




Extensibility, Adaptation and more Patterns for truly flexible Standard Software

Sebastian Wennemers, SAP

 @S7nW7s

EXTERNAL



WONDERFUL FEEDBACK?

Characters



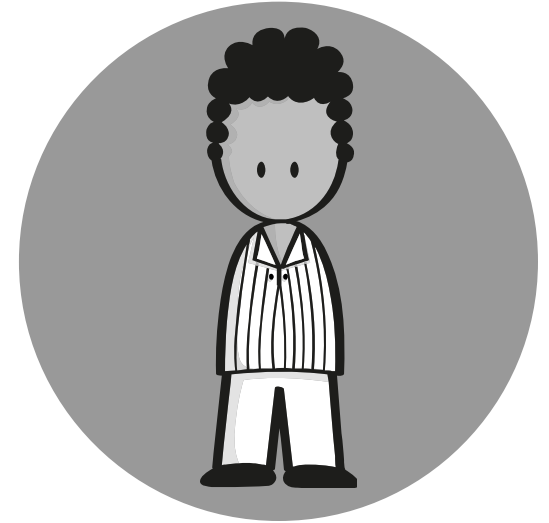
Norman, 28
Developer



Paula, 35
Partner Developer

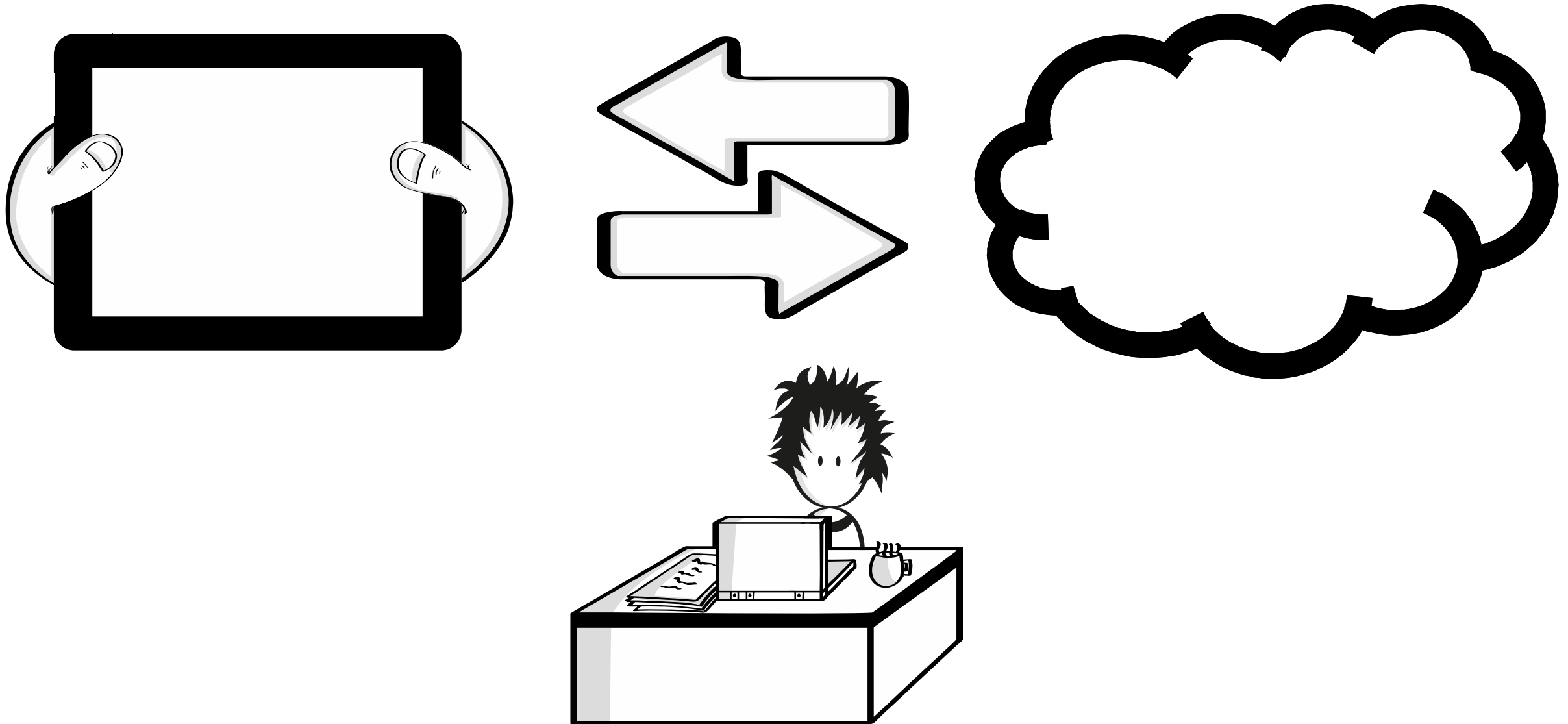


