MAAS Project

Flying Saucers Bakery

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System architecture
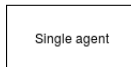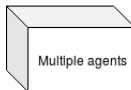
Figure 1: Architecture of the Bakery JADE multi-agent system.

System architecture
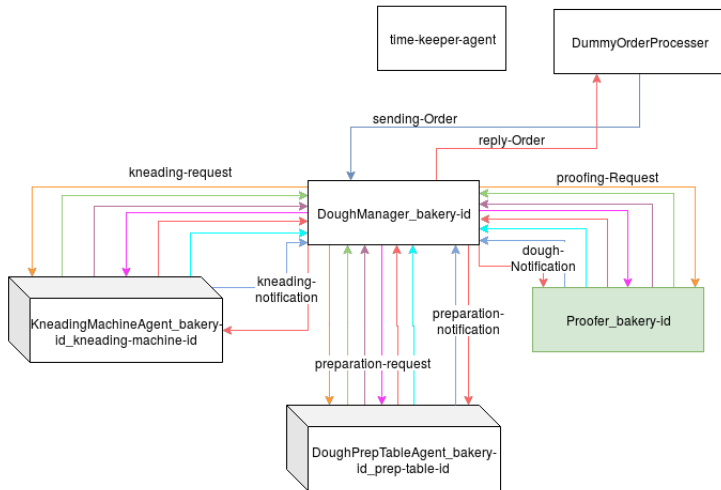
Figure 2: Architecture of the Bakery JADE multi-agent system.

System architecture
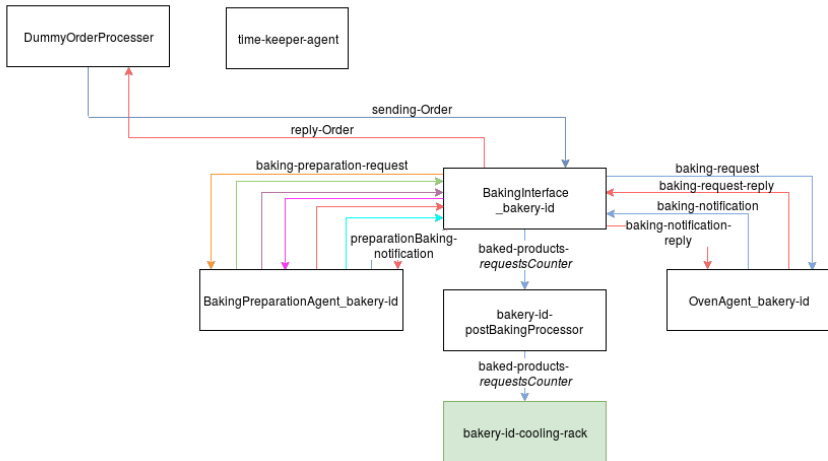
Figure 3: Architecture of the Bakery JADE multi-agent system.

Agents

Production Stage	Agent	Created by	Number of instances
Order Processing	DummyOrderProcesser	DoughPrepStageInitializer	1
Dough Preparation	DoughManager	DoughPrepStageInitializer	1 per bakery ID
	KneadingMachineAgent	DoughManager	n per bakery ID, where n is taken from bakeries.json
	DoughPrepTableAgent	DoughManger	n per bakery ID, where n is taken from bakeries.json
	Proofer	DoughPrepStageInitializer	1 per bakery ID
Baking	BakingInterface	BakingMasMaasInitializer	1 per bakery ID
	OvenAgent	BakingInterface	1 per bakery ID
	BakingPreparationAgent	BakingInterface	1 per bakery ID
	PostBakingProcessor	BakingInterface	1 per bakery ID
	CoolingRackAgent	BakingStageInitializer	1 per bakery ID

Table 1: Agents in the Bakery JADE.

Behaviours

Production Stage	Agent	Behaviour Name	Behaviour Type
Order Processing	DummyOrderProcesser	timeTracker	CyclicBehaviour
		sendOrder	Behaviour
Dough Preparation	Dough Manager	timeTracker	CyclicBehaviour
		ReceiveOrders	CyclicBehaviour
		checkingKneadingWorkqueue	CyclicBehaviour
		checkingPreparationWorkqueue	CyclicBehaviour
		checkingProofingWorkqueue	CyclicBehaviour
		RequestKneading	Behaviour
		RequestPreparation	Behaviour
		RequestProofing	Behaviour
		ReceiveKneadingNotification	CyclicBehaviour
		ReceivePreparationNotification	CyclicBehaviour

Table 2: Behaviours in the Bakery JADE. Part 1.

