Software engineering (343.303)

Subsystems	***Assigned Members***	***Student ID***	***Student e-mails***
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1. Clearly define the context/boundaries for each subsystem (to its environment). Describe for each subsystem what the main goals, functionalities, and characteristics are (not more than 150 words).

When it comes to our factory, Chef in the box, the MES role is an essential one. The order is dispatched from the WebShop right to MES. Here, every order is decomposed both in the materials required and the sequence of steps needed for the Shopfloor to create the product. MES also communicates with the Analysis department, announcing to them the needed materials to proceed with the execution.
Just to get a clear view, it is MES's job to translate a product into its datasheet and to communicate the needs of every product.

2. Identify the stakeholders of the subsystem and document its goals and relations with the system.

The stakeholders of this department will be the Web Shop department, the Monitoring & Analytics department, and the Shopfloor & Robotics department, maintenance operator.
The webshop department’s goal is to deliver orders and can only deliver data to MES.
The monitoring & Analytics department’s goal is to gain data from MES (resources needed, products ordered) and can only receive data from MES.
The developer and maintenance operator’s goal is to address every problem and can modify the software.

3. Define at least 10 requirements that describe what the subsystem should be able to do. At least 5 of the 10 requirements should be system critical. Use the table below to summarize your requirements.

ID	Requirement	Description	Tags	Priority
1	Being able to correctly identify each object of the order	Different products have different specifications therefore the subsystems must be able to identify each object correctly	mapping	***
2	Being able to create a data sheet for each product	Have its specific data sheet meaning that the process of creating an object differs for each object	datasheet	***
3	Being able to identify the needed materials for each product	Having different objects means different materials for each object. The subsystem must correctly identify the materials needed for every product	material, mapping	***
4	Being able to communicate efficiently to the shopfloor	The subsystem must export a readable type of file such that the shopfloor subsystem can understand correctly the needed steps	shopfloor, exporting	***
5	The system must send correct and relevant information	The subsystem must deliver relevant data for the analytics department	analytics	**
6	The subsystem must get information just from the Web Shop	The subsystem will be codependent with the Web Shop subsystem therefore it should only get data from the Web Shop, that is getting the name of the product(s) that have been ordered	data, webshop	*
7	The subsystem must give information just to the Analytics department and Shop Floor department	The subsystem must give information just to the Analytics department and Shop Floor department as its data is relevant just for them; for Analytics department the MES should provide quantity of needed materials and number of manufactured products and for Shop Floor, provide a human-readble datasheet	analytics, shopfloor, data	*
8	Subsystem must also map the products with their datasheet	It’s not good enough if the subsystem sends only the datasheet of the product, it should also map back the product to its datasheet	datasheet , product name	**
9	Subsystem must communicate efficiently to the analytics department	To manufacture the correct product, MES has to correctly communicate the needed materials to the analytics department	analytics, data	***

10	The subsystem must have an interpretation for each entry	It is mandatory for the system to correctly identify every entry of the webshop, that is providing datasheet only for the known items (in case of a miscommunication from the webshop e.g. item was added but the datasheet was not created) don’t create datasheet but alert other subsystems	entries	**
11	Shop Floor issues	The subsystem should get notified if anything goes wrong on the shop floor	issue	**

4. Define at least 5 risks for each subsystem each being a show stopper if they are not properly handled. Use the table below where mitigation describes a strategy to avoid risks before they occur, and contingency describes a strategy to solve the risks after they occurred. Come up with reasonable impact and probability values and compute the magnitude for the risks. Sort the risks by their magnitude.

ID	Name	Description	Mitigation	Contingency	Impact	Probability	Magnitude
1	Identification problem	the subsystem may not be able to find the item in the list of entries	Design a solution how to handle this	Subsystem should send an alert to analytics	0.8	0.5	0.4
2	Lack of resources	the subsystem may discover that there are not enough resources to create a product	check the warehouse beforehand	address the problem to the warehouse (via analytics)	0.5	0.8	0.4
3	Lack of machinery	The subsystem may provide a datasheet that contains items that can not be created	check the shop floor beforehand	address the problem to the warehouse (via analytics)	0.7	0.5	0.35
4	Lack of entry	the subsystem may not be able to generate a datasheet	design a generic alerting system	subsystem should send an alert to analytics	0.8	0.4	0.32
5	Already existing product	A product can be already found in the warehouse from previous extra production	check the warehouse beforehand	do it anyway and deposit it in the warehouse (via analytics)	0.3	0.8	0.24
6	Erroneous datasheet	the subsystem may generate an erroneous datasheet	double-check before exporting	shop floor should send an alert to analytics	0.7	0.3	0.21

5. Define a glossary that describes specific words only used in the subsystem's domain.

datasheet = a document providing the specifications for a particular product
analytics = Analytics and Monitoring department
entry = specific product
raw materials = the materials before being processed
communicate = deliver the proper files (e.g. JSON for analytics, pdf files for shop floor)
object = a particular product