Hyperautomation, Low-Code, RPA – alles klar?

@berndruecker

no-code/low-code

There will be no-code/low-code.

There will be no-code/low-code.

Let us shape how it looks

There will be no-code/low-code.
Let us shape how it looks –
before business does.

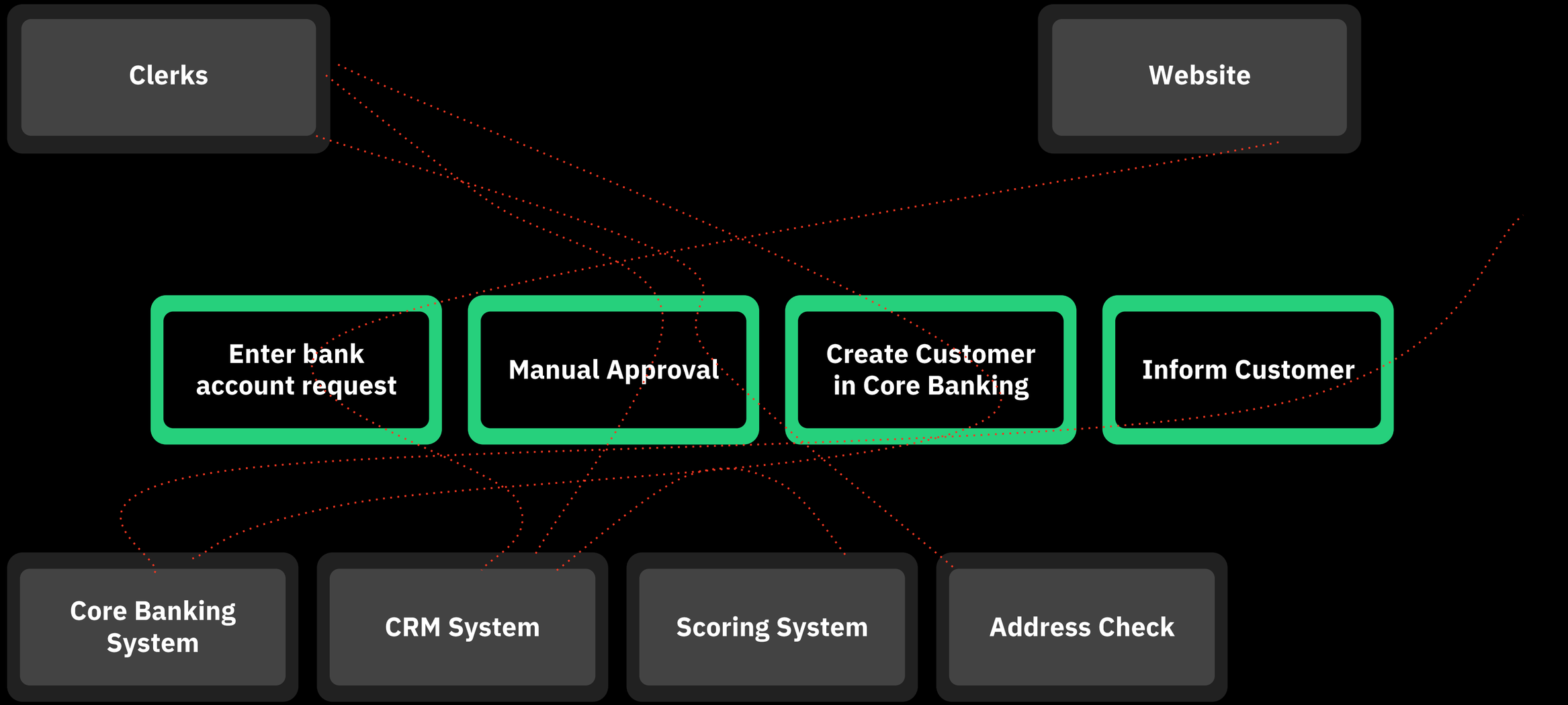
There will be no-code/low-code.
Let us shape how it looks –
before business does.

Engineers can play a key role
so, buckle up and enjoy the ride!

> We need to speed up our bank account opening. **Others do this in minutes, we need 3 days!**

The as-is situation

The problem: disconnected local automations



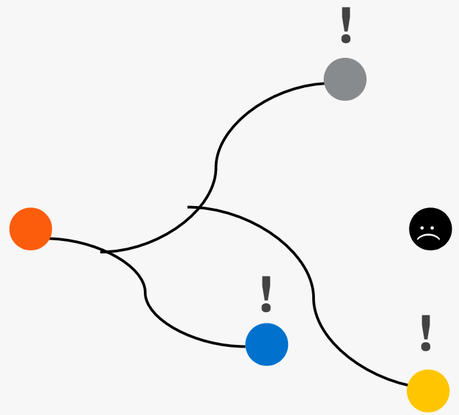
Leads to...

1. **A broken end-to-end automation**

Local automations are not integrated with one another, the end-to-end process is not fully automated.

2. **Lack of understanding**

The end-to-end process is not fully visible and key metrics are hard to track.



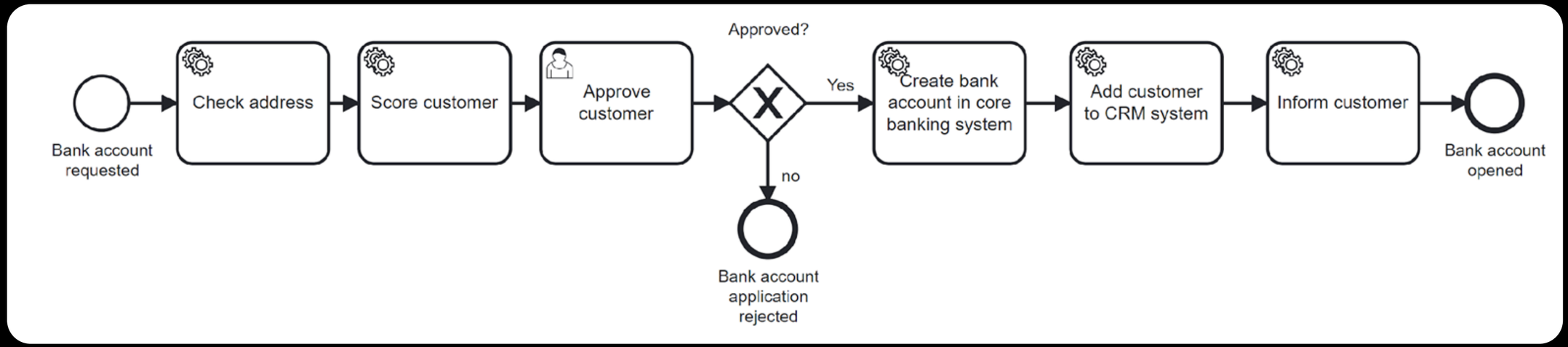
3. **Lack of flexibility**

Changing the end-to-end process is difficult since it leads to potential changes in many different systems.

Adding process orchestration

Clerks

Website



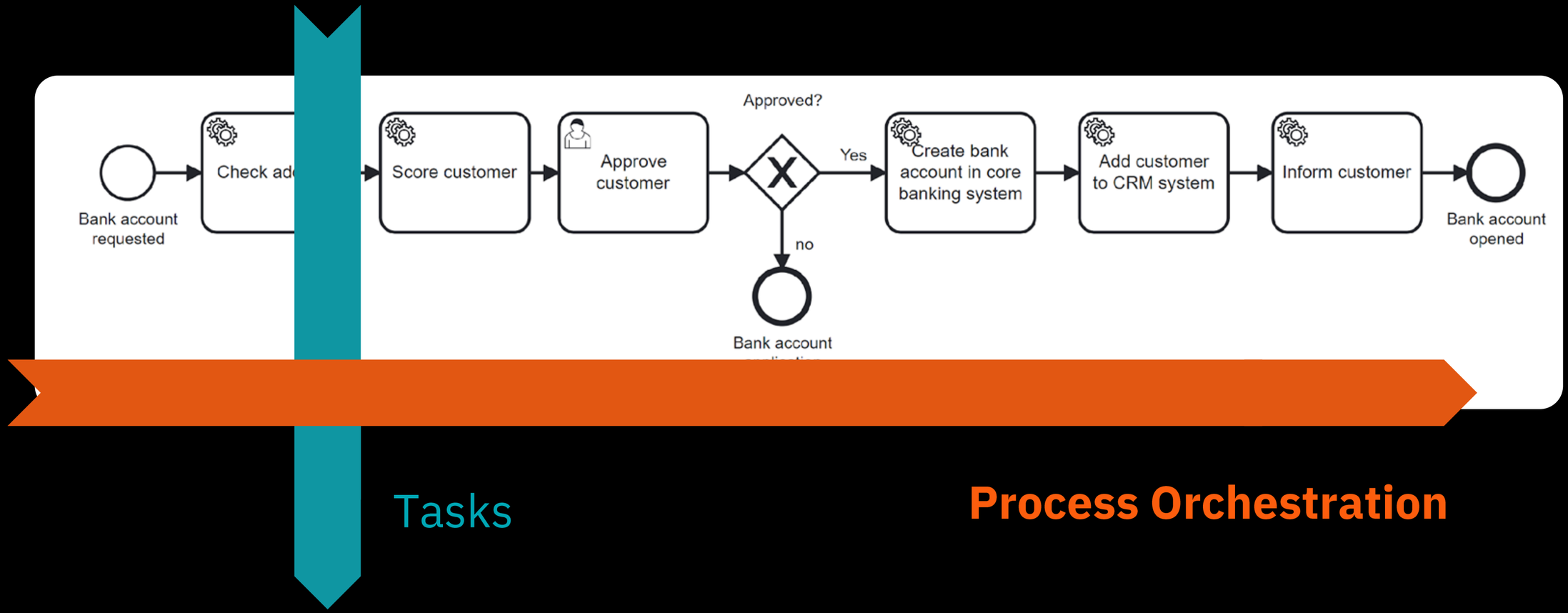
Core Banking System

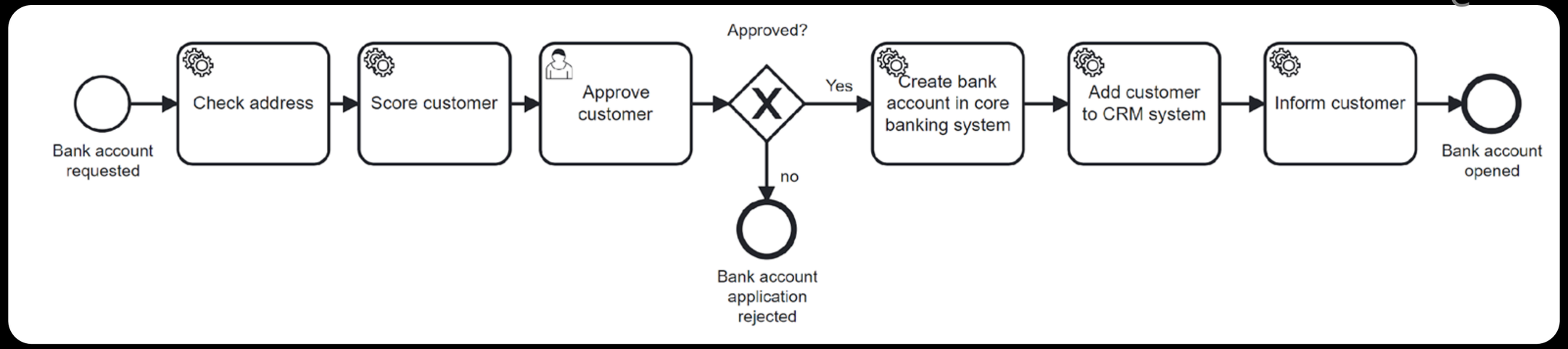
CRM System

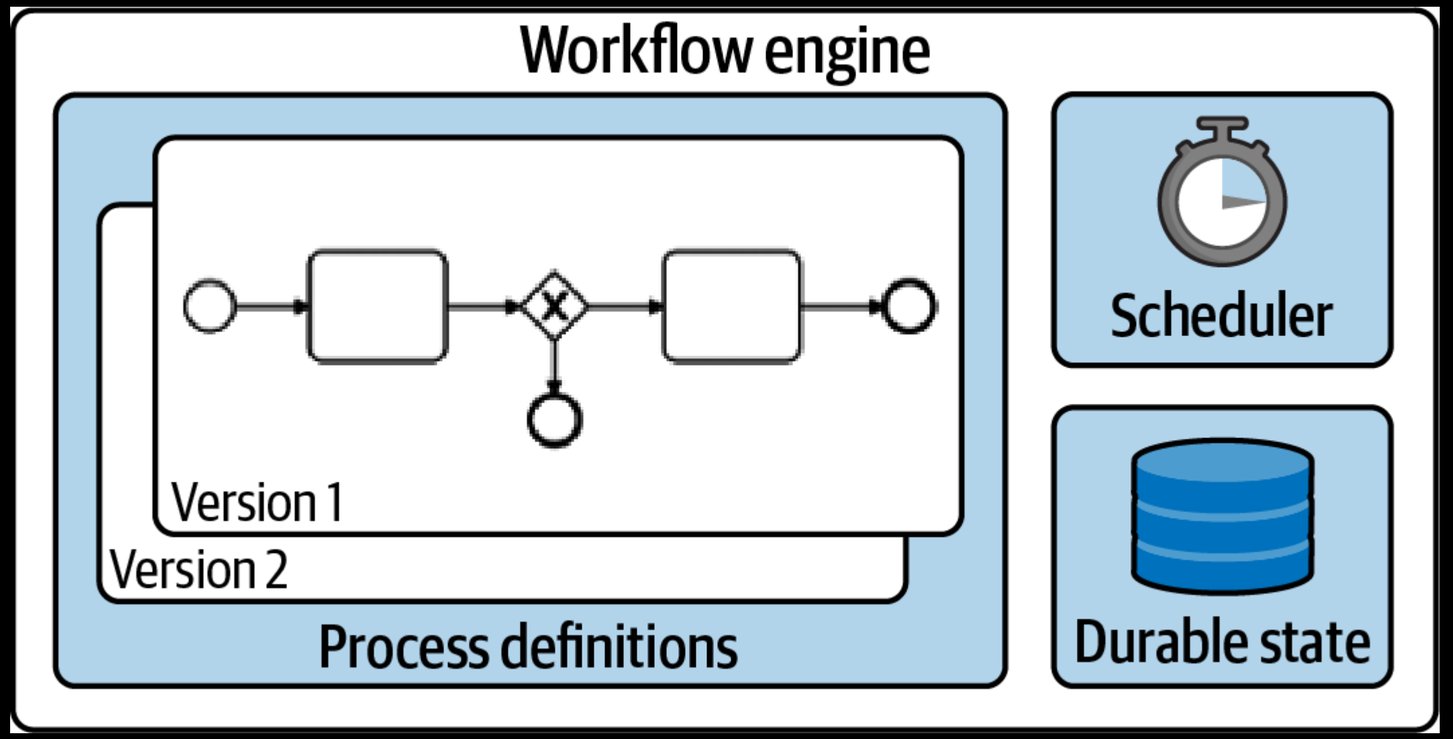
Scoring System

Address Check

Task vs. process automation



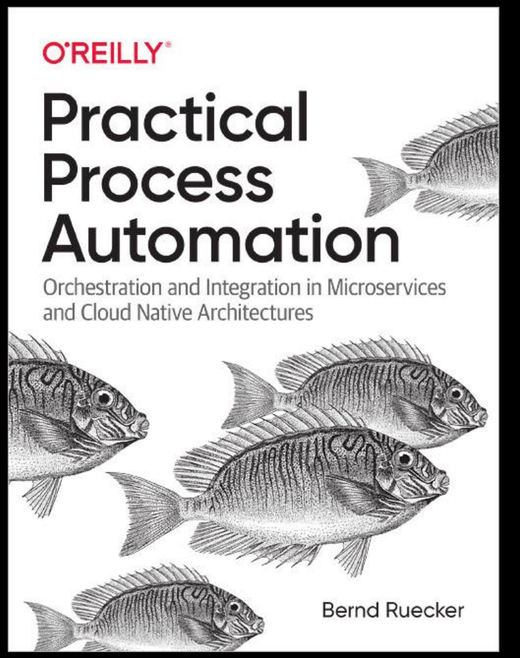

Bank account requested
Check address
Score customer
Approve customer
Approved?
Yes
no
Create bank account in core banking system
Add customer to CRM system
Inform customer
Bank account opened
Bank account application rejected

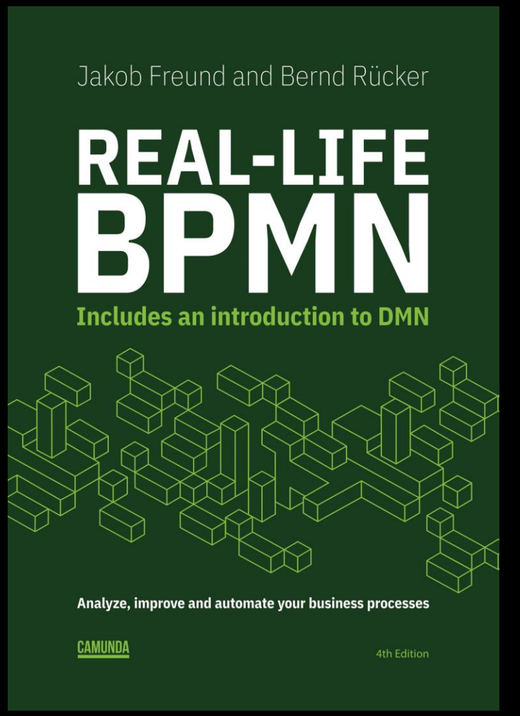

Workflow engine
Version 1
Version 2
Process definitions
Scheduler
Durable state

Bernd Ruecker

Co-founder and
Chief Technologist of
Camunda

bernd.ruecker@camunda.com
@berndruecker
http://berndruecker.io/





Pro code approach

Hook in process orchestration into professional software development.

