Extensibility, Adaptation and more
Patterns for truly flexible Standard Software

Sebastian Wennemers, SAP
@S7nW7s

EXTERNAL

SAP Run Simple

WONDERFUL FEEDBACK?

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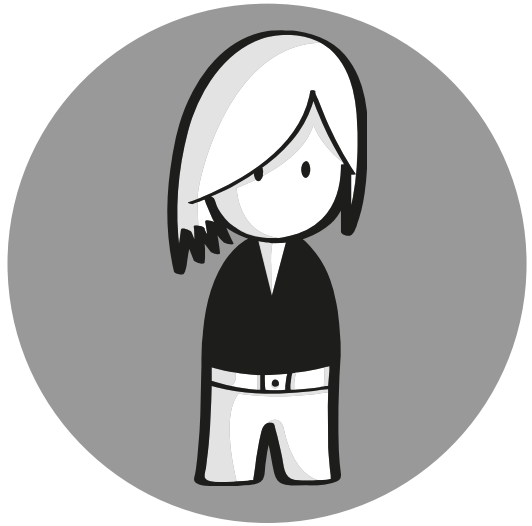
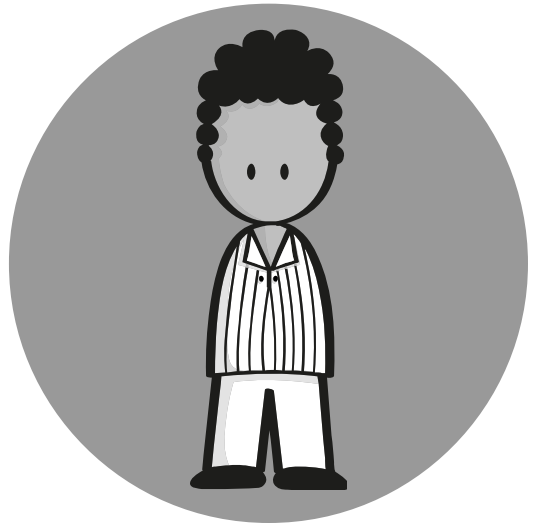
Characters

Norman, 28
Developer

Paula, 35
Partner Developer



Kate, 32
Product Mgmt



Eduardo, 42
Sales Rep

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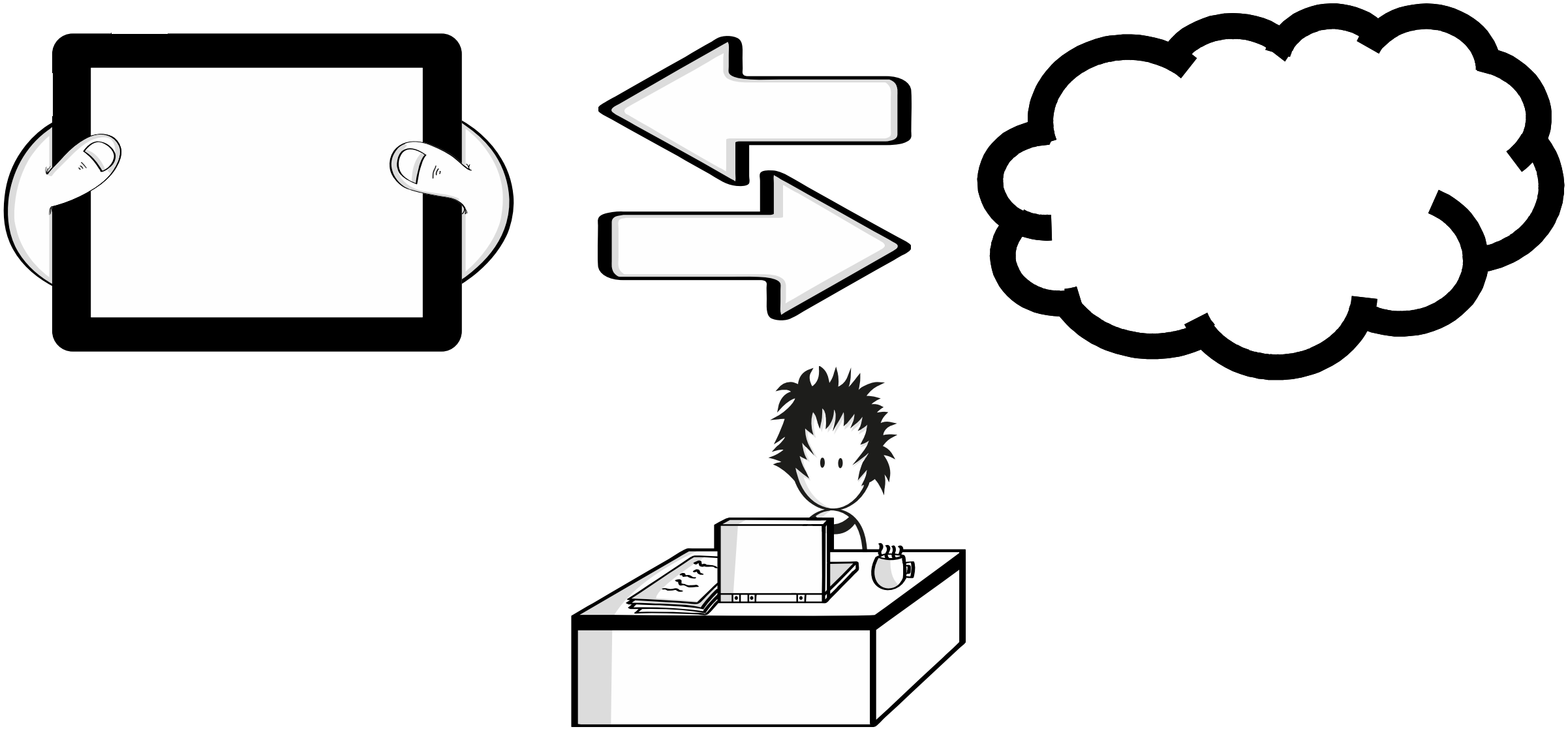
Standard software, built and deployed once, for all users at all customers



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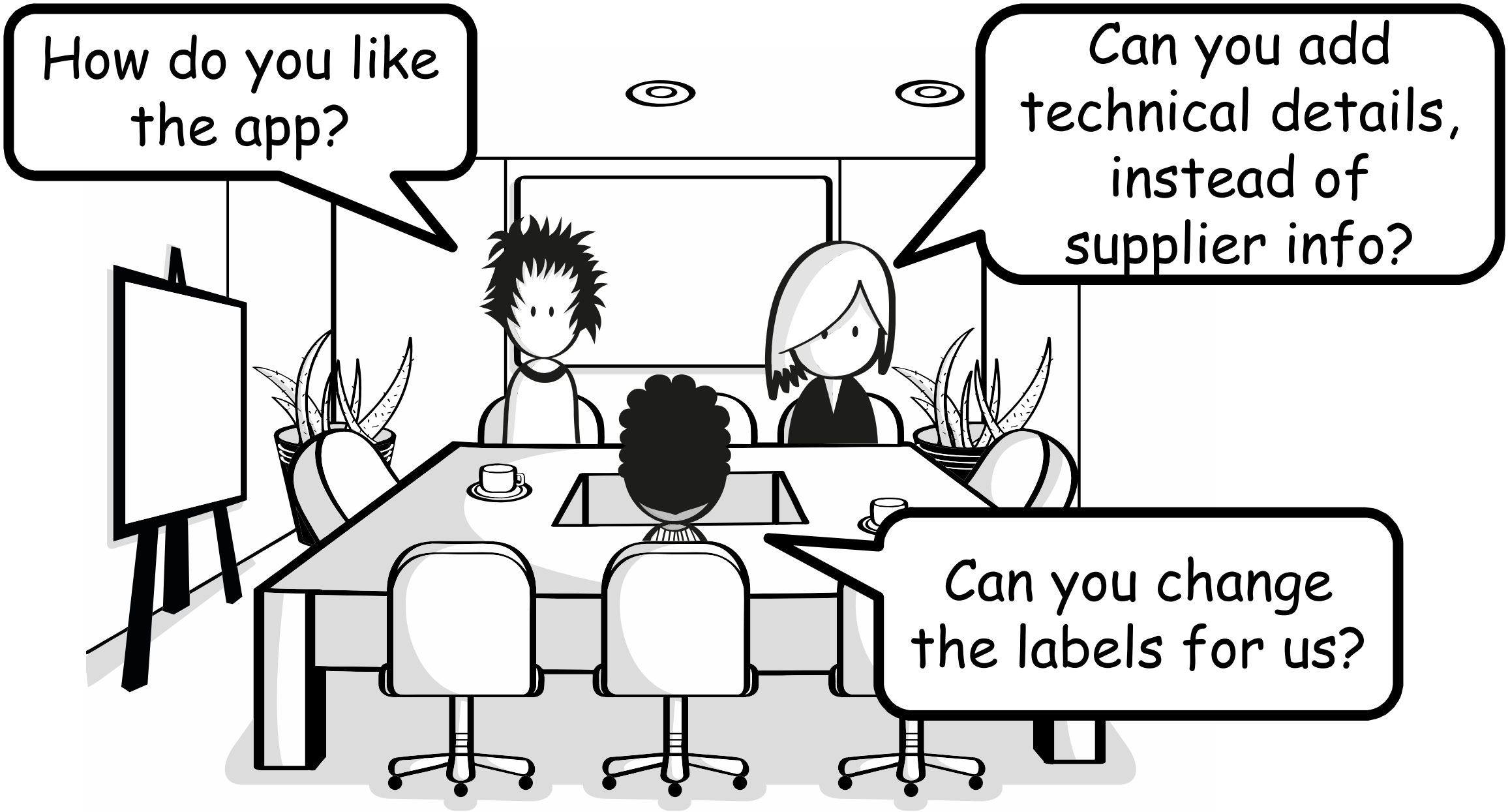

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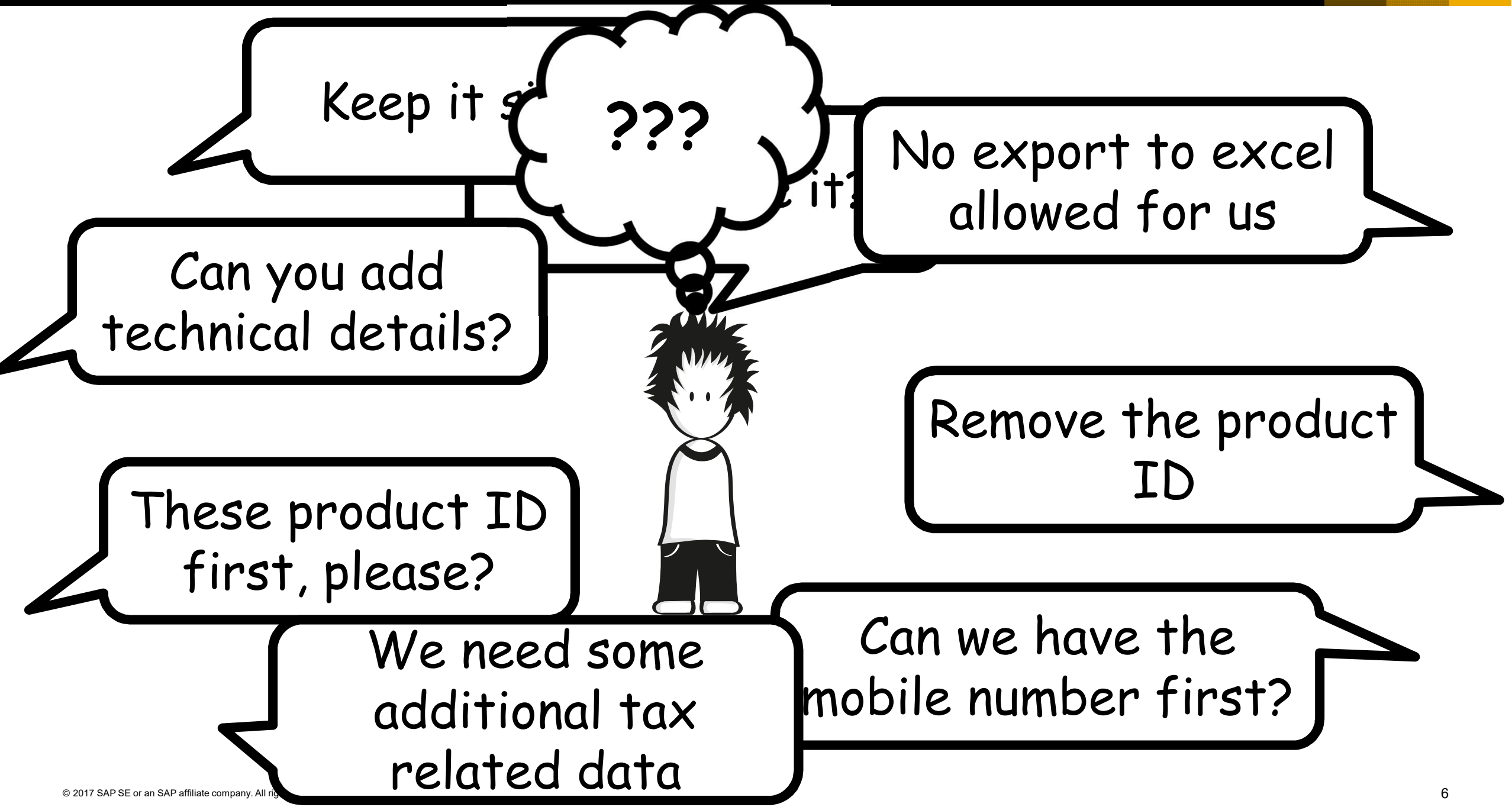

