LAB University of Applied Sciences

Project B

Progress to 23.2.2021

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Contents

1 3D modelling

Since the idea of the project is not to simply create a software for the customer, but also to provide a ready solution on how the system can be constructed and installed. Due to the simulation restrictions of the software used to create the 3D model, the team had to find a way to overcome these restrictions. The solution will be discussed after 3D model is presented.

1.1 General layout and conveyor's design

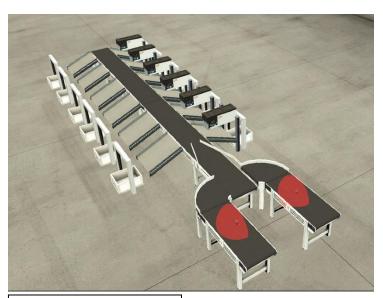Figure 1.1

Conveyor with 6 pushers

After consideration of all possible layouts, it was decided to implement simple and at the same time very functional design with 6 pushers and 12 slopes and boxes to store books (or any other items to be sorted). As for the other options, pop up wheels sorters have also been considered, but later rejected due to high costs and possible maintenance difficulties.

First, there are two lines where RFID scanners are installed to understand how items should be sorted. First two conveyors will be functioning on the principle of que: the first item to
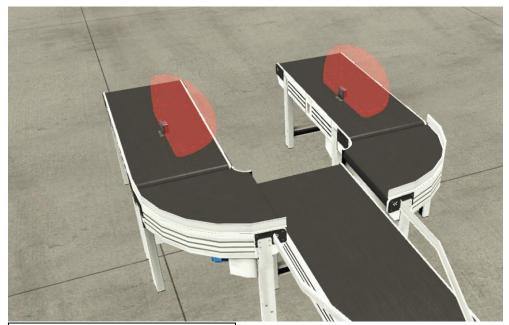
Figure 1.2

Fork of the conveyor and scanners

arrive to a main conveyor will be moved first.

1.2 RFID and scanning

To differentiate items, it was decided to take Boxes of the smallest size (S), because boxes have RFID tag and smallest size boxes are most suitable for the simulation world. When the developed system to be done in real world, all conditions regarding box sizes can be neglected.

1.3 Actuators

Fast acting pushes were chosen as actuators due to problems with distance. Special timings will be needed, but those can be easily set up during "debugging" and will not be needed in real life application, because more free and agile selection of actuators is allowed.

Figure 1.3

Fast acting pushers extended to full length

1.4 Sensors

For now, the system will implement 19 diffuse sensors to check an item on its way to a designated pusher and check if there is still free space available in every box.

2 PLC Programming

Last sprint the team finished 3D model and did not start coding yet, however system architecture is developed for now and can only undergo slight changes during the next sprint. Functionality will mostly rely on functionality of Lappeenranta Library station. Report on team's visit to Lappeenranta City Library will be available with the report.

Because more than standard number of inputs and outputs is needed, the team will add modules to the 1500-series controller.

2.1 Git and TIA Portal

Solutions for native implementation of Git are being researched now. It is known that the team will publish final logic GitHub, regardless if any integrated solutions are available or some less convenient ways to do it should be used. The result of the study will presented in final report and can be seen on GitHub.

3 Schedule

Currently the team is out of schedule, but still can guarantee to be in time for the release date. The schedule is presented below.

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Cost		18 Jan '21
									W T F S S	M T W
1		**Converge station**	**49 days?**	Fri 15.1.21	Wed 24.3.21			2 865,00€		
2		**General Planning**	**12 days?**	Fri 15.1.21	Sun 31.1.21		Nikolai Semin;Ro	1 110,00€		
3		Figuring out the end goal	2 days	Fri 15.1.21	Mon 18.1.21		Nikolai Semin	40,00€		Nikola
4		Assesing potential clients and benefits	6 days	Mon 18.1.21	Mon 25.1.21		Roman Evseev;Nikita Mosiagin	240,00€		
5		Learning new software and development enbironment	4 days	Mon 18.1.21	Thu 21.1.21		Nikolai Semin[25%]	20,00€		
6		Report, Gantt Chart and WBS	6 days	Mon 25.1.21	Sun 31.1.21		Nikita Mosiagin[25%];Ni	90,00€		
7		**Presentation**	**5 days?**	Mon 1.2.21	Fri 5.2.21			45,00€		
8		Media files preparations	3 days	Mon 1.2.21	Wed 3.2.21		Roman Evseev[25%]	15,00€		
9		Rehersals	2 days	Wed 3.2.21	Thu 4.2.21		Nikita Mosiagin[2	30,00€		
10		**3D Simulation**	**21 days**	Fri 15.1.21	Sun 14.2.21			220,00€		
11		Create simulation and test it	22 days	Fri 15.1.21	Sun 14.2.21		Nikita Mosiagin[25%];Ni Semin[25%]	220,00€		

Task	▬	Inactive Summary
Split	....	Manual Task
Milestone	◆	Duration-only
Summary		Manual Summary Rollup
Project Summary		Manual Summary
Inactive Task		Start-only
Inactive Milestone	◇	Finish-only

External Tasks	
External Milestone	◇
Deadline	↓
Progress	
Manual Progress	

Project: Project B Chart
Date: Mon 22.2.21

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ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Resource Names	Cost		18 Jan '21
									W T F S S	M T W
12		**PLC Programming and Software Testing**	44 days	Mon 1.2.21	Thu 1.4.21		Nikolai Semin[25%]	1 255,00€		
18		**Final presentation and report**	10 days	Thu 25.3.21	Wed 7.4.21		Nikita Mosiagin[25%];R Evseev[25%]	235,00€		

Task	▬	Inactive Summary
Split	....	Manual Task
Milestone	◆	Duration-only
Summary		Manual Summary Rollup
Project Summary		Manual Summary
Inactive Task		Start-only
Inactive Milestone	◇	Finish-only

External Tasks	
External Milestone	◇
Deadline	↓
Progress	
Manual Progress	

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| | 25 Jan '21 | 1 Feb '21 | 8 Feb '21 | 15 Feb '21 | 22 Feb '21 |
| T F S S | M T W T F S S | M T W T F S S | M T W T F S S | M T W T F S S | M T W T F S S |

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Nikita Mosiagin[25%];Nikolai Semin[25%];Roman Evseev[25%]

Roman Evseev[25%]

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Task		Inactive Summary		External Tasks	
Split		Manual Task		External Milestone	◇
Milestone	◆	Duration-only		Deadline	⬇
Summary		Manual Summary Rollup		Progress	
Project Summary		Manual Summary		Manual Progress	
Inactive Task		Start-only	[		
Inactive Milestone	◇	Finish-only	]		

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