5: Skipper

Functional Requirements

ID	Requirements	Comment
1	***Environmental Information***	
1.1.0	**Water level**	
1.1.1	System displays real-time water level/depth	
1.1,2	System alerts users when water level is lower/higher than certain level	
1.1,3	System calculates and displays predicted water level for next several weeks	
1.1,4	System alerts users when predicted water level/depth is lower/higher than certain level	
1.1.5	Systems allow users to set alarm actions to be activated under specific conditions	
2	***Operational management***	
2.1.0	**Bridge and lock information**	
2.1.1	System displays real-time waiting time at the locks and bridges	
2.1.2	System displays information about lock/bridge operation, malfunctions and maintenance schedules	
2.2.0	**Operational plan**	
2.2.1	System allows users to create and save operational plan, route	
2.2.2	System allows users to modify/adjust the operational plan	
2.2.3	System allows users to view the operational plan	
2.2.4	System displays information on narrow and difficult waterways, obstacles on waterways, and other obstacles on the transportation route	
2.2.5	System calculates and suggests optimal transportation plan to transport destination	Based on current, wind, distance, CO_2 emission

2.3.0	**Cargo management**	
2.3.1	System alerts users when a transport plan is planned with less than 80% of the vessel's load capacity	Because regulations could require companies to pay 80% of transportation costs if less than 80% of the cargo is loaded
2.4.0	**Ship information**	
2.4.1	System displays real-time navigation status information such as ship number, location, speed, cargo information, load, crew size	
2.2.2	System displays an overview of available ships and its information (Possible load capacity, etc.)	
2.4.3	System alerts users when recreational activities are scheduled on the canal	
2.5.0	**Fuel management**	
2.5.1	System notifies users when weather and environmental factors that significantly affect fuel consumption are observed along the transportation route	Such as wind strength and direction, temperature and wave height.
2.5.2	Systems calculate the amount of fuel required based on information about the vessel, water level, navigational resistance, fuel type and other information	
3	***Data sharing & Collaboration***	
3.1.0	**Communication channel**	
3.1.1	System provide communication channels to share information about return trip	
3.1.2	System provides communication channels for sharing information regarding recreational activities on the waterways	
3.1.3	System provides communication channels between vessels	
3.1.3	System displays emergency evacuation route and plan	
3.2.0	**Information hub**	
3.2.1	System provides information hub to share	

	information from government	
3.2.2	System displays costs incurred at the port at each port, such as port fees	
3.2.3	System displays weather, water levels, river news, and other information	NOS Teletekst provides these info
4	***Account***	
4.1	System provides accounts with different permissions and access levels	
4.2	System limits the account types that can send messages per communication channel	