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Behaviours

Production Stage	Agent	Behaviour Name	Behaviour Type
Dough Preparation	KneadingMachineAgent	timeTracker	CyclicBehaviour
		ReceiveProposalRequests	CyclicBehaviour
		ReceiveKneadingRequests	CyclicBehaviour
		Kneading	OneShotBehaviour
		SendKneadingNotification	Behaviour
	DoughPrepTableAgent	timeTracker	CyclicBehaviour
		ReceiveProposalRequests	CyclicBehaviour
		ReceivePreparationRequests	CyclicBehaviour
		Preparation	OneShotBehaviour
		SendPreparationNotification	Behaviour
	Proofer	timeTracker	CyclicBehaviour
		ReceiveProposalRequests	CyclicBehaviour
		ReceiveProofingRequests	CyclicBehaviour
		Proofing	OneShotBehaviour
		SendDoughNotification	Behaviour

Table 3: Behaviours in the Bakery JADE. Part 2.

Behaviours

Production Stage	Agent	Behaviour Name	Behaviour Type
Baking	BakingInterface	timeTracker	CyclicBehaviour
		ReceiveOrders	CyclicBehaviour
		ReceiveDoughNotification	CyclicBehaviour
		checkingBakingWorkqueue	CyclicBehaviour
		checkingPreparationWorkqueue	CyclicBehaviour
		RequestBaking	Behaviour
		RequestPreparation	Behaviour
		RequestCooling	Behaviour
		ReceiveBakingNotification	CyclicBehaviour
		ReceivePreparationNotification	CyclicBehaviour
	OvenAgent	timeTracker	CyclicBehaviour
		ReceiveBakingRequests	CyclicBehaviour
		checkingBakingRequests	CyclicBehaviour
		Baking	OneShotBehaviour
		SendBakingNotification	Behaviour

Table 4: Behaviours in the Bakery JADE. Part 3.

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Behaviours

Production Stage	Agent	Behaviour Name	Behaviour Type
Baking	BakingPreparationAgent	timeTracker	CyclicBehaviour
		ReceiveProposalRequests	CyclicBehaviour
		ReceivePreparationRequests	CyclicBehaviour
		Preparation	OneShotBehaviour
		SendPreparationNotification	Behaviour
	PostBakingProcessor	timeTracker	CyclicBehaviour
		ReceiveAndRequestCooling	CyclicBehaviour

Table 5: Behaviours in the Bakery JADE. Part 4

Messages

Production Stage	Message	Performative	Sender	Receiver
Order Processing	Order	INFORM	DummyOrderProcesser	DoughManager and BakingInterface agents of a bakeryID
Dough Preparation	Kneading Request	CFP	DoughManager of bakery ID.	All KneadingMachine agents of bakery ID.
	Kneading Notification	INFORM	KneadingMachine of bakery ID that accepted the kneading request.	DoughManager of bakery ID.
	Preparation Request	CFP	DoughManager of bakery ID.	All PreparationTable agents of bakery ID.
	Preparation Notification	INFORM	PreparationTable of bakery ID that accepted the preparation request	DoughManager of bakery ID.
	Proofing Request	CFP	DoughManager of bakery ID	Proofer of bakery ID.
Baking	Dough Notification	INFORM	Proofer of bakery ID.	BakingInterface of bakery ID
	Baking Request	INFORM	BakingInterface of bakery ID	Oven agent of bakery ID
	Baking Notification	INFORM	Oven agent of bakery ID	BakingInterface of bakery ID
	Baking Preparation Request	CFP	BakingInterface of bakery ID	BakingPreparationTable agent of bakery ID
	Baking Preparation Notification	INFORM	BakingPreparationTable agent of bakery ID	BakingPreparationTable agent of bakery ID
	Cooling Request	INFORM	BakingInterface of bakery ID	PostBakingProcessor of bakery ID
	Loading Bay Message	INFORM	PostBakingProcessor of bakery ID	Cooling Rack of bakery ID

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Visualization