“Developer friendly”

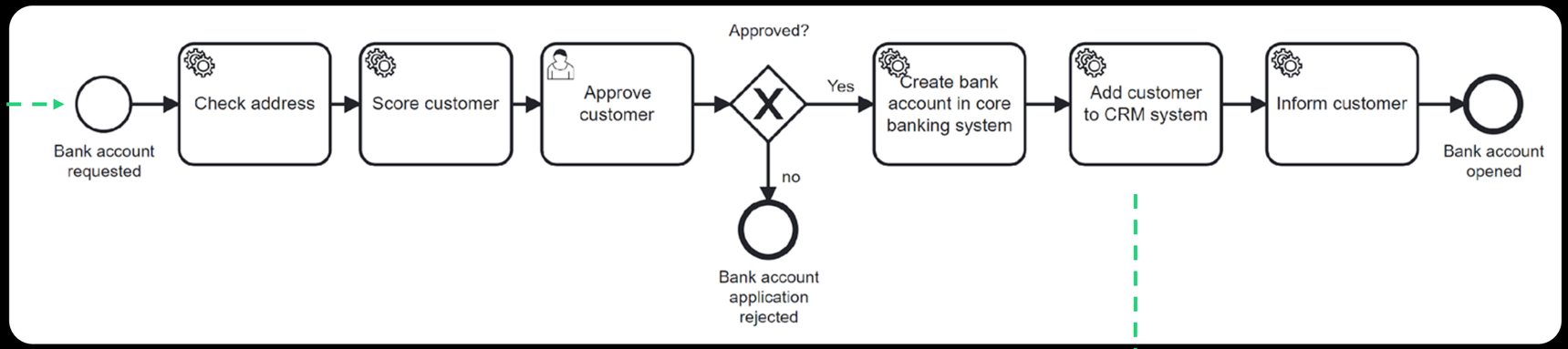
Example

https://github.com/berndruecker/customer-onboarding-camunda-8-springboot/

```java
@PutMapping("/customer")
public ResponseEntity<CustomerOnboardingResponse> onboardCustomer(ServerWebExchange exchange) {
  HashMap<String, Object> variables = new HashMap<~>();
  variables.put("automaticProcessing", true);
  variables.put("someInput", "yeah");

  client.newCreateInstanceCommand() //
        .bpmnProcessId("customer-onboarding") //
        .latestVersion() //
        .variables(variables) //
        .send().join();
  return ResponseEntity.status(HttpStatus.ACCEPTED).build();
}
```

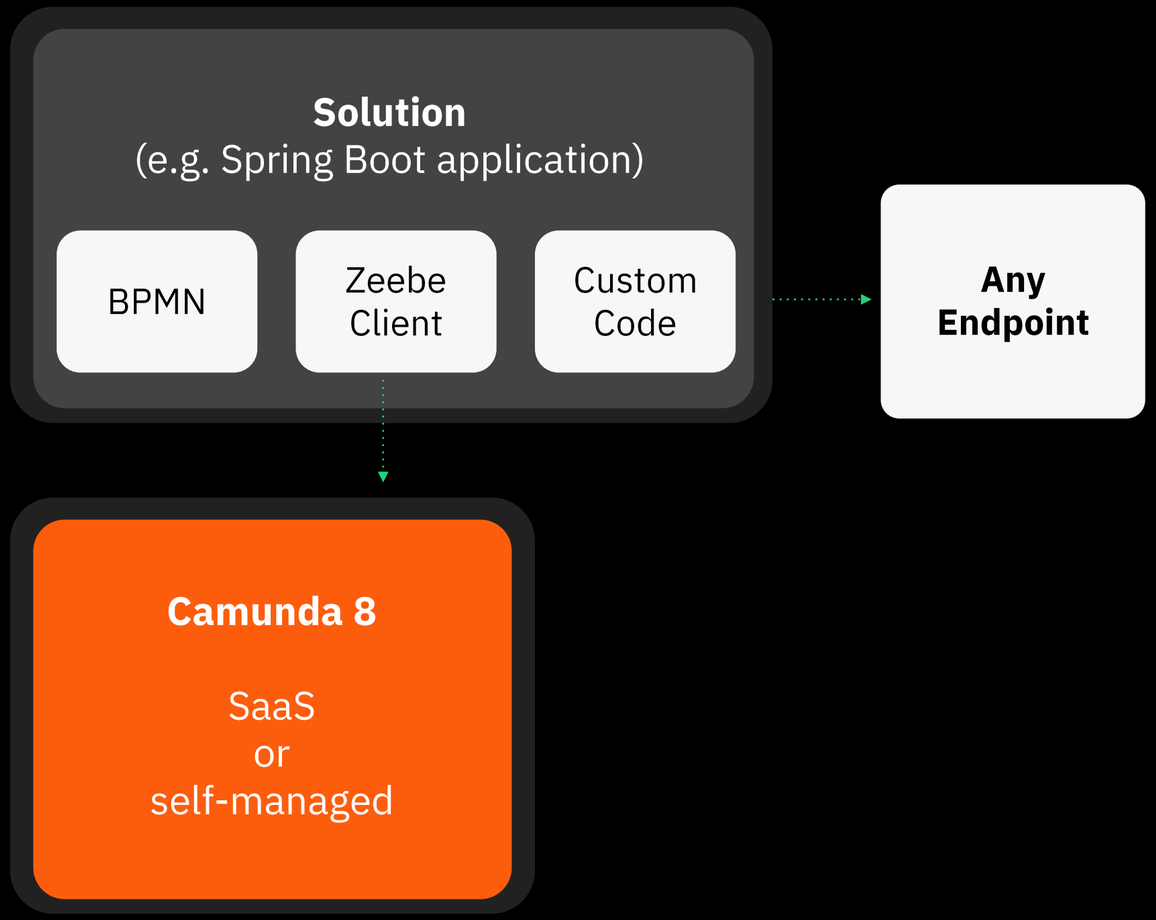
Your code to provide a REST endpoint



Your code to implement the REST call

```java
@JobWorker(type = "addCustomerToCrm")
public void addCustomerToCrmViaREST(final ActivatedJob job) {
    String request = "someData";
    restTemplate.put(ENDPOINT_CRM, request);
}
```

Solution architecture example



Supports any programming language

- Clients for Java, C#, NodeJS, Go, … available
- Natively integrates into your stack

Runs anywhere

- Available as a SaaS service
- Manage it yourself (in your own cloud, your datacenter, your laptop)

Camunda **Operate** | Dashboard | Processes | Decisions

Filters

Process

Name: Customer Onboarding (Si...

Version: 2

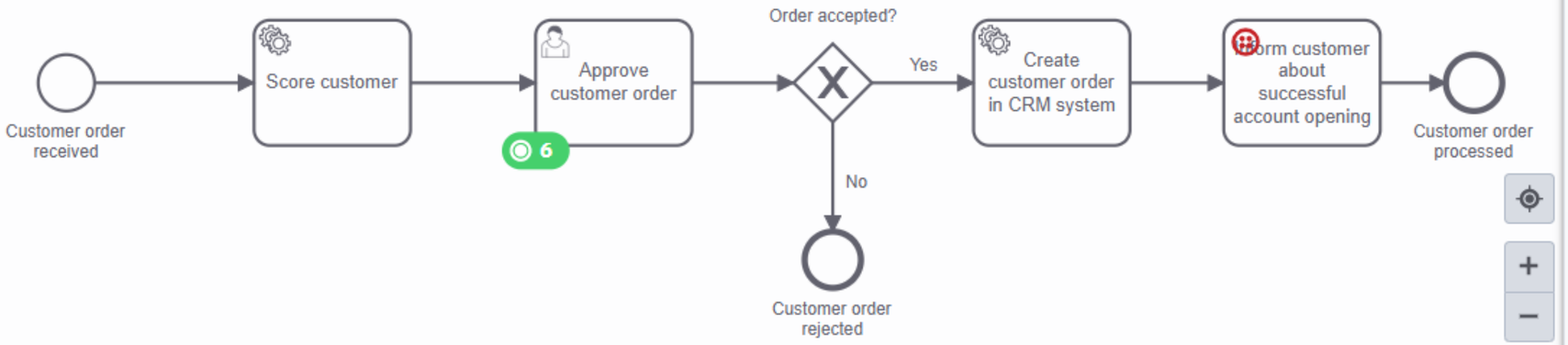
Flow Node: Search by Process Flow Node

Instance States

- [x] Running Instances
  - [x] Active
  - [ ] Incidents
- [ ] Finished Instances
  - [ ] Completed
  - [ ] Canceled

Reset Filters

Customer Onboarding (Simple)

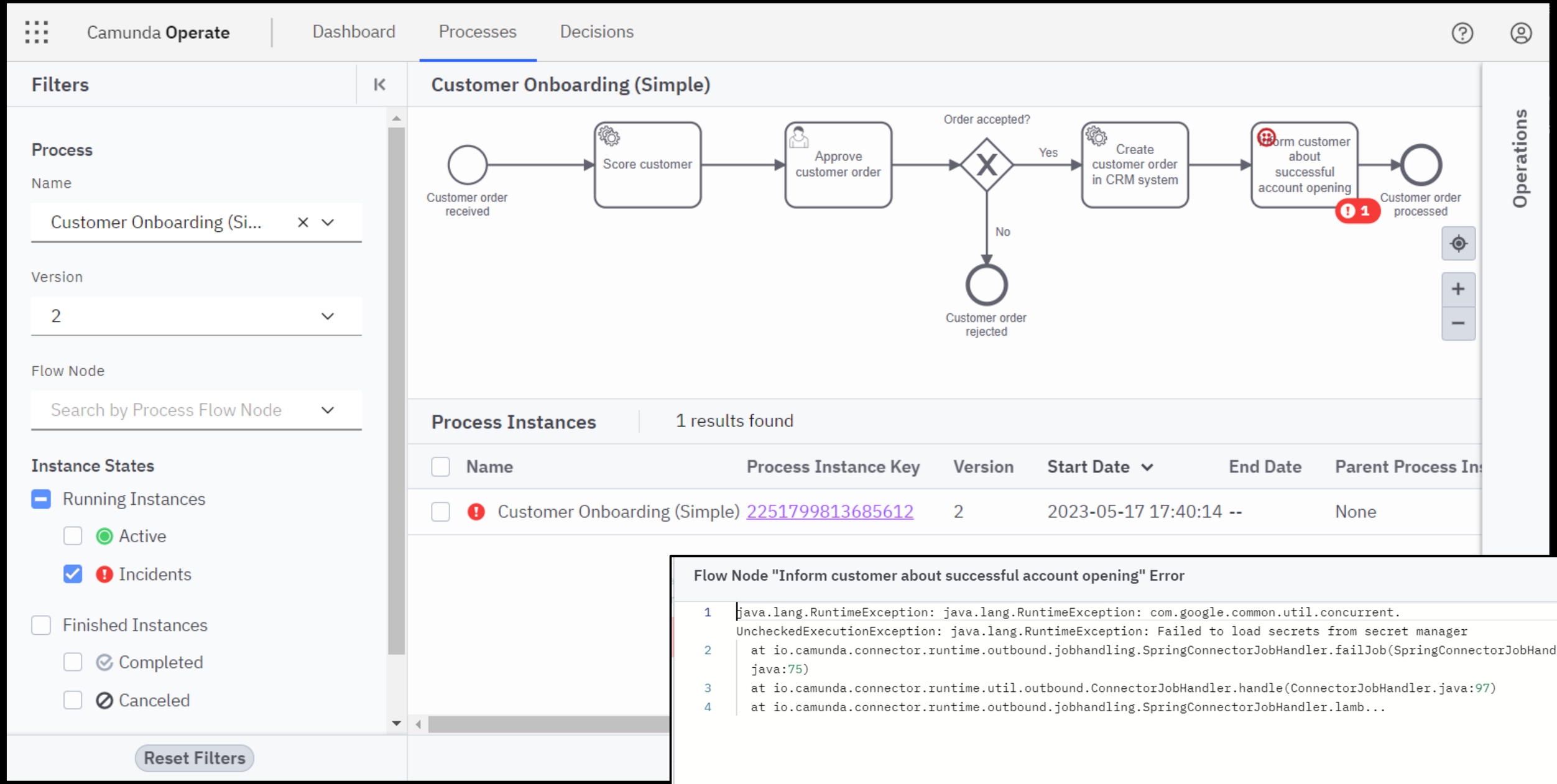


Process Instances

6 results found

Name	Process Instance Key	Version	Start Date	End Date	Parent Process
Customer Onboarding (Simple)	4503599627370990	2	2023-05-17 17:41:54	--	None
Customer Onboarding (Simple)	2251799813685807	2	2023-05-17 17:41:54	--	None
Customer Onboarding (Simple)	2251799813685798	2	2023-05-17 17:41:54	--	None
Customer Onboarding (Simple)	4503599627370975	2	2023-05-17 17:41:54	--	None
Customer Onboarding (Simple)	4503599627370960	2	2023-05-17 17:41:54	--	None

Operations


Camunda Operate
Dashboard
Processes
Decisions
Filters
Process
Name
Customer Onboarding (Si...
Version
2
Flow Node
Search by Process Flow Node
Instance States
Running Instances
Active
Incidents
Finished Instances
Completed
Canceled
Reset Filters
Customer Onboarding (Simple)
Customer order received
Score customer
Approve customer order
Order accepted?
Yes
No
Create customer order in CRM system
Inform customer about successful account opening
1
Customer order processed
Customer order rejected
Operations
Process Instances
1 results found
Name
Process Instance Key
Version
Start Date
End Date
Parent Process Ins
Customer Onboarding (Simple)
2251799813685612
2
2023-05-17 17:40:14
--
None
Flow Node "Inform customer about successful account opening" Error
java.lang.RuntimeException: java.lang.RuntimeException: com.google.common.util.concurrent.
UncheckedExecutionException: java.lang.RuntimeException: Failed to load secrets from secret manager
at io.camunda.connector.runtime.outbound.jobhandling.SpringConnectorJobHandler.failJob(SpringConnectorJobHandler
java:75)
at io.camunda.connector.runtime.util.outbound.ConnectorJobHandler.handle(ConnectorJobHandler.java:97)
at io.camunda.connector.runtime.outbound.jobhandling.SpringConnectorJobHandler.lamb...

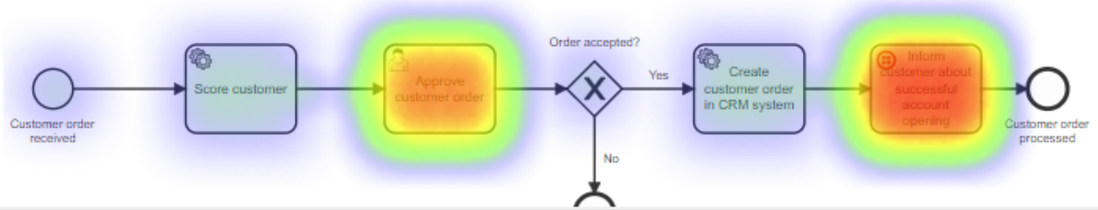
Process performance overview

Edit | Delete | Share | Enter Fullscreen | Auto Refresh

0	5 hours	5 hours	100%	75%
0 Target 200	0ms Target 1 day	0ms Target 1 week	0% 100%	0% Target 99%

Which process steps take too much time? (To Do: Add Target values for these pr...

Heat: Duration - Avg

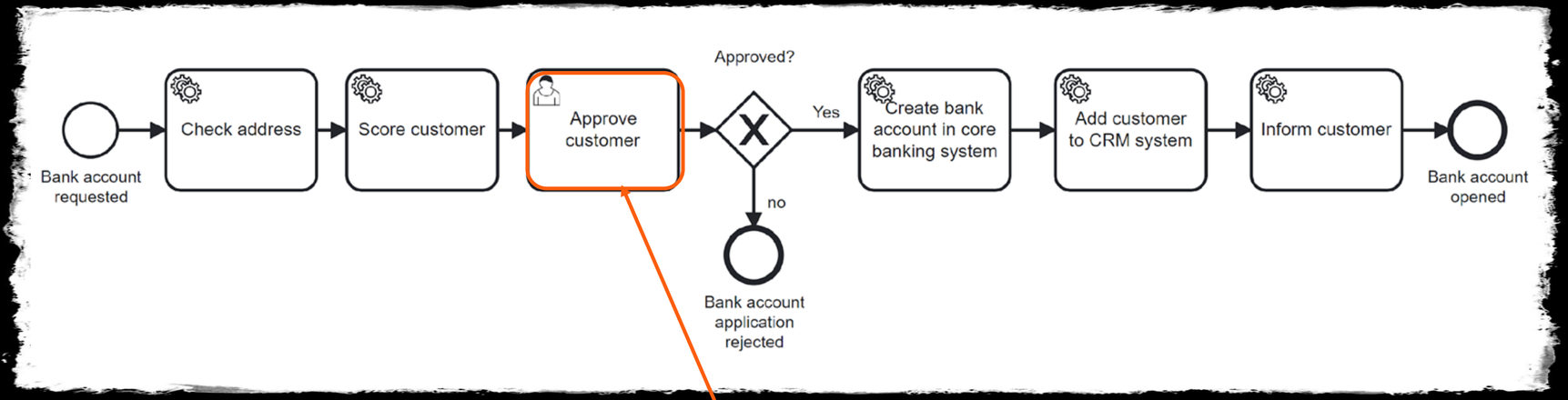


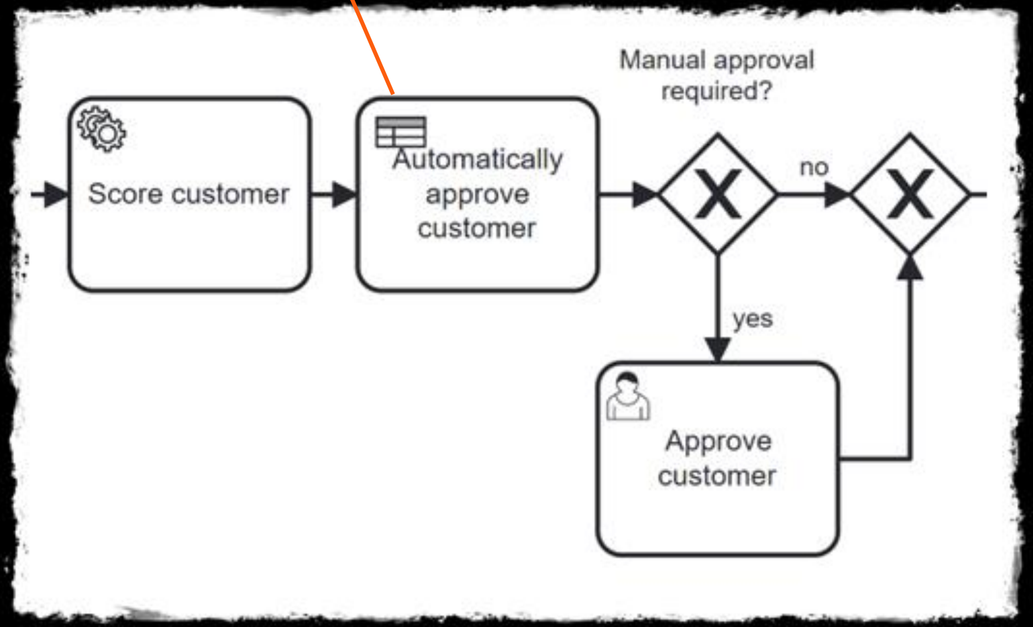
Is my process within control?