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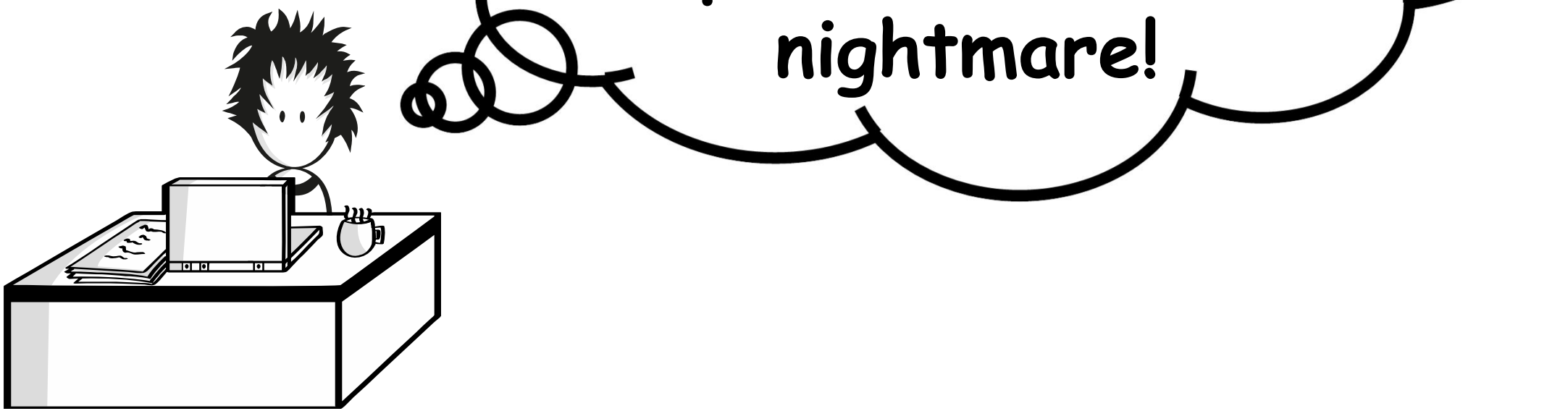

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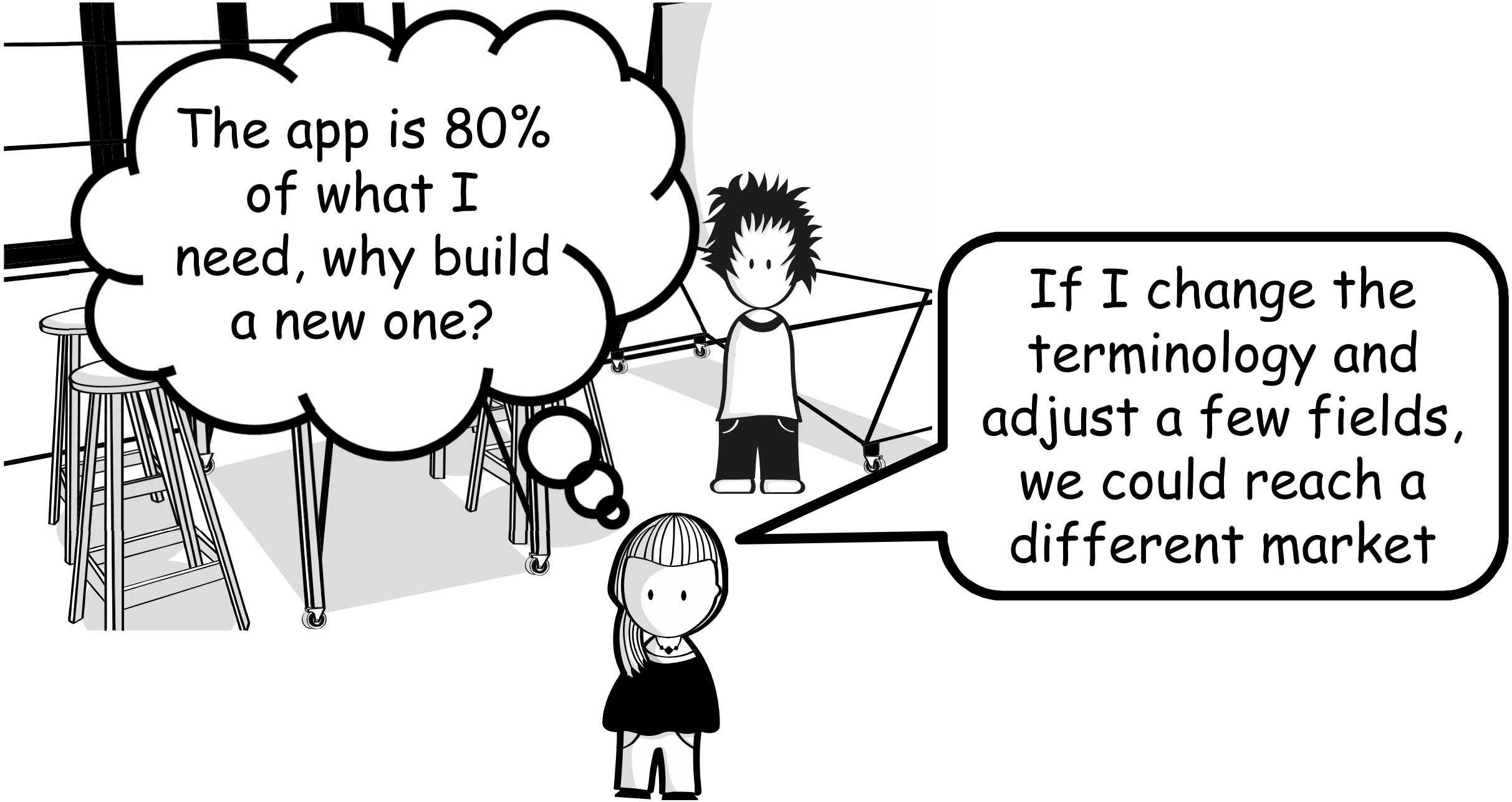

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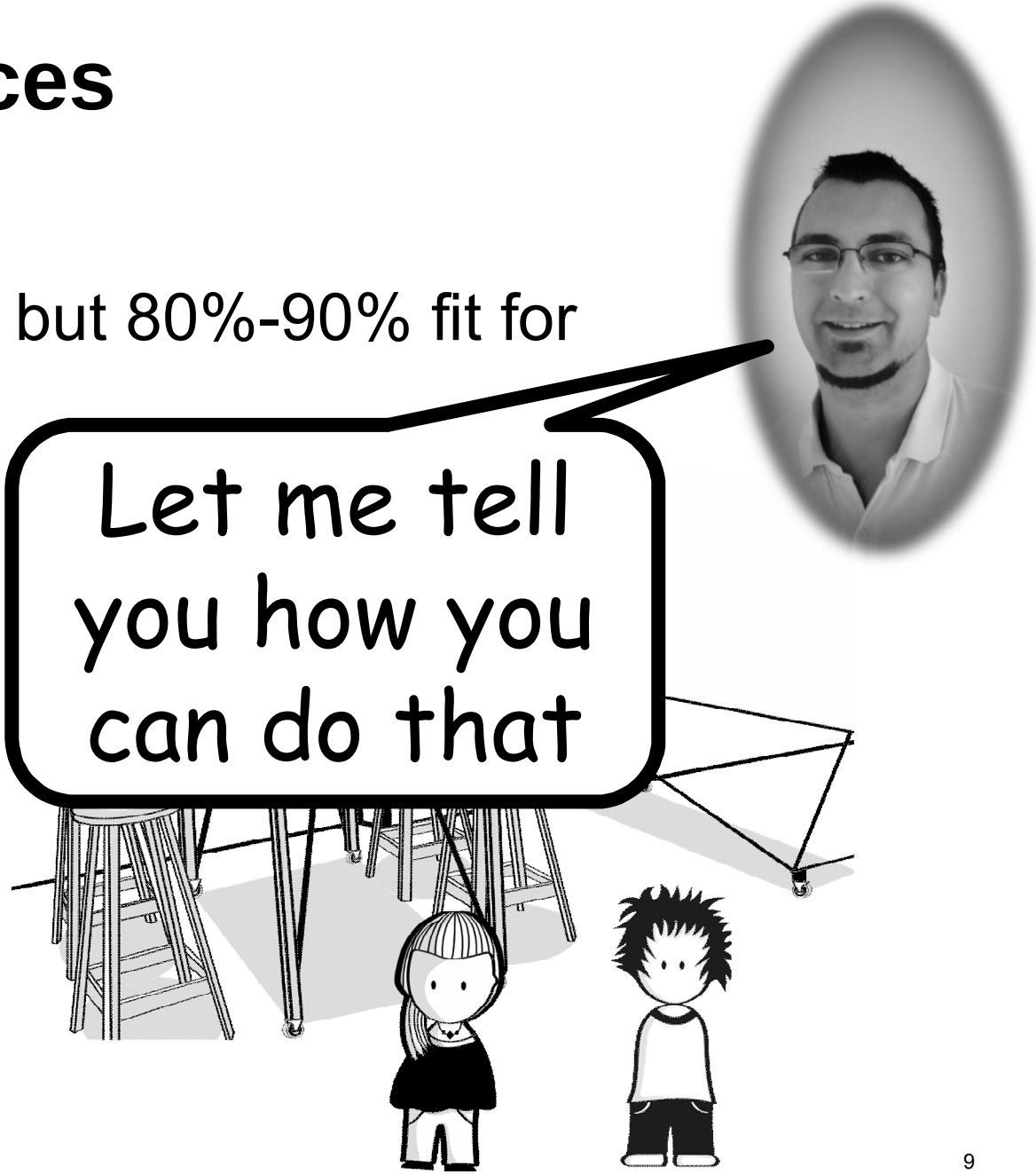
Summary of Context & Forces

- Conflicting customer requirements but 80%-90% fit for everyone
- Get new features & bugfixes into extended apps
- Don’t break extensions
- Multilayer/Ecosystem enabling



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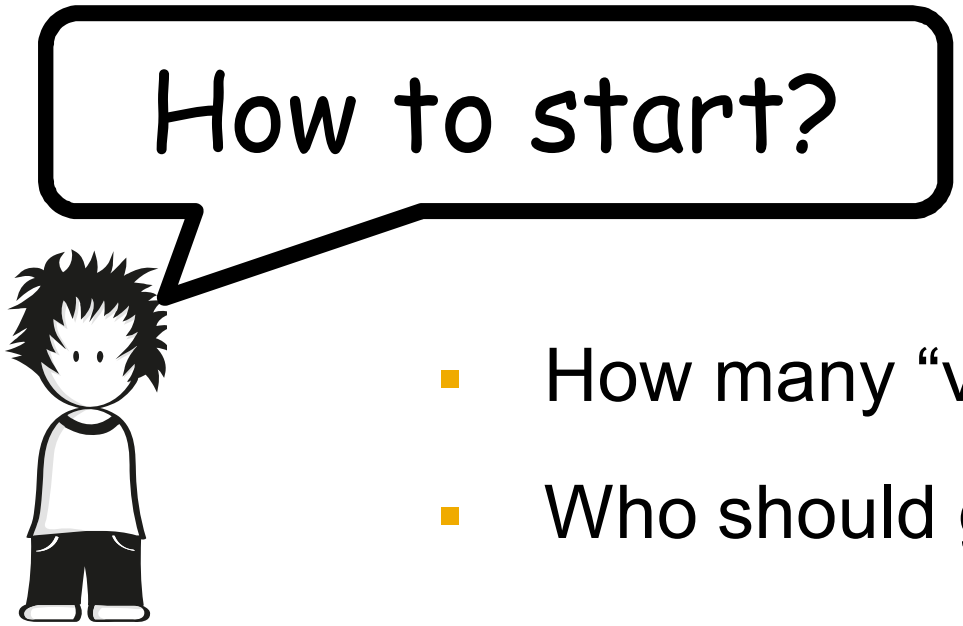
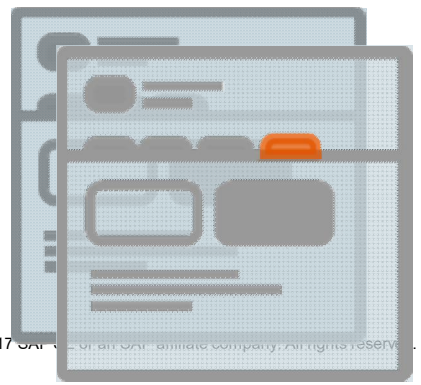


Identity Pattern

- How many “virtual” apps do your users want?
- Who should get which adaptation?