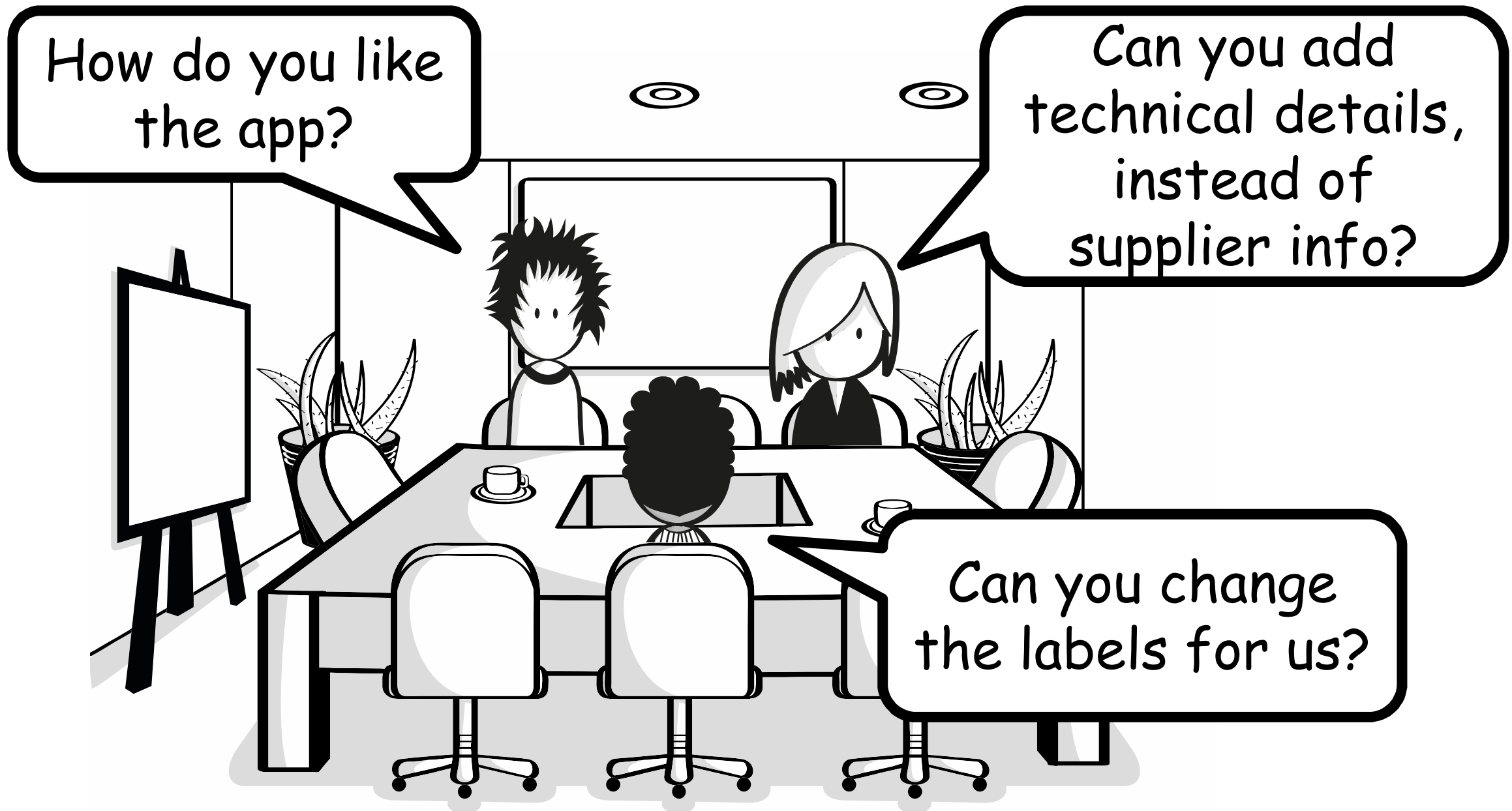
Kate, 32
Product Mgmt

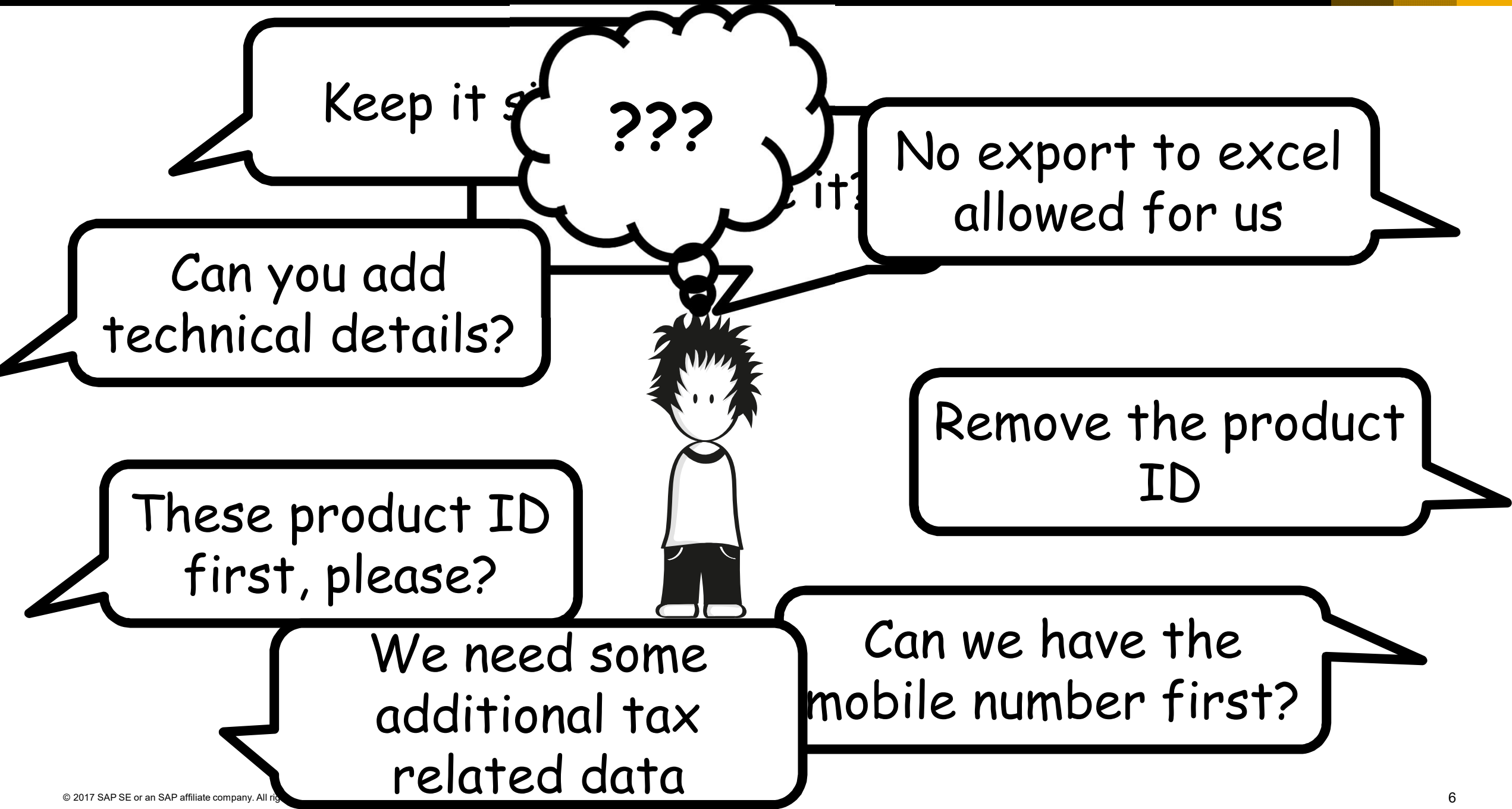


Eduardo, 42
Sales Rep

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

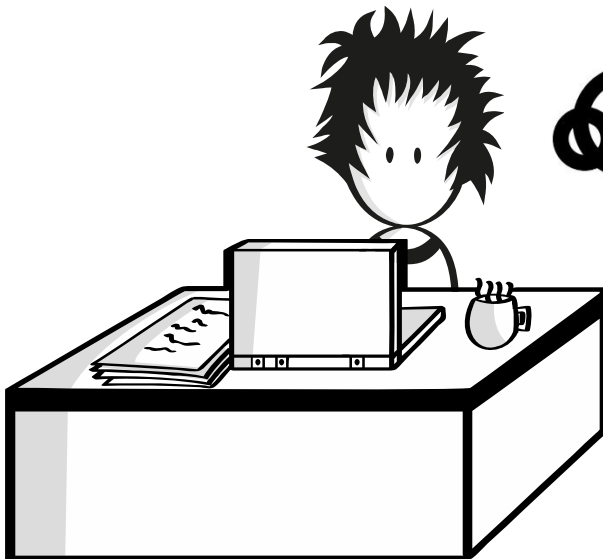


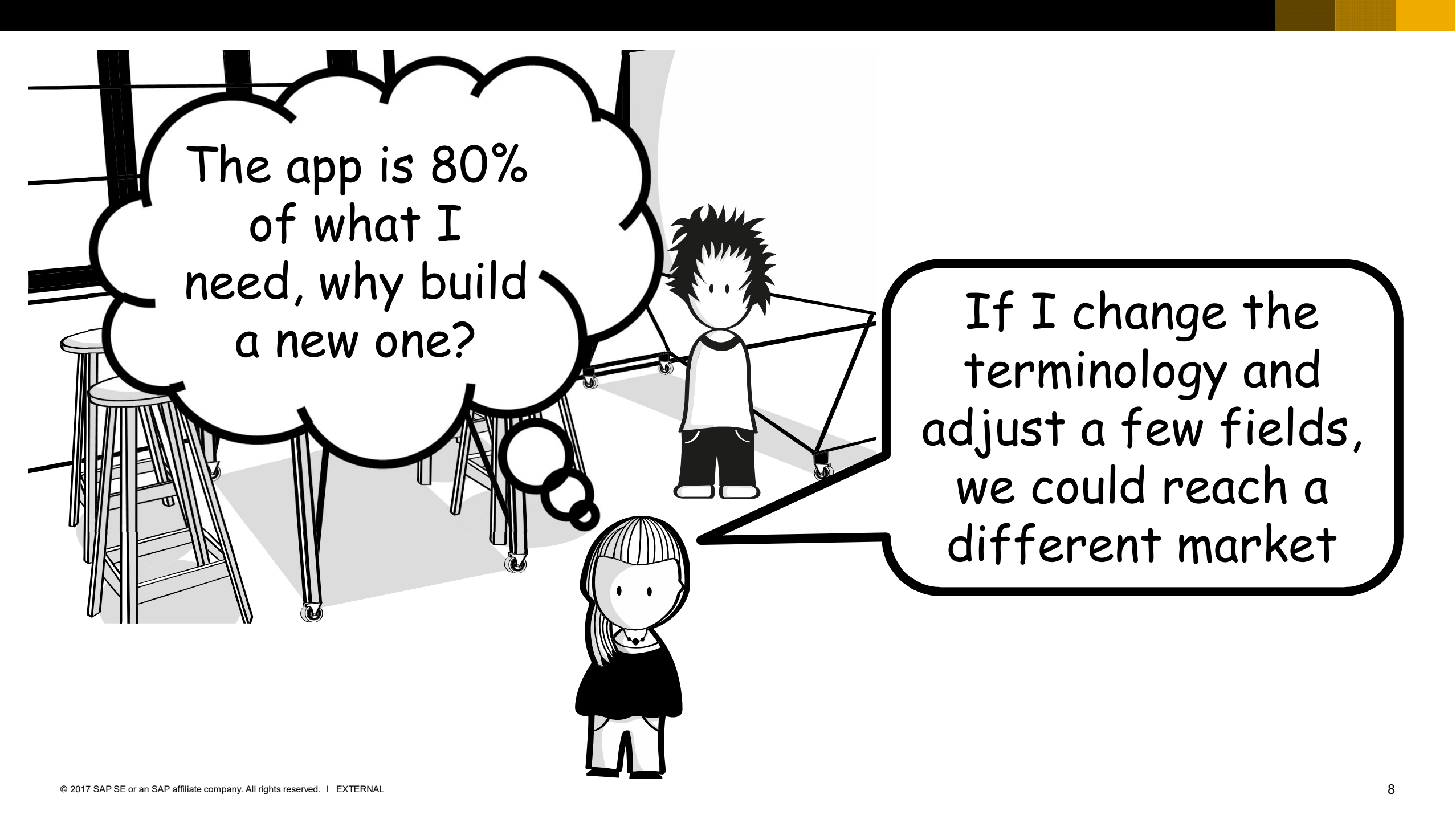




How many apps
should I build?

Updates will be a
nightmare!