Date and Time displayed in local timezone: Europe/Berlin

“We need to speed up our bank account opening. Others do this **in minutes**, we need 3 days!

Changing tasks





Gartner

Press Release

Newsroom

Menu

STAMFORD, Conn. April 28, 2021

Gartner Forecasts Worldwide Hyperautomation-Enabling Software Market to Reach Nearly $600 Billion by 2022

Digital Transformation and IT Automation Needs Drive Hyperautomation Opportunities

The worldwide market for technology that enables hyperautomation will reach $596.6 billion in 2022, according to a new forecast from Gartner, Inc. This is up from $481.6 billion in 2020 and a projected $532.4 billion this year.

Hyperautomation

Hyperautomation is an approach to automation that involves combining various technologies such as artificial intelligence, machine learning, robotic process automation, and other automation tools to create an end-to-end automation solution that can handle complex business processes.

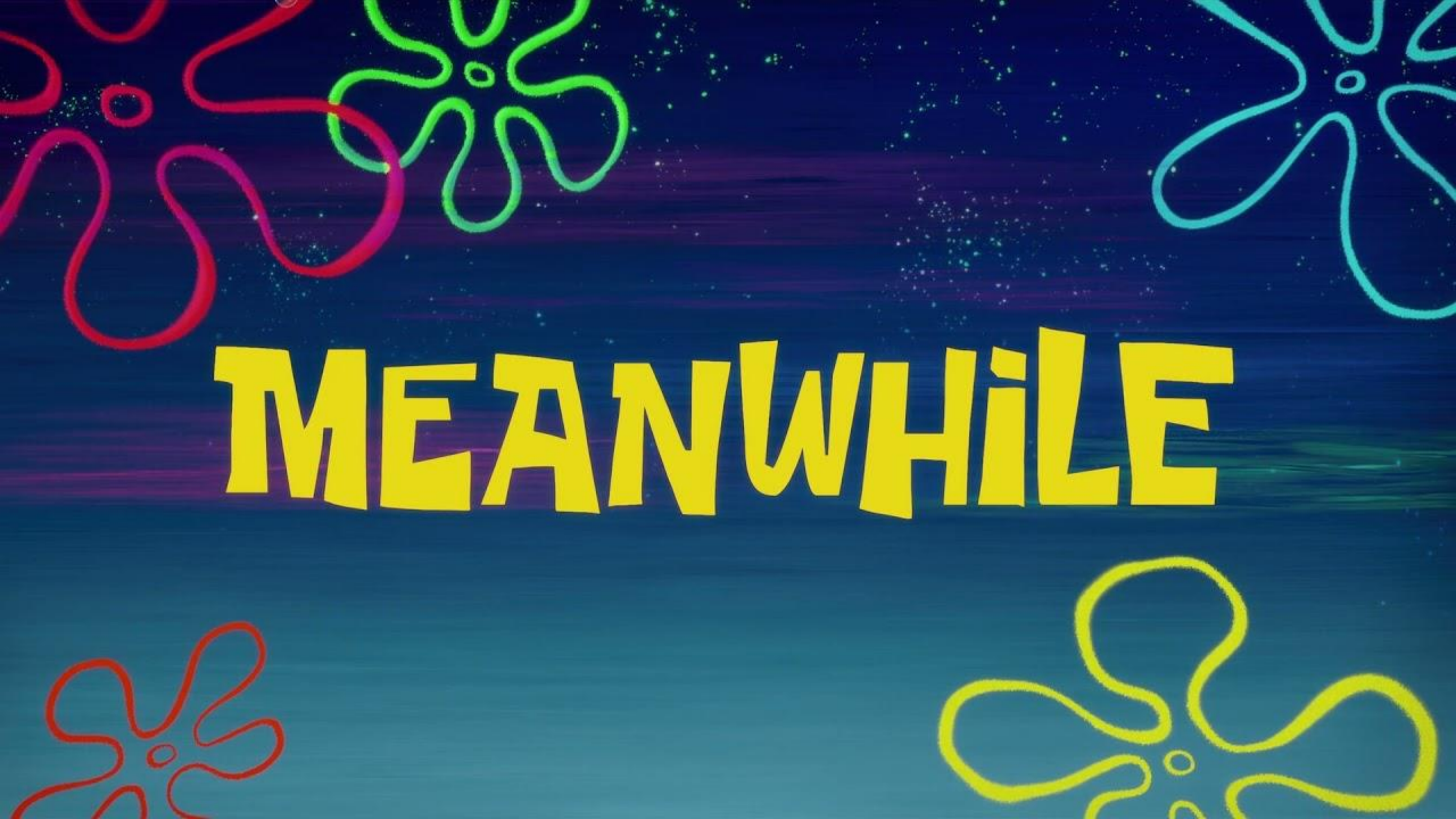
Hyperautomation goes beyond traditional automation, which typically involves automating specific tasks or processes. With hyperautomation, the goal is to automate as much of the entire process as possible, from start to finish, using a range of automation tools and technologies. This approach can help organizations achieve significant improvements in efficiency, productivity, and accuracy while reducing costs and minimizing errors.

ChatGPT, as of April 2023

AUTOMATE ALL THE THINGS!

AUTOMATE ALL THE THINGS!

end to end


MEANWHILE

Talent Shortage

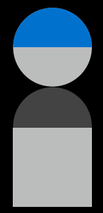
Yes, there are several sources that can provide evidence of the talent shortage of developers. Here are a few:

1. According to the 2021 Harvey Nash/KPMG CIO Survey, 67% of technology leaders reported skills shortages as a barrier to digital transformation. This survey involved more than 4,200 CIOs and technology leaders from 108 countries.
2. In a 2021 survey by Indeed, 80% of hiring managers and recruiters reported that they are having difficulty finding and hiring software development talent.
3. The 2021 State of Software Development report by Coding Sans found that 55% of developers surveyed reported difficulty finding and hiring talent.
4. A 2021 report by the Center for Cyber Safety and Education found that the global cybersecurity workforce gap has grown to 3.12 million, with 63% of organizations reporting a shortage of cybersecurity staff.

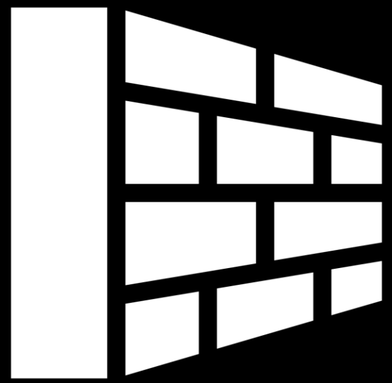
These sources, among others, provide evidence of the talent shortage of developers in various sectors and regions.

ChatGPT, as of April 2023

Business vs. IT?

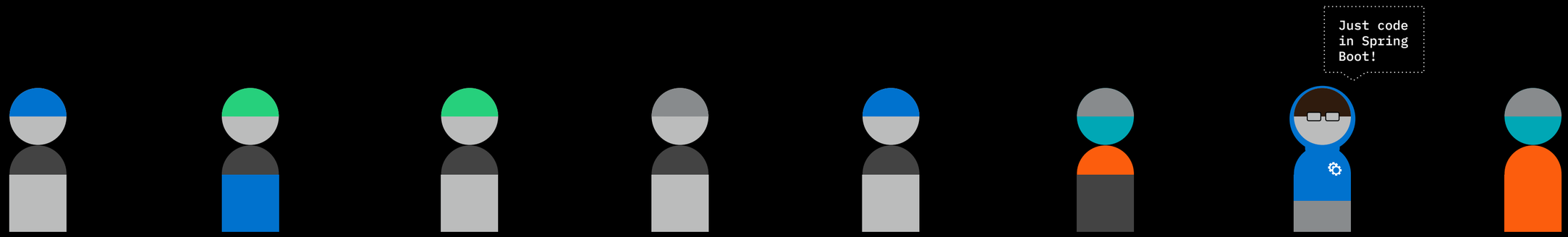


Business
Person



Java
Developer

Diversity of roles



Business Person

Citizen Developer

Consultant or **Power User**

Bot Developer

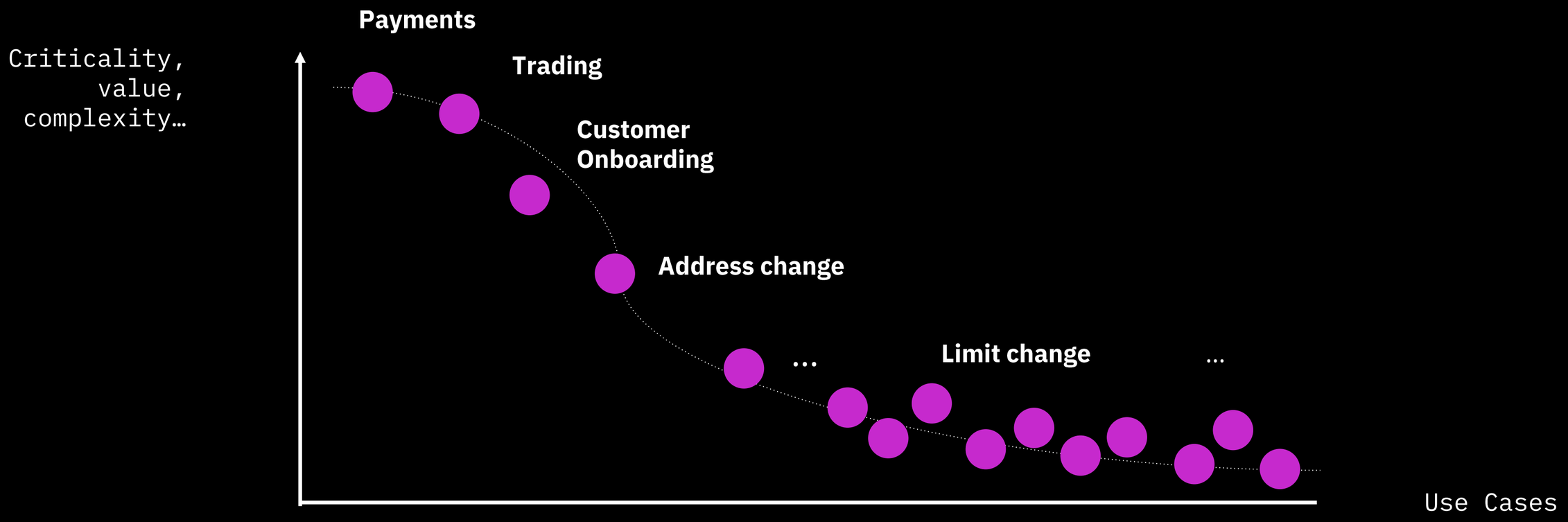
Low-code Developer

Junior Developer

Senior Developer or **Camunda Co-founder**

Principal Developer

Diversity of processes

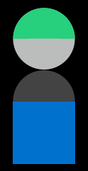


Categorize your use case

Green
Do it yourself

- simple
- local automations with little criticality

- no governance or quality assurance

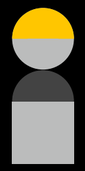


Citizen Developer

Yellow
Guided

- medium complexity
- medium criticality

- some governance required
- some guidance necessary



Anything in between

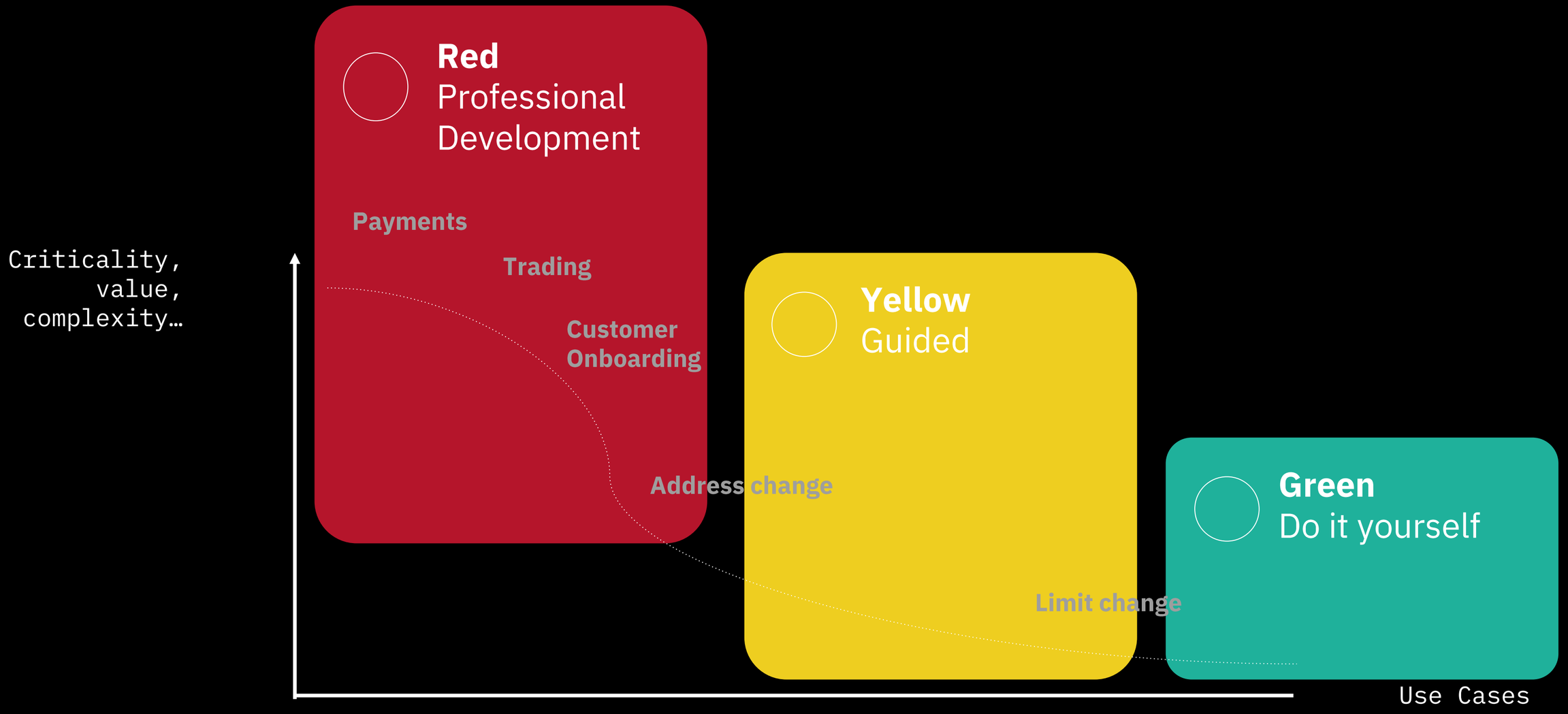
Red
Professional Development

- high complexity
- high criticality
- compliance and regulatory requirements

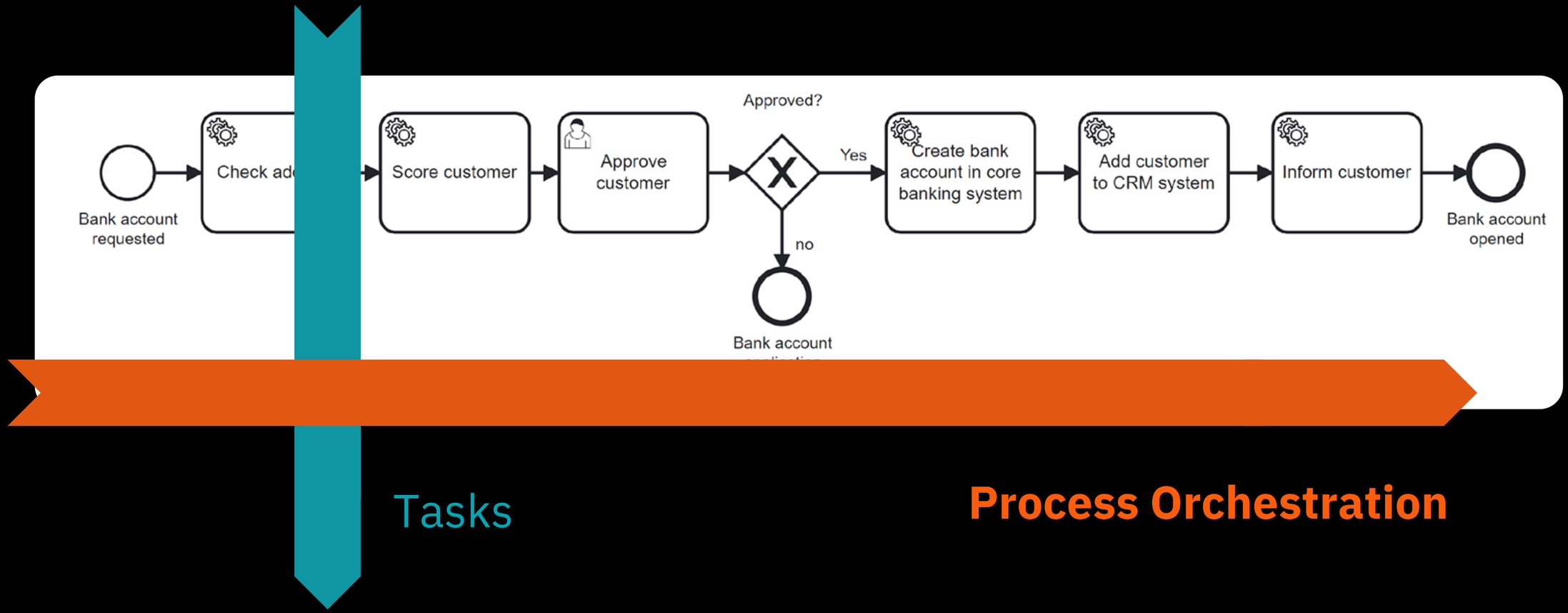
- version control
- automated testing
- CI / CD

Professional Developer

Inspired also by https://www.forrester.com/blogs/how-shell-led-a-citizen-developer-movement/

