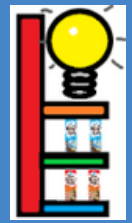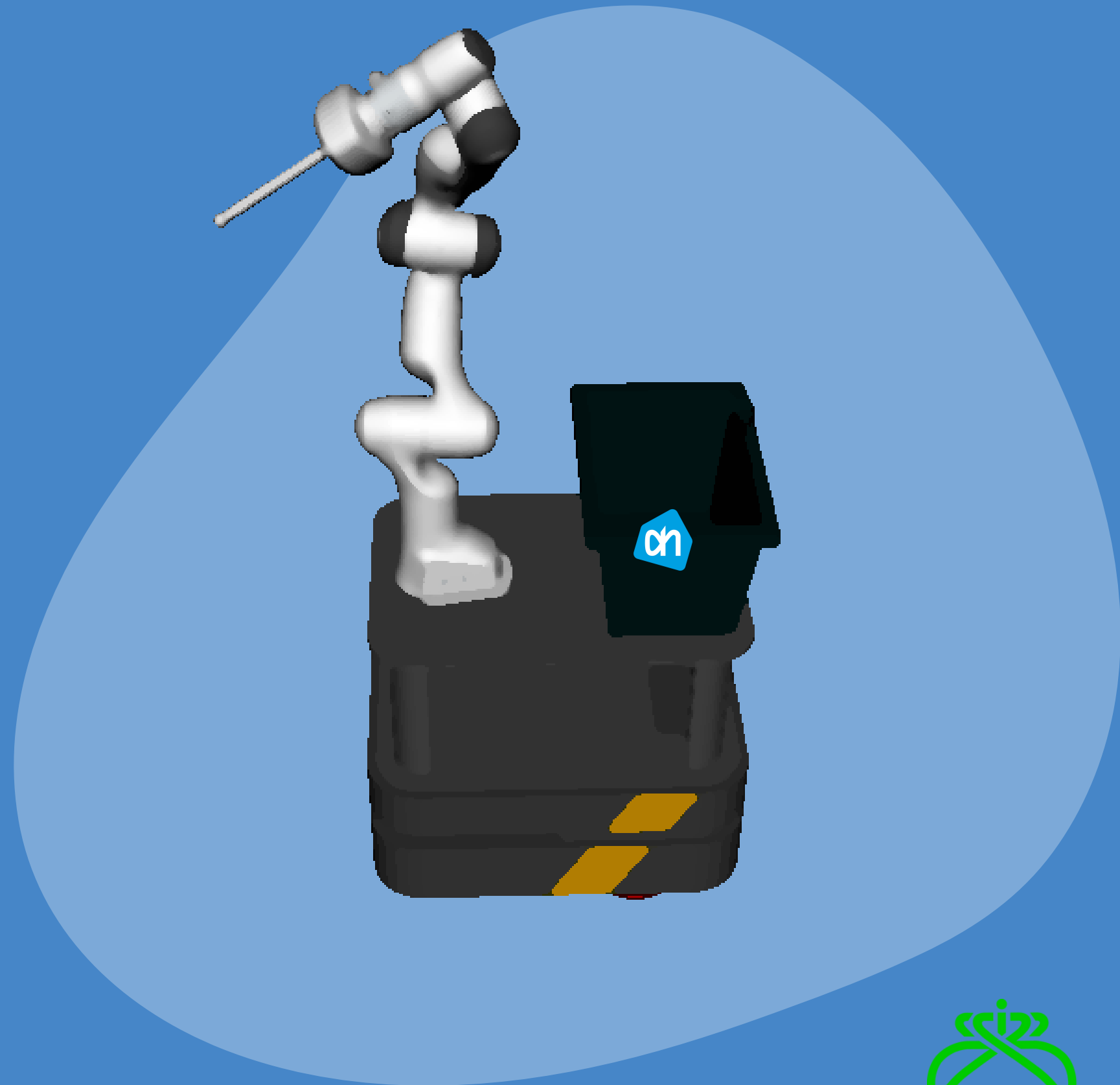# Ahold Delhaize

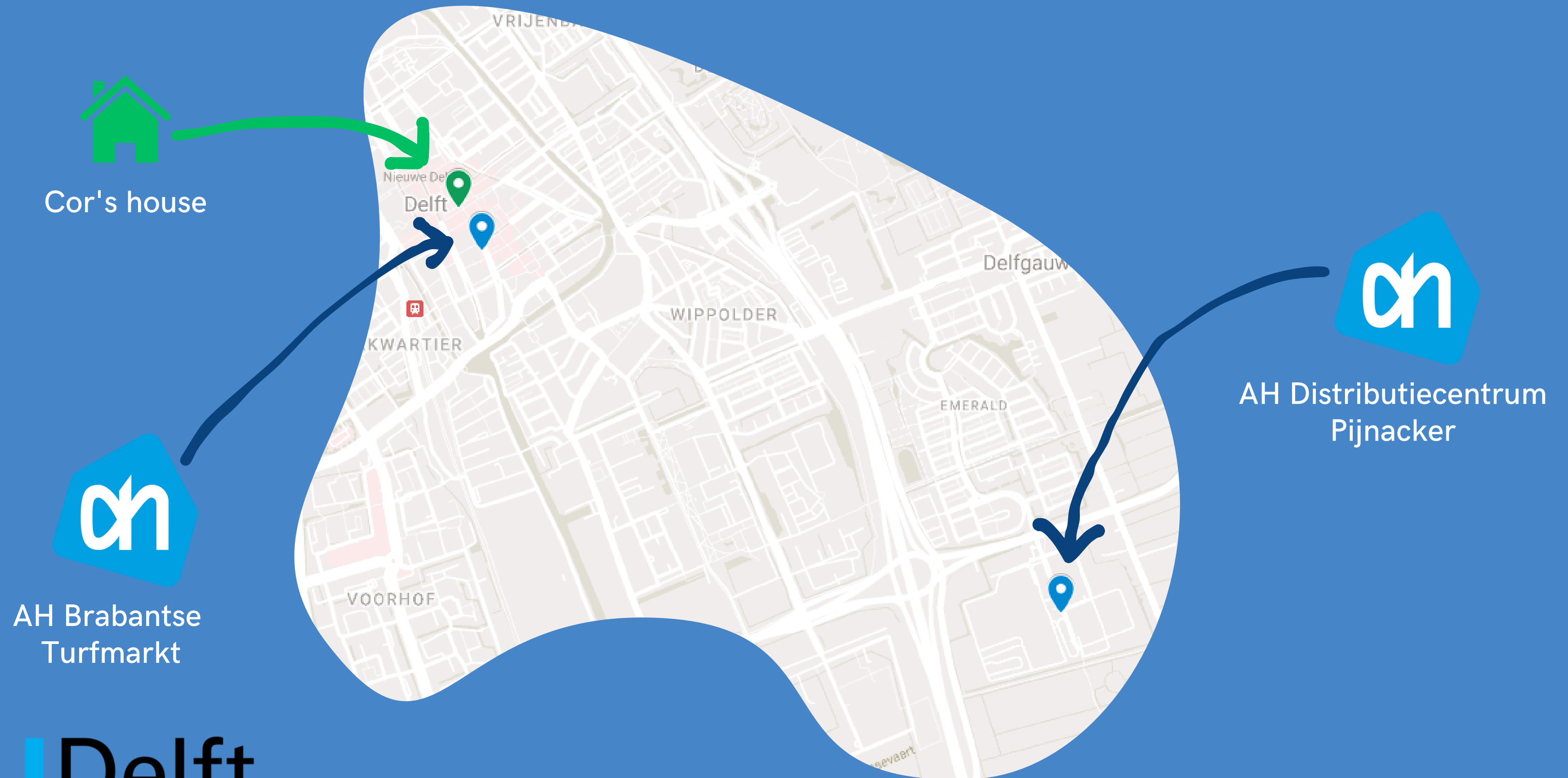## SmartShelf Engineers (Group 20)