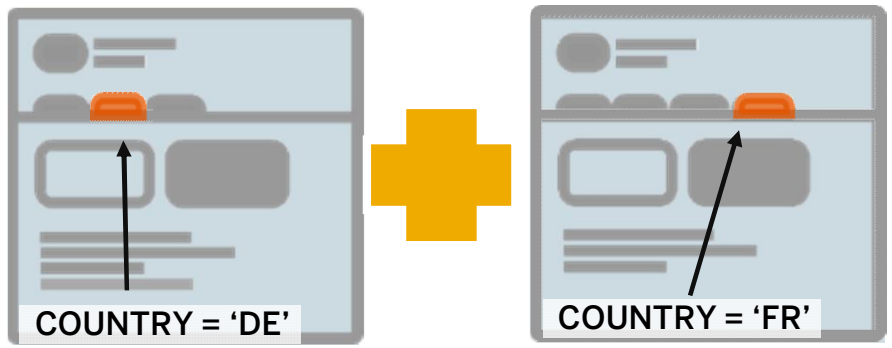
Replacement

- Everyone



Coexistence

- User groups



Inclusion

- Everyone

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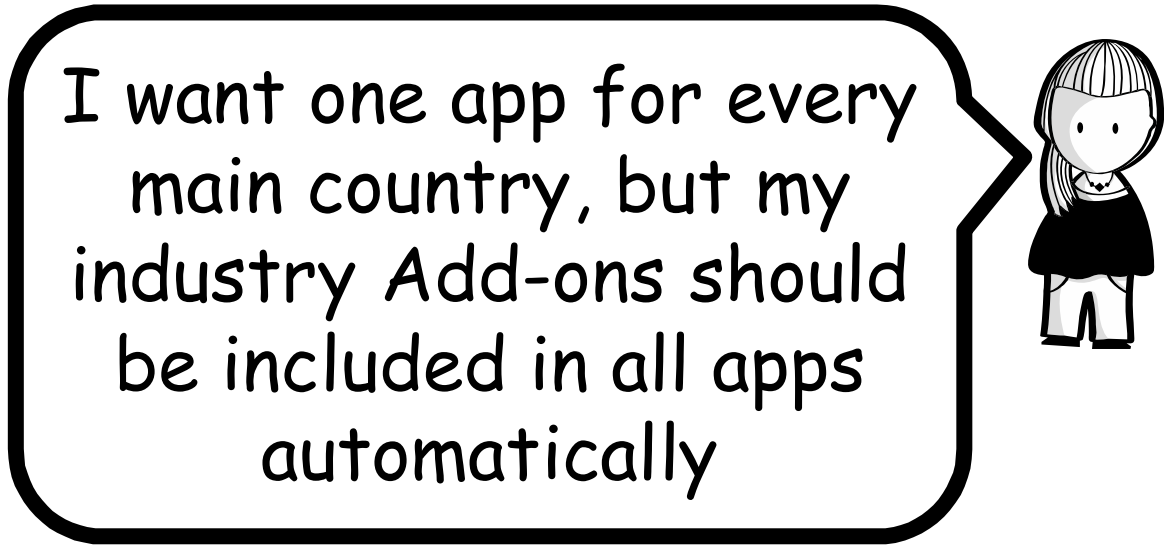
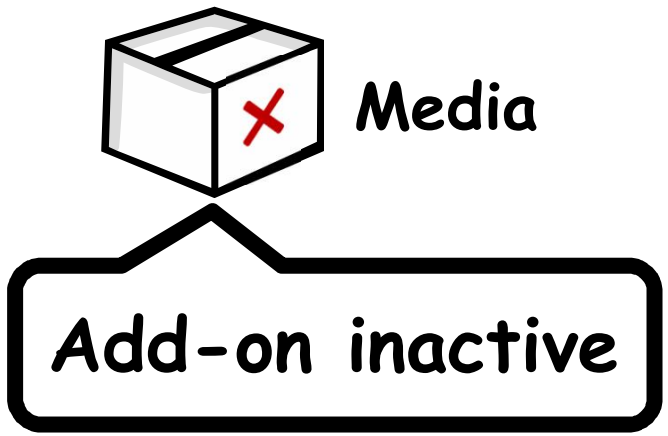
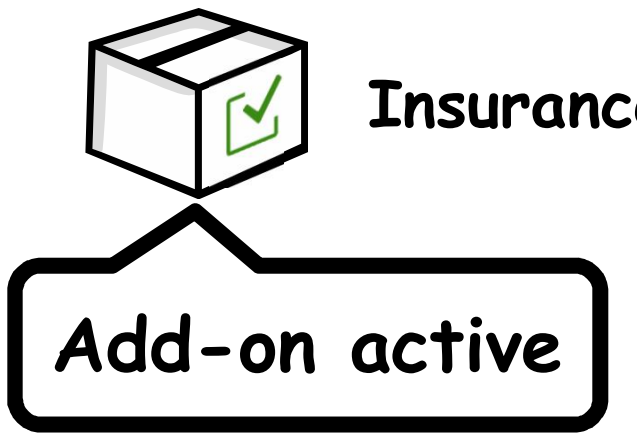
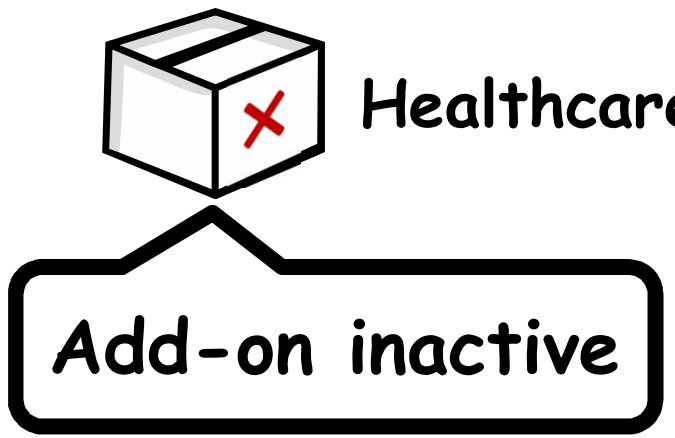
Context Pattern

- Too many combinations for “Coexistence”
- Activate extensions based on a context









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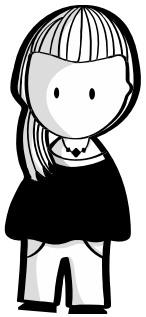
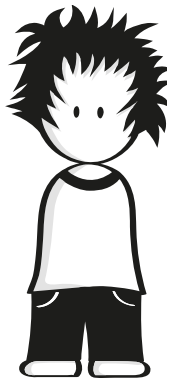
Copy Pattern

What is wrong with copies?



- Decoupling from the bugfixes and new features

Are there any good use cases for the copy pattern?



- The original as template
- Extremely simple and fast to implement mechanism
- You need decoupling for e.g. legal requirements

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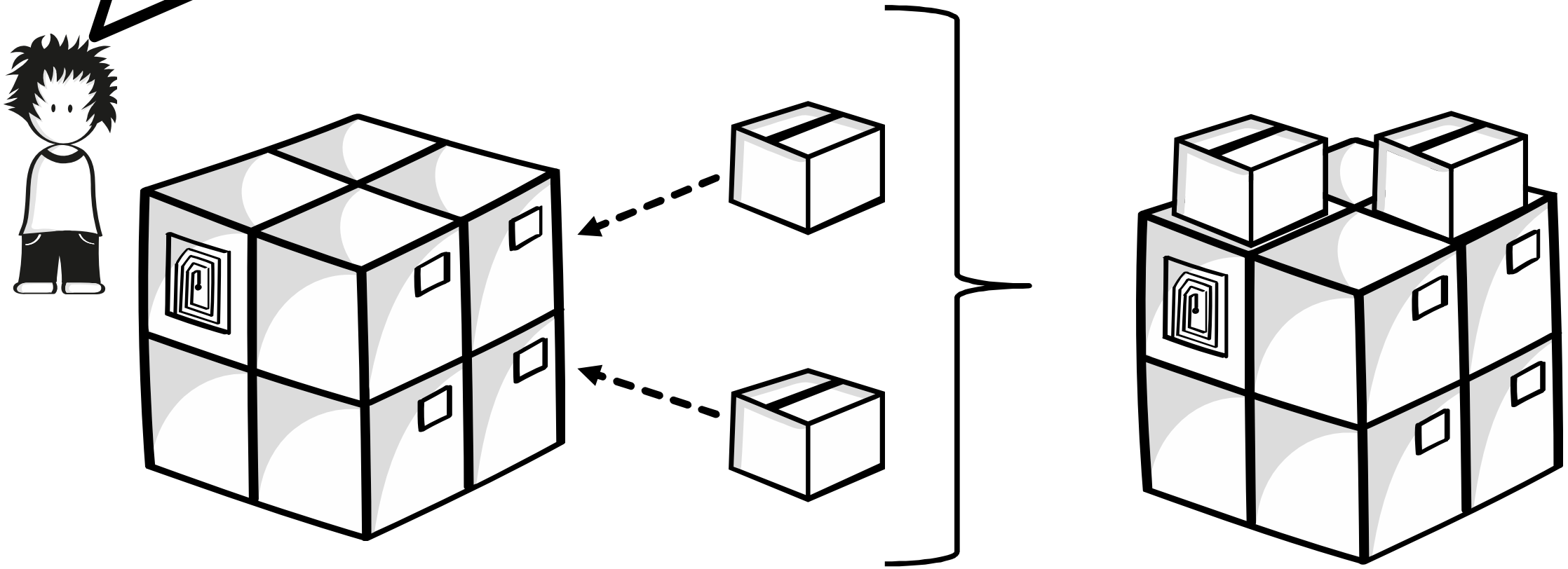
Extend by Delta Object Pattern



Compiler/Interpreter/
Runtime Environment

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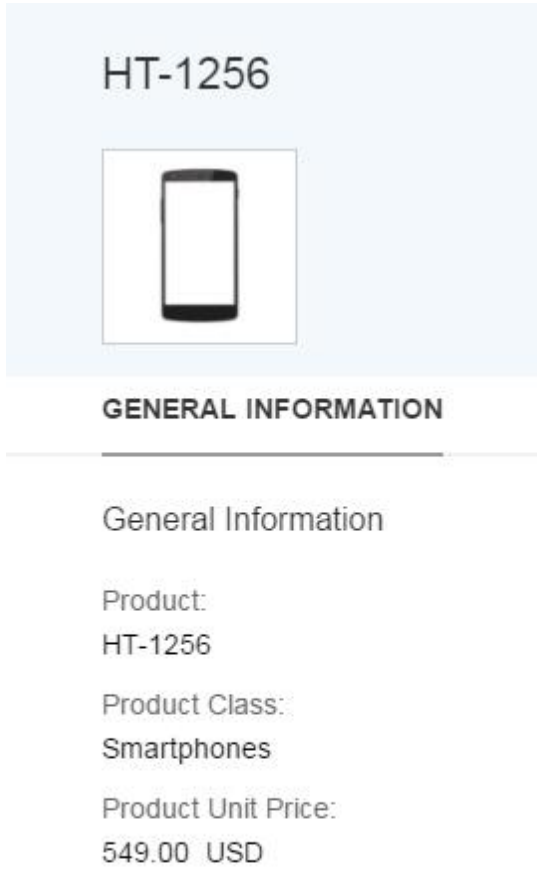
Example: UI changes as Delta Object for SAPUI5 flexibility application




```
<smartForm:SmartForm id="ProductForm">
    <smartForm:Group id="ProductFormGenInfo" label="General Information">
        <smartForm:GroupElement>
            <smartField:SmartField value="{Product}" />
        </smartForm:GroupElement>
        <smartForm:GroupElement>
            <smartField:SmartField value="{ProductCategory}" />
        </smartForm:GroupElement>
        <smartForm:GroupElement>
            <smartField:SmartField value="{Price}" />
        </smartForm:GroupElement>
    </smartForm:Group>
</smartForm:SmartForm>
```

View with a form

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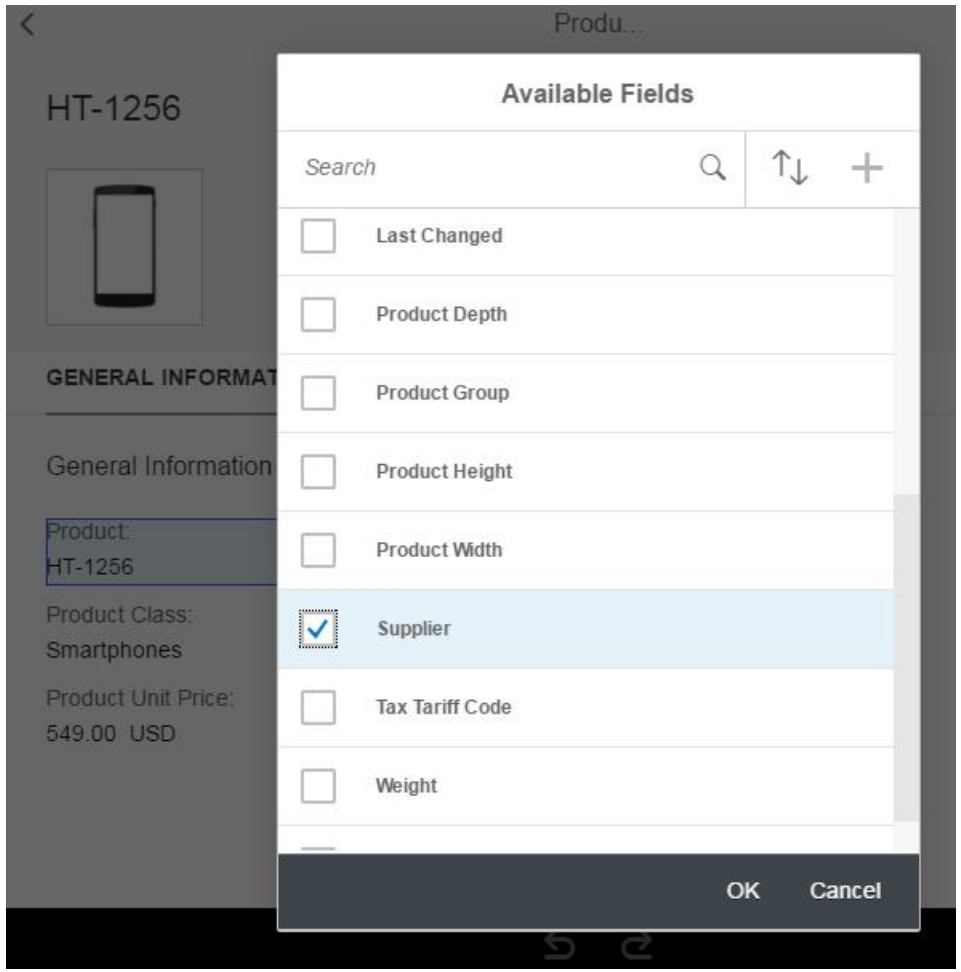
Example: UI changes as Delta Object for SAPUI5 flexibility application




```
{
    "fileName": "id_1470120176605_80_addFields",
    "fileType": "change",
    "changeType": "addFields",
    "reference": "ProductsFromCDS.Component",
    "content": {
        "field": {
            "value": ["Supplier"],
            "valueProperty": ["value"],
            "id": "ProductFormGenInfo_Z_99_ProductsType_Supplier",
            "jsTypes": ["sap.ui.comp.smartfield.SmartField"],
            "index": 1
        }
    },
    "selector": {
        "id": "ProductFormGenInfo",
    },
    "layer": "VENDOR"
```

A new field is added into the view using UI adaptation…

… and creates a UI change

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Example: UI changes as Delta Object for SAPUI5 flexibility application

```
<smartForm:Sma
    <smartForm
        <smart
            <s
        </smar
        <smart
            <s
        </smar
        <smart
            <s
        </smar
        <smart
            <s
        </smar
    </smartFor
</smartForm:Sm
```

```
{
    "fileName": "id_1470120176605_80_addFields",
    "fileType": "change",
    "changeType": "addFields",
    "reference": "ProductsFromCDS.Component",
    "content": {
        "field": {
            "value": ["Supplier"],
            "valueProperty": ["value"],
            "id": "ProductFormGenInfo_Z_99_ProductsType_Supplier",
            "jsTypes": ["sap.ui.comp.smartfield.SmartField"],
            "index": 1
        }
    },
    "selector": {
        "id": "ProductFormGenInfo",
    },
    "layer": "VENDOR"
}
```