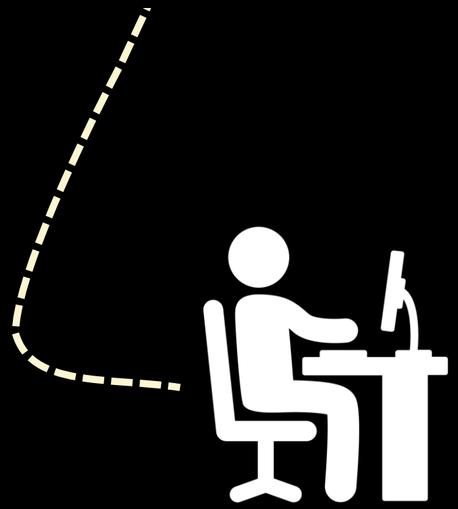

Red
Professional
Development
Payments
Trading
Customer
Onboarding
Yellow
Guided
Address change
Limit change
Green
Do it yourself
Criticality,
value,
complexity…
Use Cases

Task vs. process automation

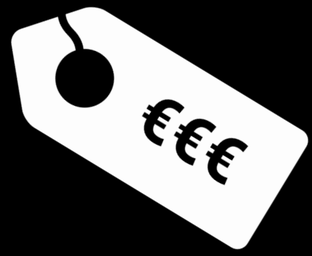



TEL

3–5
minutes

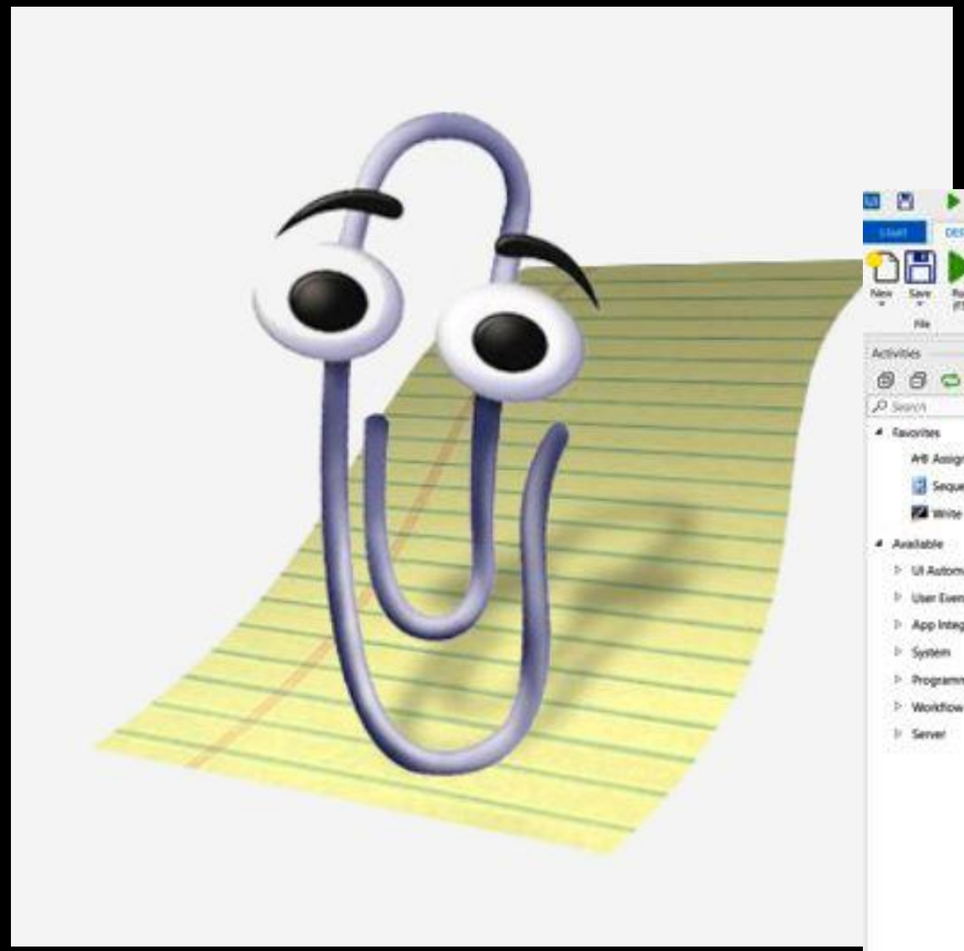


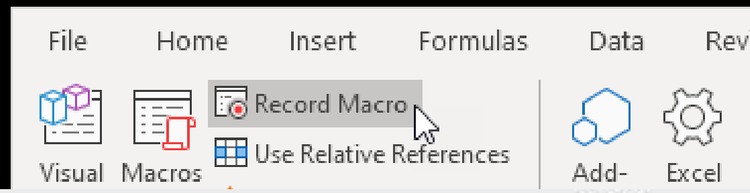
Slow,
expensive ...

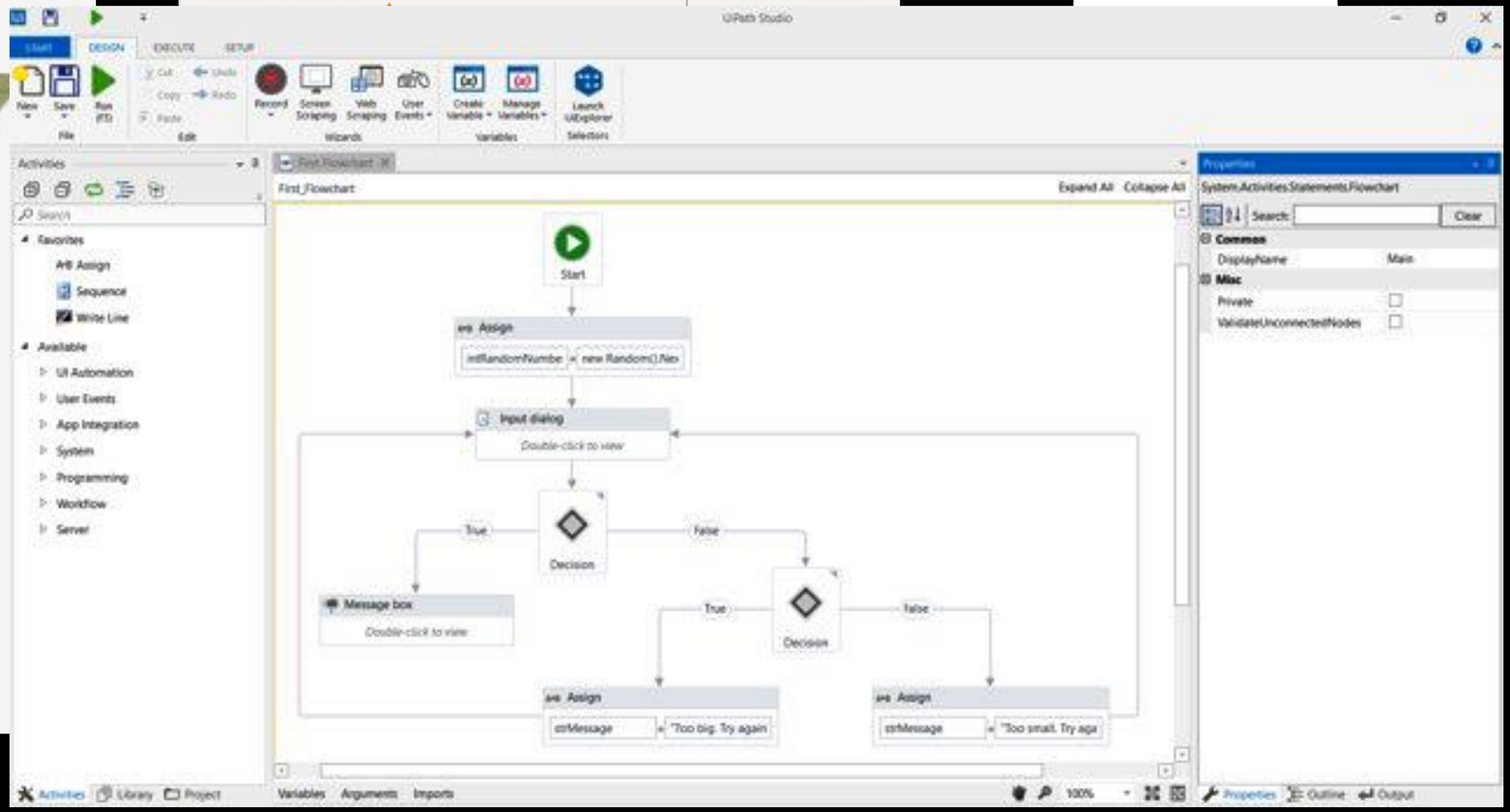


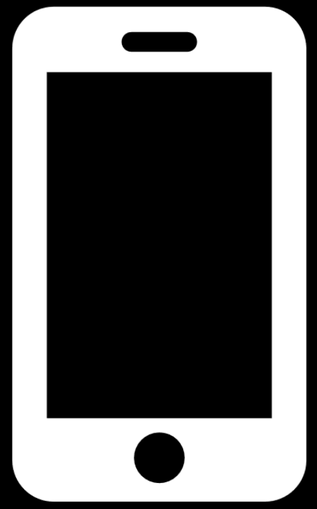
... and annoying

Robotic Process Automation (RPA)

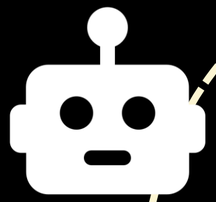


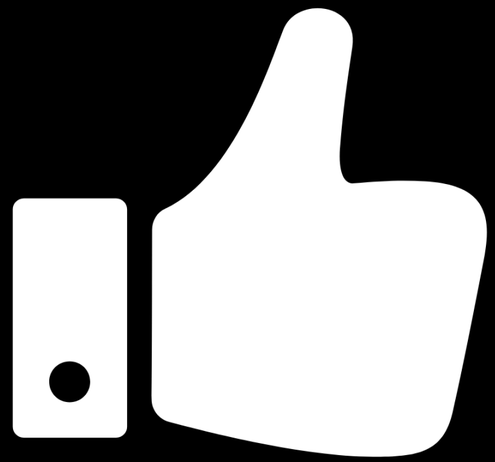


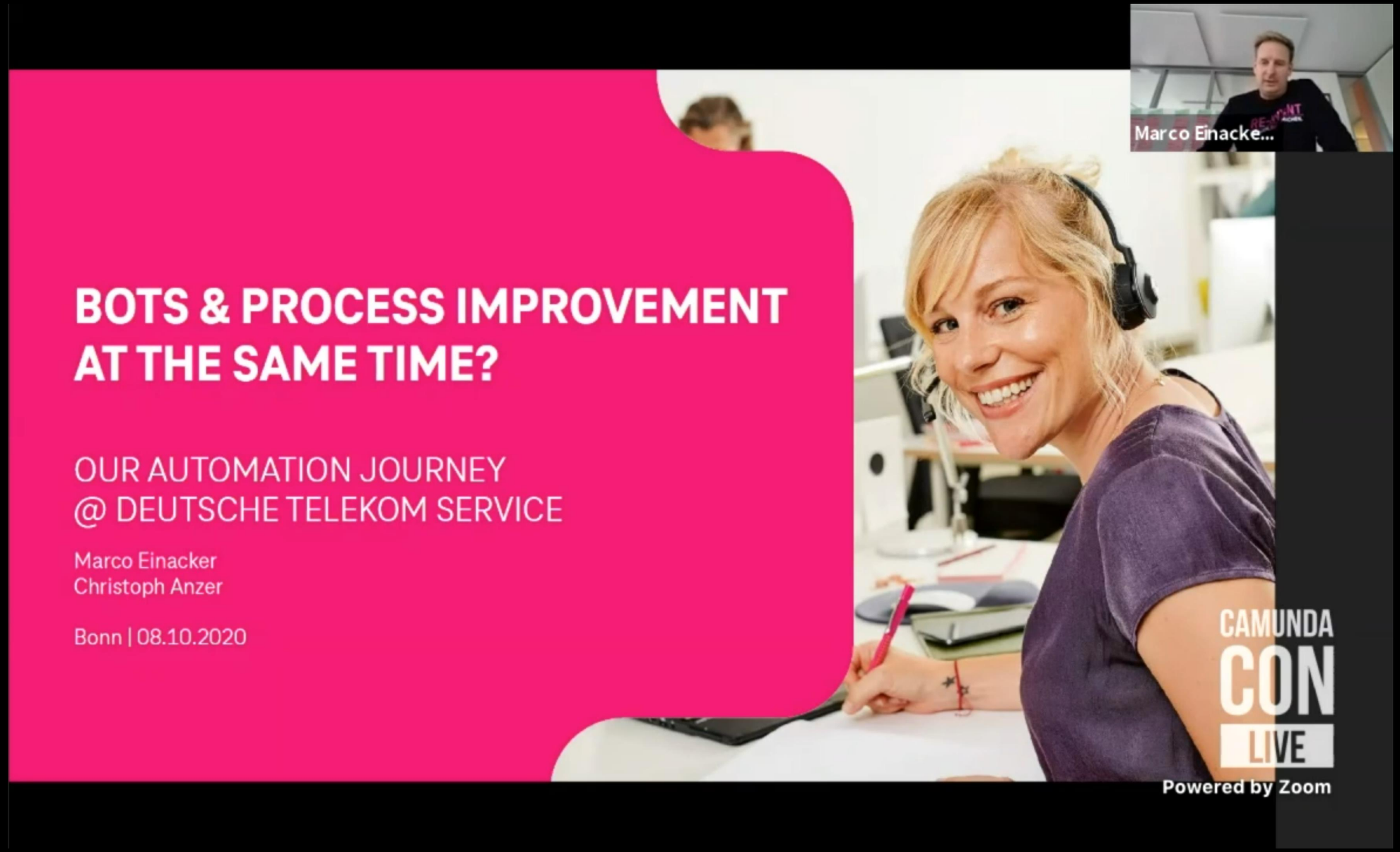




Self-service
Immediate
response







Source: Talk at Camunda Con 2020 (https://blog.bernd-ruecker.com/process-automation-in-harmony-with-rpa-720effdb0513)

3: FROM FRONTEND AUTOMATION TO BACKEND AUTOMTATION

Manual process

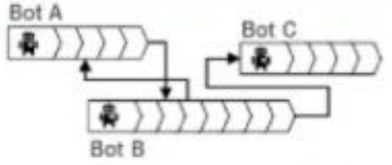
1

Short time-to-market results in "quick & dirty" process design

→ Complex processes including workarounds

RPA / Frontend Automation

2

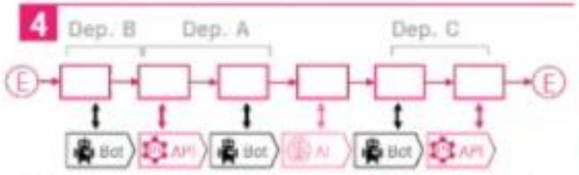


Robotic process automation imitates the human way of working

→ Complex "Spaghetti Bot" automation

Backend Automation

4

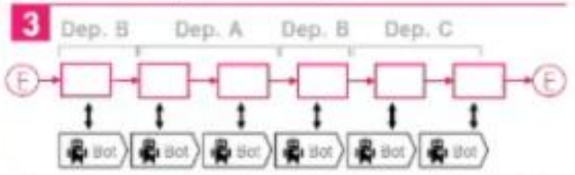


Shift from Bots **(Front-End)** to APIs **(Back-End)** and other technologies better fit for purpose

→ Enlarged scope for automation + higher efficiency

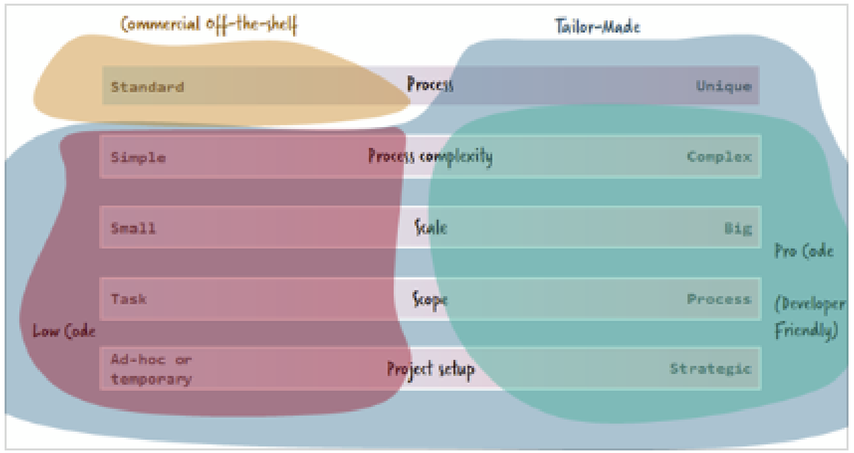
Separation process layer

3



Separation of **Process Layer** (Bot Orchestration) and **Bot Layer**

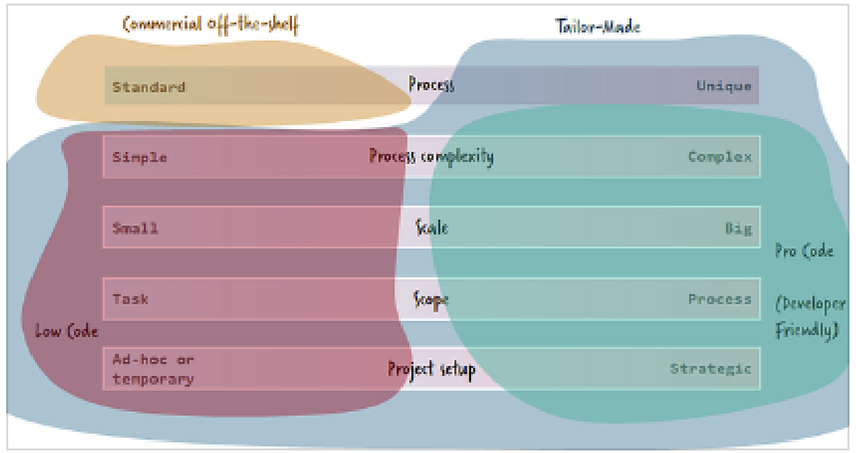
→ Increased process transparency and optimization



The Process Automation Map

This article was originally posted on techspective.