Marijn de Rijk

Ernst Cancrinus

Stan Vijverberg

Henk Jekel

Kenny Brandon

The Problem

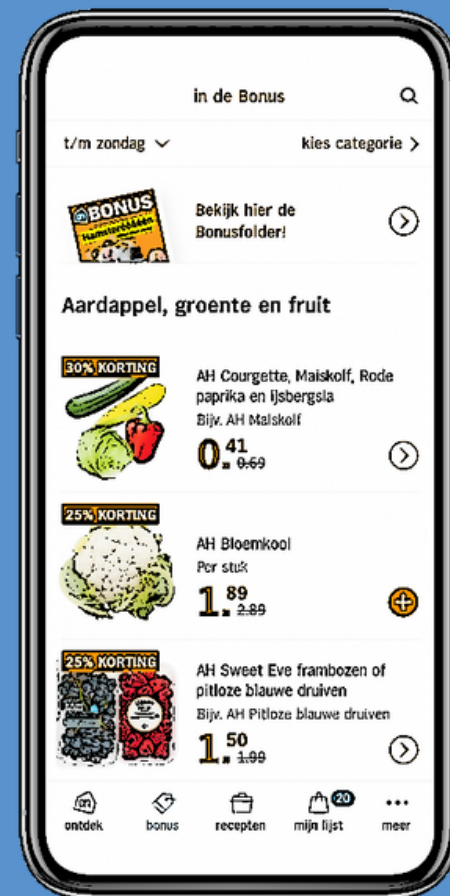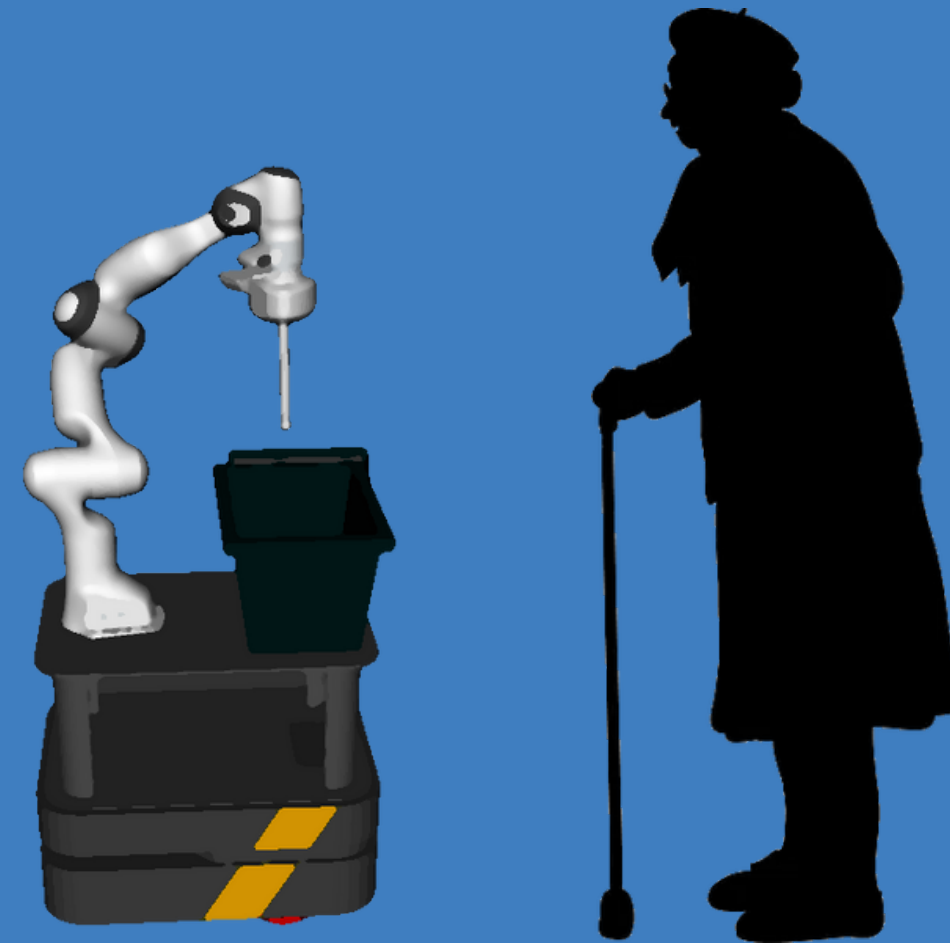Cor's house

