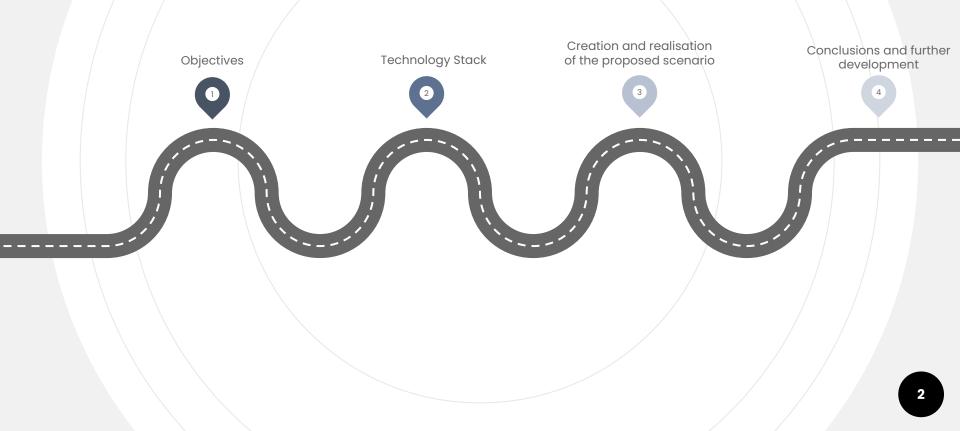


MODELLING AND SIMULATION OF AN AUTOMATED SYSTEM IN AN AGRICULTURAL WAREHOUSE

Marthallow

Scientific leader: Prof. Dr. Ing. Florea Adrian Graduate: Corlaciu Andrei-Răzvan Specialization: Computer Science

Agenda



Objectives

Creating the scenario in Scene2Model

Implementing the scenario in the Bee-Up environment

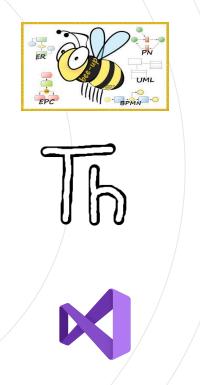
Writing code to perform specific operations





REALVOC





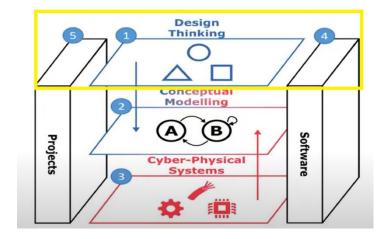
Creation and realisation of the proposed scenario

Design Thinking

□ Conceptual Modelling

Cyber-Physical Systems (CPS)

Design Thinking



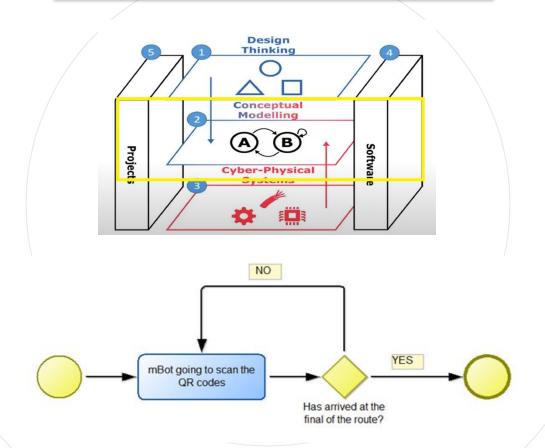
Implemented scene

- mBot starts from a fixed starting point of the route
- mBot stops at the side of each QR code to scan it
- The scanned information is instantly sent to a database

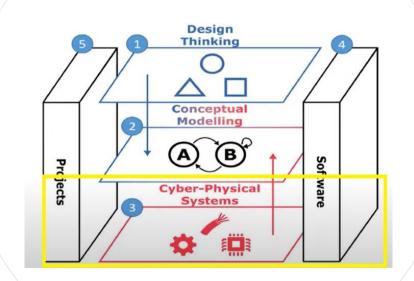
□ mBot reaches the end of the pre-defined route