Bernd Rücker
Dec 21, 2021 · 7 min read



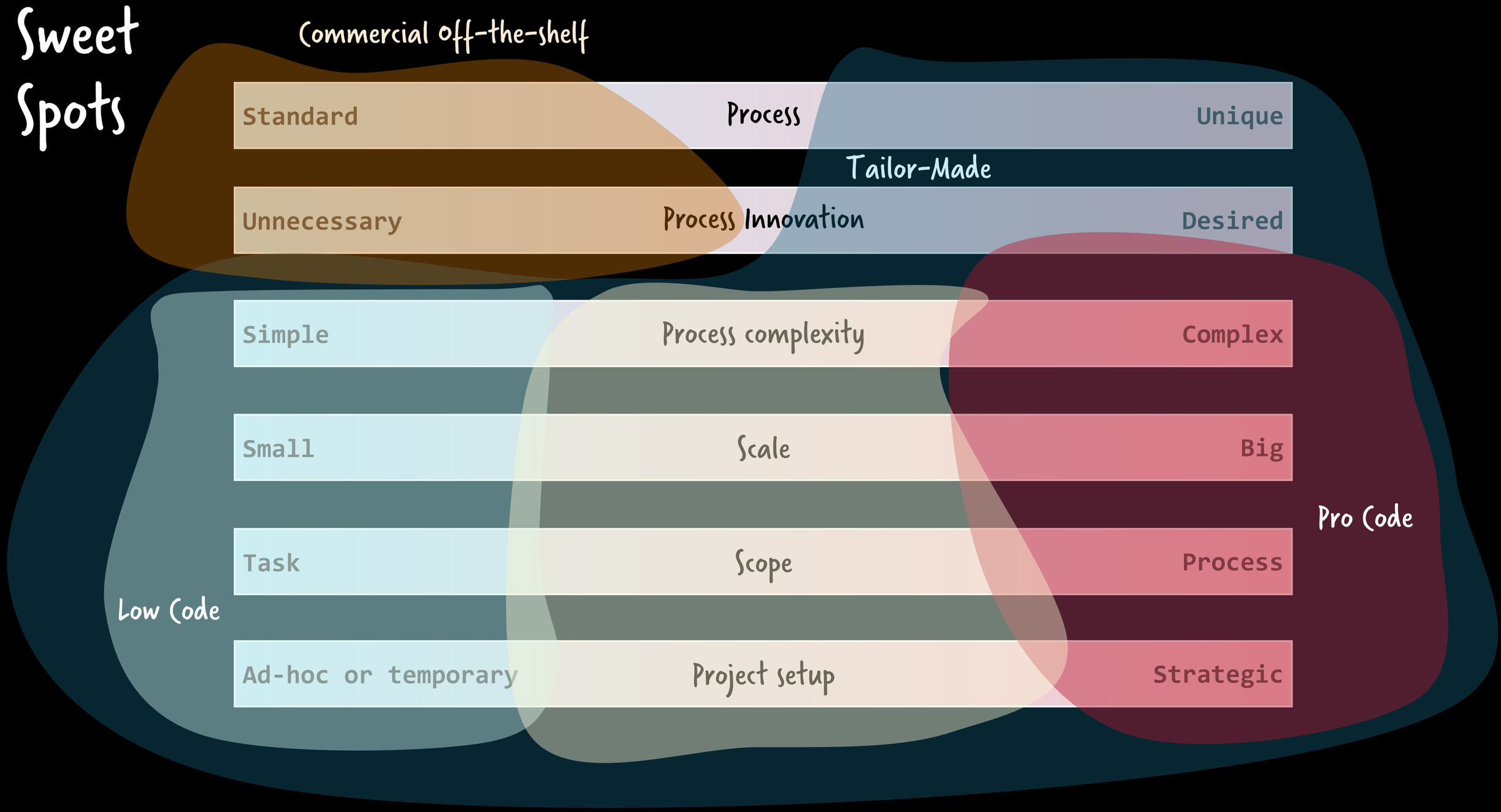
Exploring the Process Automation Map

This article dives deeper into the dimensions of the process automation map

Bernd Rücker
Nov 23, 2021 · 9 min read

https://blog.bernd-ruecker.com/

Sweet Spots


Commercial off-the-shelf
Standard
Process
Unique
Tailor-Made
Unnecessary
Process Innovation
Desired
Simple
Process complexity
Complex
Small
Scale
Big
Task
Scope
Process
Ad-hoc or temporary
Project setup
Strategic
Low Code
Pro Code


public CamundaModelApiOrderEventHandler() {
engine = CamundaEngineHelper.startUpEngineAndInit();
createFlow();
}
private void createFlow() {
engine.getRepositoryService().createDeployment() //
.addModelInstance("order.bpmn", Bpmn.createProcess("order").executable() //
.startEvent()
.serviceTask().name("Fetch goods").camundaClass(FetchGoodsAdapter.class.getName())
.serviceTask().name("Ship goods").camundaClass(ShipGoodsAdapter.class.getName())
.serviceTask().name("Retrieve payment").camundaClass(RetrievePaymentAdapter.class.getName
.endEvent().camundaExecutionListenerClass("end", OrderDeliveredAdapter.class.getName())
.done()
).deploy();
}
[CamundaModelApiOrderEventHandler] Ignored Command FetchGoods {"type":"Command","na
[CamundaModelApiOrderEventHandler] Received: Event GoodsFetched
Sending event via Kafka: {"type":"Command","name":"ShipGoods","sender":"OrderEventP
[CamundaModelApiOrderEventHandler] Handled: Event GoodsFetched {"type":"Event","nam
[CamundaModelApiOrderEventHandler] Received: Command ShipGoods
[CamundaModelApiOrderEventHandler] Ignored Command ShipGoods {"type":"Command","nam
Sending event via Kafka: {"type":"Event","name":"OrderCompleted","sender":"OrderEve
[CamundaModelApiOrderEventHandler] Handled: Event GoodsShipped
[CamundaModelApiOrderEventHandler] Received: Event GoodsShipped {"type":"Event","nam
[CamundaModelApiOrderEventHandler] Received: Event OrderCompleted
[CamundaModelApiOrderEventHandler] Ignored Event OrderCompleted {"type":"Event","na
JAVAFORUM stuttgart
Eine Veranstaltung der JUGS

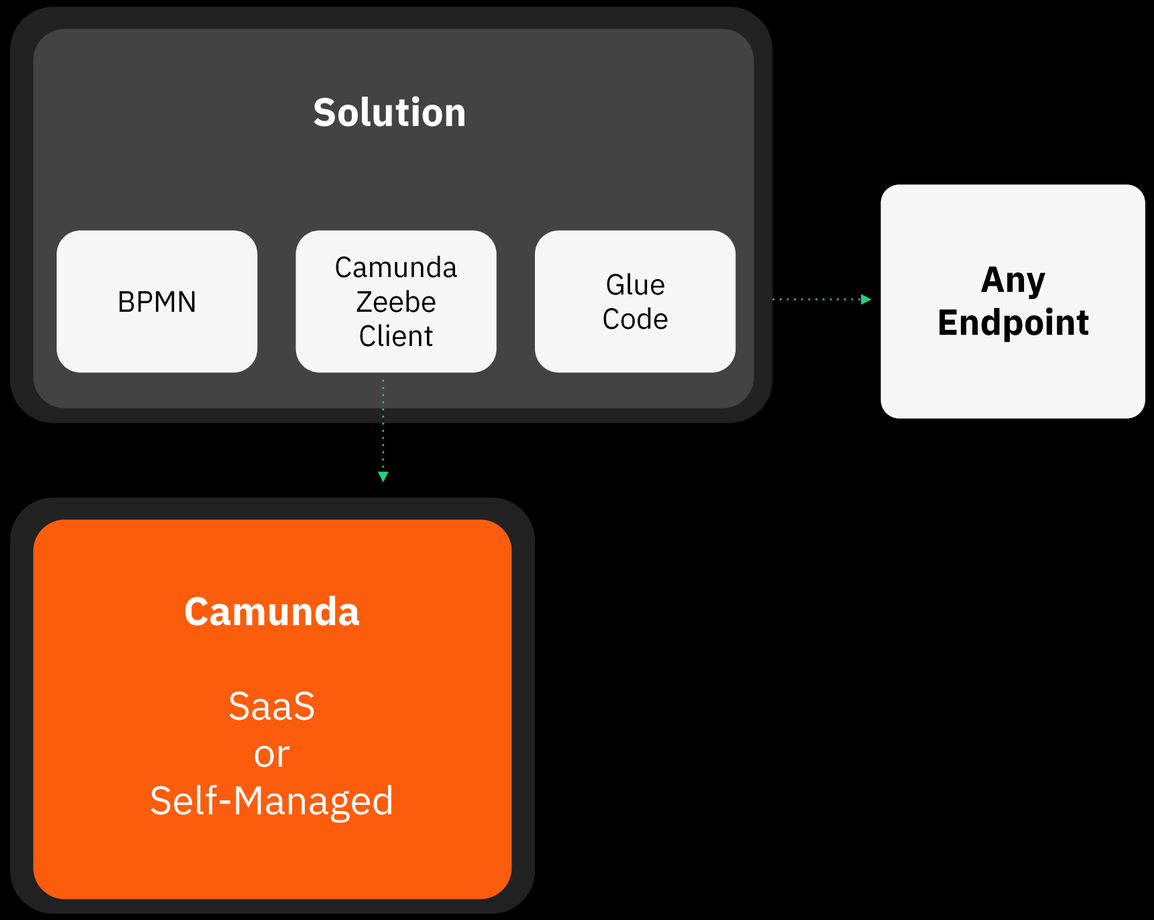
Low-code?