AH Brabantse
Turfmarkt

AH Distributiecentrum
Pijnacker

TUDelft

The Problem

Online

In-Store

System Requirements
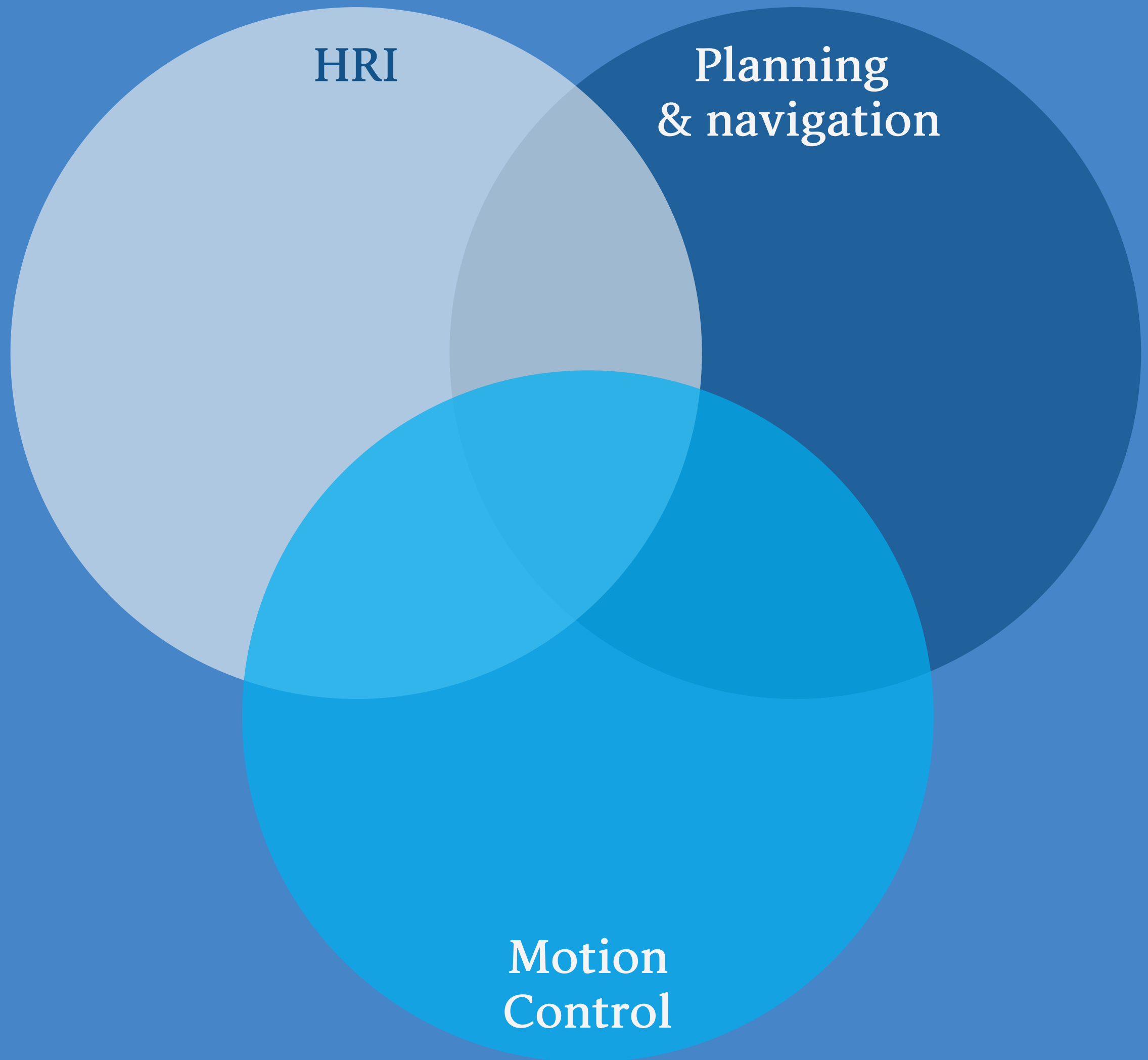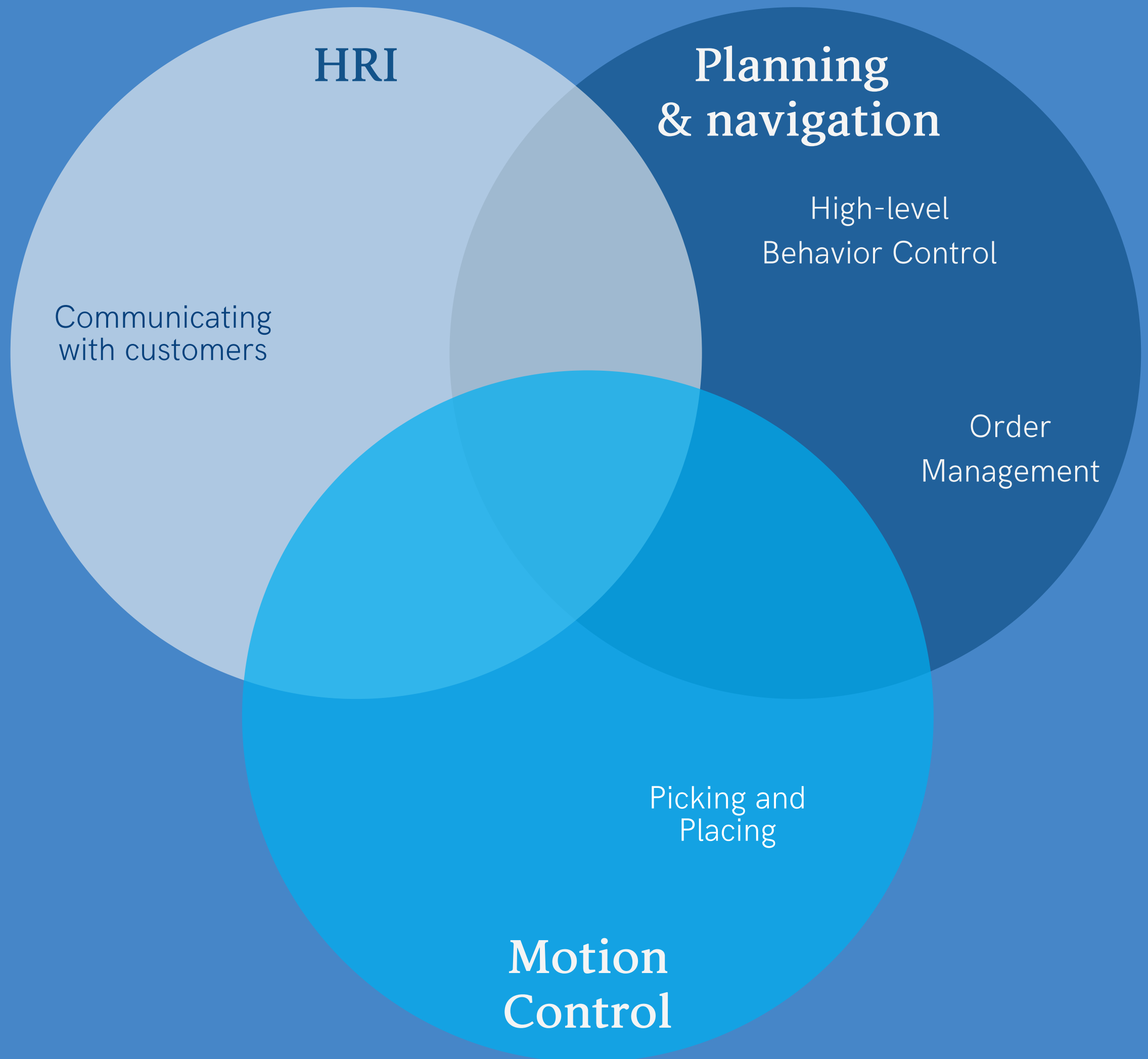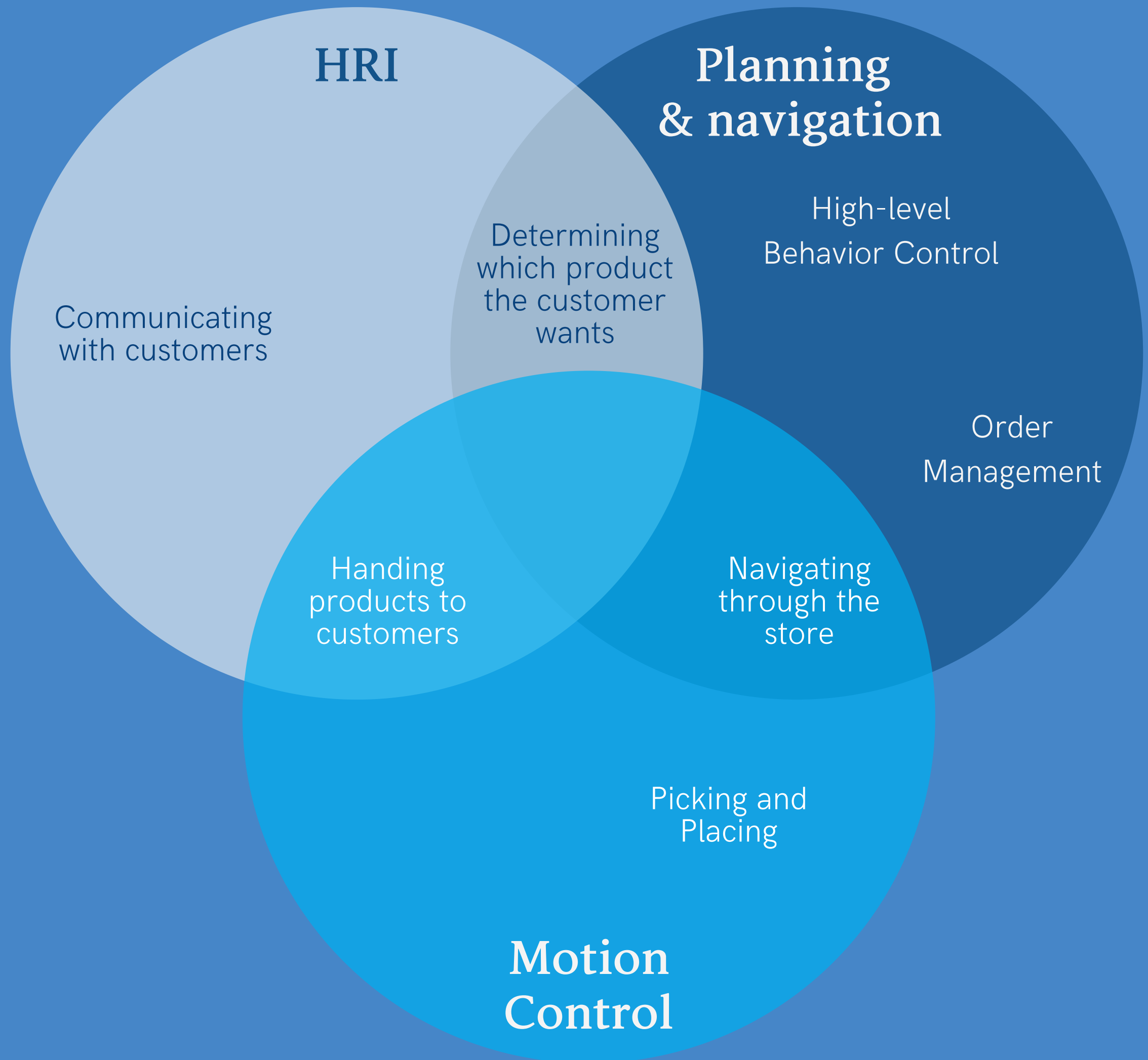
HRI

