TECHNISCHE UNIVERSITÄT WIEN
Vienna | Austria

Christian Doppler Forschungsgesellschaft

SURVEY GUIDELINE

INTRODUCTION

Dear domain expert!

At the Christian Doppler Laboratory at Technical University Vienna[1] we are researching

how to make engineering data exchange for production systems more secure and efficient.

Within this research, the analysis of Technical Debt research results can help us to identify challenges and improvement areas in daily engineering data exchange. For you, the following questions can provide lessons learned from other organisations which challenges they face in the data exchange and whether you can identify similar gaps in your company.

Definition of Technical Debt: Technical debt is a concept adapted from Software Engi- neering to communicate additional future work and thereby additional unplanned costs and time efforts, resulting from shortcuts or non-standard solutions that are chosen in the present, and which seemed to save cost and time for at that moment, but not in the long term.

Replies will be analysed anonymously, results will be used for further scientific research. Estimated time: 20 minutes

Thank you very much for your expertise & time!

[1] https://sqi.at

BACKGROUND

Please provide background information about the company you work in What industry does the company operate in? (single answer)

- Production systems engineering
- Automotive
- Manufacturing
- Supplier
- Automation technology
- Aeronautics
- Electrical engineering
- Consulting
- Software solutions
- Other

How many employees does your company have? (single answers)

- Less than 10
- 10-100
- 100-1000
- More than 1000

What products does the company you work in produce? (single answer)

- Small components (pumps, motors, sensors)
- Small and big system components (mechanical engineering, monitoring parts, robotics, facility cooling)
- Production systems

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PERSONAL BACKGROUND

Please provide information about your personal background

Which workgroup are you associated with? (single answer)

- Automation engineering
- Chemical engineering
- Electrical engineering
- Information technology
- Sales
- Mechanical engineering
- Pneumatic engineering
- Simulation
- Other

How many years of work experience do you have in this area? (single answer)

- Less than 5 years
- 5-10 years
- More than 10 years

PROJECT EXPERIENCE

Please think of a typical, recent project you were involved in to answer the following questions.

Please, provide a name or acronym for the project that you chose as a reference for your answers.

What was the duration of the project? (single answer)

- less than 6 months
- less than 1 year
- 1 year or more

How many engineering disciplines had to exchange data in this project ? (single answer)

- under 5
- 5 to 10
- more than 10

What were the most relevant cooperating engineering disciplines ? (multiple answer)

- Automation engineering
- Chemical engineering
- Electrical engineering
- Information technology
- Sales
- Mechanical engineering
- Pneumatic engineering
- Simulation
- Other

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EXCHANGE PROCESS

Please answer the following questions in context of your recent

project. This section focuses on the data exchange process.

Did you and other stakeholders in the project primarily exchange engineering data updates via artefacts (e.g., emailing PDFs, or Excel tables)?

• Yes

• No

If you and other stakeholders exchanged engineering data updates by artefacts, e.g. emailing PDFs, or Excel tables, this led to ... (one or multiple answers possible)

• uncertainties about the exchanged data (what does it mean, from whom is it, etc.)

• unplanned rework effort (e.g. person-hours)

• mistakes or wrong assumptions about the data

• other impact

• no impact

• N/A

Did you and other stakeholders in the project have access to versioned engineering data (e.g. changes & their contributors)?

• Yes

• No

If you and other stakeholders in the project did not have access to versioned data, e.g. earlier versions of data cannot be retrieved, changes and contributors are not visible , this led to ... (one or multiple answers possible)

• uncertainties about the exchanged data (what does it mean, from whom is it, etc.) • unplanned rework effort (e.g. person-hours)

• mistakes or wrong assumptions about the data

• other impact

• no impact

• N/A

DATA MODEL AND INFORMATION

Description Please answer the following questions in context of your recent project. This section is focused on the data model used in the project.

Were you and other stakeholders in the project aware of and used specifications for terms and attributes for system parts between disciplines (data model)?

• Yes

• No

If you and other stakeholders did not know the data model or common terminology for system parts between disciplines, this led to (one or multiple answers possible)...

• uncertainties about the exchanged data (what does it mean, from whom is it, etc.) • unplanned rework effort (e.g. person-hours)

• mistakes or wrong assumptions about the data

• other impact

• no impact

• N/A

LANGUAGES

Please answer the following questions in context of your recent project. This section is focused on used description languages (any language used to decode information) used in the project.

Did you and other stakeholders in the project know how to map "foreign" description languages (e.g., XML, CAD, or SysML) from other work groups to your working language?

• Yes

• No

If you and other stakeholders did not know how to map description languages, e.g., XML, CSV tables, or SysML; or any other used language from other workgroups to your the languages used in your work group, this led to (one or multiple answers possible)...

• uncertainties about the exchanged data (what does it mean, from whom is it, etc.) • unplanned rework effort (e.g. person-hours)

• mistakes or wrong assumptions about the data

• other impact

• no impact

• N/A

Could you and other stakeholders transform engineering data from other disciplines into your specific description language, e.g., automatically with tools/scripts?

• Yes

• No

If you and other stakeholders could not transform data in different description languages to the description language(s) used in your work group, this led to (one or multiple answers possible)...

• uncertainties about the exchanged data (what does it mean, from whom is it, etc.)

• unplanned rework effort (e.g. person-hours)

• mistakes or wrong assumptions about the data

• other impact

• no impact

• N/A

Were you and other stakeholders in the project aware of the semantic description of system components (e.g where to find specific information in a document, which units are used, etc.)?

• Yes

• No

If you and other stakeholders were not aware of semantic descriptions of single parameters of system components, this led to (one or multiple answers possible)...

• uncertainties about the exchanged data (what does it mean, from whom is it, etc.)

• unplanned rework effort (e.g. person-hours)

• mistakes or wrong assumptions about the data

• other impact

• no impact

• N/A