How to get a Software Specification?

One Facet: Printed forms as a driving force

Olga Schiemangk

Humboldt University Berlin
Department of Computer Science
Software Engineering Group

Contents

- **Introduction / Metals Projects**

- Specification and business processes

- Example:

  - Business process "Scrap receipt"

  - Printed form "Delivery Acceptance Document" and software specification

- Generalization and Conclusions

Introduction / Metals Projects

- My interest:

  Relationship between academic software engineering concepts and the practice in commercial software projects

- Case studies in metals industry

  2011: a tube plant in Russia

  2012: a steel-making factory near Moscow

  PSI

  PSI Metals production management solution for electrical steel production from scrap.

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Specification and Business Processes

- A PSI Metals specification is a text document having a defined structure
    - Introduction to the Project
    - Business Processes
    - User Interface
    - Interfaces to other Systems
    - Hardware, System Software and System Administration
    - Project Management

- Chapter "Business Processes"
    - Kernel of the specification
    - Refers to GUI screens and messages that must be exchanged with partner systems

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Business Process "Scrap Receipt"
Participating IT Systems

SAP
Ordering scrap,
Bookkeeping,
Paying suppliers

FACS
Factory Access
Control System
Collecting and checking
data of arriving trucks

Interface:
Asynchronous
Exchange of
Messages

Interface:
Asynchronous
Exchange of
Messages

PSI PM
Production Management
Receipt of scrap, Quality control,
Tracking of trucks and wagons

Interface:
Set of messages to be exchanged

Message:
Well-defined structured data record

Business Process "Scrap Receipt"
Actions

- Truck's arrival
  - FACS sends data of the shipping documents to PSI PM
  - PSI PM decides to accept the truck based
    on the list of SAP Purchase Orders

- Accepted truck in factory
  - Registration of its gross weight - PSI PM
  - Unloading and quality control
  - Registration of tare weight and
    calculation of the net weight - PSI PM

- PSI PM software creates and prints *Delivery Acceptance Document*
  - A very important commercial document
  - Predefined by Russian law and specific rules of the steel trust
  - Significant for specification: all contained data must be available
    on time in PSI PM

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Delivery Acceptance Document
An important printed form

ContractId

TruckType   TruckId

Эфферт/ТД-2-001 с ЛОП ООО "Эфферт"

МАЗ С549ОУ48

GrossWeight   TareWeight   NetWeight

Вес брутто, т	Вес тары, т	Засор %	Вес нетто, т
23,390	13,060	2	10,120

Signatures of different persons in charge.

Responsible for Quality and Security check:

Responsible for receipt:

Delivery Acceptance Document
Work through its Definition

Steps concerning creation of specification:

1. For each data field find out its source system

   - SAP, FACS or PSI PM

2. For each field coming from SAP or FACS

   - Find out which interface message contains the field
     → SAP or FACS interfaces might be extended

3. For each field having its source in PSI PM

   - Find out on which PM screen the field occurs, either as input field or as calculated field
     → PM screen might be modified

The next three slides illustrate these steps

Delivery Acceptance Document
Work through Step 1

For each field find out its source system: SAP, FACS or PSI PM

DAD Fields	Data Source
TruckID	FACS
TruckType	FACS
ContractID	FACS
...	
Supplier	SAP
...	
ScrapType	PM
GrossWeight	PM
TareWeight	PM
NetWeight	PM (c)
...	