The change is applied to the view

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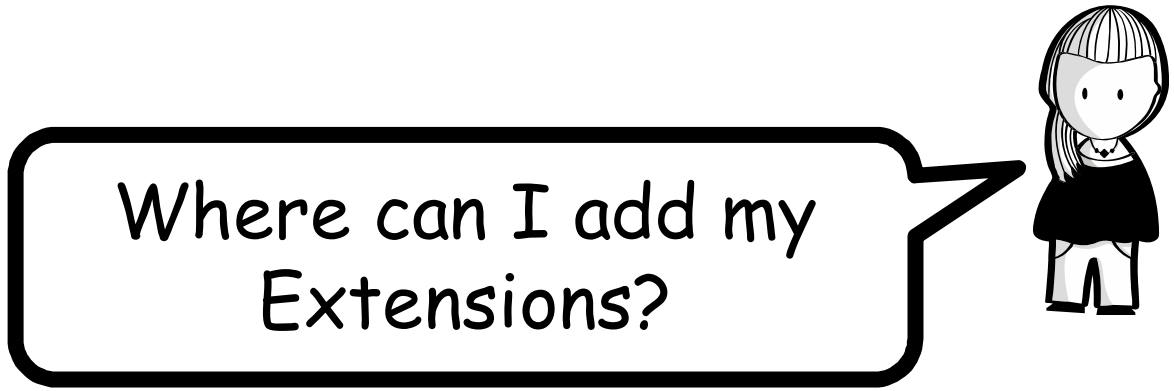
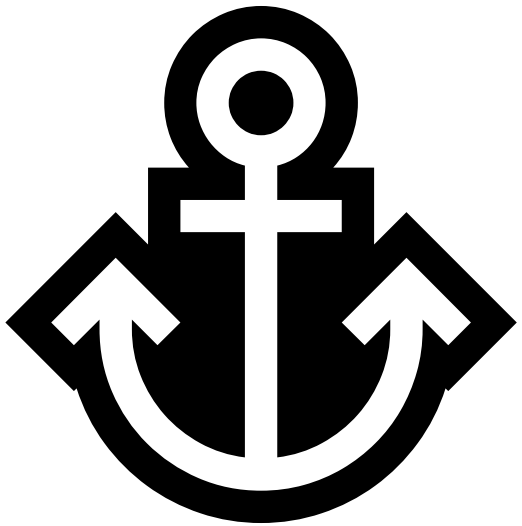
Anchor Point Pattern



Explicit

- Pre-thought and placed
- Stability



Generic

- Framework provided places
- Availability

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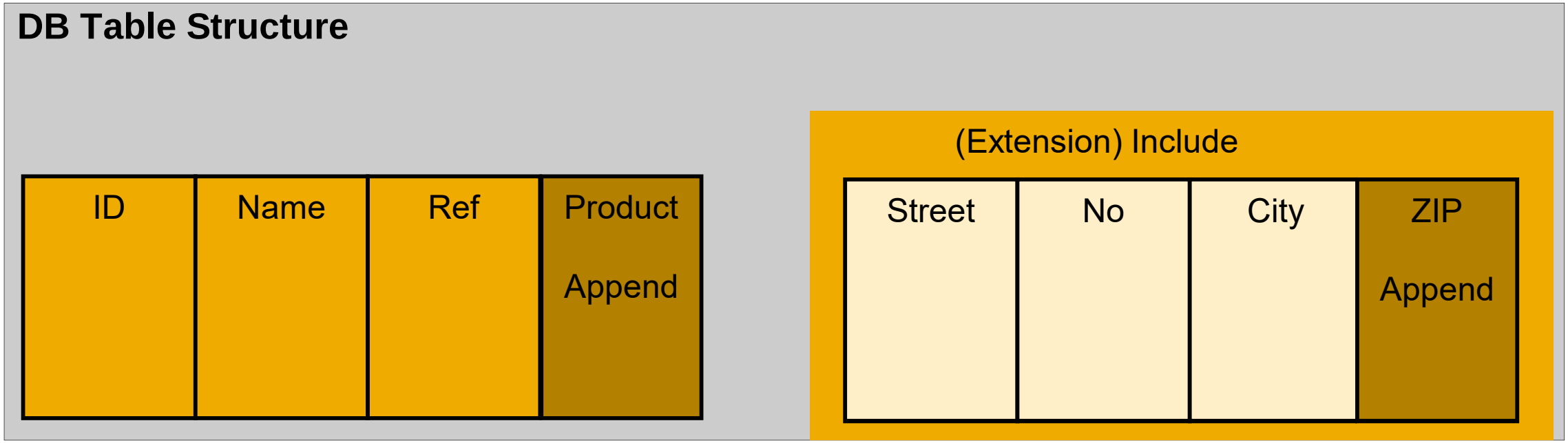
Extension Includes as **Anchor Points** and **Appends** as **Delta Object**



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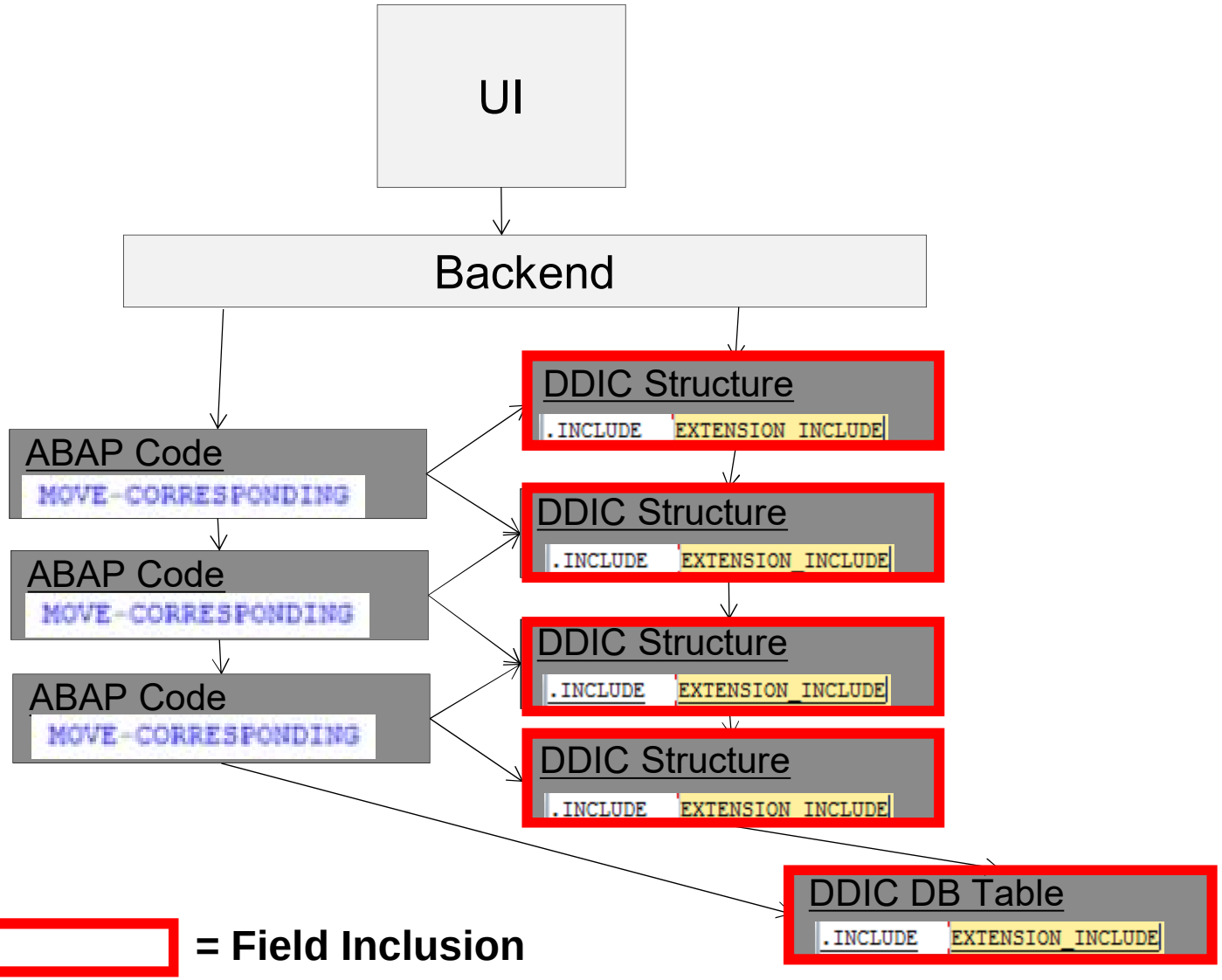
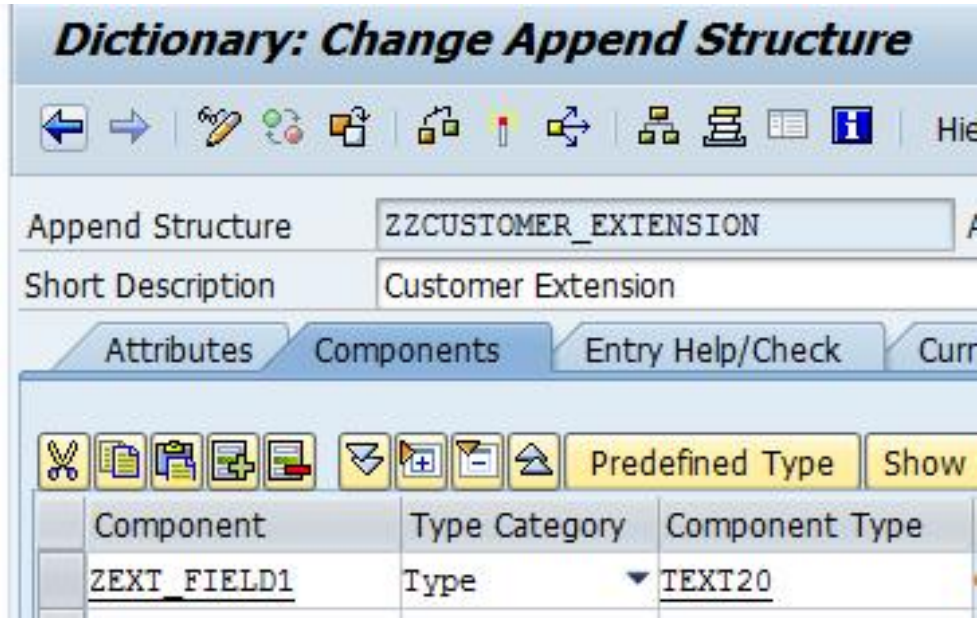
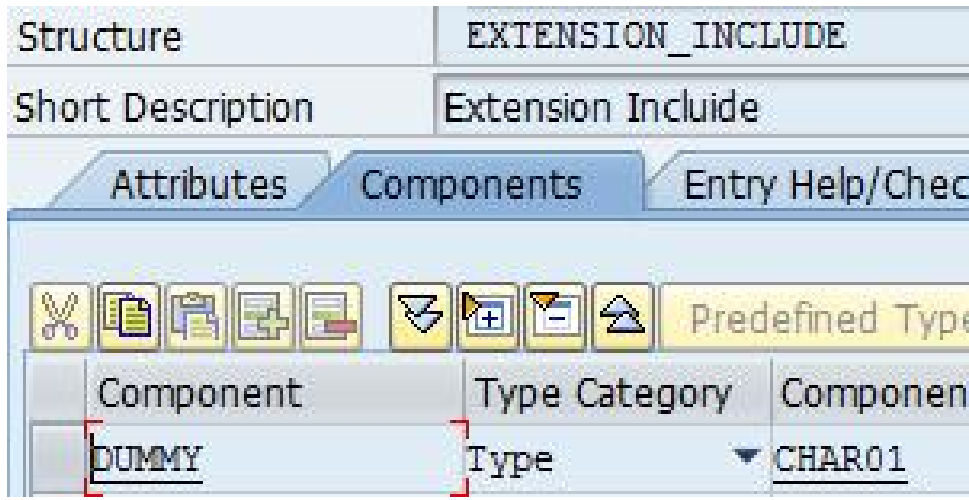
Extension Includes as Anchor Points and Appends as Delta Object







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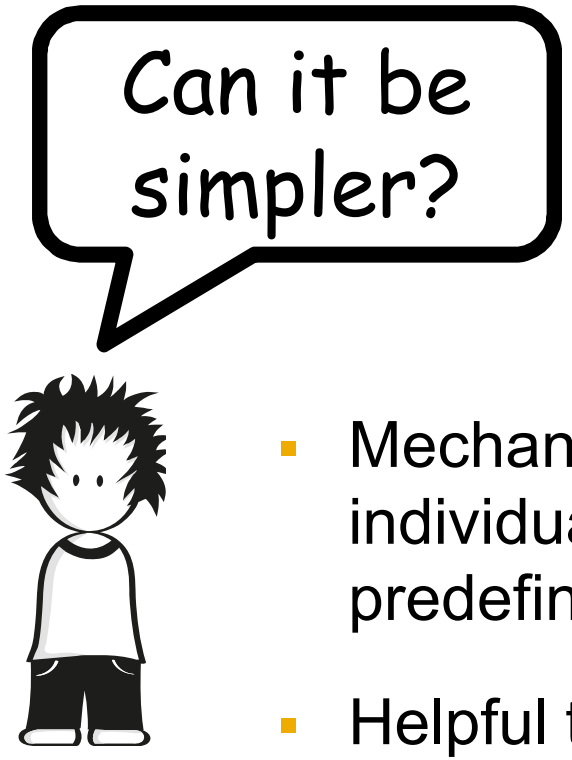
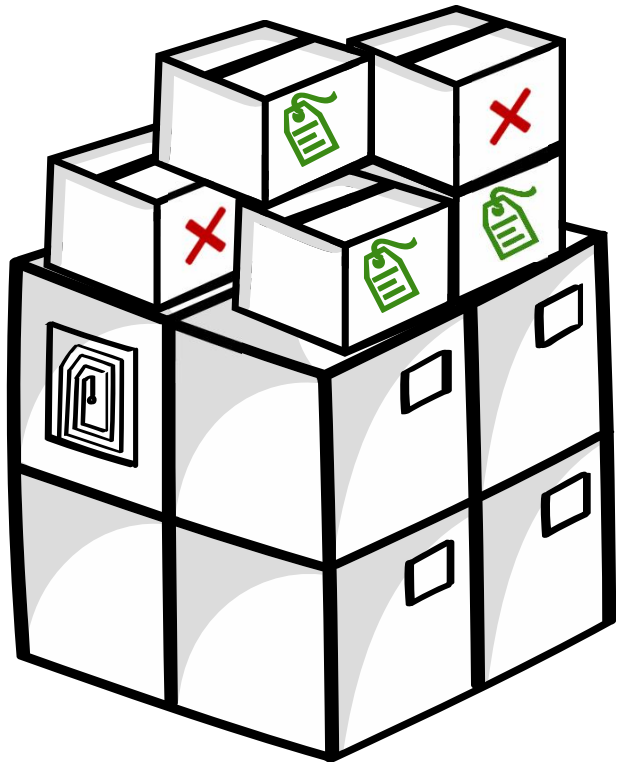


