

# Seamless Engineering Milestone 1 - Requirements Template

Team number: Seamless Engineering Group 06

## Requirements

If there is one aspect a project must have in order not to be doomed to failure, it is a reasonable and comprehensive repository of both functional and non-functional requirements. A project's requirements must be well considered, balanced and easily understood by all team-members, but perhaps most importantly, they must not be dropped or compromised during half of the project.

Fill out the following templates according to your requirements.

### Definition

Source: Projektmanagement in der Entwicklung von Produkten für sicherheitskritische Anwendungen, Prof. Nolle, ITIV, 2021

Must	Overriding requirements that must be complied with by both the purchaser and the supplier (by law, standard, rules, ...).
Shall	Indispensable requirements; a deviation is not permitted without formal agreement between buyer and supplier.
Should	Recommendation or indication of the implementation of a requirement; a deviation is only allowed in justified cases.
Will	Statement of intent in connection with a requirement.
May	Permitted execution or deviation, no requirement.

## Functional Requirements

Product Requirement		System Requirement			
ID	Title	ID	Description	Priority	Remarks
F1	Throughput	F1.1	The throughput of the system shall be 2 cubes per minute.	Shall	Minimum throughput
		F1.2	The throughput of the system will be 6 cubes per minute.	Will	Desired throughput
F2	Reliability	F2.1	Objects A and B shall only go in their respective slots on the transport platform.	Shall	
		F2.2	The objects shall not be stacked upon one another.	Shall	
		F2.3	Objects shall not be dropped.	Shall	
		F2.4	The system shall operate event driven.	Shall	As opposed to being time driven.
F3	Customer Satisfaction	F3.1	The system shall keep track of all moving objects.	Shall	Every part of the system shall know at any point in time which object is where and can thus assure that it doesn't end up in the wrong delivery box.
F4	Emergency Stop	F4.1	The system must stop all movements when the emergency stop button is pressed.	Must	
		F4.2	The system must not drop any objects.	Must	Vacuum gripper remains active.

## Non-Functional Requirements

Product Requirement		System Requirement			
ID	Title	ID	Description	Priority	Remarks
NF1	Easy usability of the system	NF1.1	We will provide a customer-friendly user interface.	Will	
		NF1.2	We may provide a graphical user interface.	May	
NF2	Portability of the System	NF2.1	We shall use ROS as a coding platform, so the system will be easily portable.	Shall	
		NF2.2	Embedded systems shall not be modified.	Shall	E.g. we shall not install additional packages on the TurtleBot.
NF3	Central settings area	NF3.1	All settings shall be loaded by a single roslaunch file.	Shall	
		NF3.2	All settings shall be contained in a single folder.	Shall	
		NF3.3	Settings may be contained in a single file or split into multiple files.	May	Multiple files may be clearer than a single large file.
NF4	Robustness against external interferences	NF4.1	The system shall be able to resist against external interference.	Shall	
NF5	Optimized routes	NF5.1	The TurtleBot should follow the optimal path.	Should	
		NF5.2	The TurtleBot may deviate by up to 10% from the optimal path.	May	
NF6	Efficient use of sensors and actuators	NF6.1	The system should try to minimize the number of roundtrips of the TurtleBot.	Should	
		NF6.2	The subsystems shall enter a low power state if possible.	Shall	E.g. the conveyor belt shall stop moving if no object is placed upon it
NF7	Scalability	NF7.1	The system shall be developed using ROS which assures scalability.	Shall	
NF8	Reusability	NF8.1	Documentation shall be provided.	Shall	