Conclusion

- FACS must send the values via message interface to PSI PM

- SAP must send the values via message interface to PSI PM

- Values must be typed in via PSI PM screens or can be calculated (c) inside PSI PM
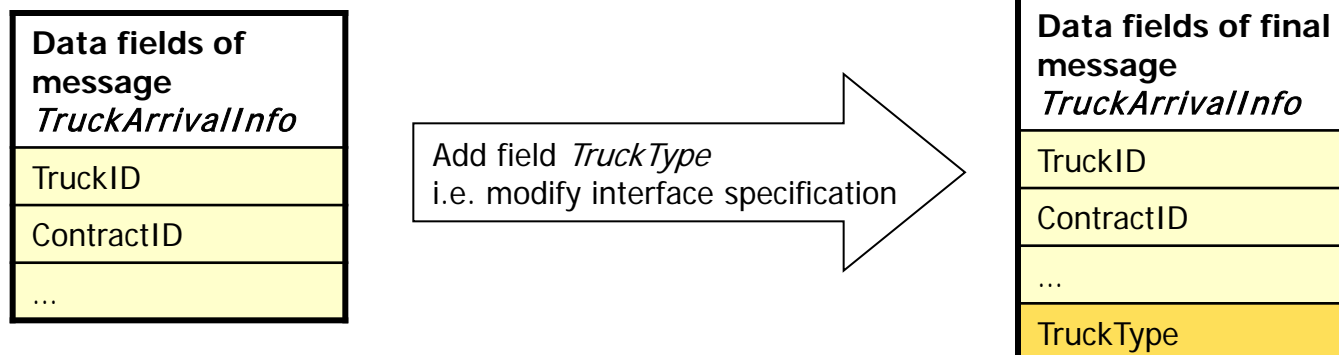
Delivery Acceptance Document
Work through Step 2

For each field having its source in SAP or FACS

- Find out which interface message contains the field
- If a field of DAD can't be found, it must be added to an appropriate message

Example

- *TruckId* and *ContractId* are found in the message *TruckArrivalInfo* FACS → PM
- No message of interface FACS → PM contains the field *TruckType*
- Thus a new data field *TruckType* is added to the message *TruckArrivalInfo*
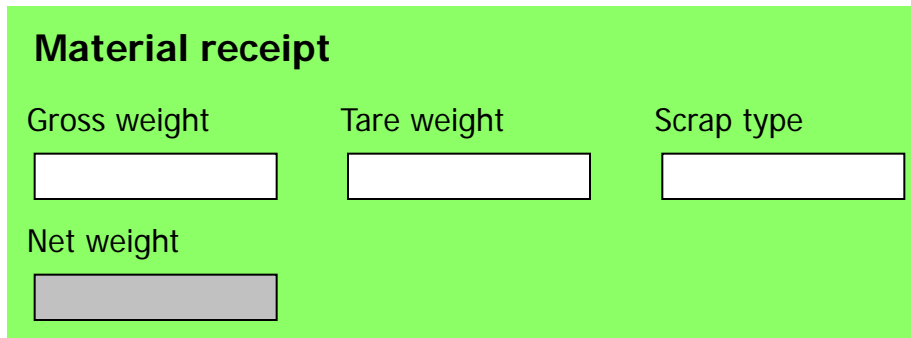
Data fields of message *TruckArrivalInfo*
TruckID
ContractID
...

Add field *TruckType*
i.e. modify interface specification

Data fields of final message *TruckArrivalInfo*
TruckID
ContractID
...
TruckType

Delivery Acceptance Document
Work through Step 3

For each field having its source in PSI PM

- Find out on which PM GUI screen the field occurs either as input field or as calculated field
- If a field of DAD can't be found, it must be added to an appropriate PM GUI screen

Example

- *GrossWeight* and *TareWeight* are input fields on screen *MaterialReceipt*
- *NetWeight* is a calculated field on the same screen
- *ScrapType* is missing; thus it should be added as an input field on that screen

Material receipt

Gross weight   Tare weight   Scrap type

Net weight

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Generalization and Conclusions

- The described procedure of work through printed documents is a recurring standard pattern in the creation of specifications

- Content of documents which have to be printed generally influences
  - Interfaces to partner systems
  - GUI screens of PM

- Experience in many projects: customers discuss more about printed forms than about screens

- Best Practice: regard printed documents early. Clients like it!

- Printed documents are a driving force in the creation of software specifications