Predefined Extensions

- Mechanism to activate and individualize predefined extensions
- Helpful to ship complex scenario variations



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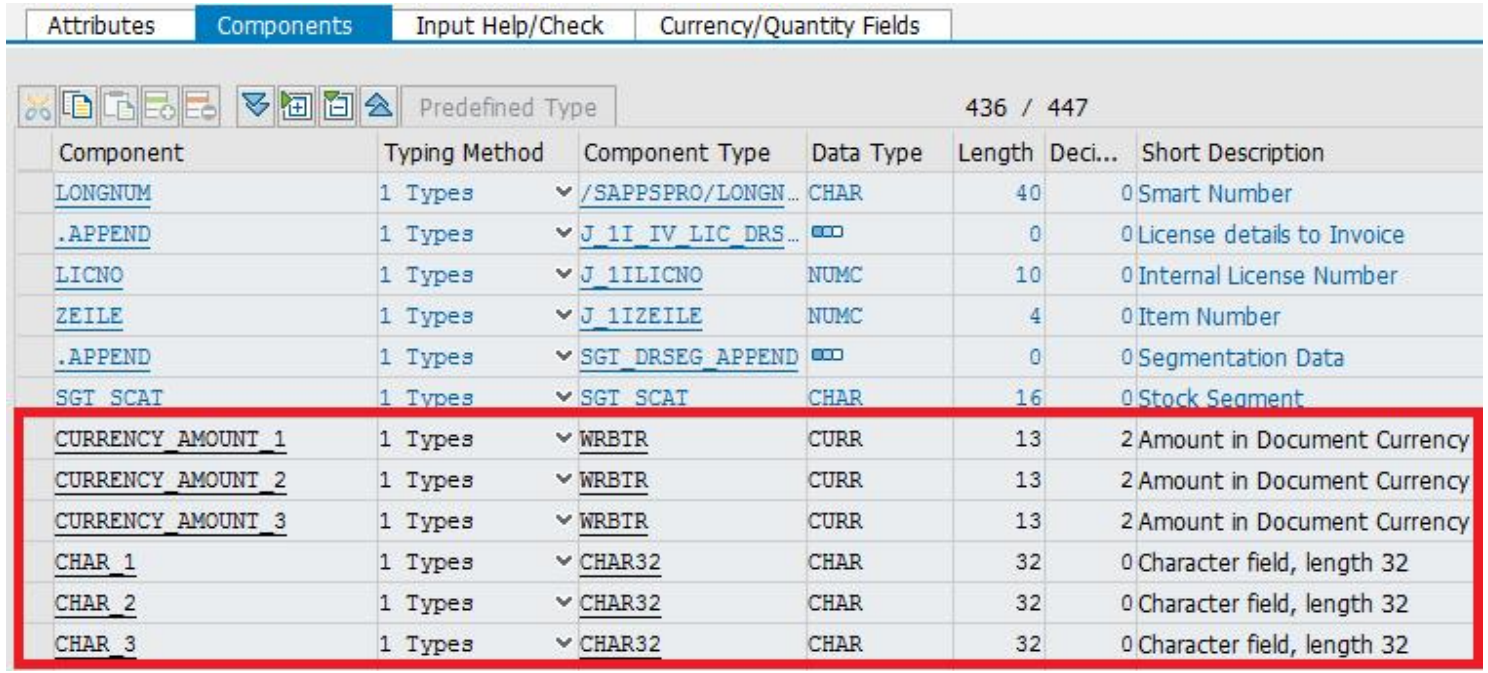
Predefined Fields as example for Predefined Extensions

- Application provides a set of typed dummy fields in the runtime and database structures
- Customers label them individually



Component	Typing Method	Component Type	Data Type	Length	Deci...	Short Description
LONGNUM	1 Types	/SAPPSPRO/LONGN...	CHAR	40	0	Smart Number
.APPEND	1 Types	J_1I_IV_LIC_DRS...		0	0	License details to Invoice
LICNO	1 Types	J_1ILICNO	NUMC	10	0	Internal License Number
ZEILE	1 Types	J_1IZEILE	NUMC	4	0	Item Number
.APPEND	1 Types	SGT_DRSEG_APPEND		0	0	Segmentation Data
SGT_SCAT	1 Types	SGT_SCAT	CHAR	16	0	Stock Segment
CURRENCY_AMOUNT_1	1 Types	WRBTR	CURR	13	2	Amount in Document Currency
CURRENCY_AMOUNT_2	1 Types	WRBTR	CURR	13	2	Amount in Document Currency
CURRENCY_AMOUNT_3	1 Types	WRBTR	CURR	13	2	Amount in Document Currency
CHAR_1	1 Types	CHAR32	CHAR	32	0	Character field, length 32
CHAR_2	1 Types	CHAR32	CHAR	32	0	Character field, length 32
CHAR_3	1 Types	CHAR32	CHAR	32	0	Character field, length 32

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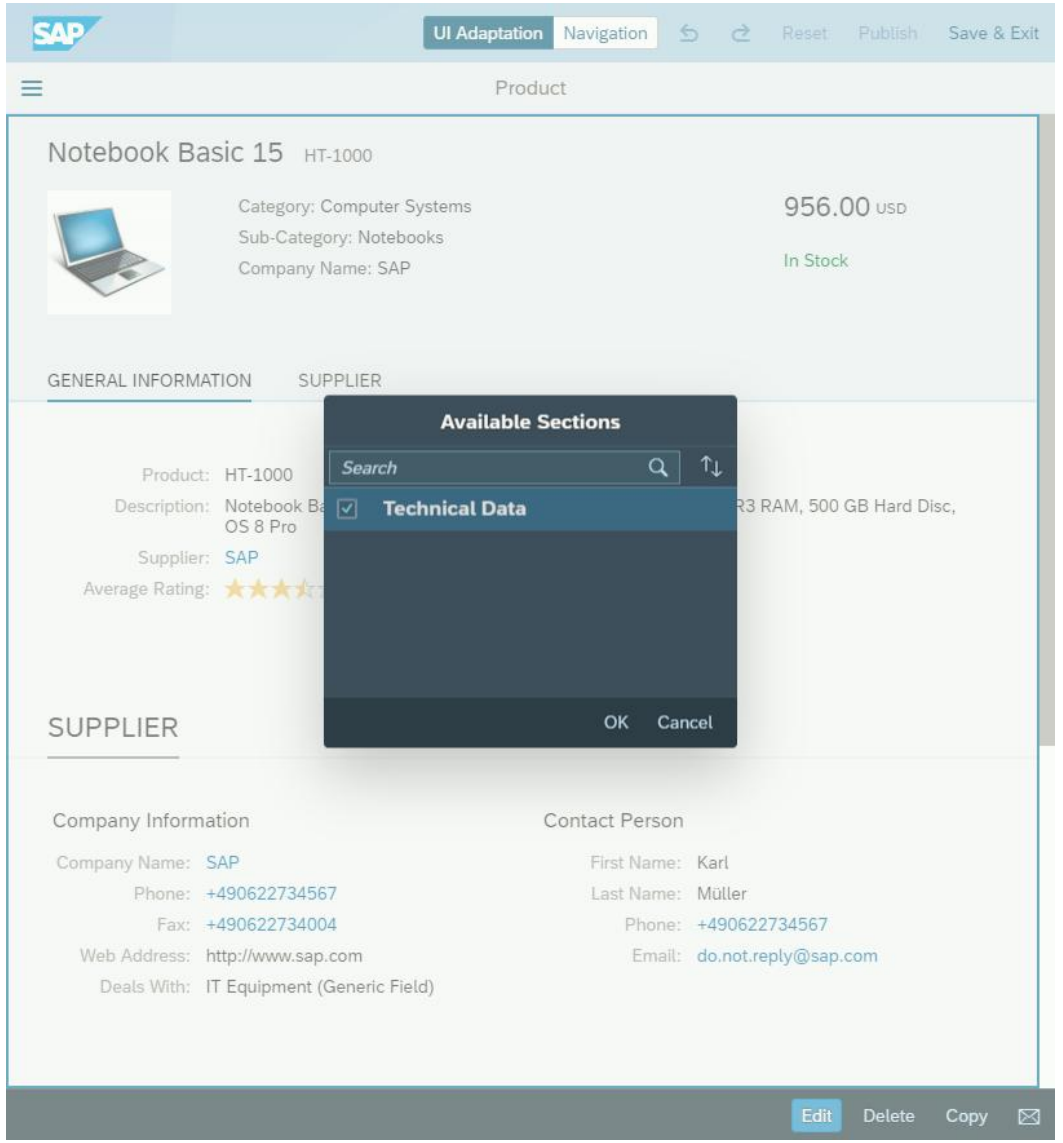
Hidden Section as example for Predefined Extensions

- Application developed optional, inactive section
- Customers add them when needed



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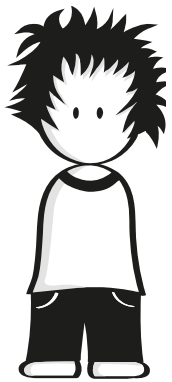
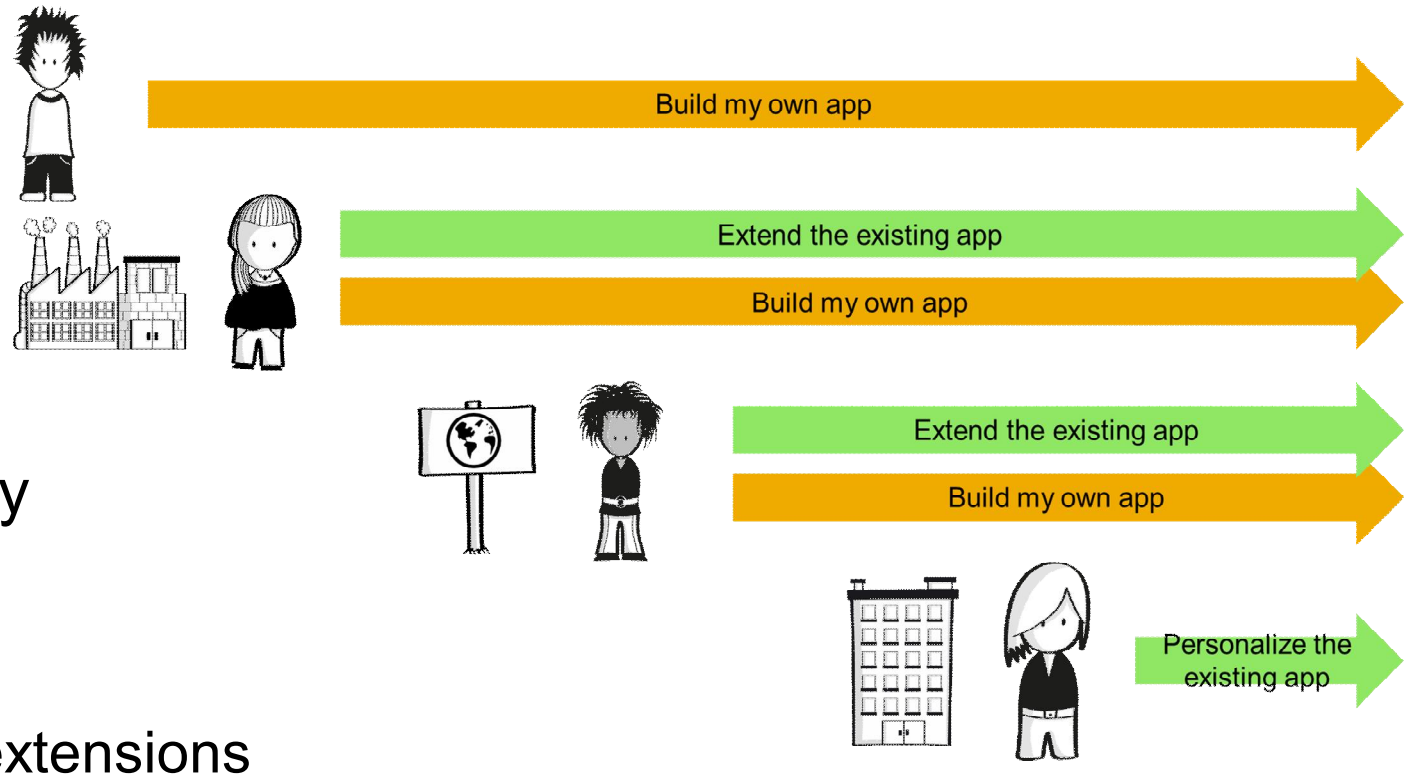
Priority Pattern

What if different groups extend my app independently?