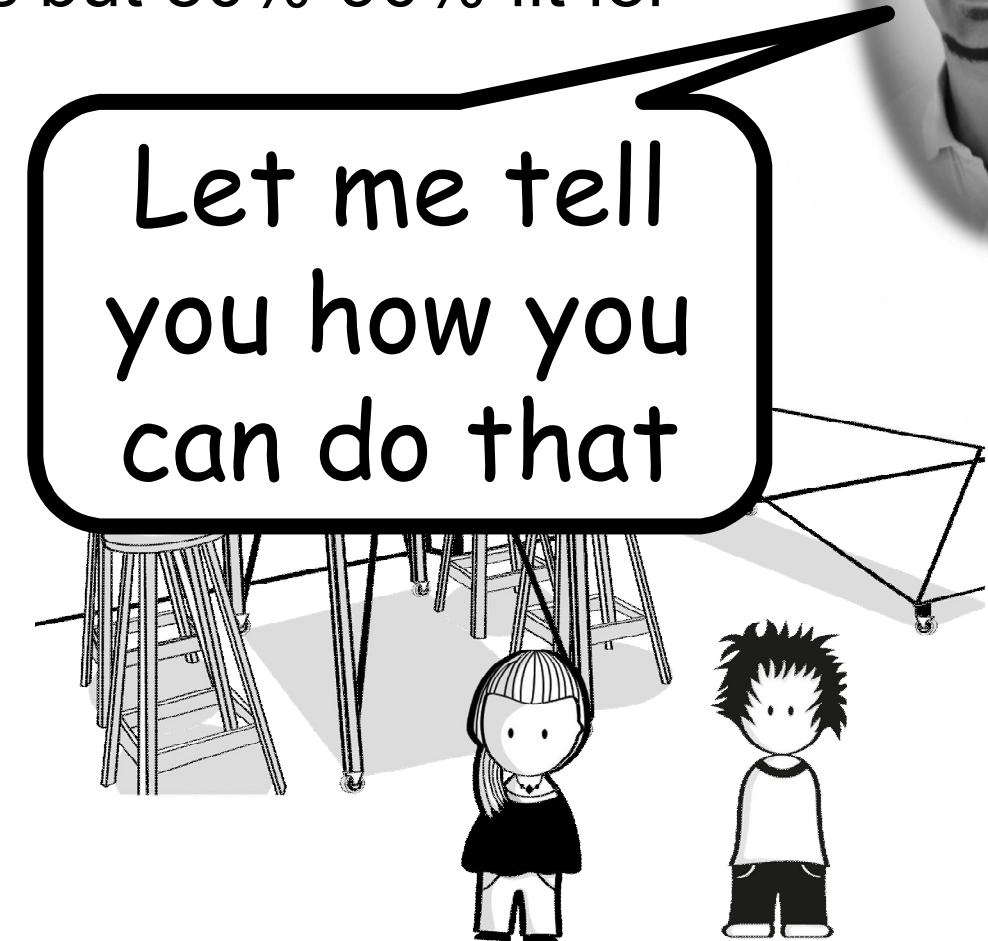


The app is 80%
of what I
need, why build
a new one?

If I change the
terminology and
adjust a few fields,
we could reach a
different market

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



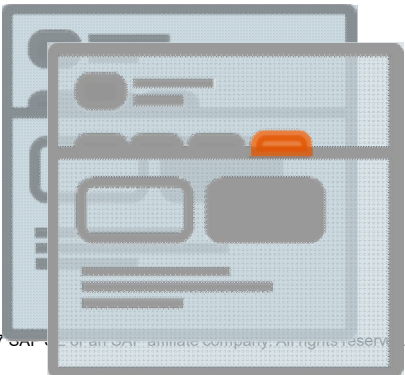
How to start?

Identity Pattern

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

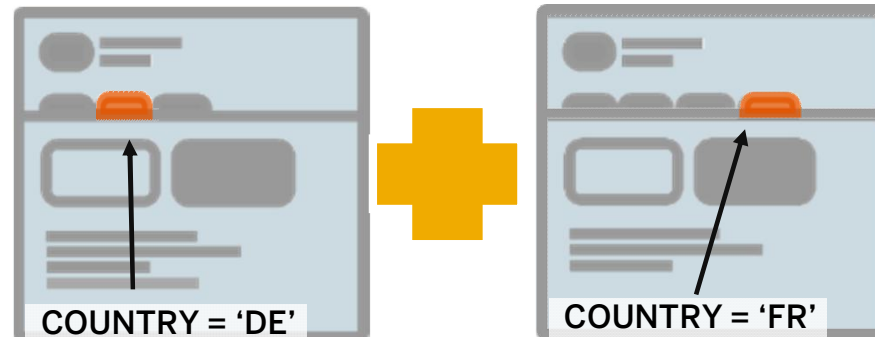
Replacement

- Everyone



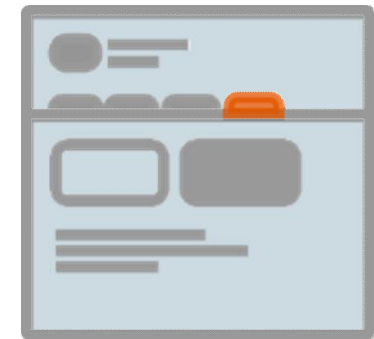
Coexistence

- User groups



Inclusion

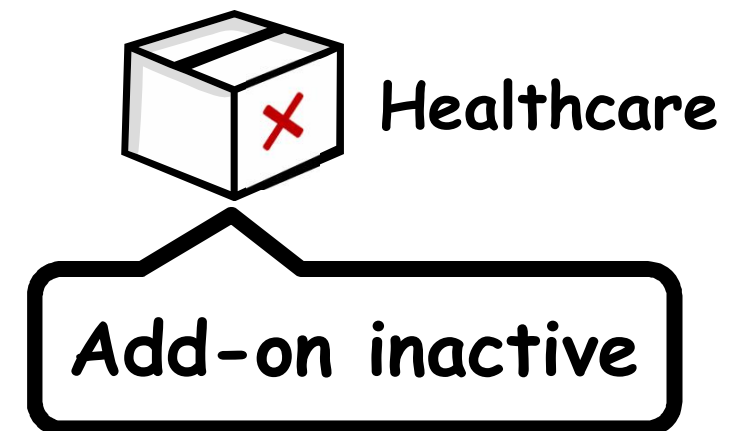
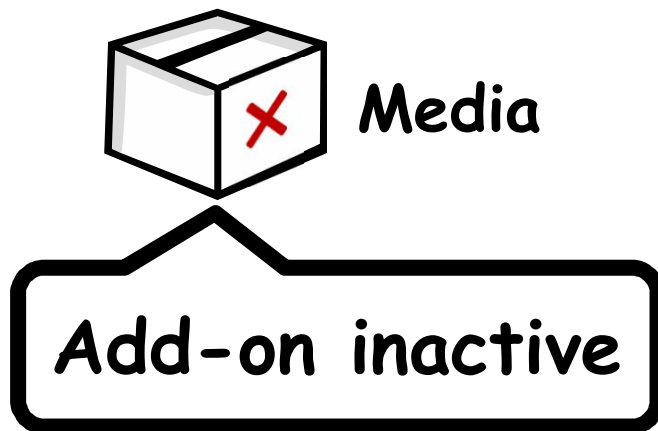
- Everyone



Context Pattern

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

I want one app for every main country, but my industry Add-ons should be included in all apps automatically



What is wrong with copies?

Copy Pattern

- Decoupling from the bugfixes and new features

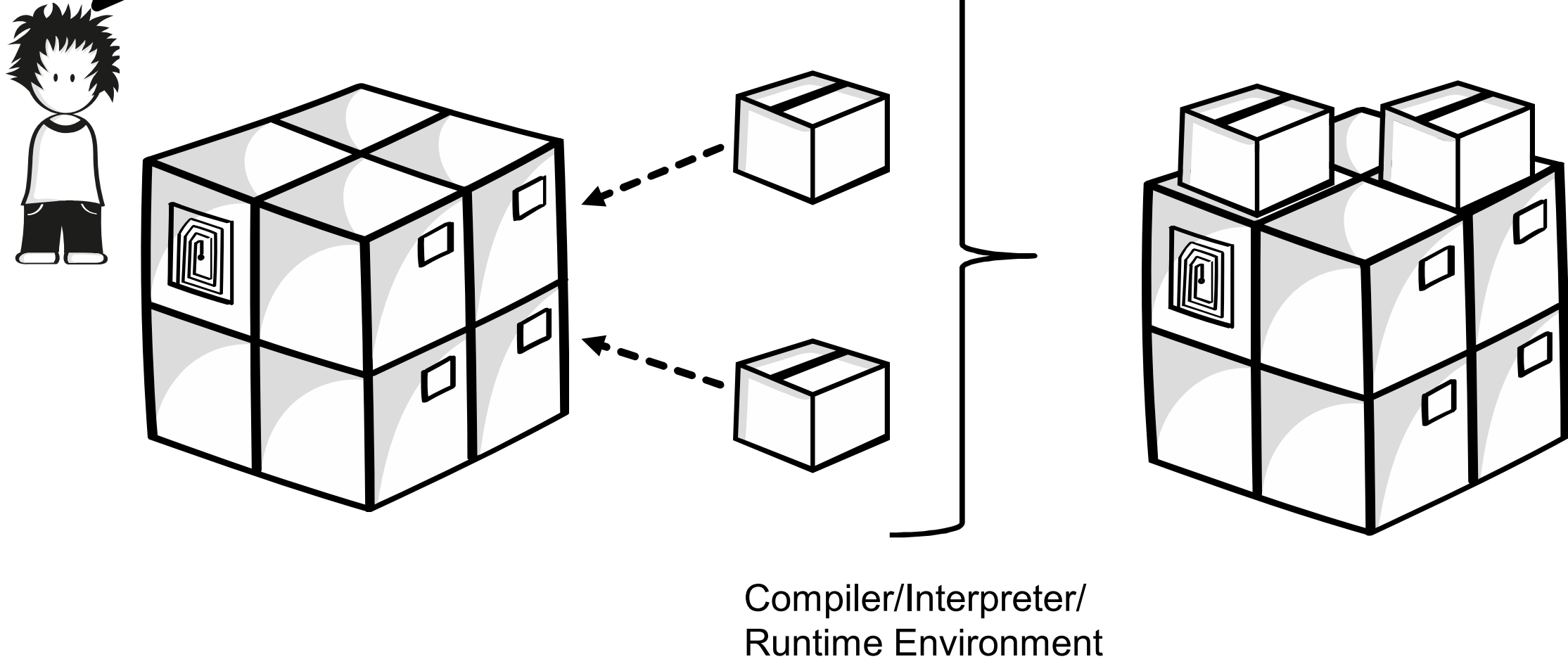


Are there any good use cases for the copy pattern?