Planning
& navigation

Motion
Control

TU Delft

System Requirements

HRI

Communicating with customers

Planning & navigation

High-level Behavior Control

Order Management

Picking and Placing

Motion Control

TUDelft

System Requirements

HRI

Planning & navigation

Communicating with customers

Determining which product the customer wants

High-level Behavior Control

Order Management

Handing products to customers

Navigating through the store

Picking and Placing

Motion Control

TU Delft

Design choices

Order handling system

Used to process order requests from online and in-store customers.

TUDelft

Design choices

Order handling system

Used to process order requests from online and in-store customers.

Voice request system

Allows customer to request picking assistance through voice interaction with Albert.

Design choices

Order handling system

Used to process order requests from online and in-store customers.

Voice request system

Allows customer to request picking assistance through voice interaction with Albert.

FlexBE

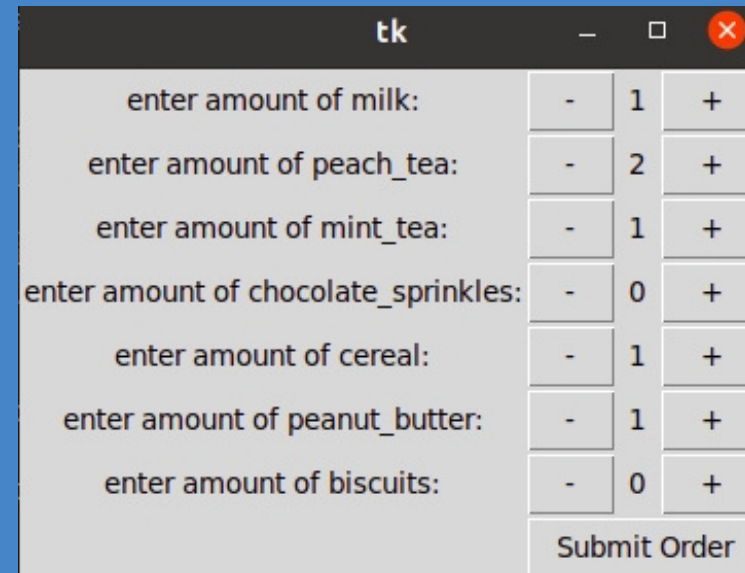Full behavior model for the robot to execute its tasks autonomously.

TUDelft

Video demonstration

Order handling system

Online & in-store customers

GUI for products and quantities

Video demonstration

Order handling system

Online & in-store customers

GUI for products and quantities

tk

enter amount of milk:	-	1	+
enter amount of peach_tea:	-	2	+
enter amount of mint_tea:	-	1	+
enter amount of chocolate_sprinkles:	-	0	+
enter amount of cereal:	-	1	+
enter amount of peanut_butter:	-	1	+
enter amount of biscuits:	-	0	+
			Submit Order

order list

Product	Location	Order ID	Request type
milk	shelf_1	0	0
peach_tea	shelf_2	0	0
peach_tea	shelf_2	0	0
mint_tea	shelf_2	0	0
cereal	shelf_4	0	0
peanut_butter	shelf_4	0	0
base_station	base_station	100	3
chocolate_sprinkles	shelf_3	1	0
cereal	shelf_4	1	0
peanut_butter	shelf_4	1	0
biscuits	shelf_3	1	0
base_station	base_station	100	3