Define execution order by

- Creation Time
- Layer/Group
- Dependency to other extensions
- <your strategy>

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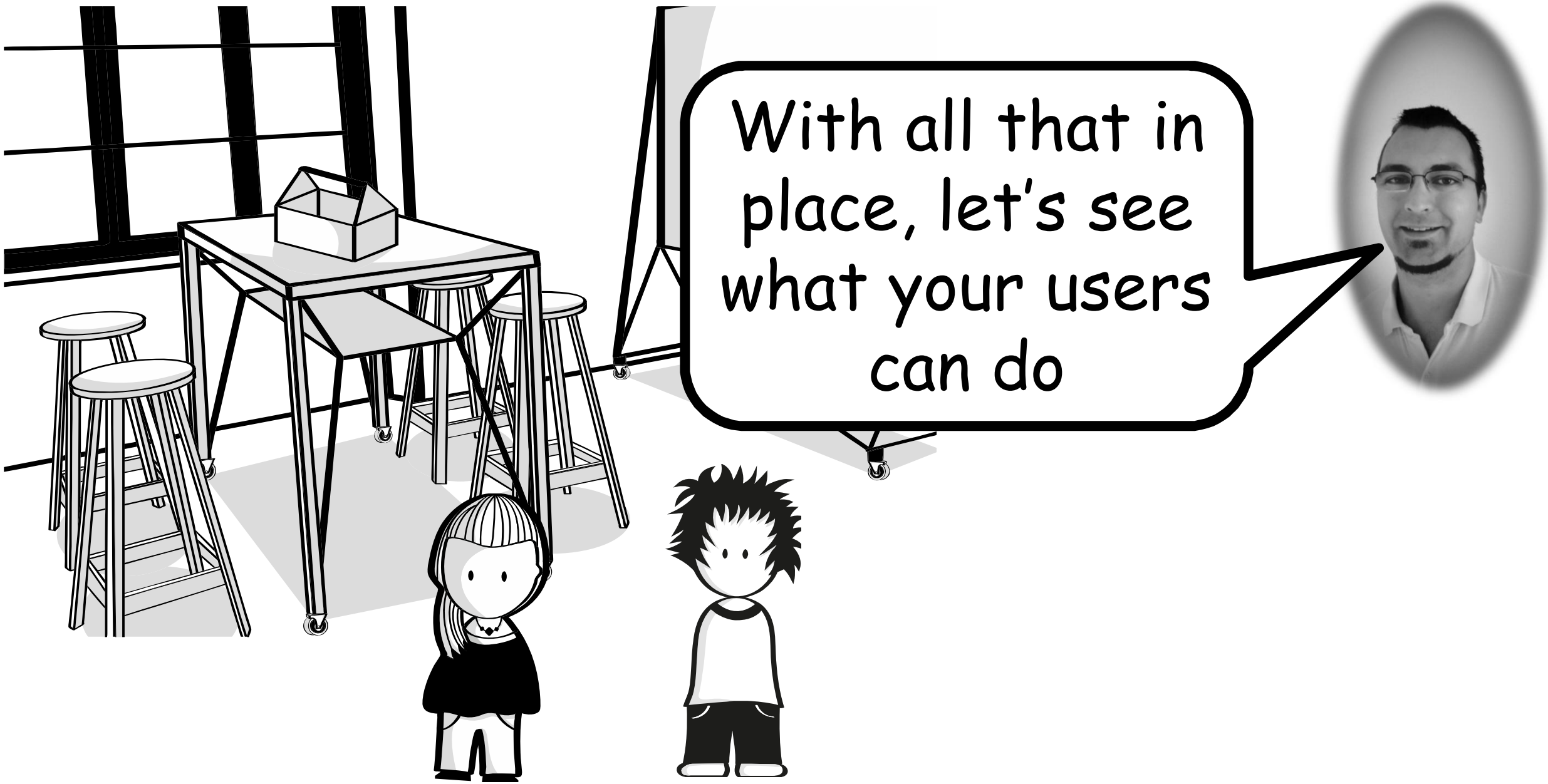

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NO WAY TO REACH THE CUSTOMER

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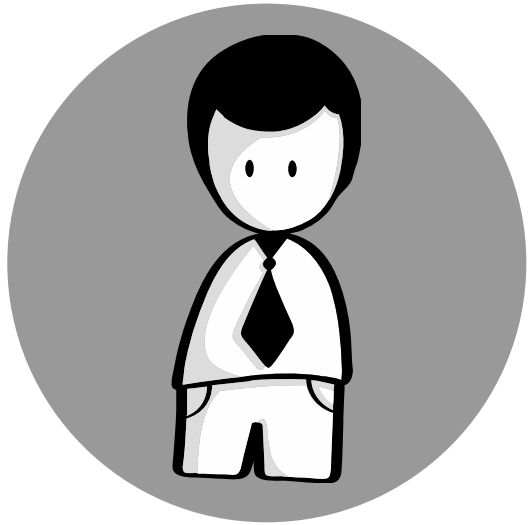
Characters

Kate, 35
Project Manager



Jack, 31
Consultant

Norman, 28
Developer

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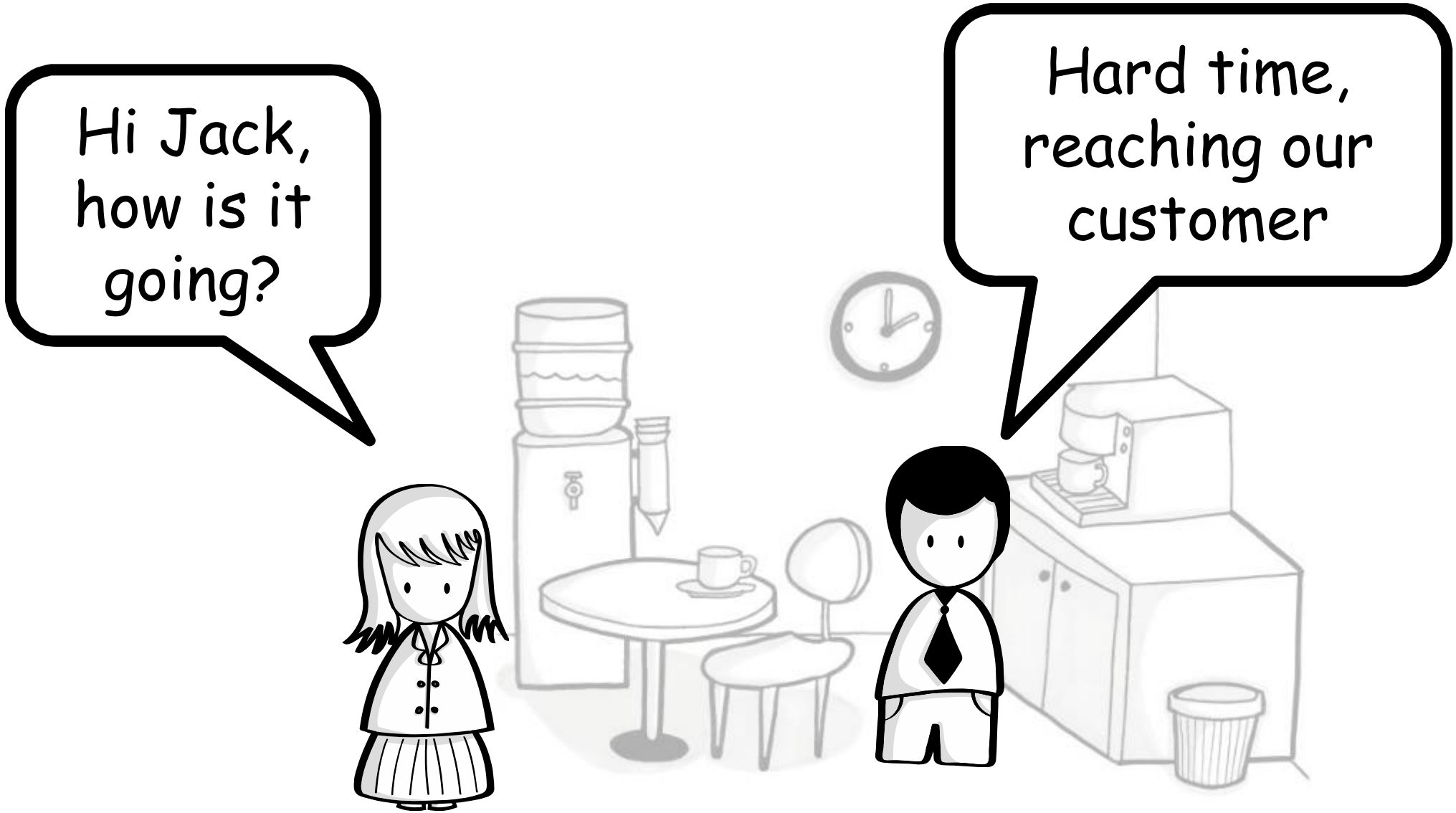

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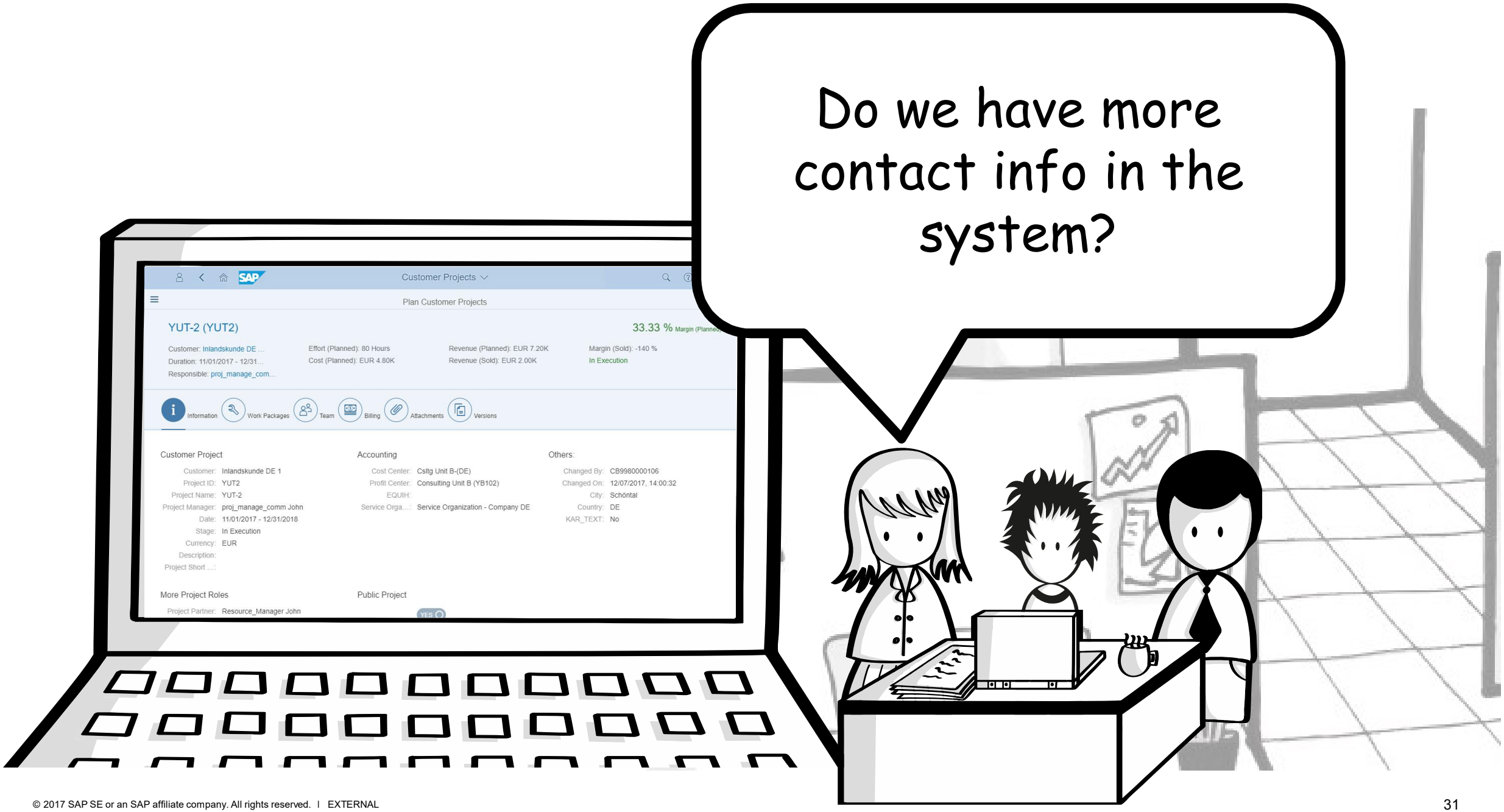