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


How do I keep
it one app

Extend by Delta Object Pattern



Example: UI changes as Delta Object for SAPUI5 flexibility application

HT-1256



GENERAL INFORMATION

General Information

Product:
HT-1256

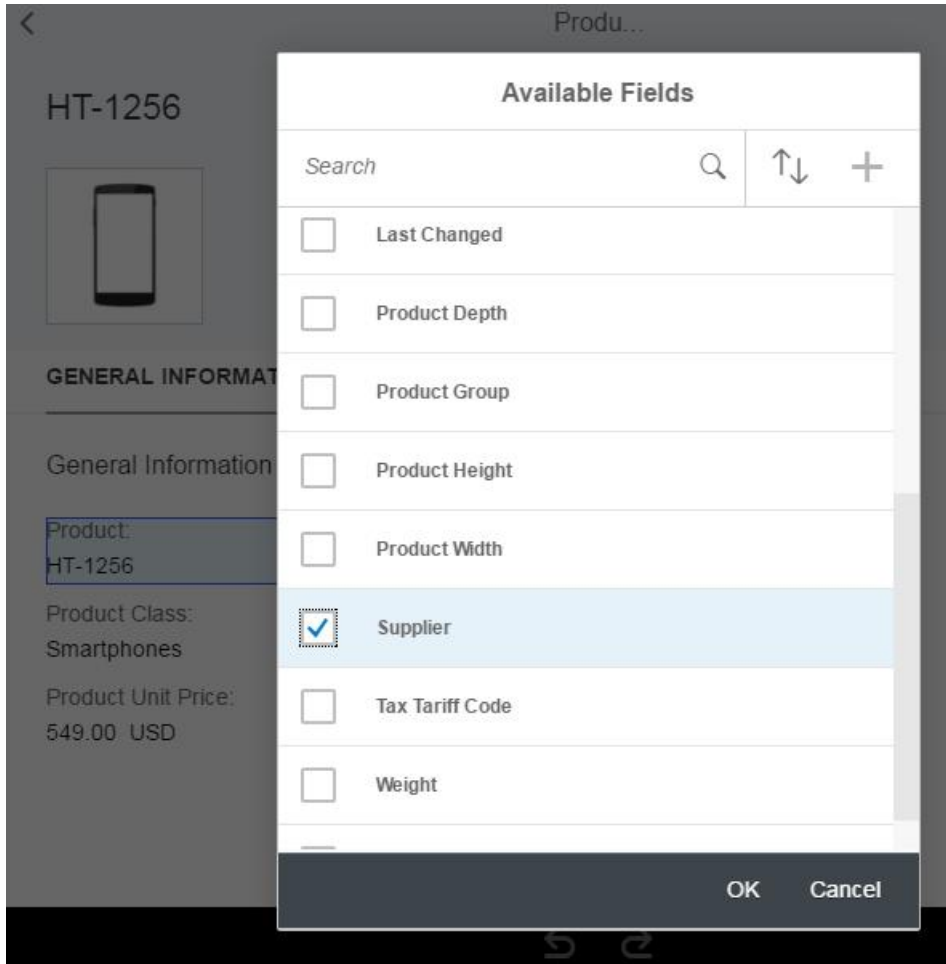
Product Class:
Smartphones

Product Unit Price:
549.00 USD

```
<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

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

Example: UI changes as Delta Object for SAPUI5 flexibility application

HT-1256



GENERAL INFORMATION

General Information

Product:

HT-1256

S:

100000030

Product Class:

Smartphones

Product Unit Price:

549.00 USD

```
<smartForm:Sma {
  <smartForm
    <smart
      <sl
    </smar
    </smar
    <smart
      <sl
    </smar
    <smart
      <sl
    </smar
    <smart
      <sl
    </smar
  </smartForm
</smartForm:Sma
}
```

```
{
  "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

Anchor Point Pattern

Where can I add my Extensions?



Explicit

- Pre-thought and placed
- Stability



Generic

- Framework provided places
- Availability

Extension Includes as Anchor Points and Appends as Delta Object

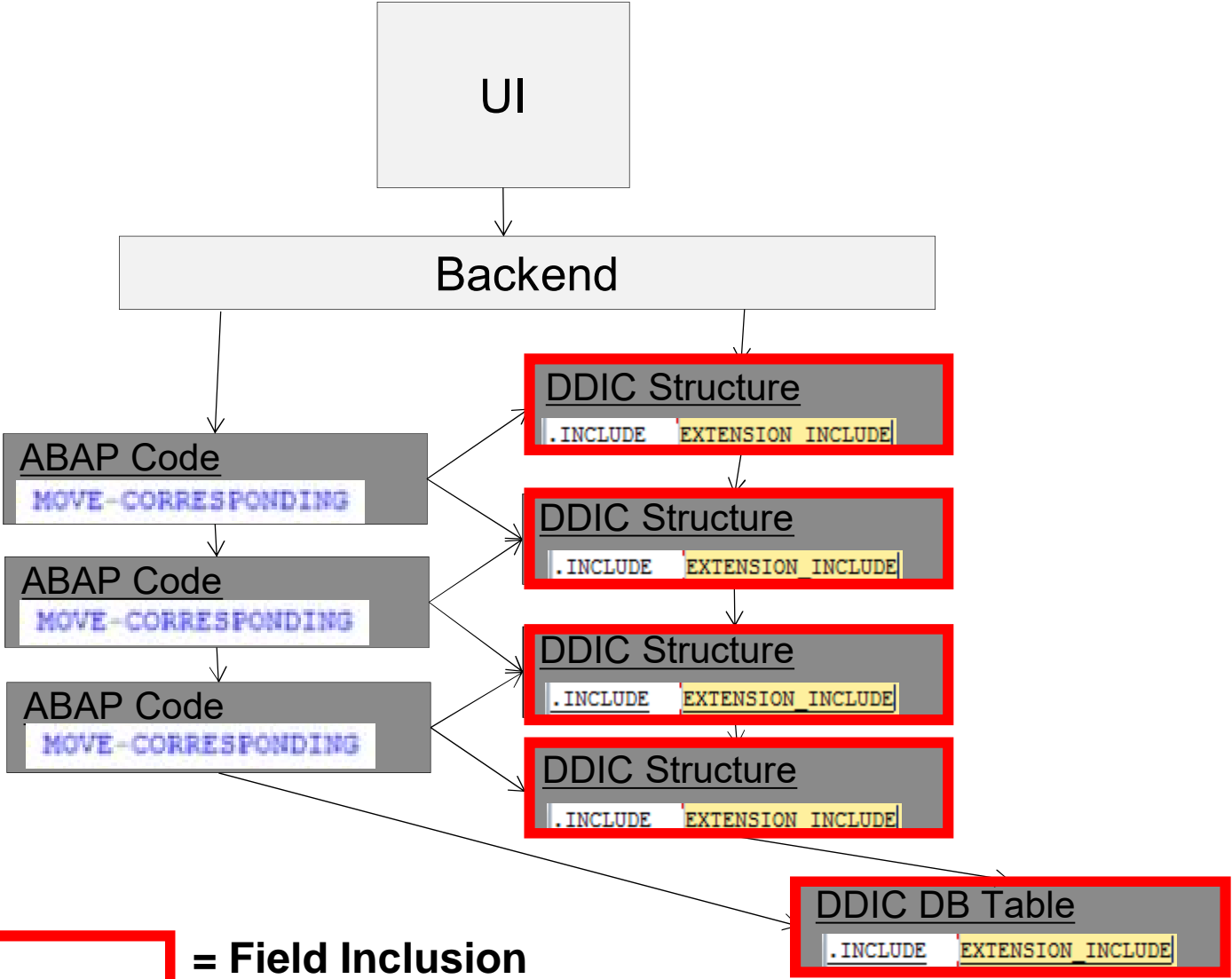
DB Table Structure

ID	Name	Ref	Product
			Append

(Extension) Include

Street	No	City	ZIP
			Append

Extension Includes as Anchor Points and Appends as Delta Object



Dictionary: Change Append Structure

Append Structure: ZZCUSTOMER_EXTENSION
Short Description: Customer Extension

Attributes Components Entry Help/Check Curr

Predefined Type Show

Component	Type Category	Component Type
ZEXT_FIELD1	Type	TEXT20

Structure: EXTENSION_INCLUDE
Short Description: Extension Include

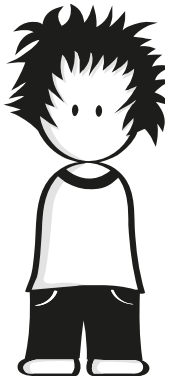
Attributes Components Entry Help/Check

Predefined Type

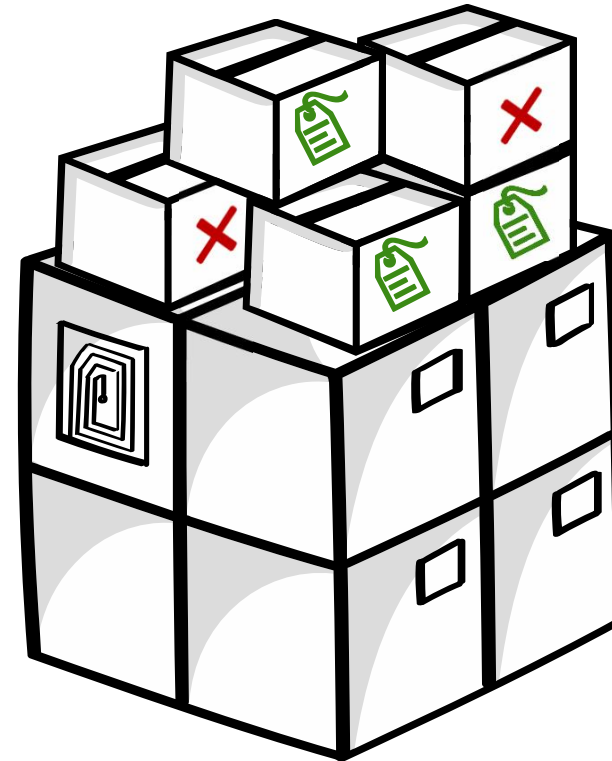
Component	Type Category	Component
DUMMY	Type	CHAR01

Can it be simpler?