Low-code as an accelerator

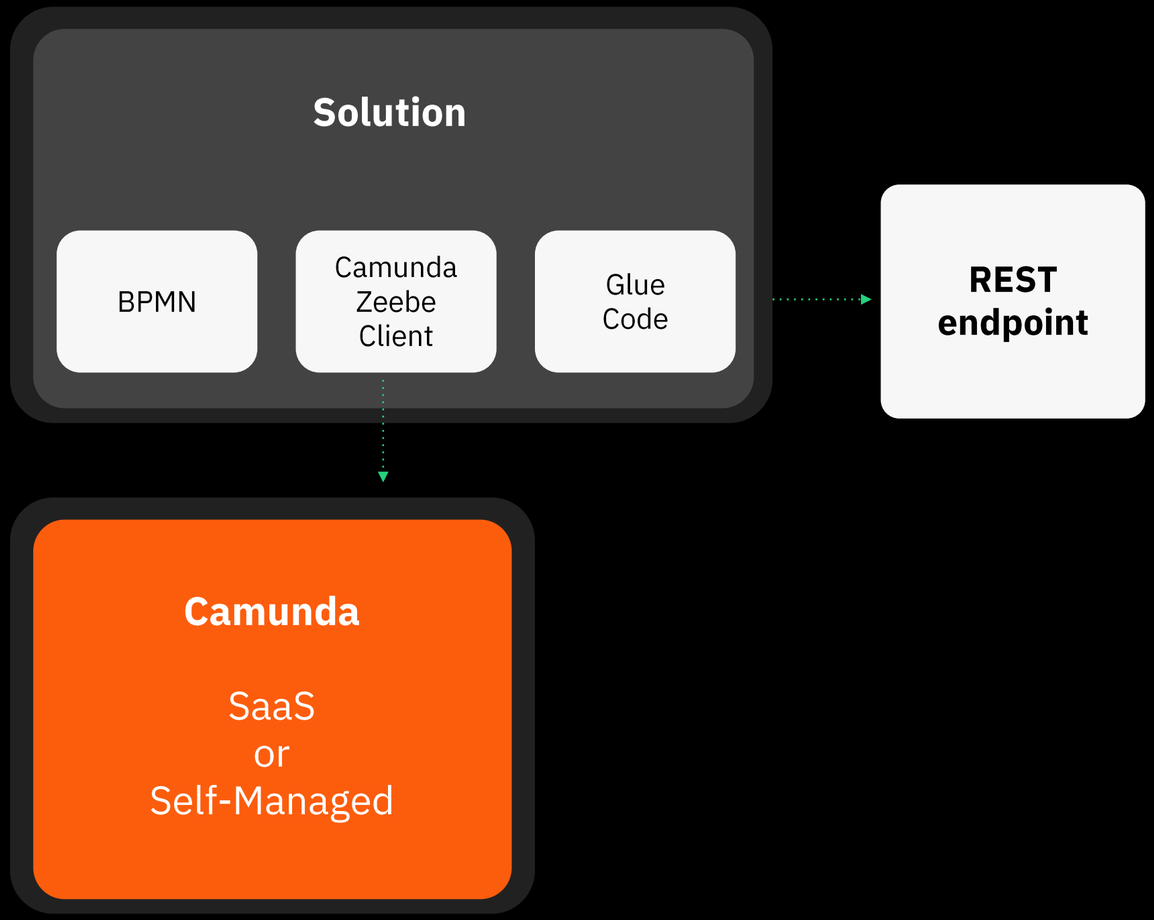
@berndruecker

Dial-in low-code as much as you need

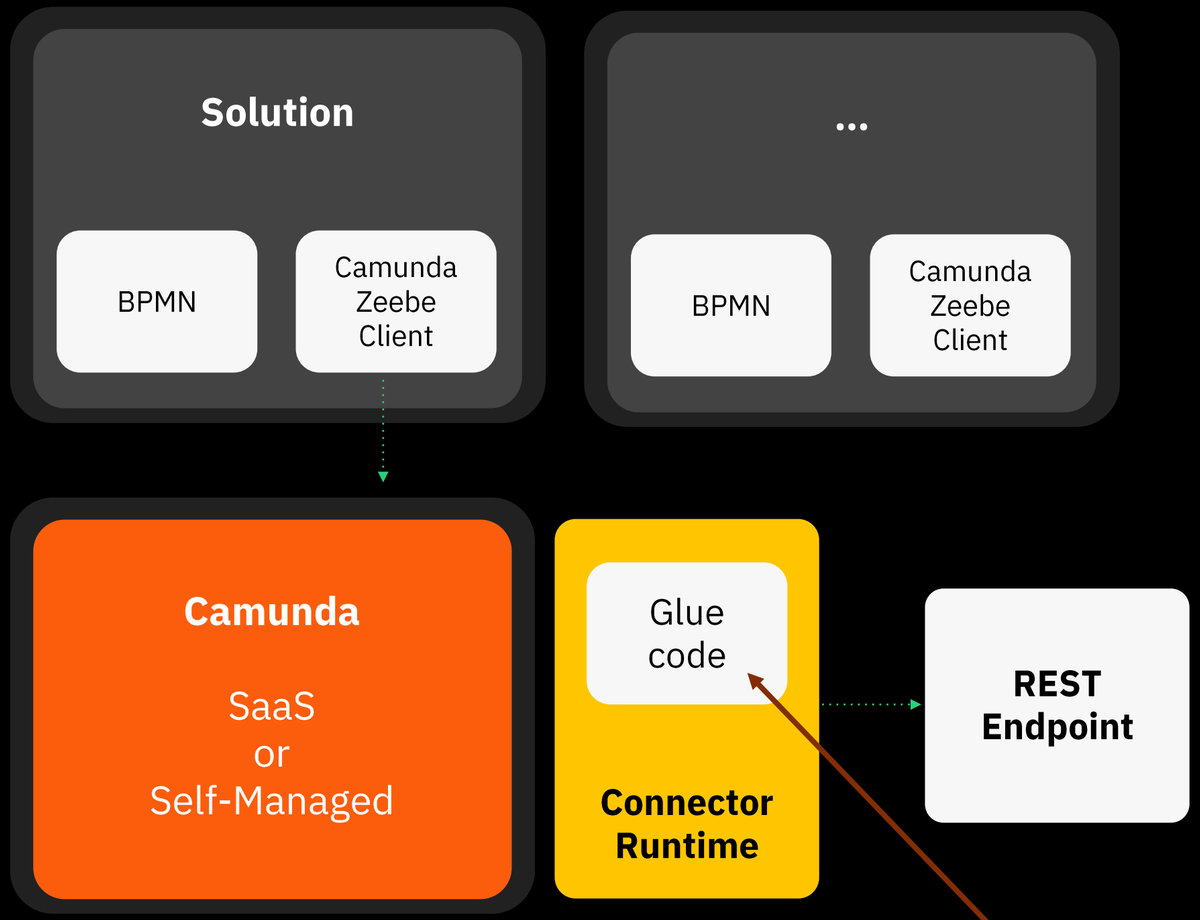
Solution architecture example

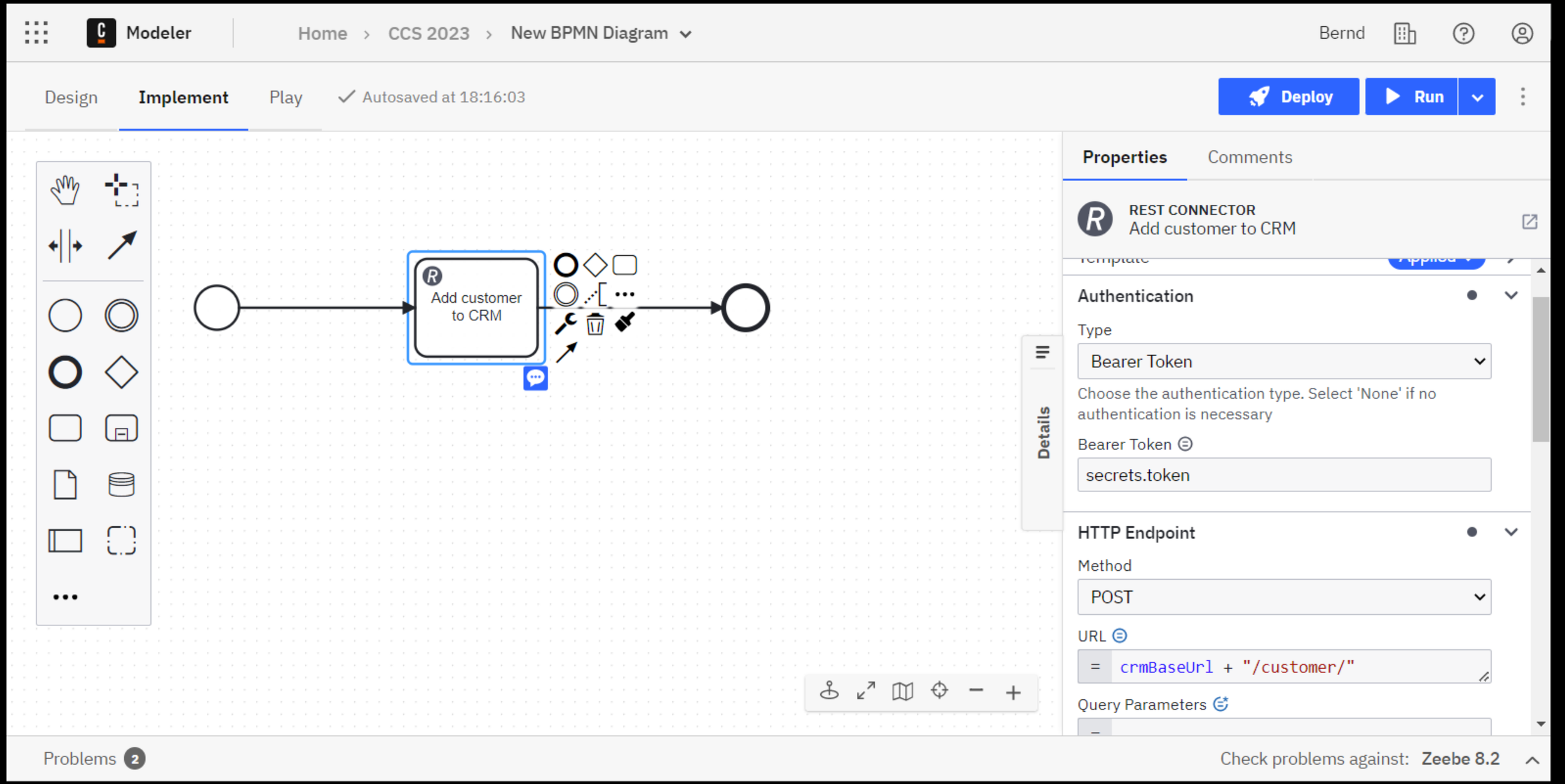


Solution architecture example



Solution architecture example with connector

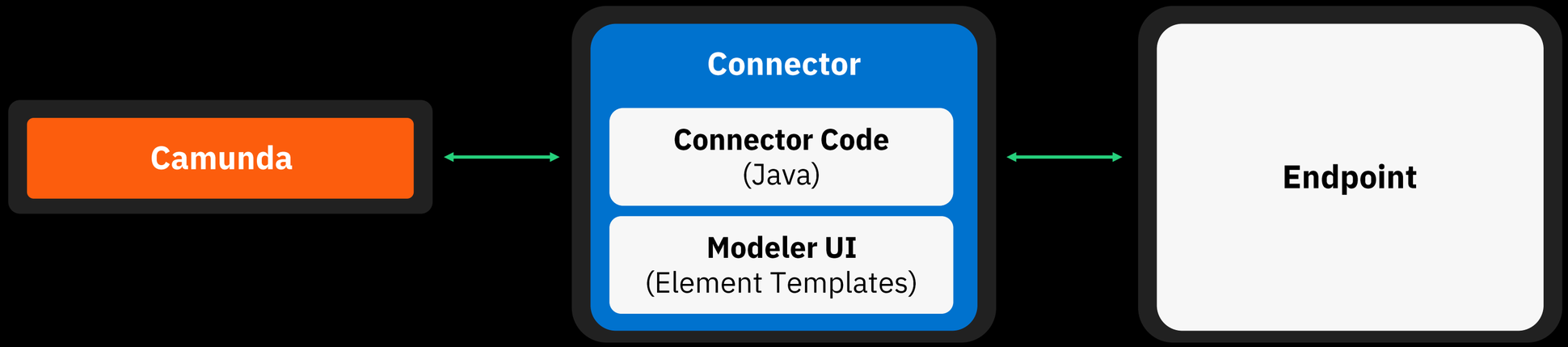



Modeler
Home
CCS 2023
New BPMN Diagram
Bernd
Design
Implement
Play
Autosaved at 18:16:03
Deploy
Run
Add customer to CRM
Properties
Comments
REST CONNECTOR
Add customer to CRM
Authentication
Type
Bearer Token
Choose the authentication type. Select 'None' if no authentication is necessary
Bearer Token
secrets.token
HTTP Endpoint
Method
POST
URL
= crmBaseUrl + "/customer/"
Query Parameters
Details
Problems 2
Check problems against: Zeebe 8.2

ok – but what's a connector?

What is a Connector?

@berndruecker

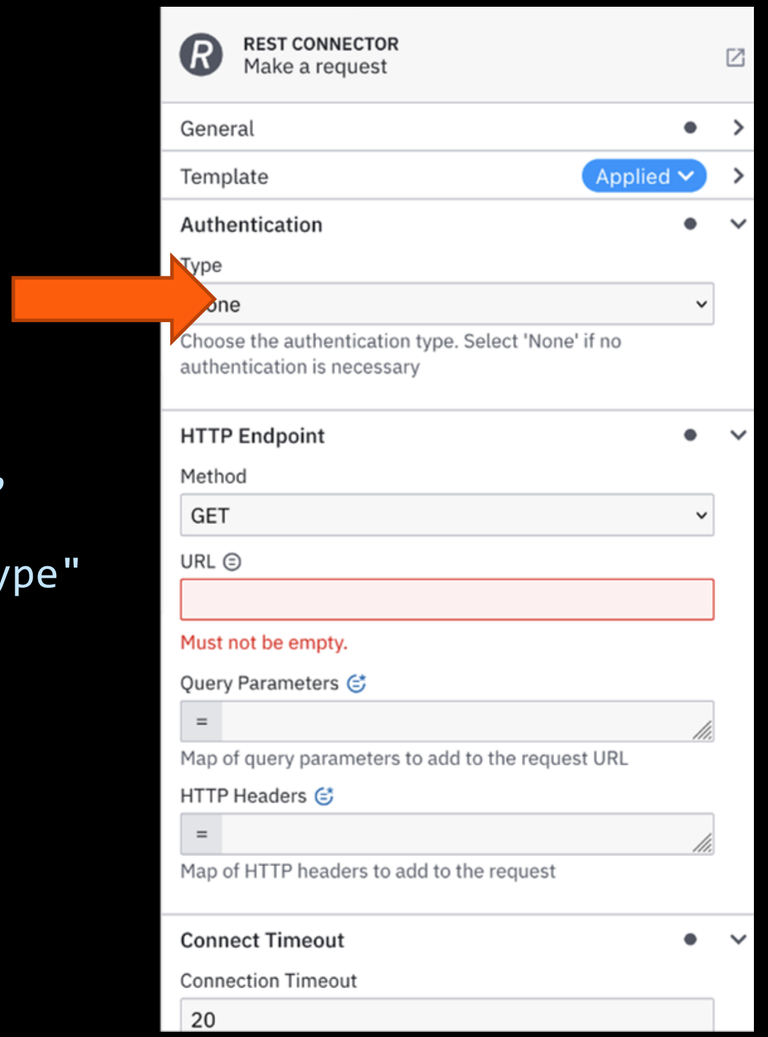


```java
@OutboundConnector(
     type = "io.camunda:http-json:1", inputVariables = {"method", ...},
)
public class HttpJsonFunction implements OutboundConnectorFunction {

  public Object execute(final OutboundConnectorContext context) throws Exception {
    final var json =;
    final var request = createRequest(context);
    return httpService.executeConnectorRequest(request);
  }
}
```

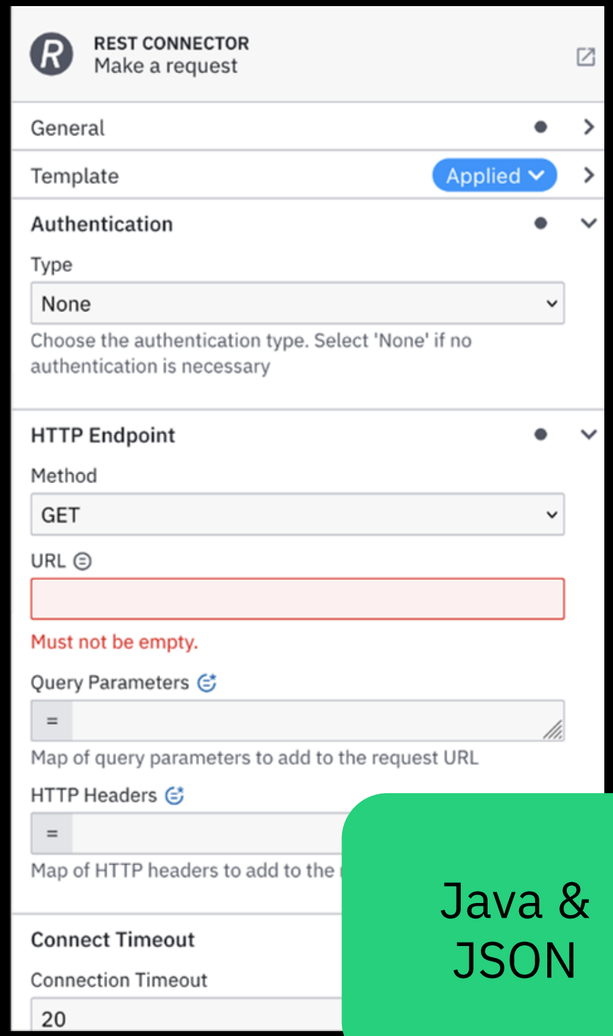
+

```json
{
  "name": "REST Connector",
  "properties": [
    {
      "type": "Hidden",
      "value": "io.camunda:http-json:1",
      "binding": {
        "type": "zeebe:taskDefinition:type"
      }
    },
    {
      "id": "method",
      "label": "REST Method",
      "group": "endpoint",
      "type": "Dropdown",
      "value": "get",
      "choices": [
```

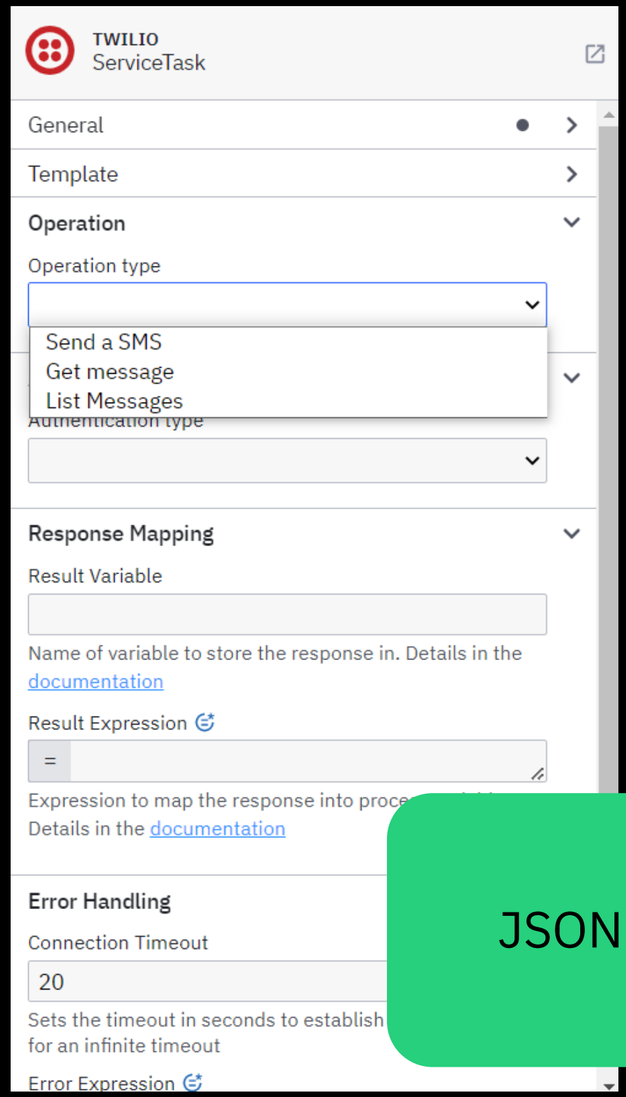


https://github.com/camunda/connectors-bundle/tree/main/connectors/http-json

Protocol > Generic System Connector



Java & JSON



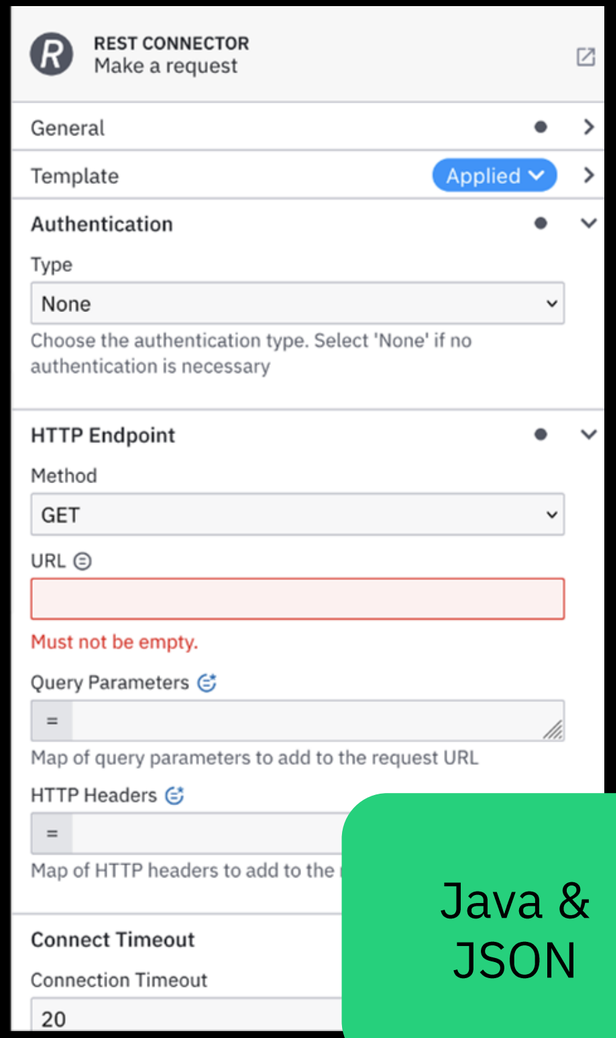
JSON

```
{
  "type": "Hidden",
  "value": "post",
  "binding": {
    "type": "zeebe:input",
    "name": "method"
  },
  "condition": {
    "property": "operationType",
    "equals": "sendSms"
  }
},
```

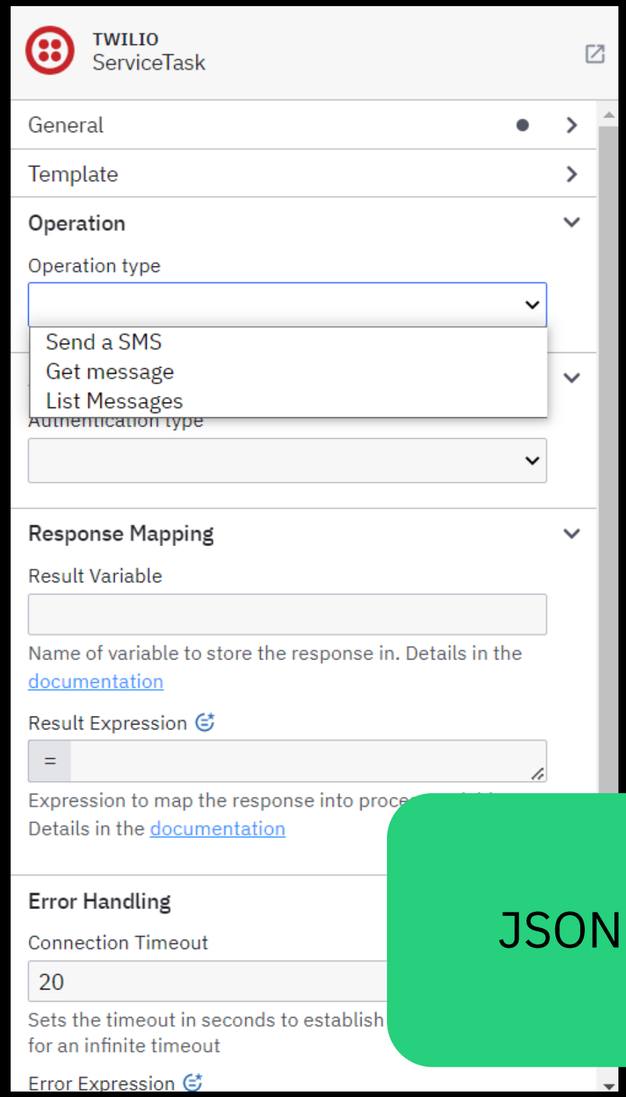
```
{
  "type": "Hidden",
  "value": "={\"content-type\":\"application/x-www-form-urlencoded\"}",
  "binding": {
    "type": "zeebe:input",
    "name": "headers"
  },
  "condition": {
    "property": "operationType",
    "equals": "sendSms"
  },
  "optional": false
},
```

https://github.com/camunda/connectors-bundle/blob/main/connectors/twilio/element-templates/twilio-connector.json

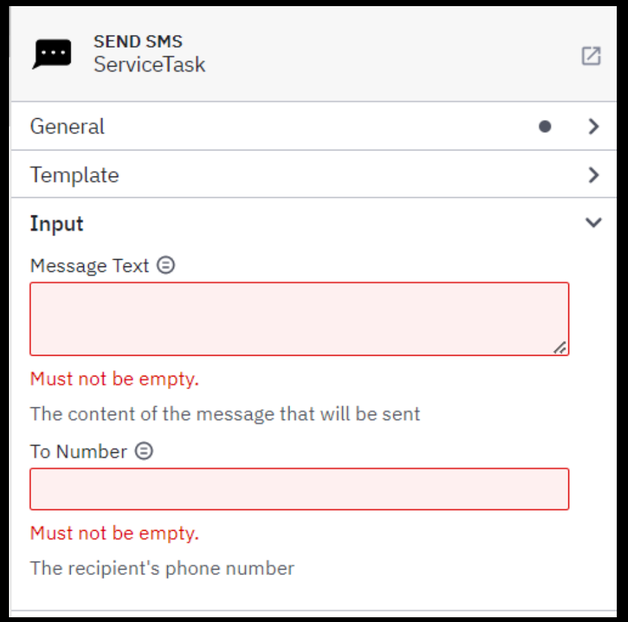
Protocol > Generic > Specific Connectors