Scan shelf

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Video demonstration

Voice request system

ChatGPT API

Google text to speech
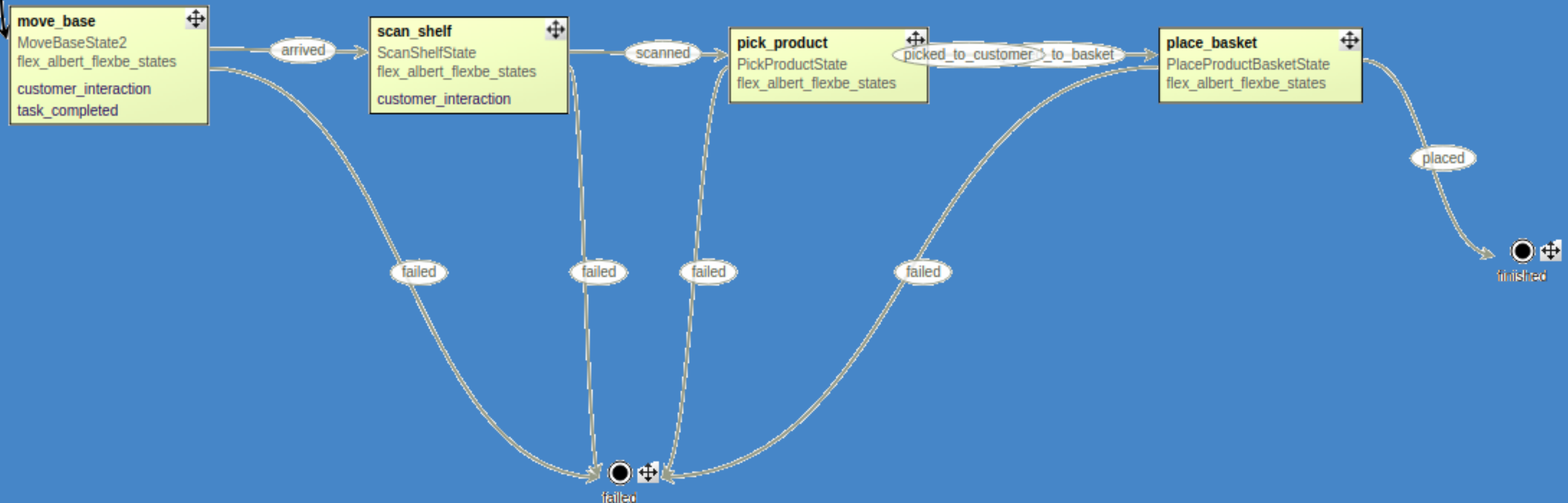
Google speech recognition
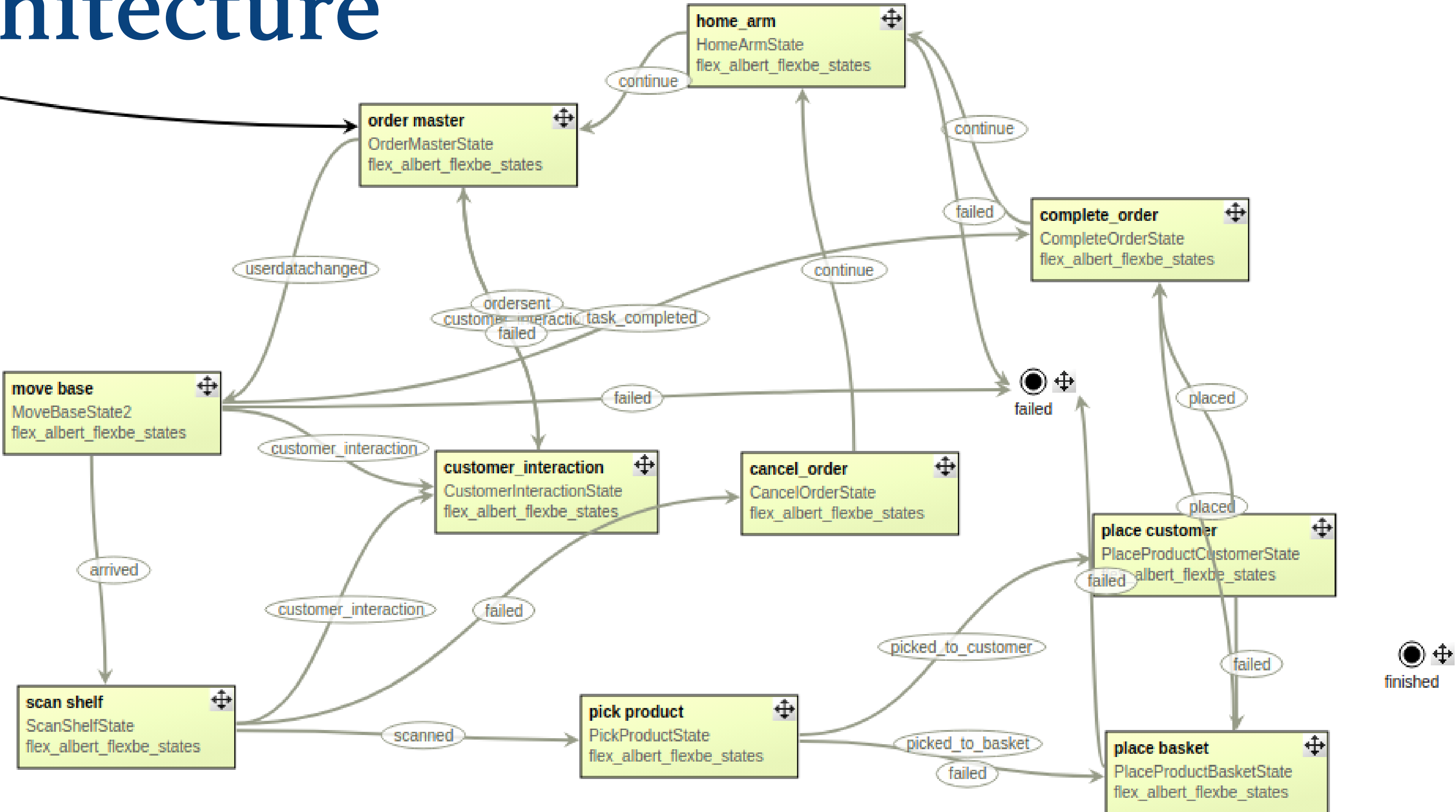
Product database integration

