RQs vs. Data

ou - observed unit // cu - comparison unit

	Research Question	Used Data	used measures (Variable Names from XLSX)	Possible Outcomes (italic = expected outcome bold = real outcome)	Alternative Explanation
(RQ1) Framework application	(RQ1.1) Do practitioners find the framework reasonable? (EX: 1.1)	Survey 2020	MaintenanceTicketRecordingReasonable MaintenanceTicketRecordingProcedureReasonable MaintenanceTicketProcessingReasonable MaintenanceTicketProcessingProcedureReasonable TechnicalDebtTicketRecordingReasonable TechnicalDebtTicketRecordingProcedureReasonable TechnicalDebtTicketProcessingReasonable TechnicalDebtTicketProcessingProcedureReasonable DismantlingTicketRecordingReasonable DismantlingTicketRecordingProcedureReasonable DismantlingTicketProcessingReasonable DismantlingTicketProcessingProcedureReasonable TechnicalProjectRecordingReasonable TechnicalProjectRecordingProcedureReasonable TechnicalProjectProcessingReasonable TechnicalProjectProcessingProcedureReasonable	Reasonable not reasonable	
	(RQ1.2) Are the processes of the framework feasible in practice? (EX: 1.2)	Survey 2020 + Ticket statistics	MaintenanceTicketRecordingProcedureWorks MaintenanceTicketProcessingProcedureWorks TechnicalDebtTicketRecordingProcedureWorks TechnicalDebtTicketProcessingProcedureWorks DismantlingTicketRecordingProcedureWorks DismantlingTicketProcessingProcedureWorks TechnicalProjectRecordingProcedureWorks TechnicalProjectProcessingProcedureWorks + ticket statistics (tickets created + tickets processed at deadlines)	Survey vs stats yes + yes yes + no no + yes no + no	
(RQ2) Framework effectiveness	(RQ2.1) Does the framework lead to raised awareness for the contraction of TD? (EX: 2.1)	Survey 2020	IWhenRecoring llater TeamWhenRecording TeamLater	difference between ou and cu - more aware ou - more aware cu no difference between ou and cu - both not aware - both aware	
	(RQ2.2) Are the TD items taken on more consciously when using the framework? (EX: 2.2)	Survey 2020	QuickVsOptimal CostsImplementation CostPrincipal CostInterest	difference between ou and cu more conscious ou - more conscious cu no difference between ou and cu - both not conscious - both conscious	
	(RQ2.3) Does the framework lead to a better overview of the TD items?	Survey 2020	OverviewWho (here: make clear that this is the interpretation of the team, whereas the management is asked for this in RQ4.1. separately)	for members and managers: difference between ou and cu o more overview ou o more overview cu no difference between ou and cu o both not overview o both overview	
	(RQ2.4) Are the TD items paid back timely? (EX: 2.3)	Survey 2020 + Ticket statistics	Comparison benefit TimelyRepayment	survey vs stats yes + yes yes + no no + yes no + no	
(RQ3) Framework benefits	(RQ3.1) Can TD be prevented by the adoption of the framework? (EX: 3.1)	Survey 2020 + Ticket statistics	Comparison benefit TDPrevention + ticket statistics 2021 in comparison to 2020 + correlation between conscious contraction and prevention correlation between overview and prevention	survey vs stats yes + yes yes + no no + yes no + no + correlations no correlation (Problem: cu thinks, while ou observed => differences are not relevant and cu assessment is only relevant for correlation analysis)	
RQ 3.2	(RQ3.2) Are there other benefits arising from the adoption of framework? (EX: 3.2)	Survey 2020	Comparison benefit RationalDiscussions Comparison benefit RationalDecisions Overview benefit Rational Decisions Overview benefit Management Justification Overview benefit Project Integration (Comparison benefit TimelyRepayment? Comparison benefit AvoidSpecialKnowledge?) + correlation between effects (conscious contraction, between overview) and benefits	No Yes (Problem: cu thinks, while ou observed => differences are not relevant and cu assessment is only relevant for correlation analysis) + correlations (comparison) no correlation (overview) + answers to open questions	
RQ 3.3	(RQ3.3) Do these benefits justify the additional effort for comparing solutions and generating the overview? (EX: 3.3)	Survey 2020	JustifiedComparison Just-ExpenseEst JustifiedOverview	No Yes (Problem: cu thinks, while ou observed => differences are not relevant)	
(RQ4) Management Involvement	(RQ4.1) Do the managers have an overview of their IT systems' TD?	Survey 2021	survey2021: Q1	difference between ou and cu o more overview ou o more overview cu	no difference could be because - the TD in the smaller cu is easier to track due to its size

Involvement				<ul style="list-style-type: none"> more overview cu no difference between ou and cu <ul style="list-style-type: none"> both not overview both overview 	track due to its size => rely on answers to open questions
	(RQ4.2) What are the benefits of the TD overview from a management perspective?	Survey 2021	survey2021: Q2-Q4	positive influence negative influence no influence	no influence could be because - time pressure doesn't allow for real planning of a roadmap - manager sees no need to change anything => rely on answers to open questions

Ideas: (@Paula)

- Maybe remove RQ4 and include it in RQ'S related to overview
 - stattdessen den Bereich Framework Justification als eigenen RQ-Bereich rausnehmen?
 - remove RQ related to justification
 - Problem: will new contributions be visible?
- Combine RQ 3.4 and 3.5, because it's the same figure?**
- How to best differentiate between RQ 3.2 and 3.3?
 - RQ 3.2 only ask for conscious decision making / comparison
 - combine RQ 3.2. + 3.3 benefits of survey 2020 AND RQ 3.3 ask for management perspective only (Remove RQ 4)
 - combine RQ 3.2. + 3.3 benefits of survey 2020 AND RQ 4.2-4.4 ask for management perspective only AND integrate RQ 4.1 in RQ 2.2.**
 - combine RQ 3.2. + 3.3 benefits of survey 2020 AND RQ 4.2-4.4 ask for management perspective only AND leave RQ 4.1 and RQ 2.2 separate i**
=> depends on the answers to RQ 4.1. => maybe c and d (RQ 2.2. short info : The management was asked and thinks otherwise + RQ 4.1. details info on how the overview is generated)

Ticket statistic

- descriptive statistics
 - tickets counts per month created + processed

Survey 2020

- descriptive statistics
 - for all survey questions
- correlation analysis
 - Chi Square correlation for each two ordinal variables
 - Pearson's test with Yates correction (used by SPSS whenever 2x2 matrixes are used)
 - Phi (Φ) coefficient = Correlation strength
 - > 0.3 medium strong correlation
 - > 0.6 strong correlation
 - asymptotic significance for correlation
 - < 0.05 error probability for accepting H0 hypothesis is less than 5%
 - < 0.1 error probability for accepting H0 hypothesis is less than 10%
- open coding
 - for (optional) open questions

Survey 2021

- open coding
 - for open questions
- clustering

Discussion

- cause-and-effect diagrams => cause-and-effect-and-benefit diagrams (analog Ishikawa diagram)