Predefined Extensions



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



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

Attributes Components Input Help/Check Currency/Quantity Fields						
Predefined Type 436 / 447						
Component	Typing Method	Component Type	Data Type	Length	Deci...	Short Description
LONGNUM	1 Types	▼ /SAPSPRO/LONGN...	CHAR	40	0	Smart Number
.APPEND	1 Types	▼ J 1I IV LIC DRS...	00	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	00	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

Hidden Section as example for Predefined Extensions

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

The screenshot displays the SAP Fiori 'Product' application interface. At the top, there's a header with the SAP logo and navigation tabs: 'UI Adaptation' and 'Navigation'. Below the header, the main content area shows details for 'Notebook Basic 15 HT-1000'. This includes a laptop icon, category information (Computer Systems, Notebooks), price (956.00 USD), and stock status (In Stock). A modal window titled 'Available Sections' is open in the center, featuring a search bar and a list of sections. The 'Technical Data' section is selected and checked. The background content is partially obscured by the modal. At the bottom of the modal, 'OK' and 'Cancel' buttons are visible. The main content area also has tabs for 'GENERAL INFORMATION' and 'SUPPLIER'. Below these, there's a section for 'Product: HT-1000' with description, supplier, and average rating. Another section for 'SUPPLIER' contains company and contact information.

Product

Notebook Basic 15 HT-1000

Category: Computer Systems
Sub-Category: Notebooks
Company Name: SAP

956.00 USD
In Stock

GENERAL INFORMATION SUPPLIER

Product: HT-1000
Description: Notebook Basic 15, OS 8 Pro
Supplier: SAP
Average Rating: ★★★★★

Available Sections

Search

☒ Technical Data

OK Cancel

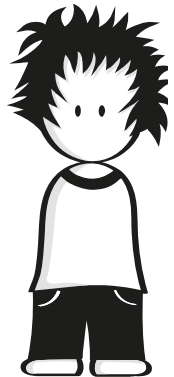
SUPPLIER

Company Information
Company Name: SAP
Phone: +490622734567
Fax: +490622734004
Web Address: http://www.sap.com
Deals With: IT Equipment (Generic Field)

Contact Person
First Name: Karl
Last Name: Müller
Phone: +490622734567
Email: do.not.reply@sap.com

Edit Delete Copy

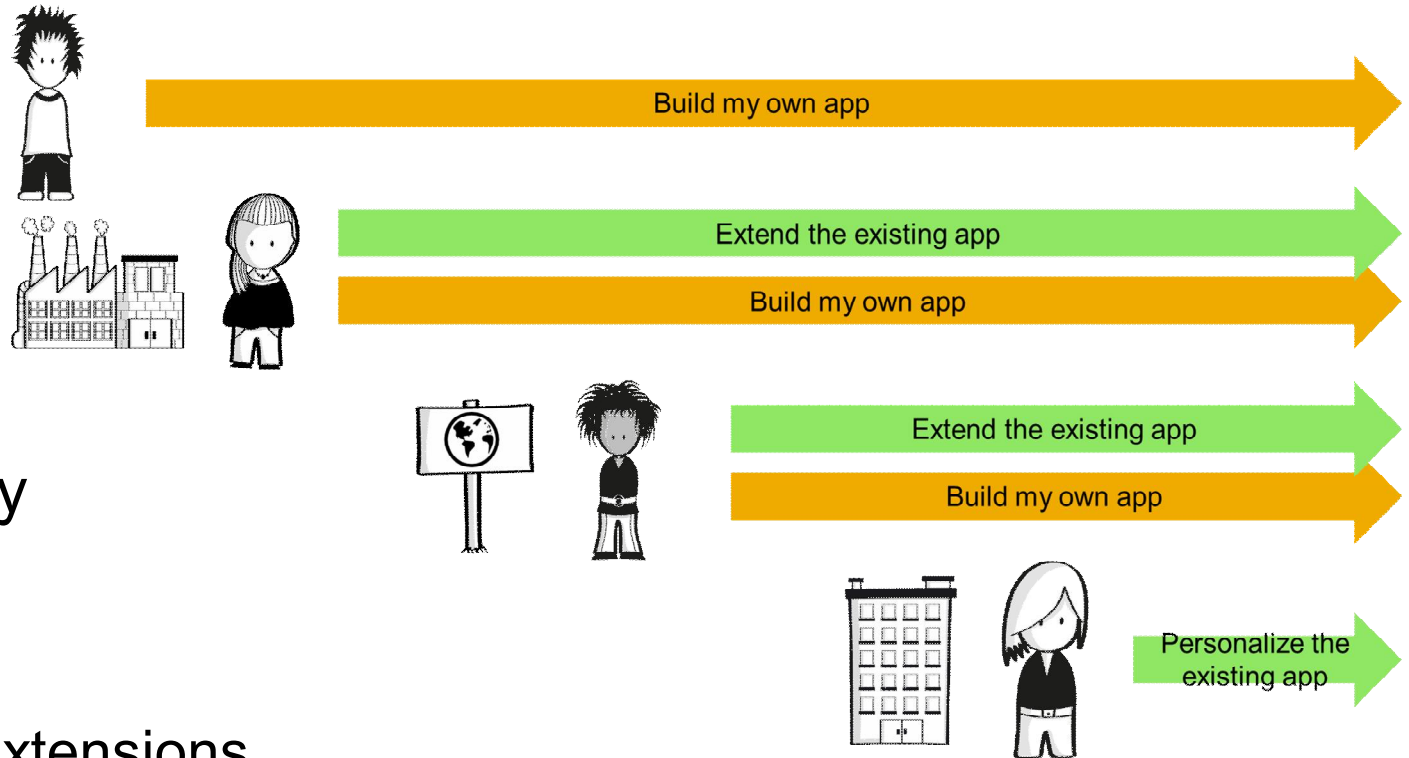
What if different groups extend my app independently?



Define execution order by

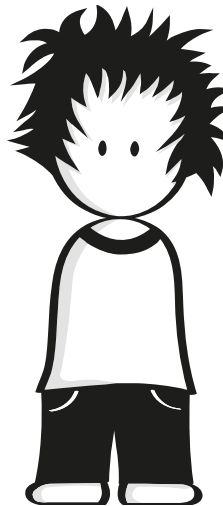
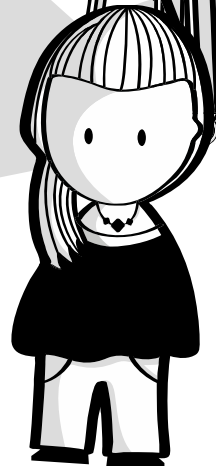
- Creation Time
- Layer/Group
- Dependency to other extensions
- <your strategy>