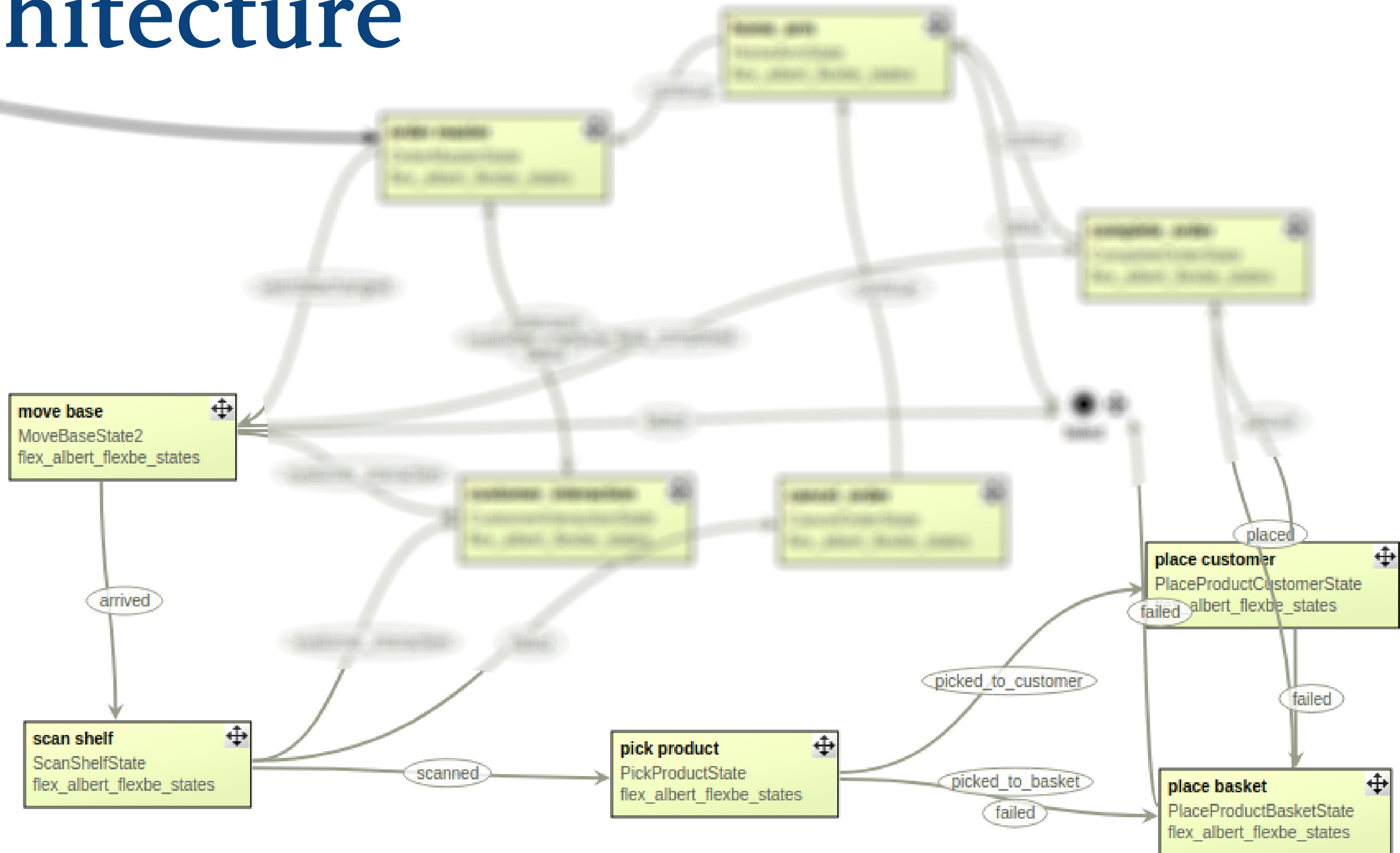Hey Albert

TU Delft

Architecture

FlexBE behavior engine
- Monitoring
- GUI
- Live adjustments

move_base
MoveBaseState2
flex_albert_flexbe_states

customer_interaction
task_completed

arrived

scan_shelf
ScanShelfState
flex_albert_flexbe_states

customer_interaction

scanned

pick_product
PickProductState
flex_albert_flexbe_states

picked_to_customer _to_basket

place_basket