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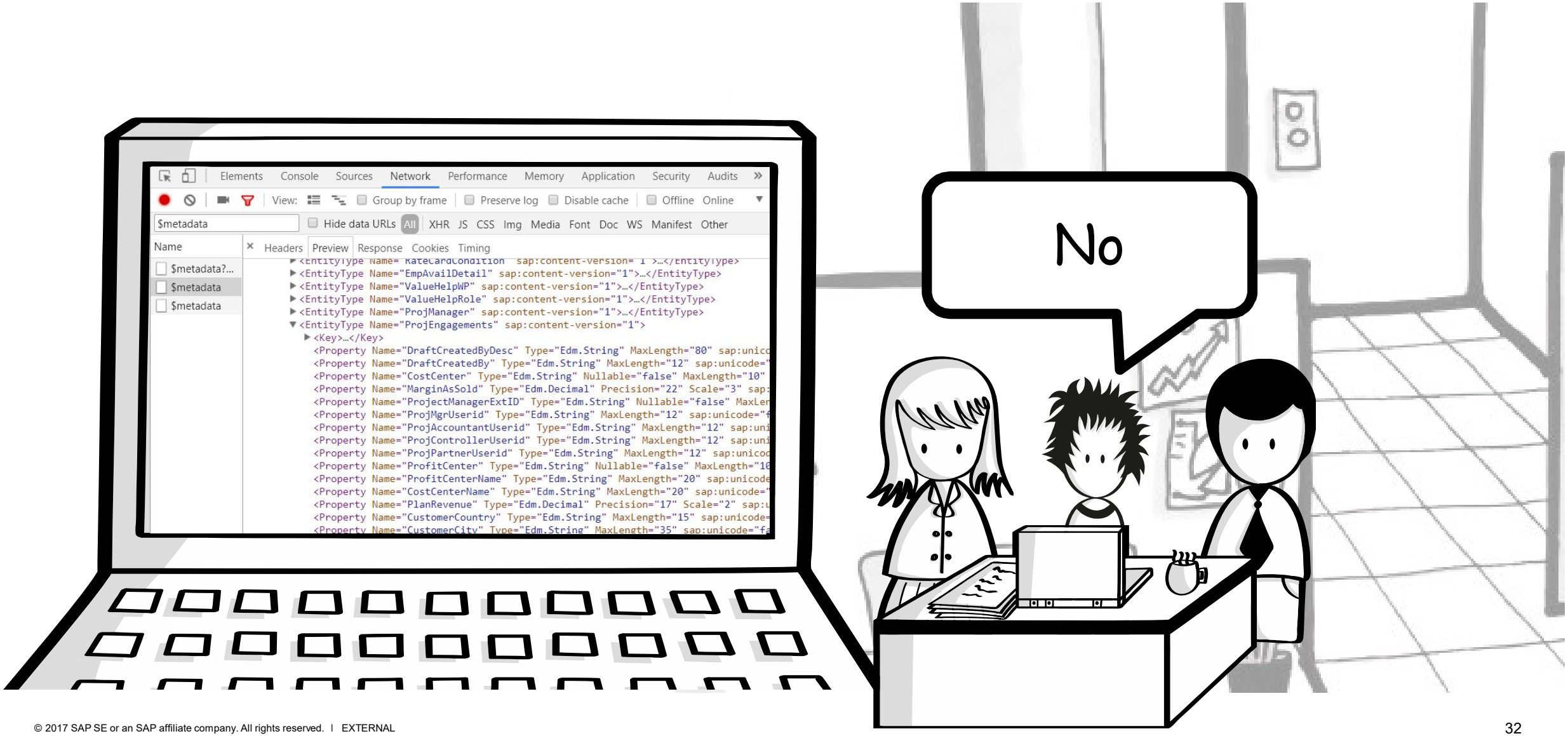

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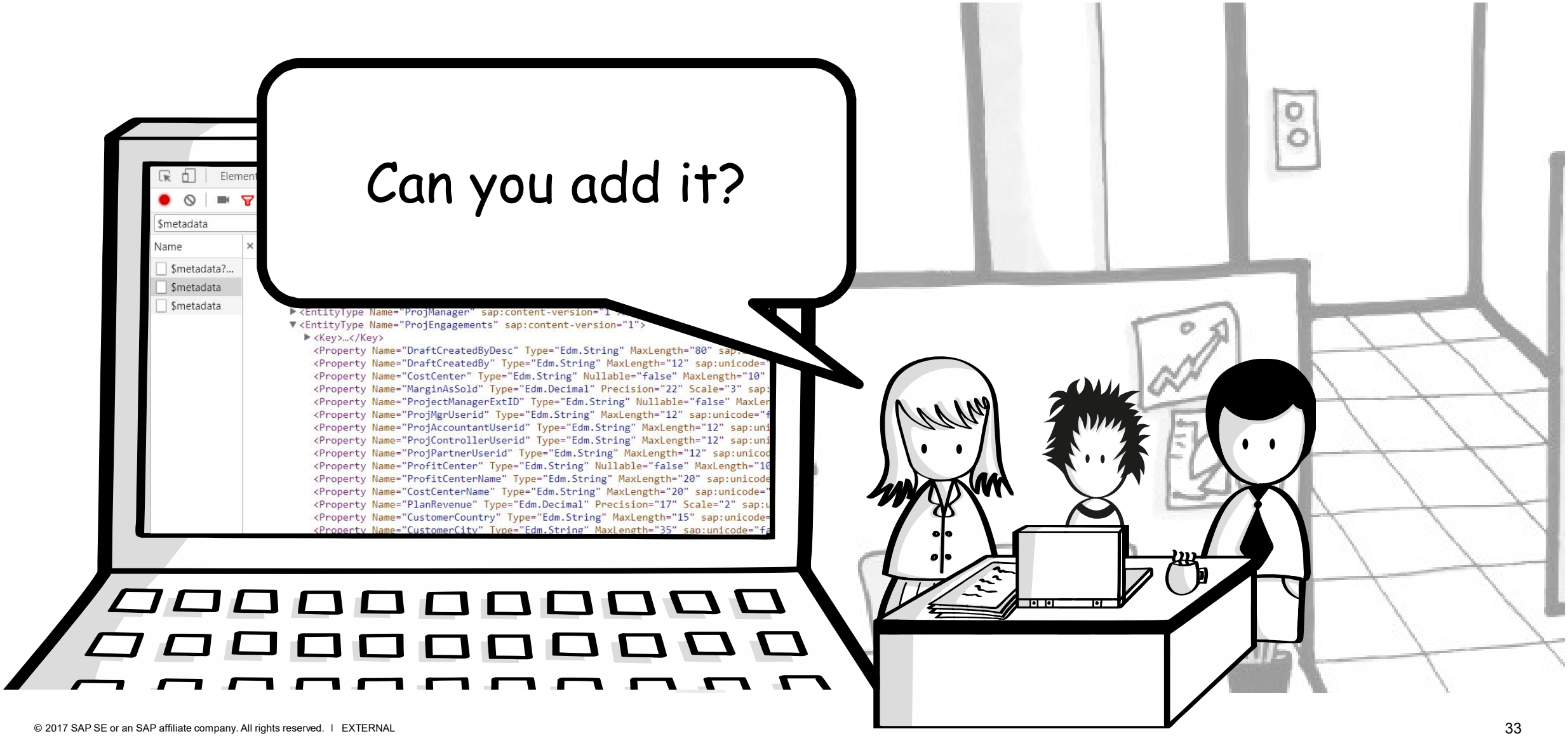

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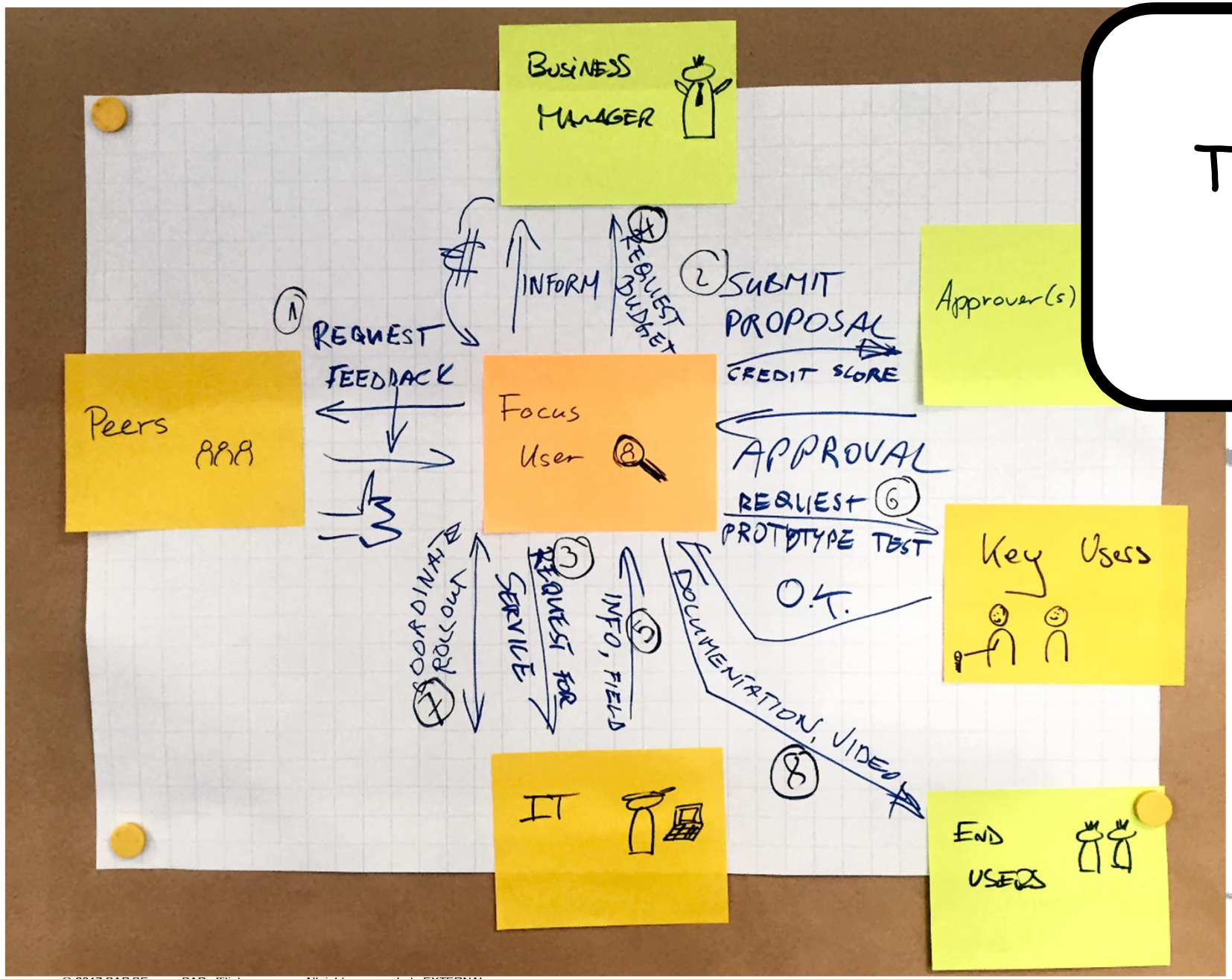
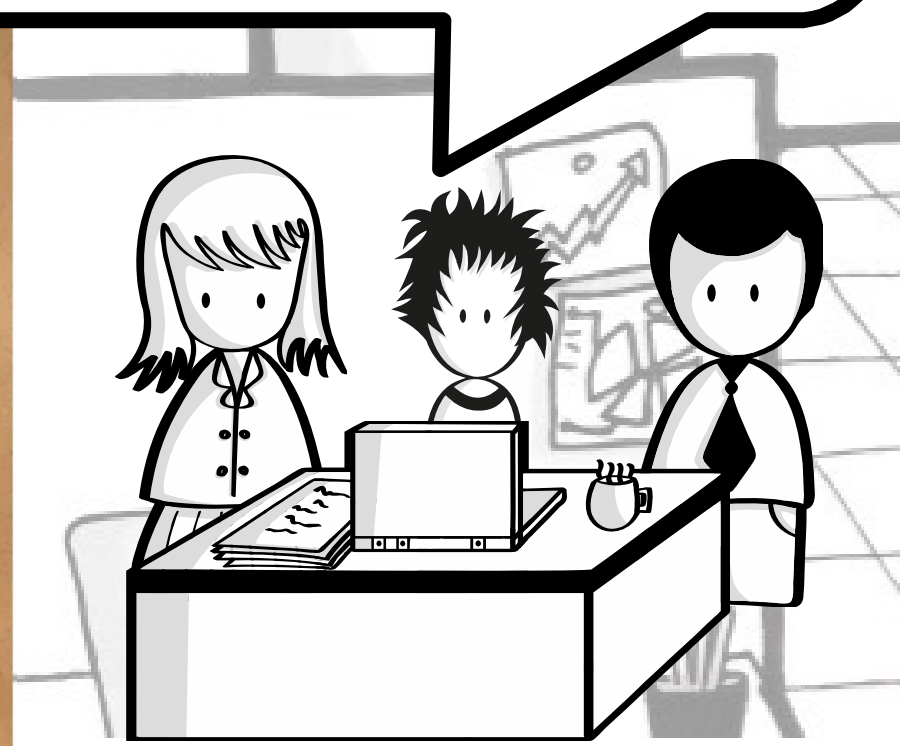


That **was** a complex process.



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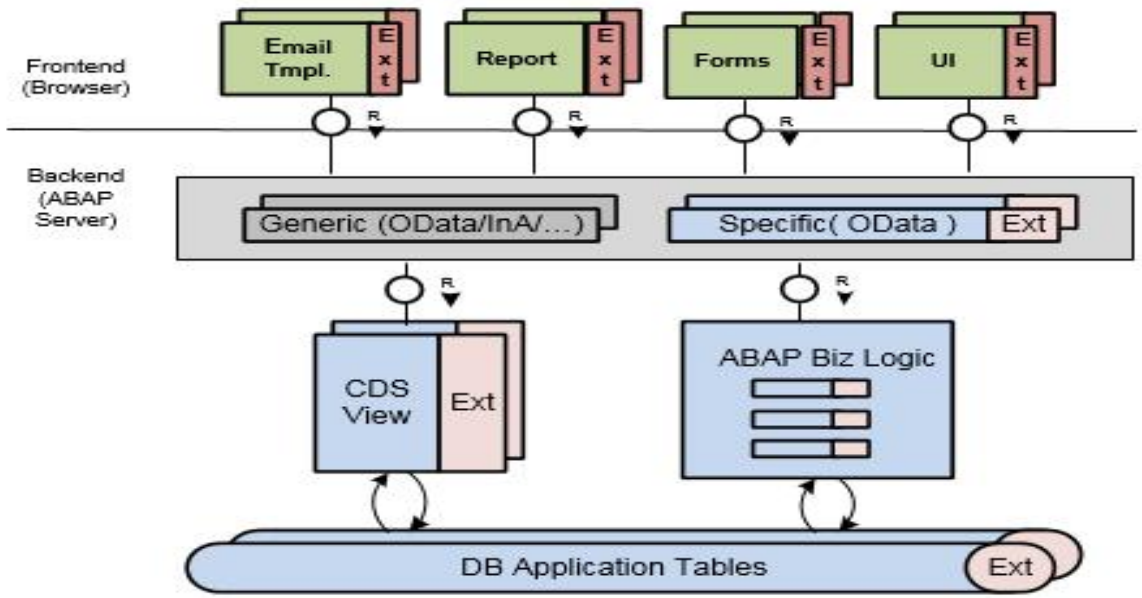