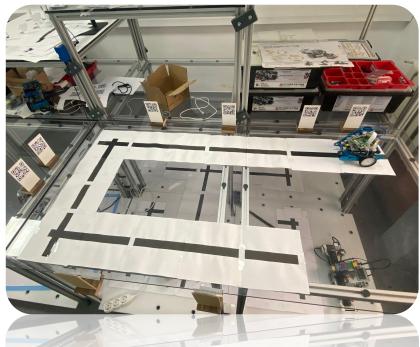
Conceptual Modelling



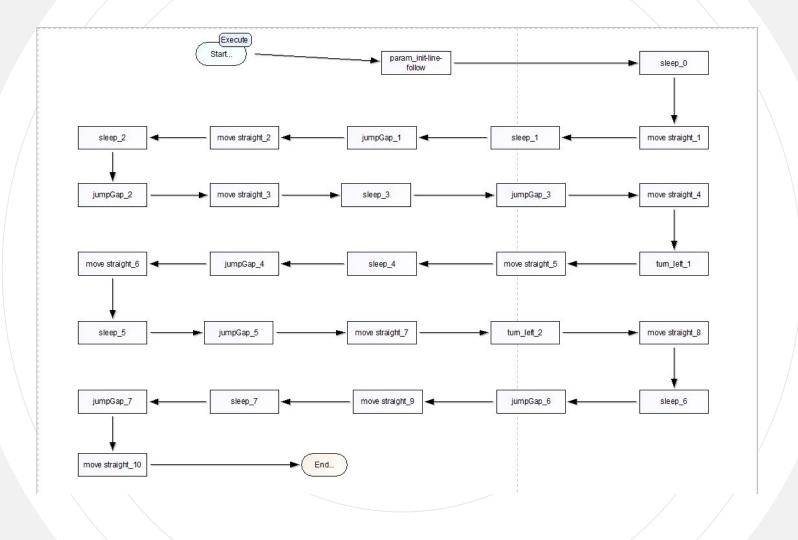
Cyber Physical System











param_init-linefollow

Operation code:

We use SETLs instead of := to set several things at once SETL str_roboturl1:("http://10.14.10.241:8080/mBot/api/linefollowing_operation/") SETL map_headers:({"Content-Type":"application/json"})

Variables:

- ip contains the IP address of the web platform to be accessed. It will also contain the name of the called function set
- map_headers specifies the JSON content-type of the HTTP API request



Operation code:

HTTP_SEND_REQUEST (str_roboturl1+ "moveStraight?speed=100") str_method:("GET") map_reqheaders: (map_headers) str_reqbody:("do") val_respcode:val_httpcode map_respheaders:map_respheaders str_respbody:str_respbody

• The input parameter can be seen in the variable speed

QR Code scanning

- □ Similar to barcodes
- □ / Can encode a variety of data types
 - Reduces human time and physical labour

```
Shell
ID: 13
Tip: Mandarine
Cantitate: 116
Pret/Kg: 5
Tara provenienta: Italia
Data scanarii: 06-Jun-2022
Ora scanarii: 13:21:11
```



Firebase database

- inventar_depozit
 - -N3PGXd0trDIQEUwVj1p
 - ▶ -N3PGe6aW2ryNADSmOxP
 -)- -N4WXB6KMds2t-GHfv32

 - -N4WXDpI5mQd99BqkLP2
 - ▶— -N4WXFdmBw29HtuDPPif
 - -N4WXHZQ-4K14NV-2ogg
 - -N4WXIpZdPG2JRTmWuWd
 - -N4WXLGLnAx1A1Z8FS_W