PlaceProductBasketState
flex_albert_flexbe_states

placed

failed

failed

failed

failed
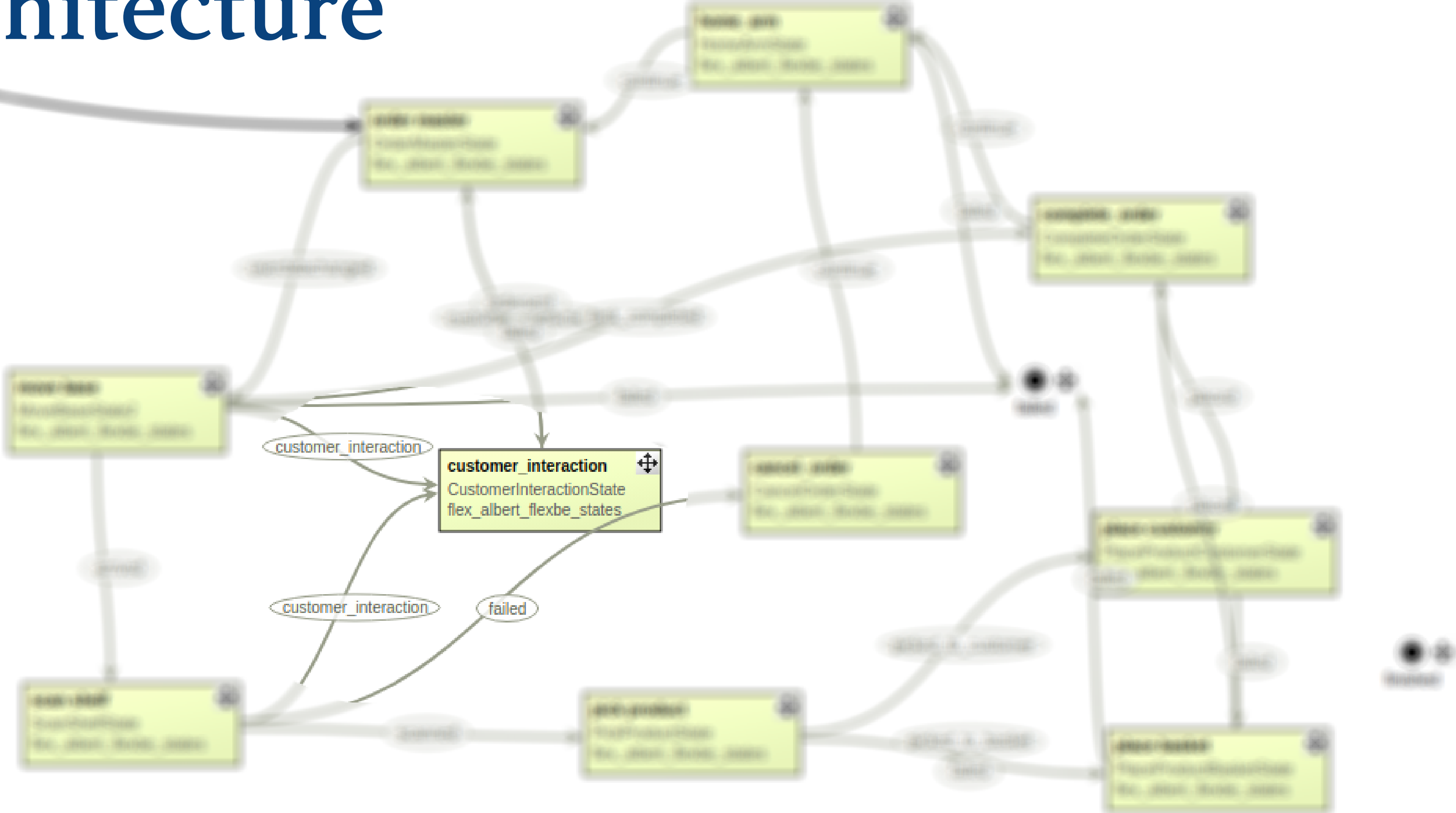
failed

finished

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Architecture

Architecture
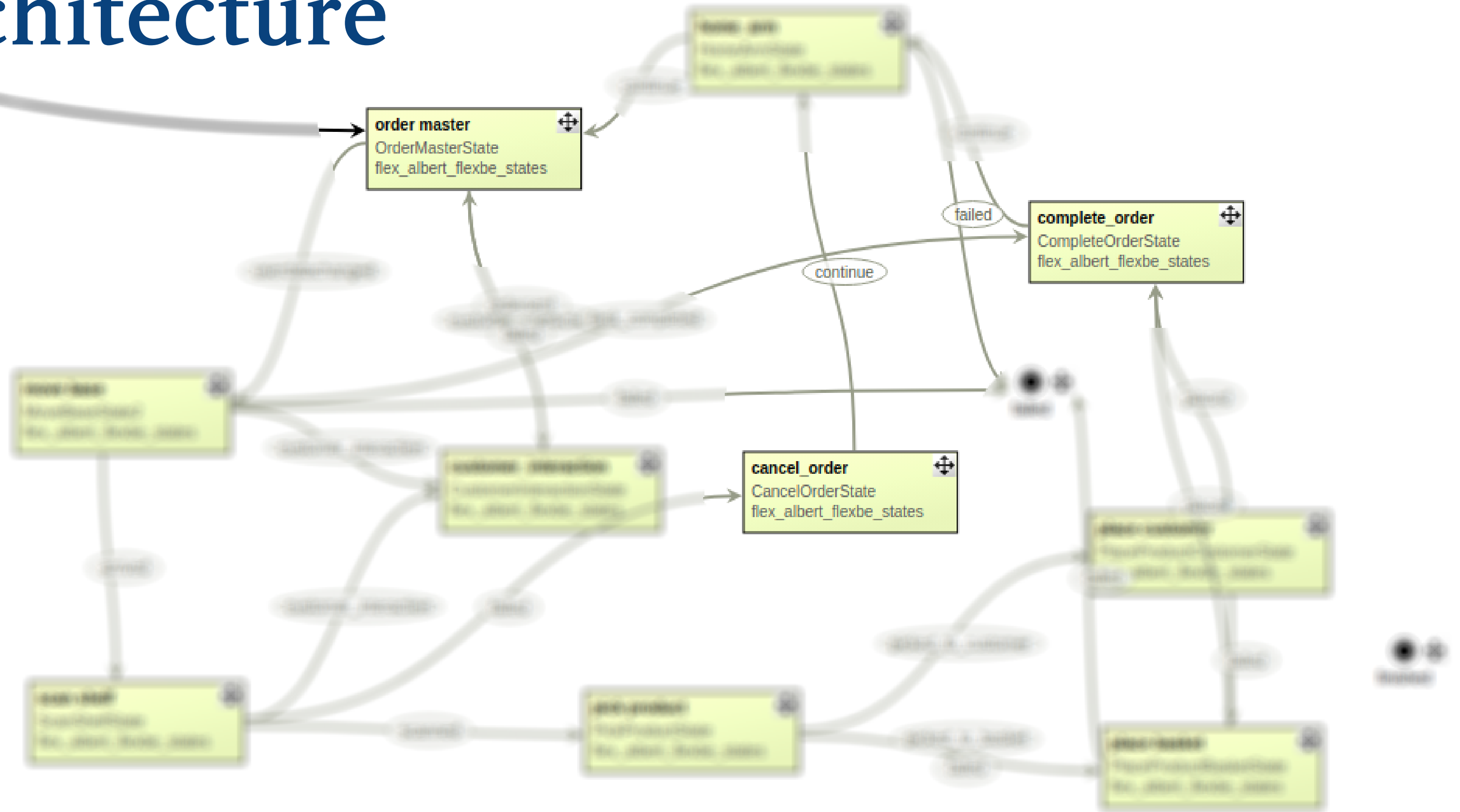
Architecture

Architecture
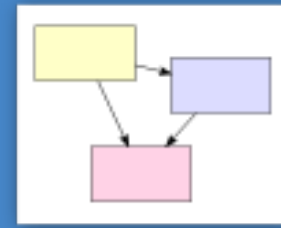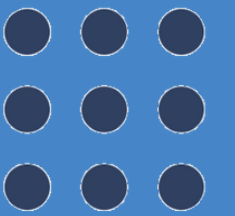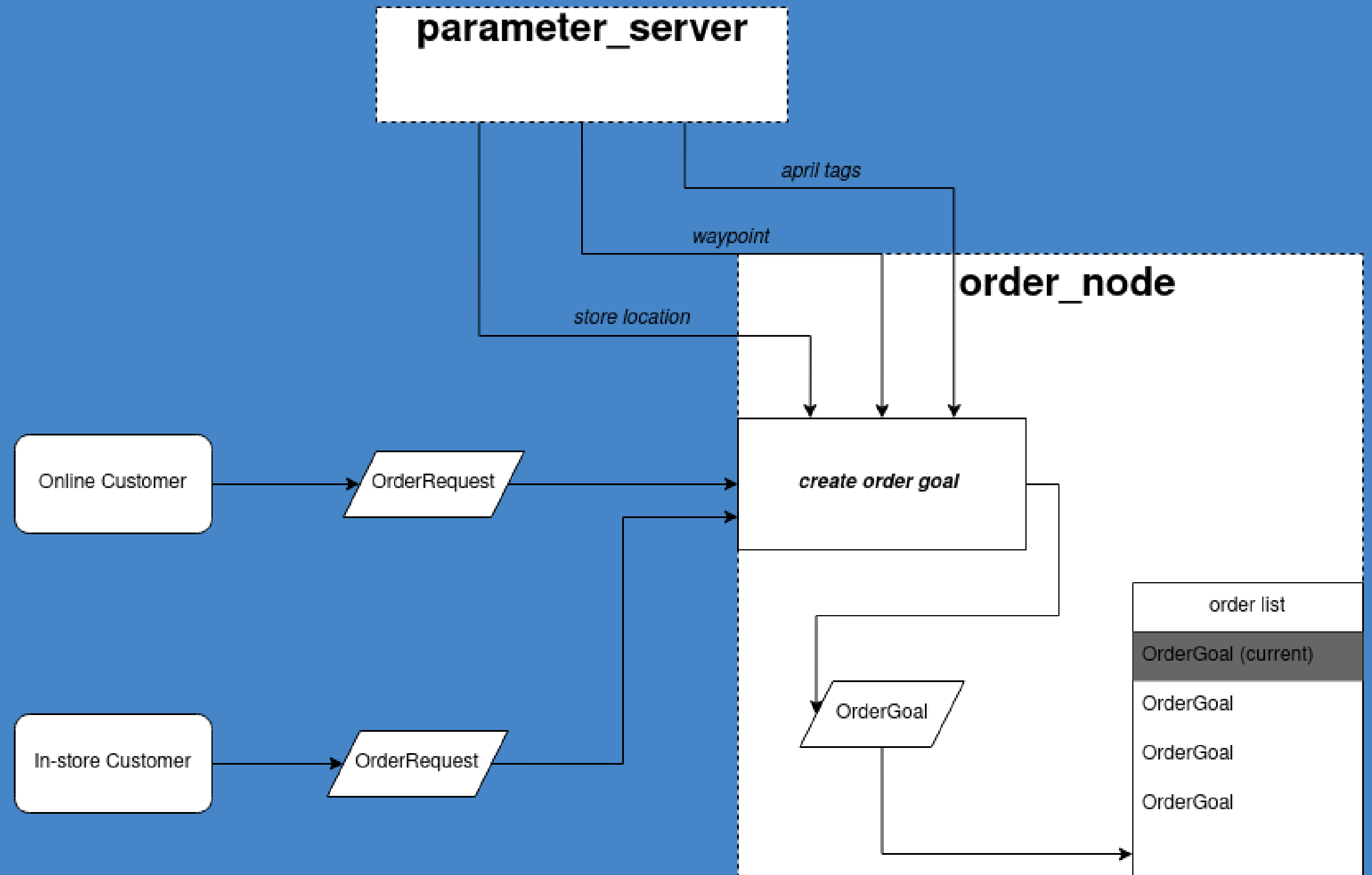
Questions?