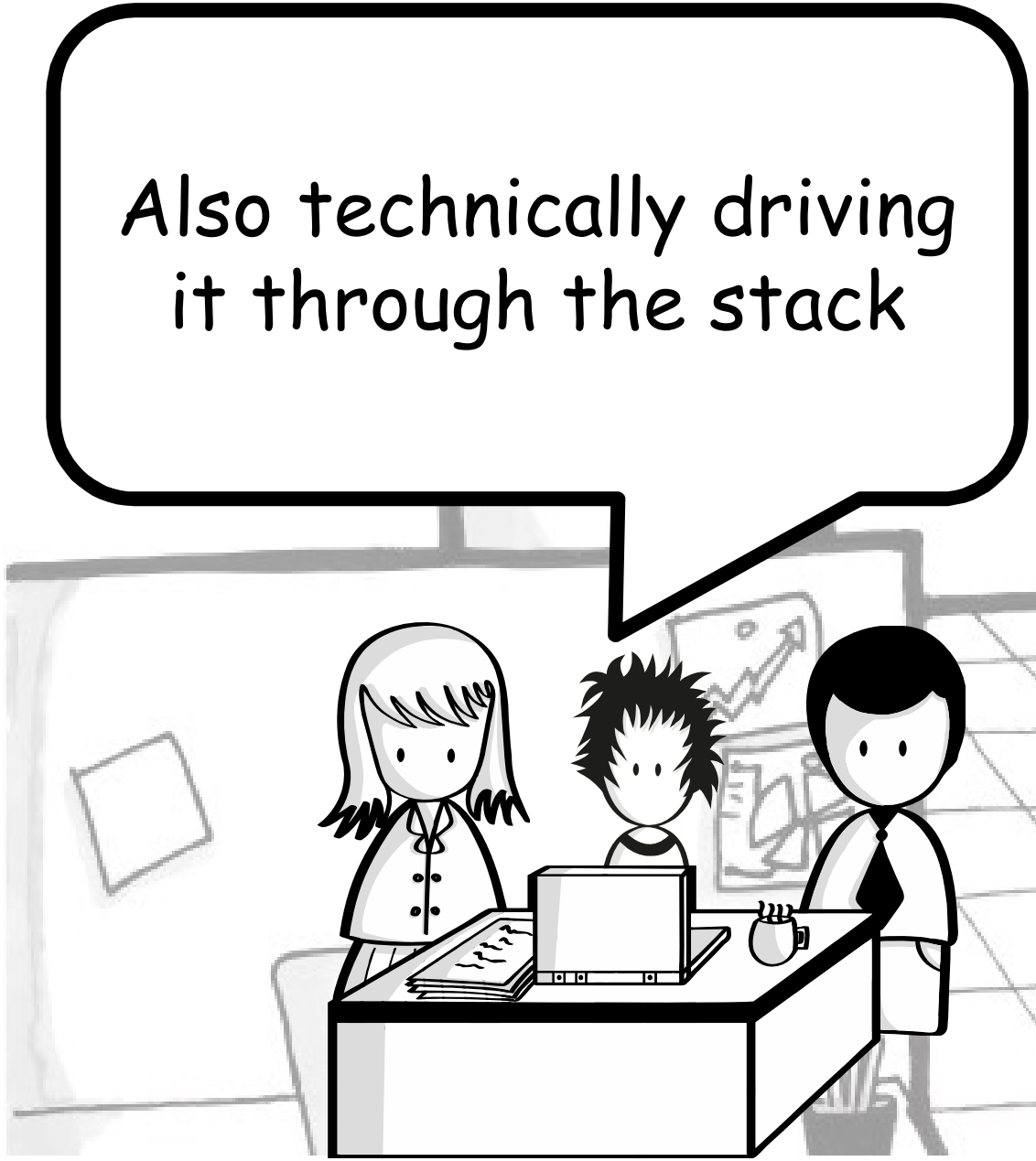

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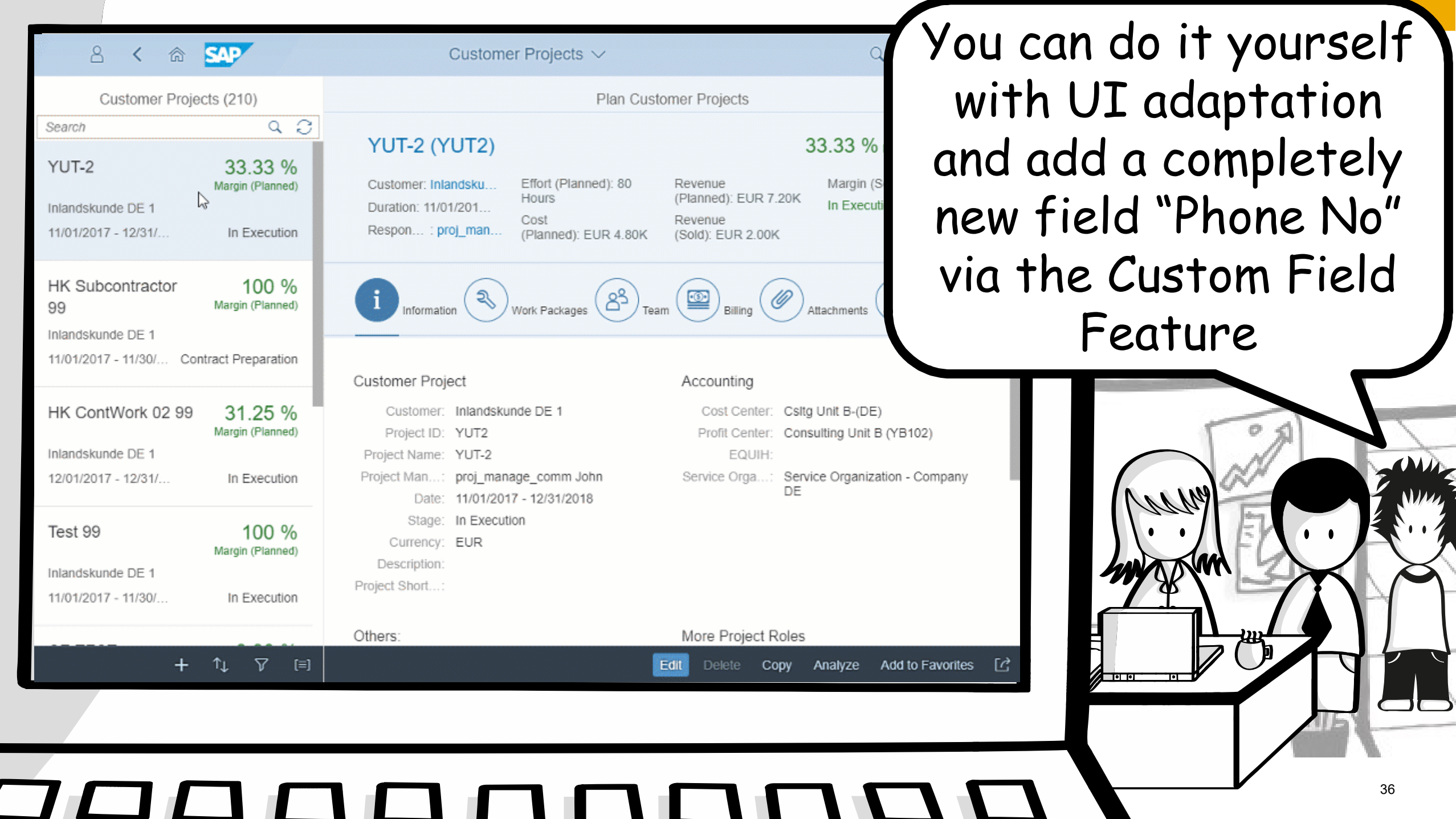
Customer Projects
Customer Projects (210)
Search
YUT-2
33.33 %
Margin (Planned)
Inlandskunde DE 1
11/01/2017 - 12/31/...
In Execution
HK Subcontractor 99
100 %
Margin (Planned)
Inlandskunde DE 1
11/01/2017 - 11/30/...
Contract Preparation
HK ContWork 02 99
31.25 %
Margin (Planned)
Inlandskunde DE 1
12/01/2017 - 12/31/...
In Execution
Test 99
100 %
Margin (Planned)
Inlandskunde DE 1
11/01/2017 - 11/30/...
In Execution
Plan Customer Projects
YUT-2 (YUT2)
33.33 %
Customer: Inlandsku...
Duration: 11/01/201...
Respon... : proj_man...
Effort (Planned): 80 Hours
Cost (Planned): EUR 4.80K
Revenue (Planned): EUR 7.20K
Revenue (Sold): EUR 2.00K
In Executi
Information
Work Packages
Team
Billing
Attachments
Customer Project
Customer: Inlandskunde DE 1
Project ID: YUT2
Project Name: YUT-2
Project Man...: proj_manage_comm John
Date: 11/01/2017 - 12/31/2018
Stage: In Execution
Currency: EUR
Description:
Project Short...:
Accounting
Cost Center: Csltg Unit B-(DE)
Profit Center: Consulting Unit B (YB102)
EQUIH:
Service Orga...: Service Organization - Company DE
Others:
More Project Roles
Edit
Delete
Copy
Analyze
Add to Favorites
You can do it yourself with UI adaptation and add a completely new field "Phone No" via the Custom Field Feature

Which pattern had been used?

▪ Still the same app	➡ Identity, Inclusion Pattern
▪ Adding the Field through the DB table, Backend Stack, Rest API, UI	➡ Delta Object Pattern (DDIC Appends & UI Changes)
▪ Where to add the field	➡ Explicit Anchor Points (Extension Includes & UI Control IDs)
▪ UI Adaptation possible from SAP development and key user (Kate)	➡ Priority Pattern (Order by Dependency, Layer, Time)

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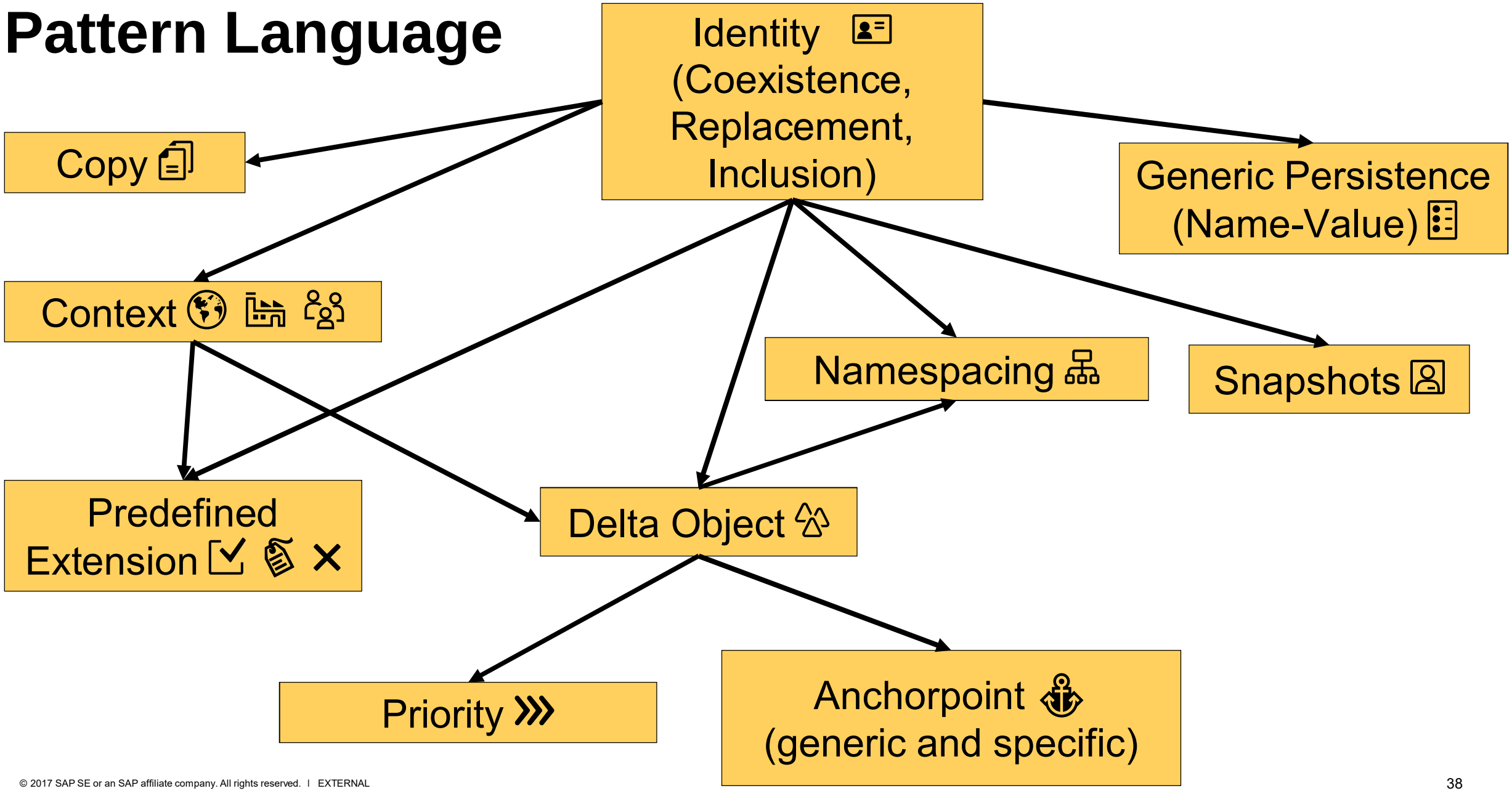
Pattern Language



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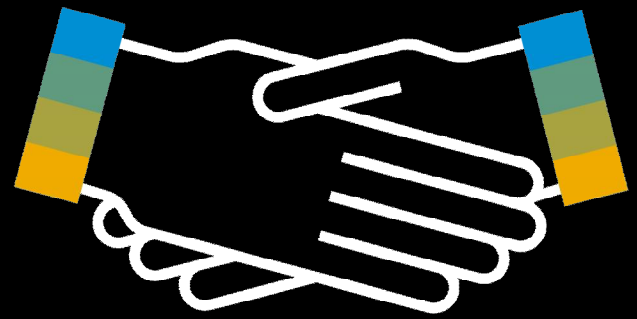
Thanks for attending this session.



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