Java & JSON

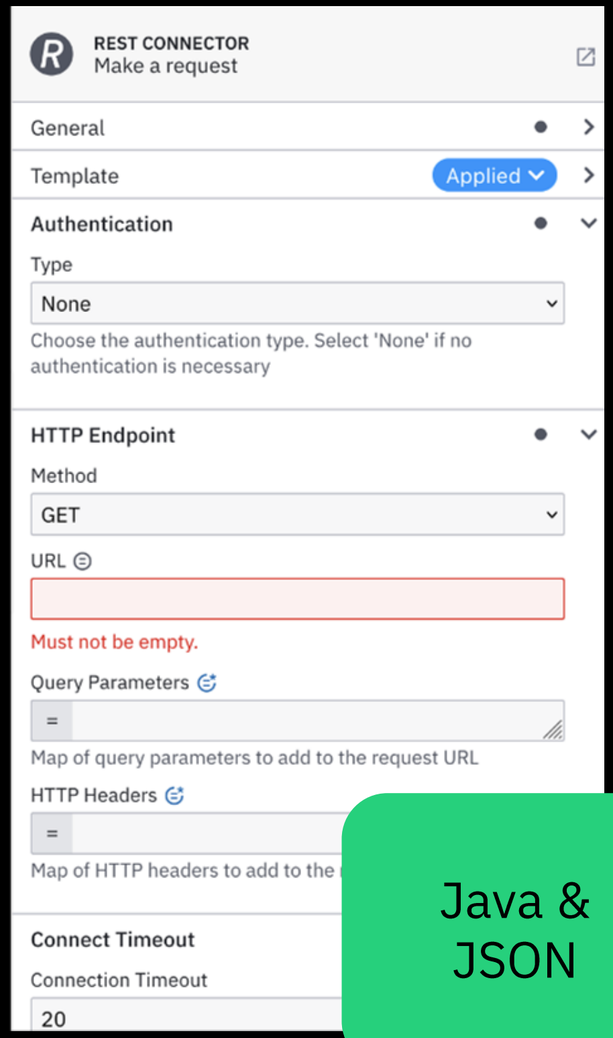


JSON

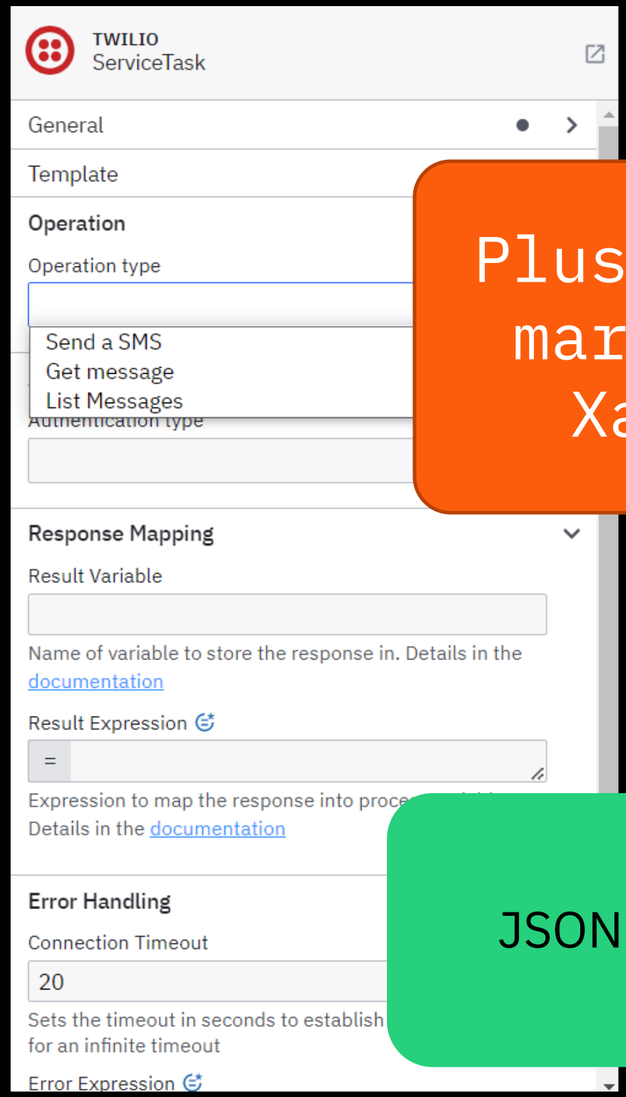


JSON

Protocol > Generic > Specific Connectors



Java & JSON

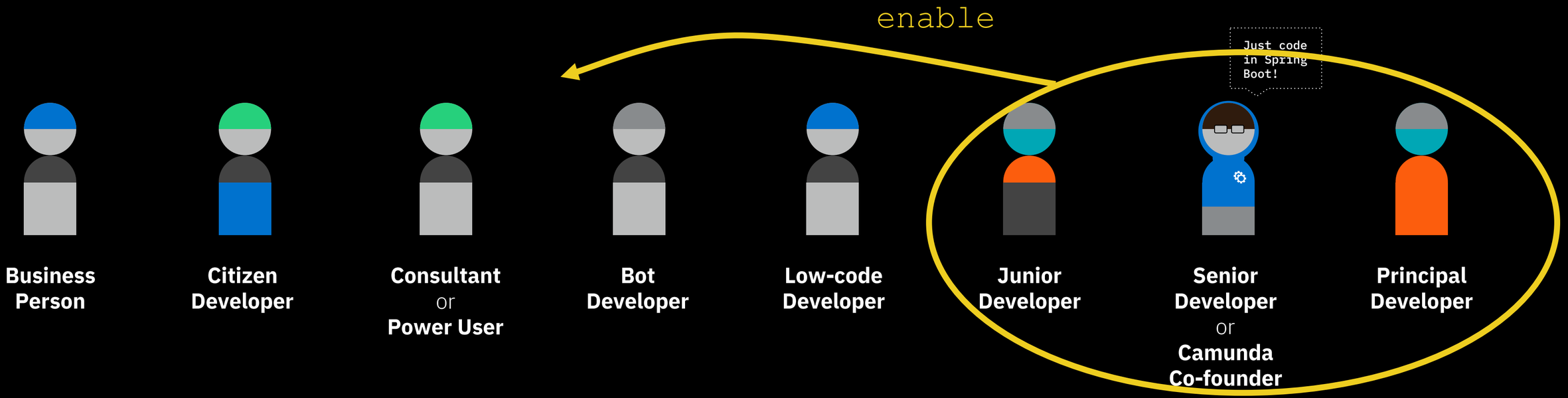


JSON

Plus: tooling, marketplace, XaaS, ...

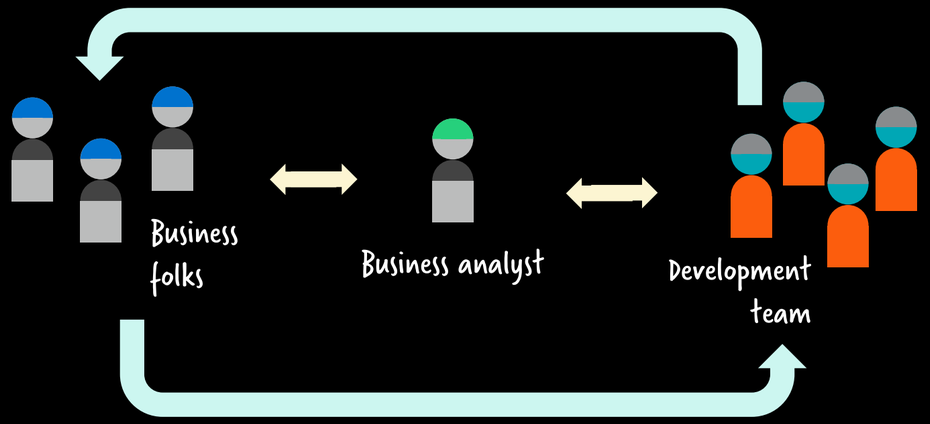
JSON

Enabling more roles to participate

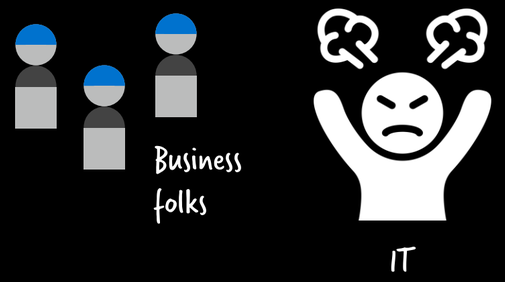


Improving your team topologies

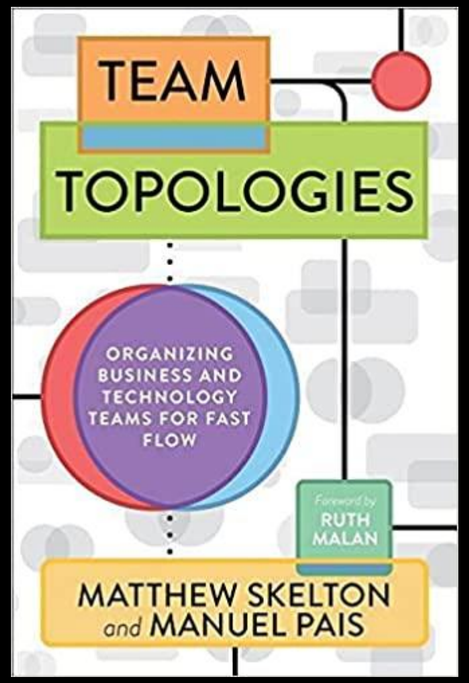
Traditional Development Models



or:



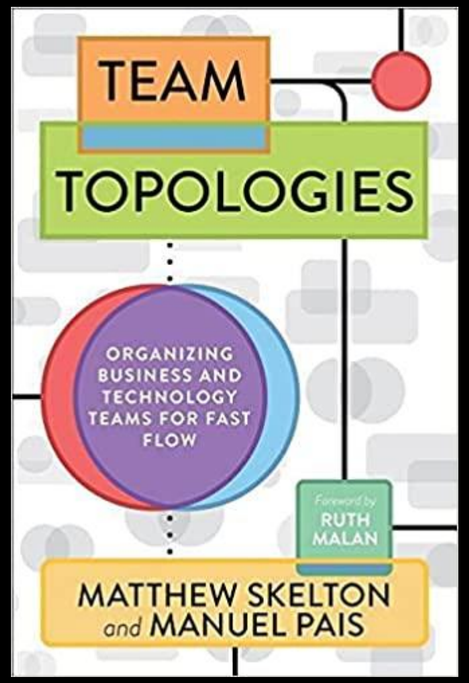
New way of working

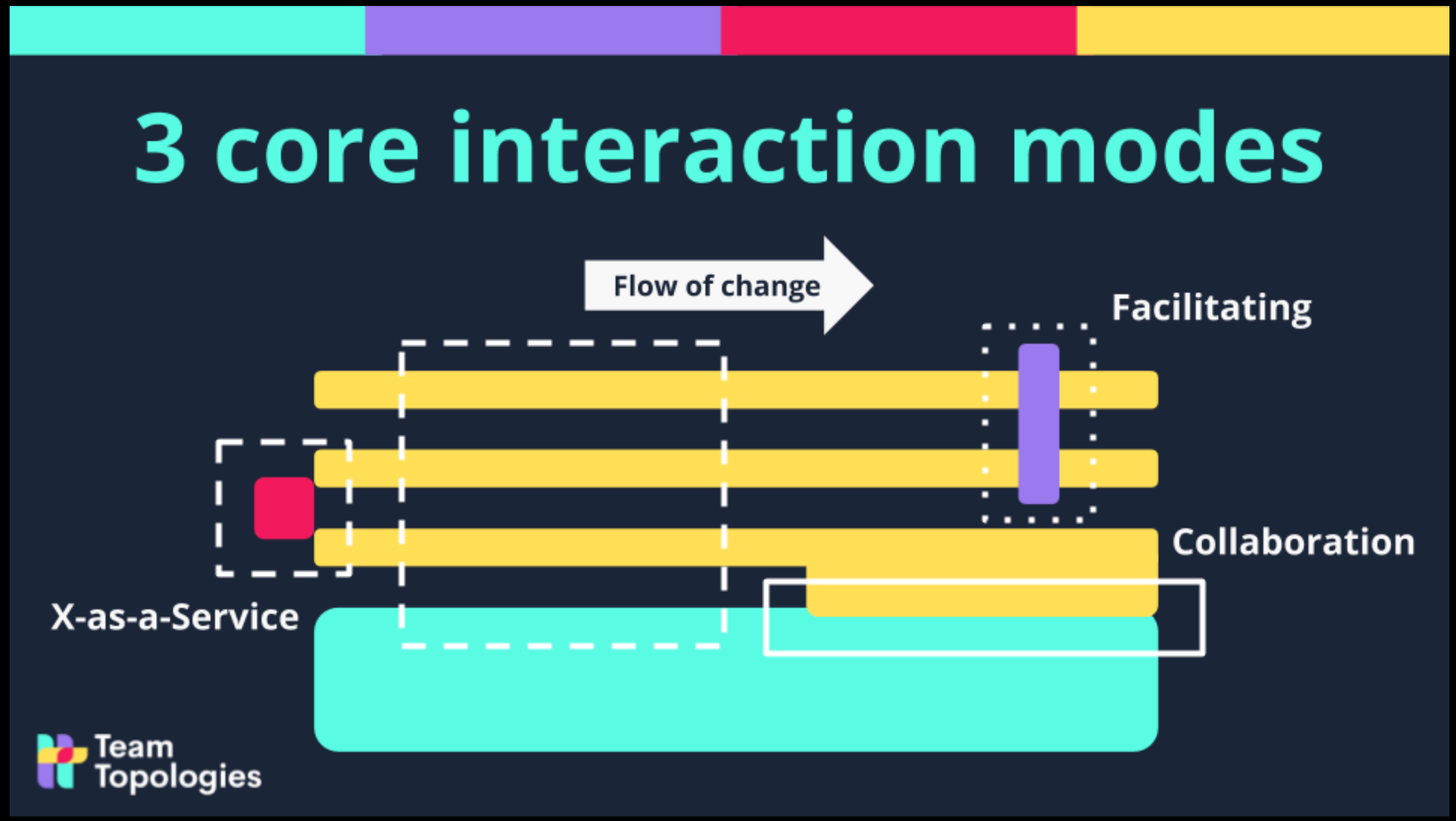


4 fundamental topologies

- Stream-aligned team
- Enabling team
- Complicated Subsystem team
- Platform team

Team Topologies



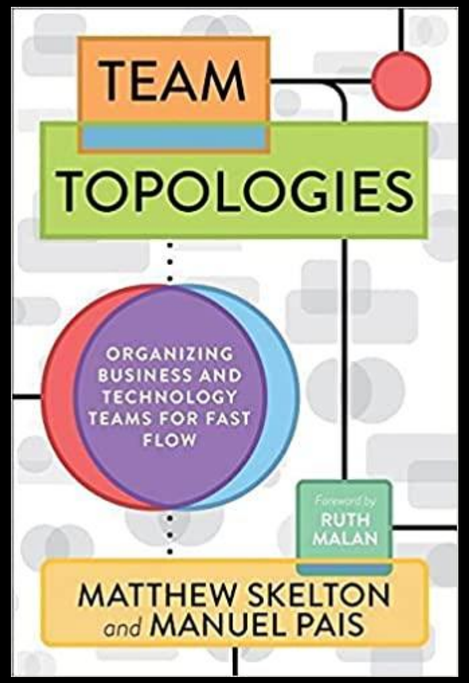


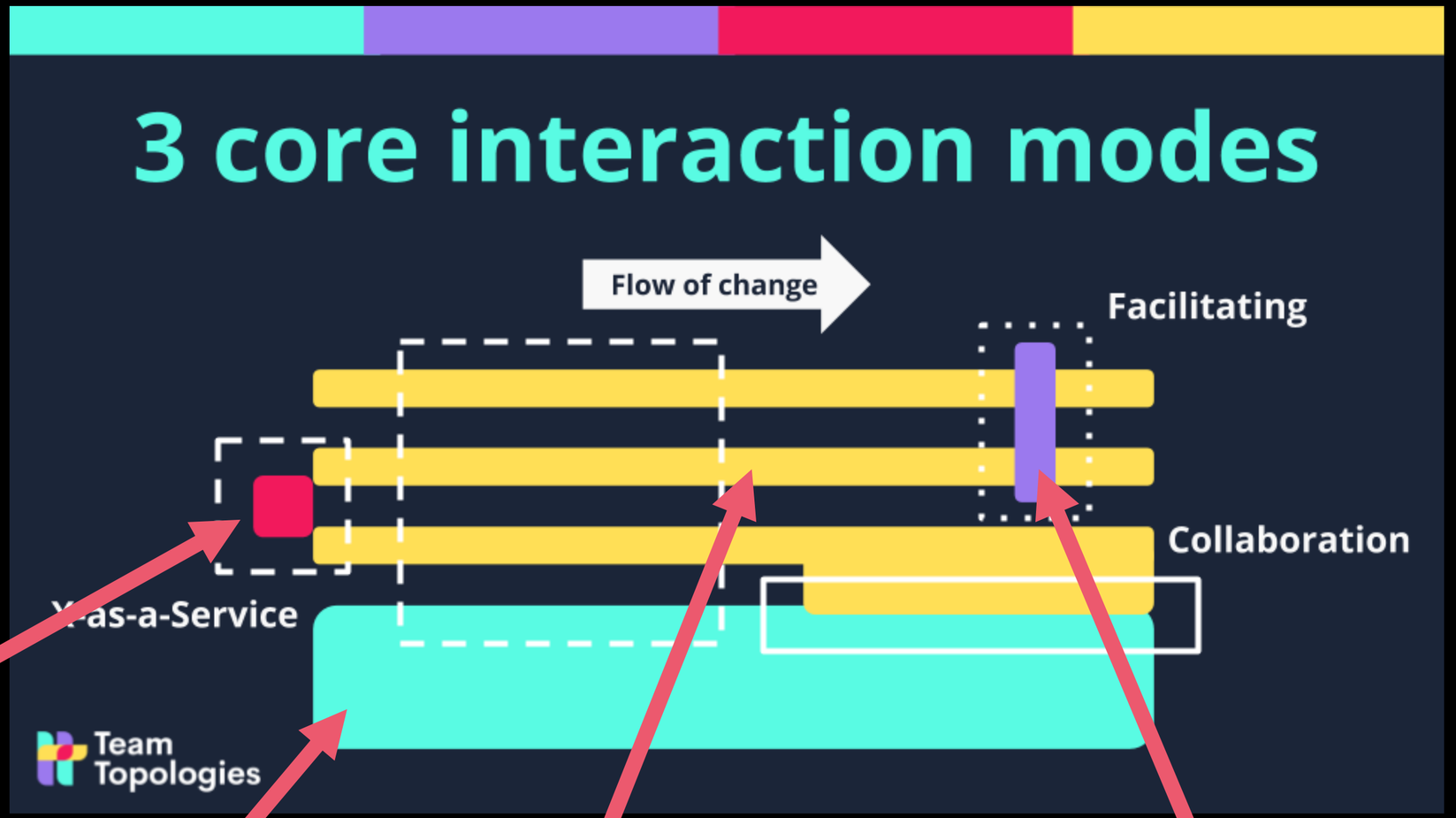
Stream-aligned team

Enabling team

Complicated Subsystem team

Platform team



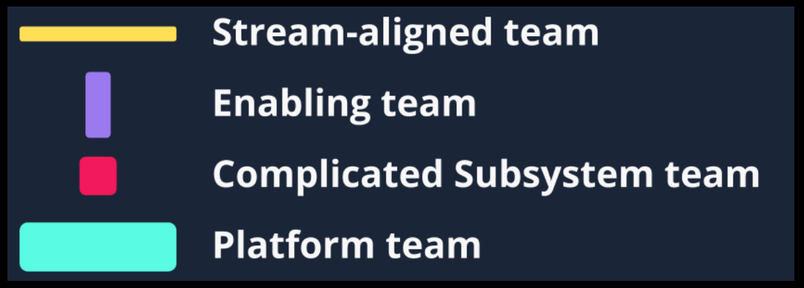


Fraud detection

Camunda + x

Bank Account Opening

Process Automation Center of Excellence



Cognitive Load

Intrinsic cognitive load

Fundamentals

(“How to program with Java?”)