TUDelft
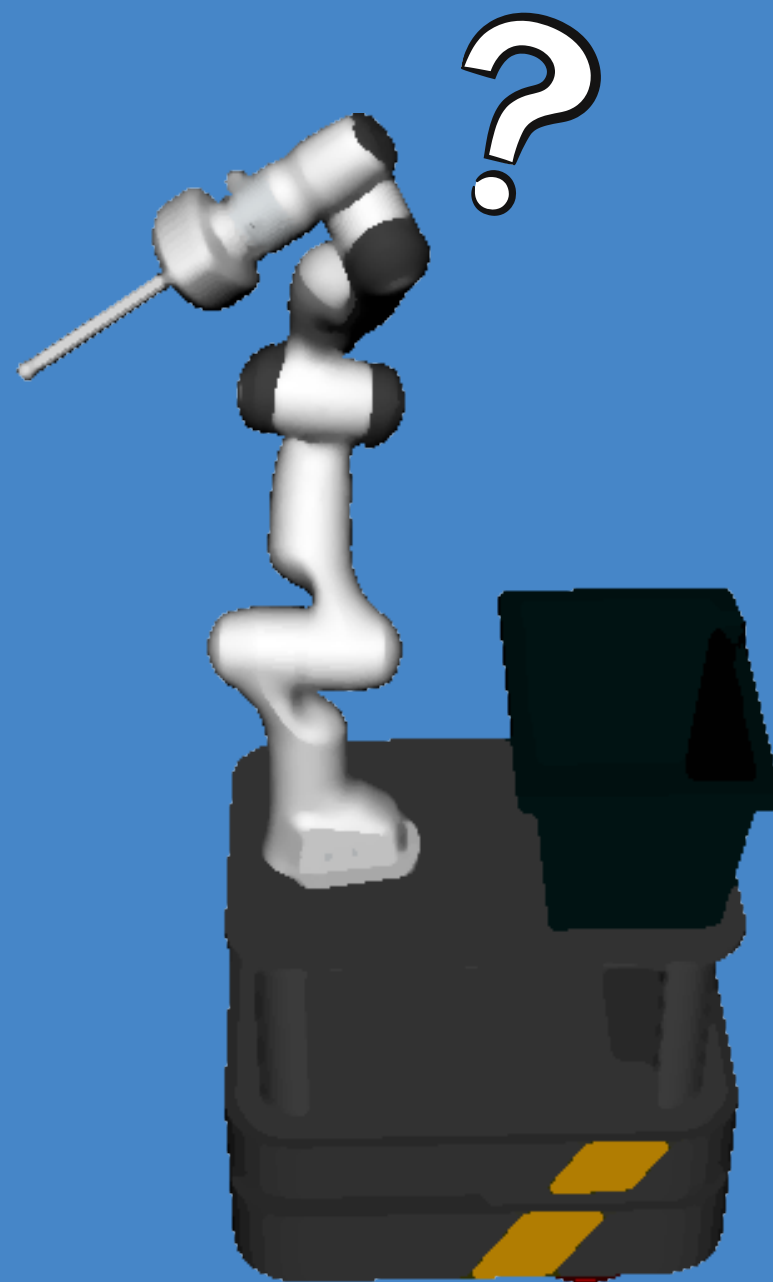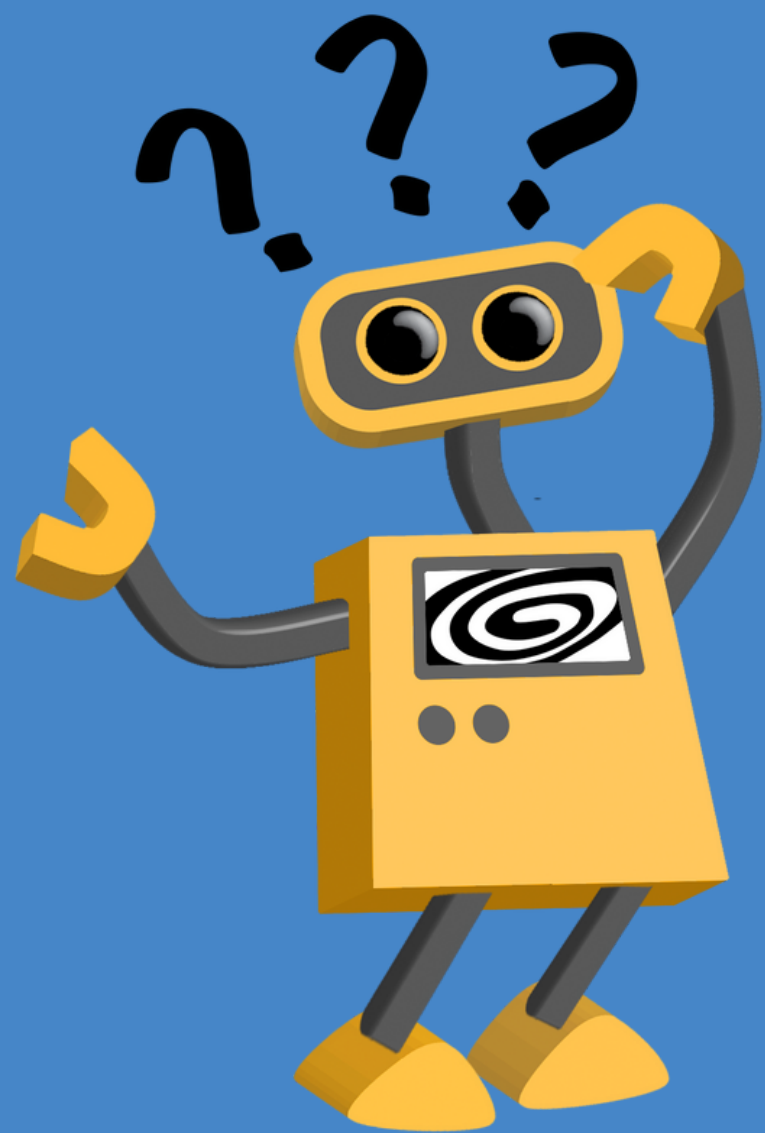
Supplementary Slides

Software

Supplimentary Slides

Order Package

Supplimentary Slides

Voice Interaction Package

/request_pending

request_detector

customer_interaction_server

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