Priority Pattern





With all that in
place, let's see
what your users
can do



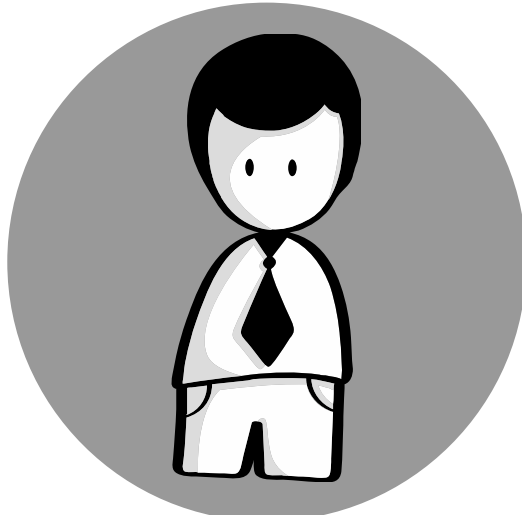


NO WAY TO REACH THE CUSTOMER

Characters



Kate, 35
Project Manager



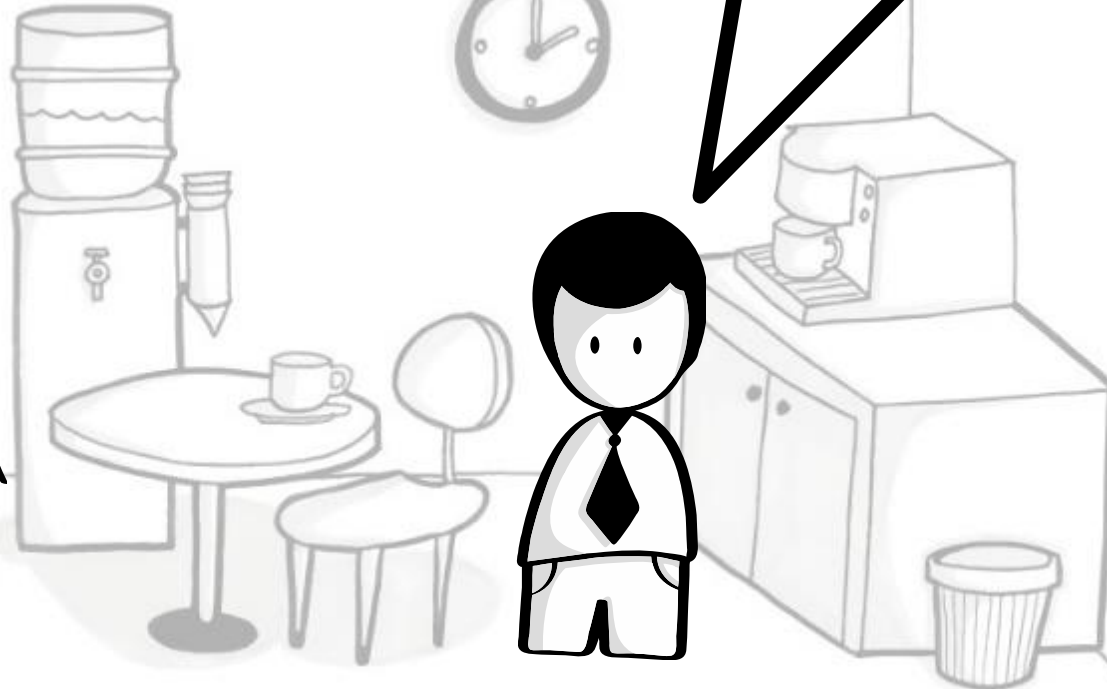
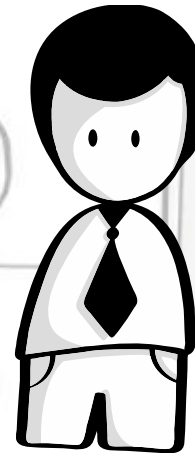
Jack, 31
Consultant



Norman, 28
Developer

Hi Jack,
how is it
going?

Hard time,
reaching our
customer



Do we have more
contact info in the
system?

YUT-2 (YUT2) 33.33 % Margin (Planned)

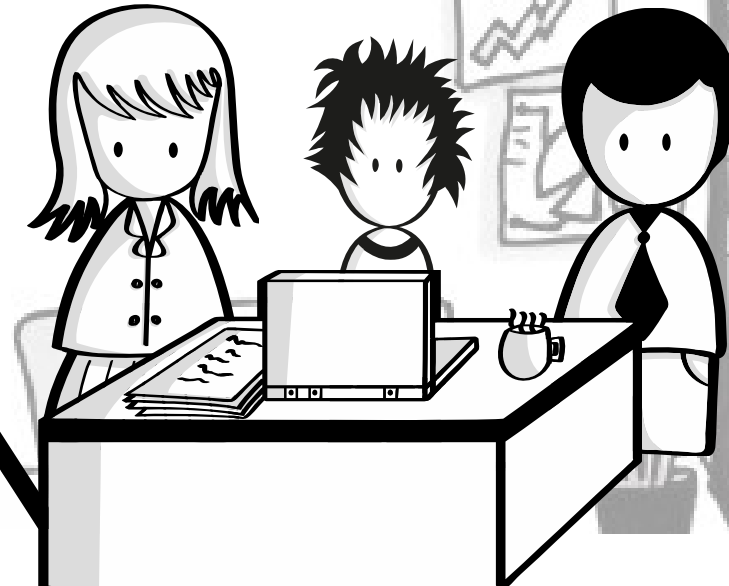
Customer: Inlandskunde DE ... Effort (Planned): 80 Hours Revenue (Planned): EUR 7.20K Margin (Sold): -140 %
Duration: 11/01/2017 - 12/31/... Cost (Planned): EUR 4.80K Revenue (Sold): EUR 2.00K In Execution
Responsible: proj_manage_com...

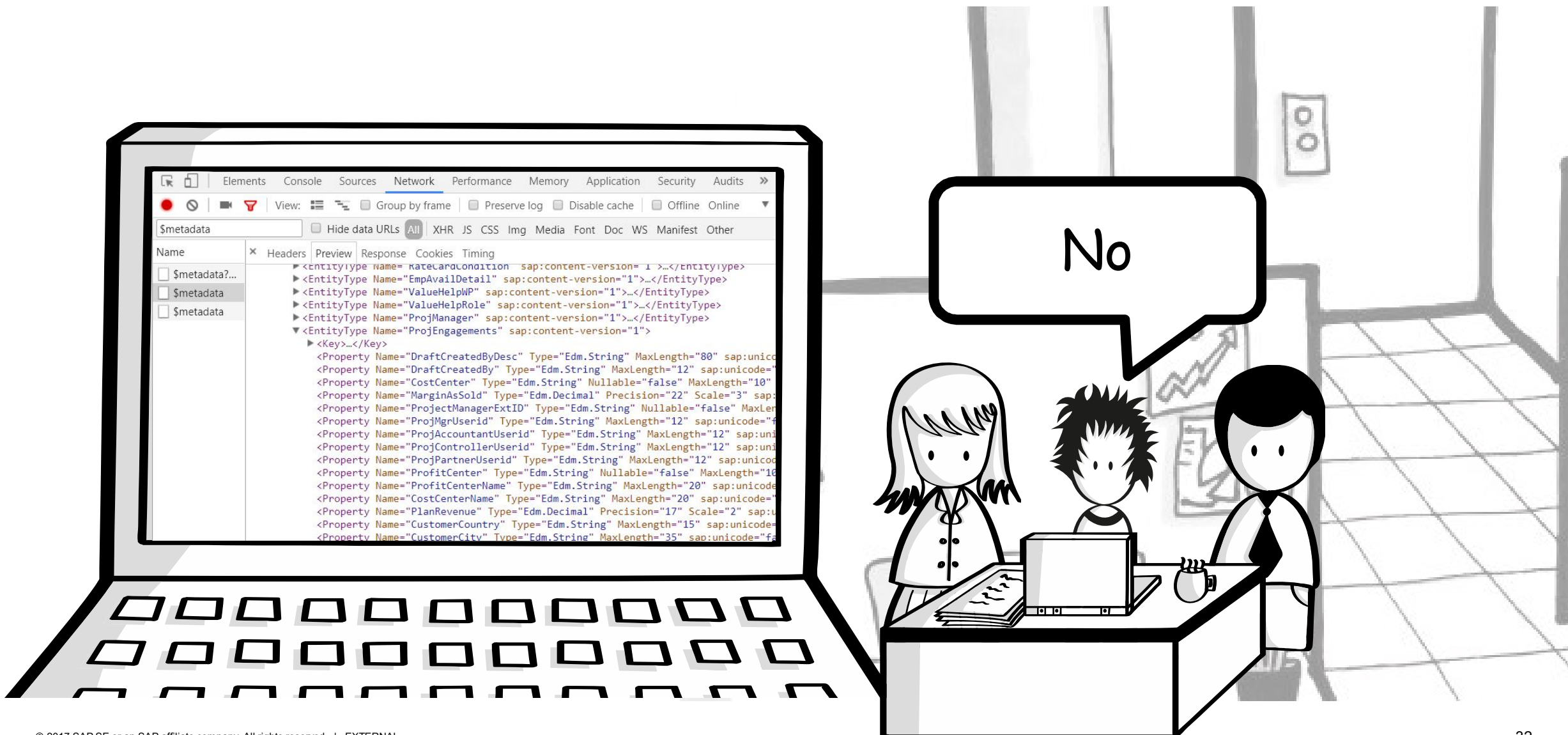
Navigation: Information | Work Packages | Team | Billing | Attachments | Versions

Customer Project	Accounting	Others:
Customer: Inlandskunde DE 1	Cost Center: Csltg Unit B-(DE)	Changed By: CB9980000106
Project ID: YUT2	Profit Center: Consulting Unit B (YB102)	Changed On: 12/07/2017, 14:00:32
Project Name: YUT-2	EQUIH:	City: Schöntal
Project Manager: proj_manage_com John	Service Orga...: Service Organization - Company DE	Country: DE
Date: 11/01/2017 - 12/31/2018		KAR_TEXT: No
Stage: In Execution		
Currency: EUR		
Description:		
Project Short ...:		