Displaying data in the visual interface

ID			ID	Tip	Cantitate	Pret	Ţară	Data Scanării	Ora scanării
Tip		•				,			
antitate(Kg)									
reț (Lei/Kg)									
Tara									
a scanării									
ra scanării									
Start refreshi	ng Delete								
		-							
						-			
		_						_	_
		-					L		
		i		-		5		_	
		i	ī	-				_	
- Descrit		i						-	
oc Depozit		i			Y				
oc Depozit P opozit							F		
	11		ID	Тір	Cantitate	Preț	Ţară	Data Scanării	Ora scanării
pozit ID	11 Manage		1	Mere golden	120	4	Cipru	31-May-2022	Ora scanării 14:20:12
pozit ID Tip	Mango		1 4	Mere golden Kiwi	120 89	4	Cipru India	31-May-2022 31-May-2022	Ora scanării 14:20:12 14:20:45
pozit ID Tip			1 4 11	Mere golden Kiwi Mango	120 89 95	4 6 13	Cipru India Indonezia	31-May-2022 31-May-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00
iD Tip antitate(Kg)	Mango 95	E E	1 4 11 12	Mere golden Kiwi Mango Lămâi	120 89 95 220	4 6 13 3	Cipru India Indonezia Turcia	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:06
ID Tip antitate(Kg) ret (Lei/Kg)	Mango 95 13		1 4 11 12 13	Mere golden Kiwi Mango Lămâi Mandarine	120 89 95 220 116	4 6 13 3 5	Cipru India Indonezia Turcia Italia	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:06 10:26:12
e pozit ID	Mango 95		1 4 11 12 13 14	Mere qolden Kiwi Manqo Lămâi Mandarine Cartofi albi	120 89 95 220 116 135	4 6 13 3 5 2	Cipru India Indonezia Turcia Italia România	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:06 10:26:12 10:26:19
ID Tip antitate(Kg) reț (Lei/Kg)	Mango 95 13		1 4 11 12 13	Mere golden Kiwi Mango Lămâi Mandarine	120 89 95 220 116	4 6 13 3 5	Cipru India Indonezia Turcia Italia	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:06 10:26:12
ID Tip antitate(Kg) ret (Lei/Kg) Țara ta scanării	Mango 95 13 Indonezia 14-Jun-2022		1 4 11 12 13 14 15	Mere qolden Kiwi Lămâi Mandarine Cartofi albi Pere	120 89 95 220 116 135 90	4 6 13 3 5 2 11	Cipru India Indonezia Turcia Italia România Franța	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:06 10:26:12 10:26:19 10:26:27
ID Tip antitate(Kg) ret (Lei/Kg) Țara	Mango 95 13 Indonezia		1 4 12 13 14 15 18	Mere qolden Kiwi Mango Lämäi Mandarine Cartofi albi Pere Ciuperci	120 89 95 220 116 135 90 76	4 6 13 3 5 2 11 5	Cipru India Indonezia Turcia Italia România Franța România	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:12 10:26:19 10:26:27 10:26:32
ID Tip antitate(Kg) reţ (Lei/Kg) Țara ta scanării	Mango 95 13 Indonezia 14-Jun-2022		1 4 12 13 14 15 18	Mere qolden Kiwi Mango Lämäi Mandarine Cartofi albi Pere Ciuperci	120 89 95 220 116 135 90 76	4 6 13 3 5 2 11 5	Cipru India Indonezia Turcia Italia România Franța România	31-May-2022 31-May-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022 14-Jun-2022	Ora scanării 14:20:12 14:20:45 10:26:00 10:26:12 10:26:19 10:26:27 10:26:32

Conclusions and further development

This type of project is innovative, with a wide range of possibilities and allows the creation of many possible scenarios without requiring advanced knowledge.

 As further developments, I would like to improve this project by managing each fruit/vegetable (UPDATE), but also by automatically summing the quantities of a product with the same ID if it has been scanned before.



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Thank you for your attention!



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