Extraneous cognitive load

Environment

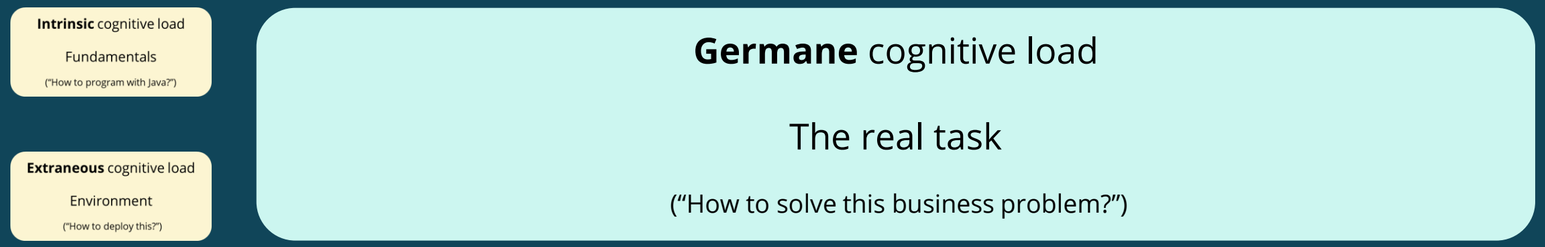
(“How to deploy this?”)

Germane cognitive load

The real task

(“How to solve this business problem?”)

Cognitive Load



Reduce intrinsic cognitive load

. Higher abstractions, moving technical details

. Diverse mix of people

Reduce extraneous cognitive load

. Golden paths

. Platforms, PaaS, SaaS, Cloud Services

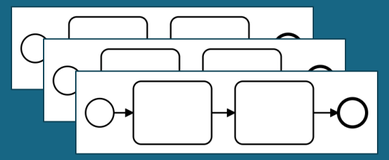
. Center of excellence

> Free up capacity to solve the real business problems

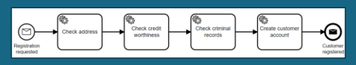
Running an orchestration platform

Every microservice (process solution) owns its process model, glue code, and any additional artifacts

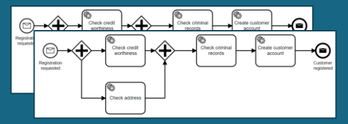
Microservice A



Microservice B



Microservice C



Orchestration Engine

Orchestration Engine

Orchestration Engine

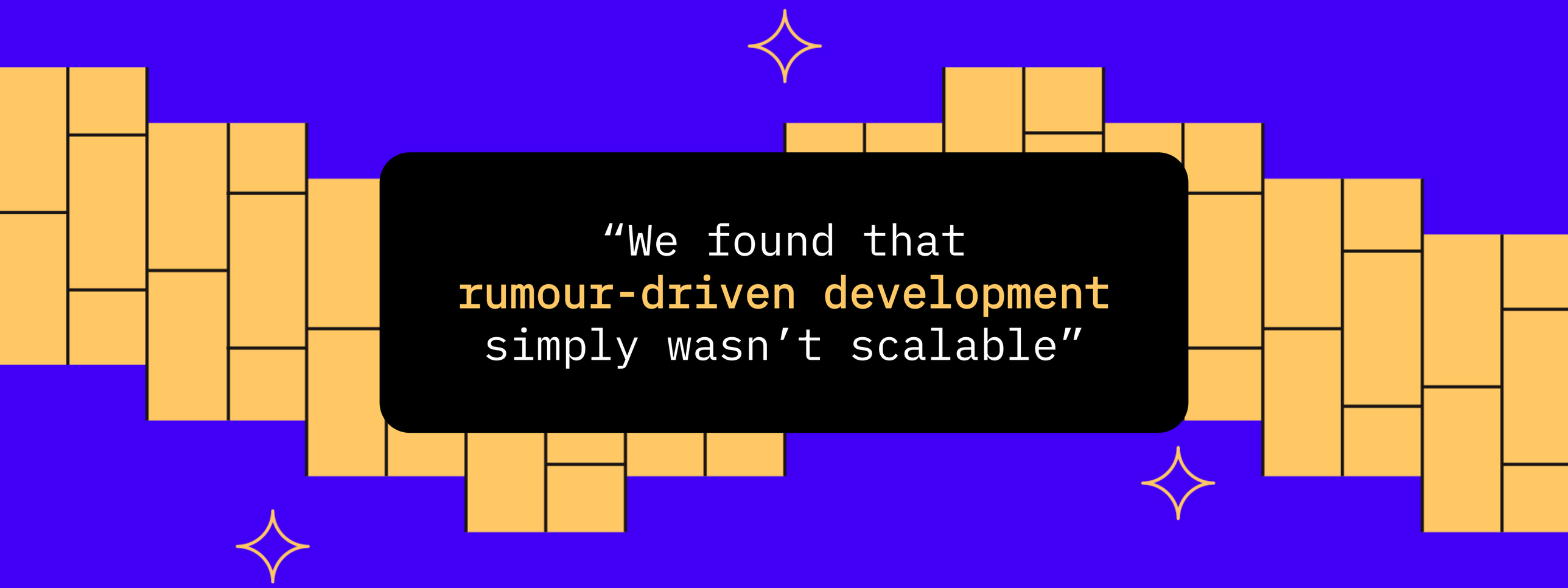
Ideally SaaS
(probably self-managed)

Platform or CoE does NOT mean unhealthy centralization!

Microservices = decentralization & autonomy

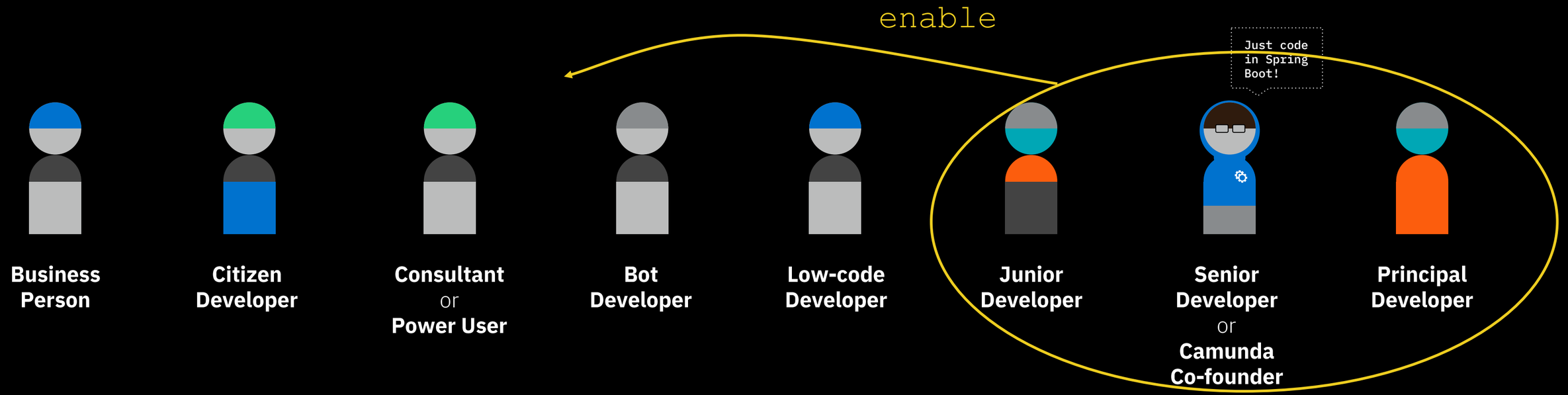
Spotify R&D

Golden Paths



https://engineering.atspotify.com/2020/08/how-we-use-golden-paths-to-solve-fragmentation-in-our-software-ecosystem/

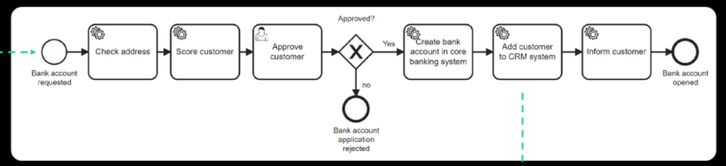
Enabling more roles to participate



```java
@PutMapping("/customer")
public ResponseEntity<CustomerOnboardingResponse> onboardCustomer(ServerWebExchange exchange) {
  HashMap<String, Object> variables = new HashMap<>();
  variables.put("automaticProcessing", true);
  variables.put("someInput", "yeah");

  client.newCreateInstanceCommand() //
        .bpmnProcessId("customer-onboarding") //
        .latestVersion() //
        .variables(variables) //
        .send().join();
  return ResponseEntity.status(HttpStatus.ACCEPTED).build();
}
```

Your code to provide a REST endpoint

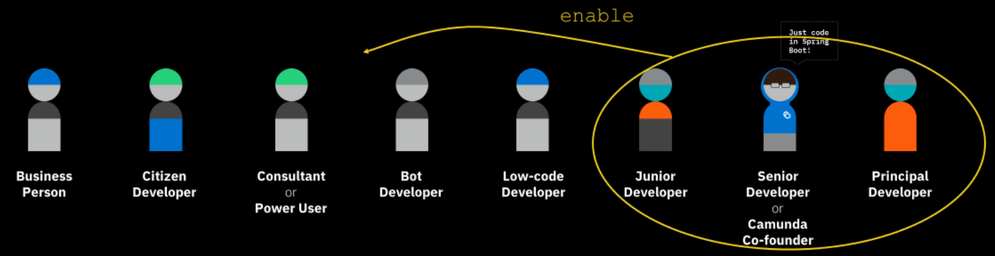


Your code to implement the REST call

```java
@JobWorker(type = "addCustomerToCrm")
public void addCustomerToCrmViaREST(final ActivatedJob job) {
    String request = "someData";
    restTemplate.put(ENDPOINT_CRM, request);
}
```


@berndruecker

Enabling more roles to participate



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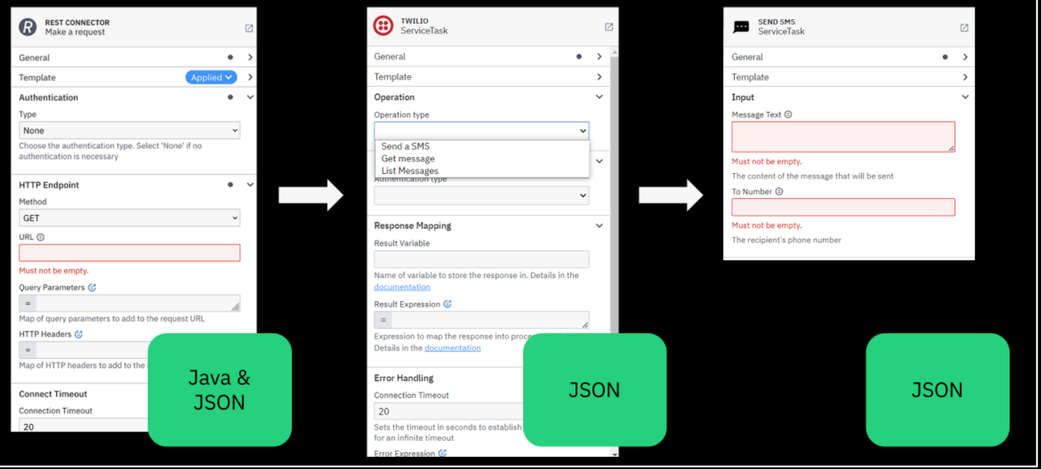
Protocol > Generic > Specific Connectors



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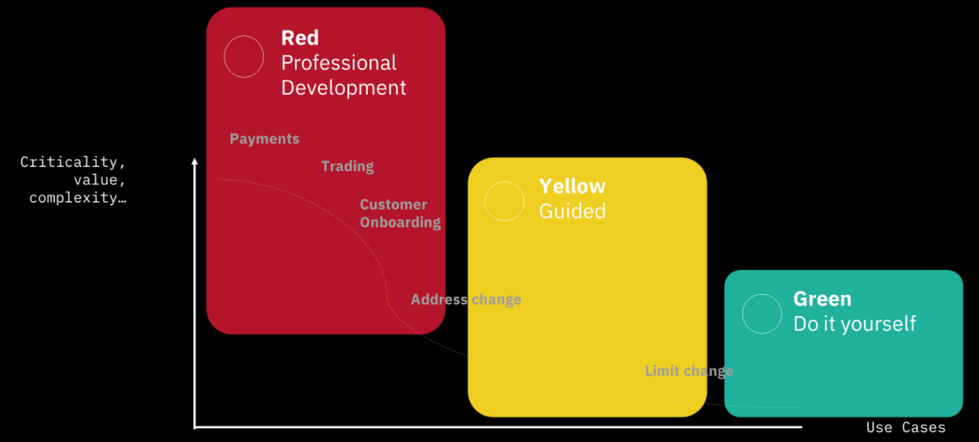


Developers, prepare to be the heros!

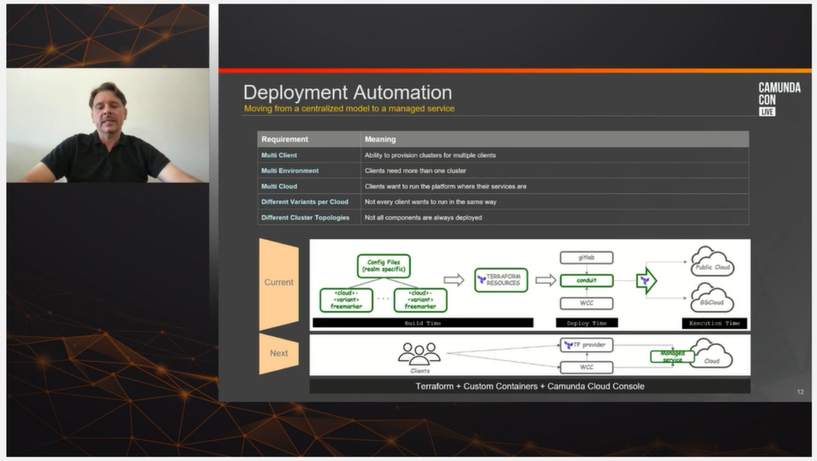
have more impact in process automation endeavours

help your organization automate more

...and focus on tech!

…
payment processing
…

CamundaCon 2021: Enabling Core Banking Use Cases with Camunda Cloud

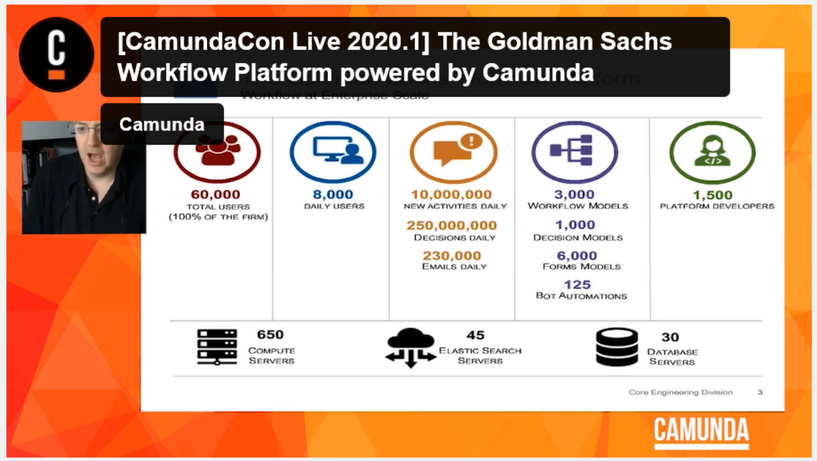


We will cover how we onboarded and extended Camunda Cloud to be the core component of our new Enterprise Process Automation Platform, which enables critical banking use cases. We'll cover the challenges of building our brand new Payments Processing Platform, an event-based microservices solution orchestrated by our Camunda Cloud Corporate Platform.

*Learn more about CamundaCon 2021, the virtual conference dedicated to Process Automation, and **watch any session on-demand**.*

…
easy workflows like "Approve access or entitlement"
…

CamundaCon 2020: The Goldman Sachs Workflow Platform powered by Camunda



Get a behind-the-scenes look how Goldman Sachs built one of the largest and most advanced process automation platforms in the industry. Used by more than 40,000 employees running over thousands of unique workflows, the team at Goldman Sachs created a vital backbone for automating many aspects the company's business.

This presentation provides an overview of how Goldman Sachs has embraced BPMN and DMN and its journey to develop an internal automation platform that accelerates engineers and enables non-engineers to deliver digital transformation at enterprise scale. At its core, the platform is powered by Camunda's open source modeling tools and BPM execution engine augmented with Goldman Sachs extensions and integrations.

The presentation covers:

- Model-driven process, task, data, decision and forms development on the platform

https://camunda.com/customer/goldman-sachs/

Thank you!

Let’s discuss!

@berndruecker

linkedin.com/in/bernd-ruecker/

berndruecker.io/