More Project Roles Public Project

Project Partner: Resource_Manager John



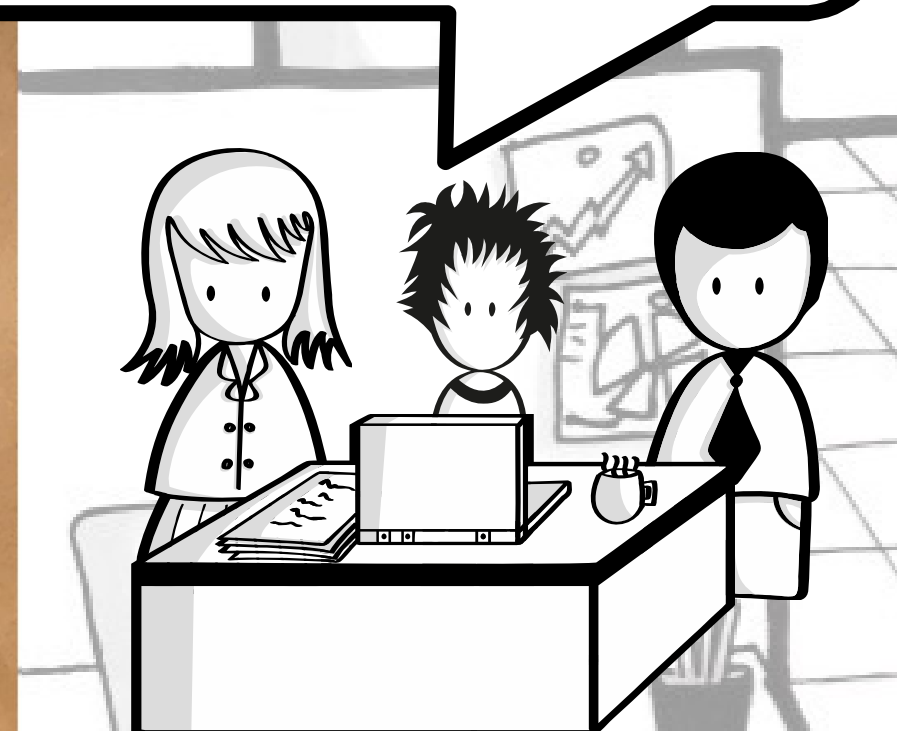
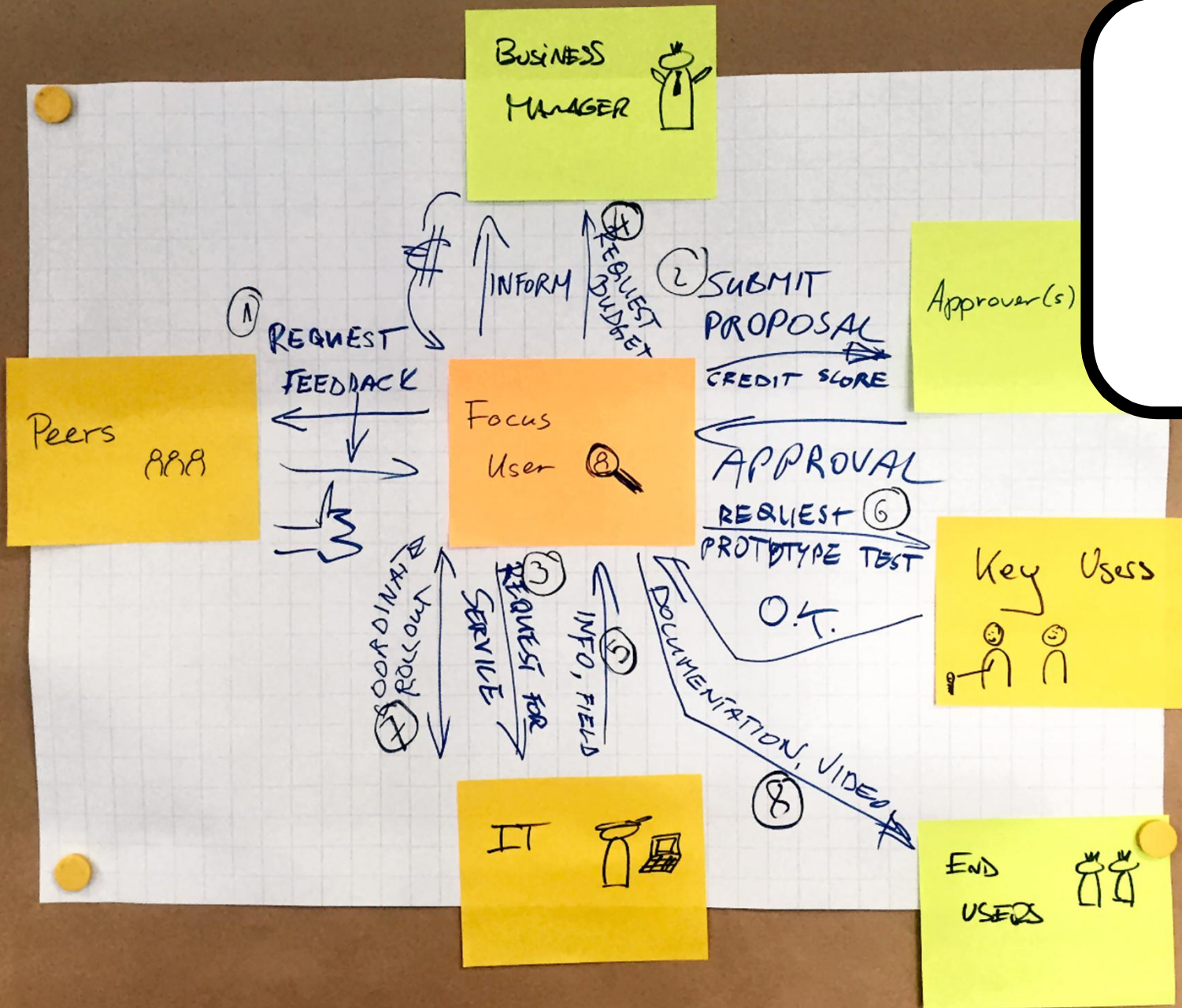


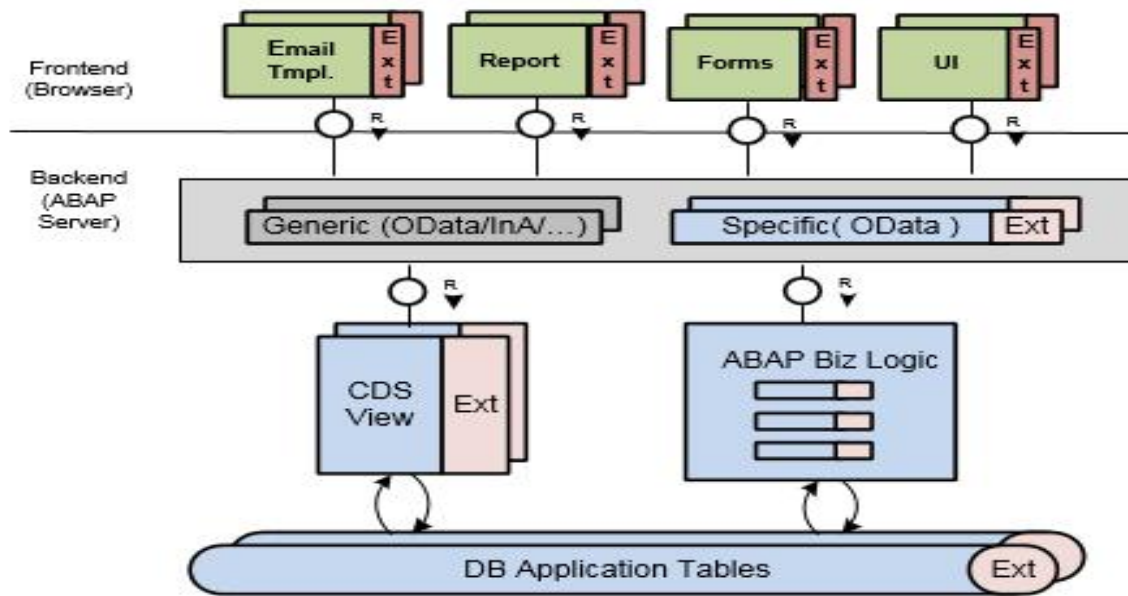
Can you add it?

```
<Entity Type Name="ProjManager" sap:content-version="1">
  <Key>...</Key>
  <Property Name="DraftCreatedByDesc" Type="Edm.String" MaxLength="80" sap:unicode="false" />
  <Property Name="DraftCreatedBy" Type="Edm.String" MaxLength="12" sap:unicode="false" />
  <Property Name="CostCenter" Type="Edm.String" Nullable="false" MaxLength="10" sap:unicode="false" />
  <Property Name="MarginAsSold" Type="Edm.Decimal" Precision="22" Scale="3" sap:unicode="false" />
  <Property Name="ProjectManagerExtID" Type="Edm.String" Nullable="false" MaxLength="12" sap:unicode="false" />
  <Property Name="ProjMgrUserId" Type="Edm.String" MaxLength="12" sap:unicode="false" />
  <Property Name="ProjAccountantUserId" Type="Edm.String" MaxLength="12" sap:unicode="false" />
  <Property Name="ProjControllerUserId" Type="Edm.String" MaxLength="12" sap:unicode="false" />
  <Property Name="ProjPartnerUserId" Type="Edm.String" MaxLength="12" sap:unicode="false" />
  <Property Name="ProfitCenter" Type="Edm.String" Nullable="false" MaxLength="10" sap:unicode="false" />
  <Property Name="ProfitCenterName" Type="Edm.String" MaxLength="20" sap:unicode="false" />
  <Property Name="CostCenterName" Type="Edm.String" MaxLength="20" sap:unicode="false" />
  <Property Name="PlanRevenue" Type="Edm.Decimal" Precision="17" Scale="2" sap:unicode="false" />
  <Property Name="CustomerCountry" Type="Edm.String" MaxLength="15" sap:unicode="false" />
  <Property Name="CustomerCity" Type="Edm.String" MaxLength="35" sap:unicode="false" />
</Entity Type>
```

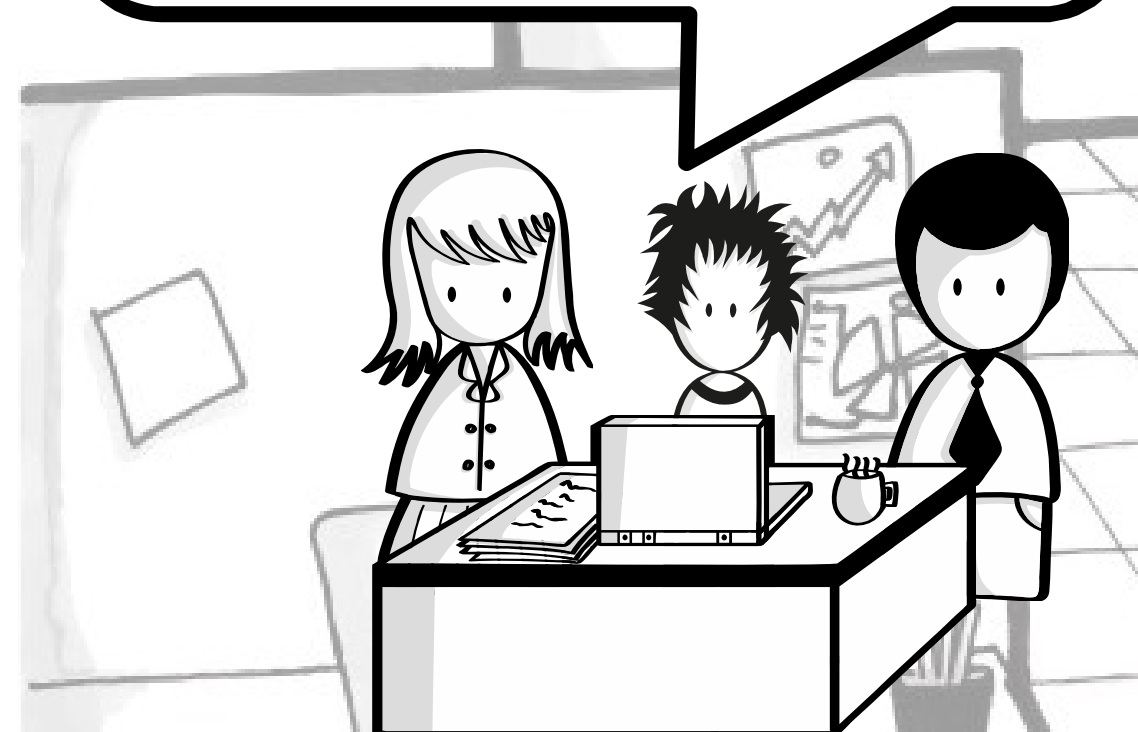


That was a complex process.





Also technically driving it through the stack



SAP Customer Projects

Customer Projects (210)

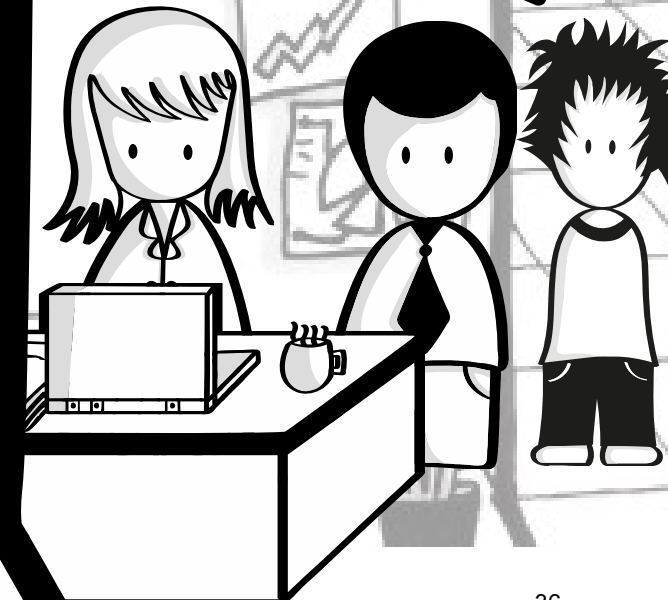
Search

Customer Projects (210)	Plan Customer Projects
YUT-2 33.33 % Margin (Planned) Inlandskunde DE 1 11/01/2017 - 12/31/... In Execution	YUT-2 (YUT2) 33.33 % Customer: Inlandskunde... 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 Margin (S...) In Executi...
HK Subcontractor 99 100 % Margin (Planned) Inlandskunde DE 1 11/01/2017 - 11/30/... Contract Preparation	Information Work Packages Team Billing Attachments
HK ContWork 02 99 31.25 % Margin (Planned) Inlandskunde DE 1 12/01/2017 - 12/31/... In Execution	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...: Others:
Test 99 100 % Margin (Planned) Inlandskunde DE 1 11/01/2017 - 11/30/... In Execution	Accounting Cost Center: Cstlg Unit B-(DE) Profit Center: Consulting Unit B (YB102) EQUIH: Service Orga...: Service Organization - Company DE

More Project Roles

Edit Delete Copy Analyze Add to Favorites

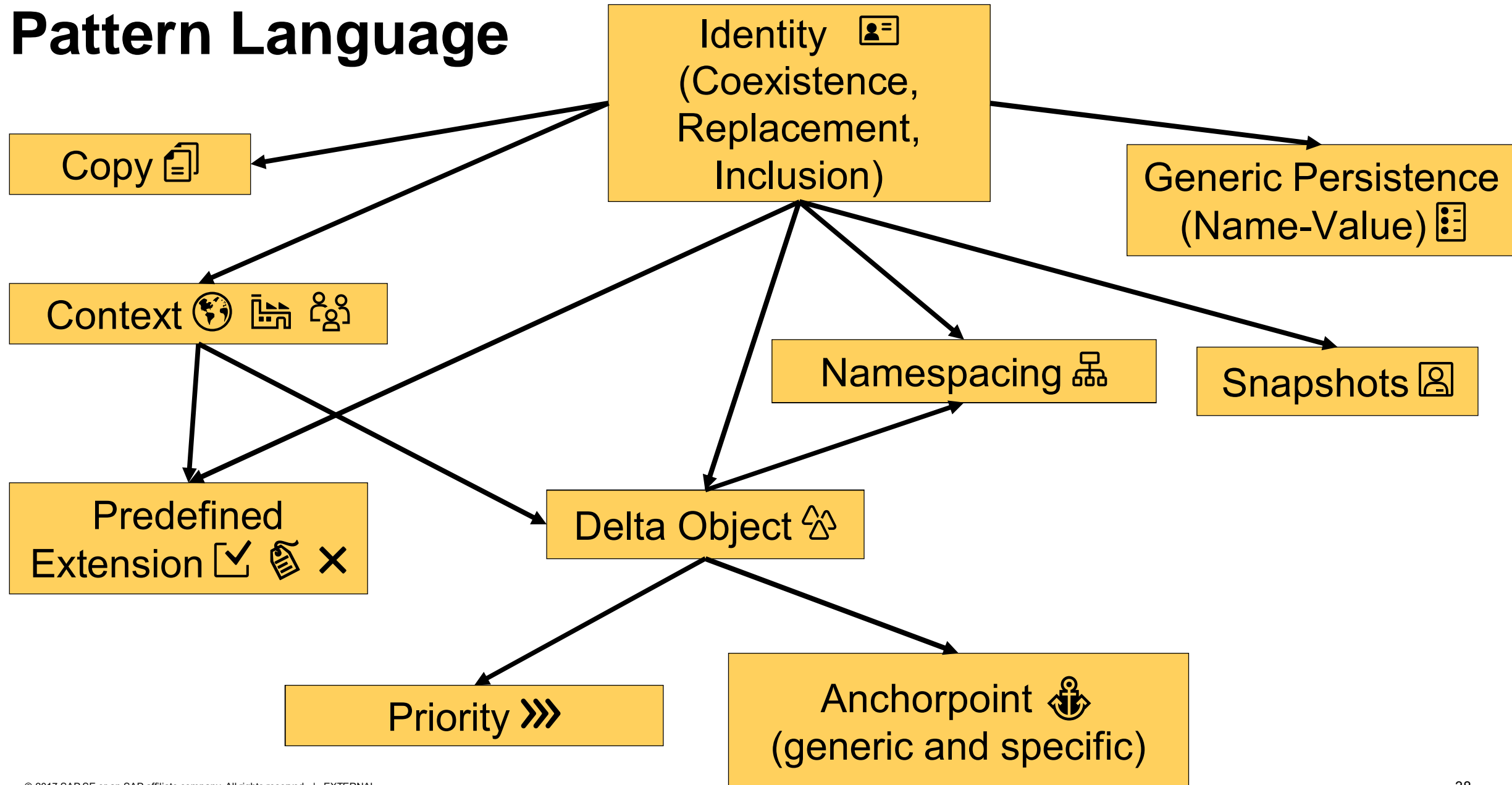
You can do it yourself with UI adaptation and add a completely new field "Phone No" via the Custom Field Feature



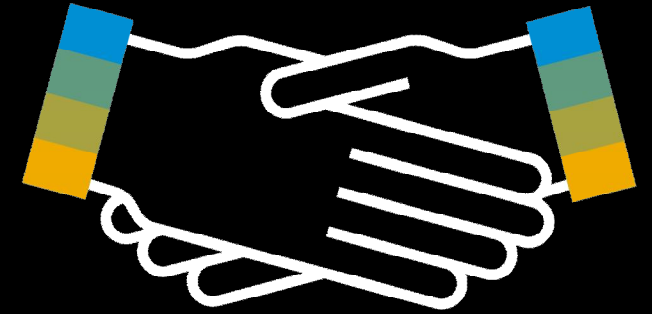
Which pattern had been used?

- 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)

Pattern Language



Thanks for attending this session.



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 @S7nW7s

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