Project Deliverable B - Needs, Problem Statement, Metrics, Benchmarking and Target Specifications

GNG2101

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Introduction

Bocar N'diaye from the Saint-Vincent Hospital currently uses a SensAct device to help patients with disabilities communicate. SensAct is a device that allows the user to connect varying inputs in order to easily communicate and use devices such as a computer. N'diaye is looking for a way to improve the user-interface of the SensAct device such that it can be more easily understood. He is hoping for the middle user to be able to use the device without needing a background in electronics or programming. He is hoping to change the program to something similar to the Node-Red dashboard, the following document will break down his specific needs and products that are similar to the SensAct.

List of Translated Customer Needs

Customer Statement	Translated Needs	Imp
Any user can use the interface without knowledge in technology or programming	The software does not require programming or electronics background to be used	4
There isn't as much funding, so we rely on volunteers and students for our devices	The software is easily accessible on varying devices (i.e. raspberry pi, laptop, desktop)	5
The device used by middle workers without technical knowledge.	The software is easy to learn and understand	5
The device is used for a variety of patients with varying disabilities.	The software is customizable	4
Sensact is a system to control different devices available to users.	The device is configurable to include more advanced devices	3
Main problem with SensAct is that it is really complicated to use.	The software is easy to use	5
The device is used by a variety of patients with varying disabilities.	The device accommodates people with varying kinds of disabilities	3
The device is used by a variety of patients with varying disabilities.	The device offers bilingual options (French and English)	2
There isn't as much funding, so we rely on volunteers and students for our devices	The device is low cost	2

Problem Statement

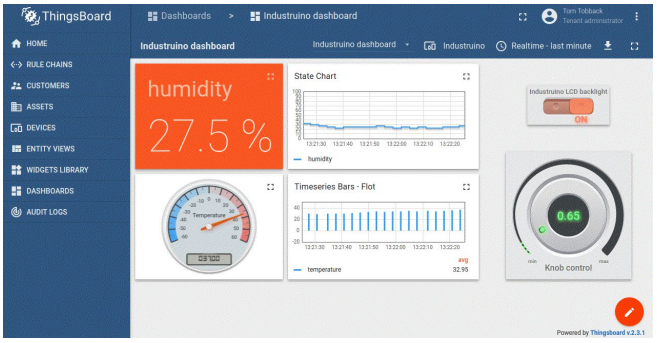
A need exists for aid workers and hospital staff, without technical knowledge, to have access to a simple, menu based, user interface, that allows the user better accessibility and easy configuration.

Metrics

#	Need	Imp	Design Criteria	Associated Metrics	Units
1	The software does not require programming or electronics background to be used	4	Required Knowledge	Required Knowledge	Scale 1-5
2	The software is easily accessible on varying devices (i.e. raspberry pi, laptop, desktop)	5	Device compatibility	# of compatible devices	#
3	The software is easy to learn and understand	5	Simple Design	Feedback Rating	Scale 1-5
4	The software is customizable	4	Customization	# of options available	Scale 1-5
5	The device is configurable to include more advanced devices	3	Future Advancements	Future Advancements	Scale 1-5
6	The software is easy to use	5	User friendliness	Feedback Rating	Scale 1-5
8	The device offers bilingual options (French and English)	2	Customization	# of different languages	#
9	The device is low cost	2	Cost	Cost	$

Benchmarking

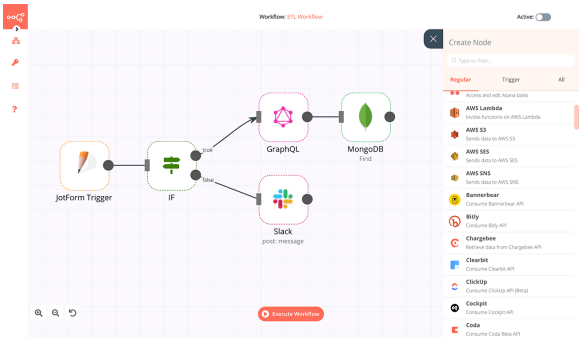
1. *ThingsBoard*
   Open-source IoT platform for data collection, processing, visualization, and device management.



web:https://thingsboard.io/docs/user-guide/attributes/

2. *Node-RED*
   Node-RED is a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways.
   web:https://nodered.org/#get-started

3. N8n.io
   web:https://n8n.io/



*Colour each box green[3]=best specs, yellow[2]=good specs, red[1]=least impressive
*Total: calculate weight times specs

#	Metrics	Units	Weight	Node red	ThingsBoard	n8n.io
1	The software does not require programming or electronics background to be used	1-5	4	2	3	4
2	The software is easily accessible on varying devices (i.e. raspberry pi, laptop, desktop)	#	5	<10	<10	N/A
3	The software is easy to learn and understand	1-5	5	3	4	4
4	The software is customizable	#	4	4	4	5
5	The software is configurable to include more advanced devices	1-5	3	5	5	5
6	The software is easy to use	1-5	5	2	3	3
	Total			51	65	63

According to our needs, ThingsBoard is the best product in the market.

Target Specifications

Metric	Associated Need	Metric/Constraint	Unit	Ideal Value	Acceptable Value	Verification Method
Functional Specifications						
1	4	No background in programming required	1-5	1	3	Observations
2	5	Accessible on many devices	#	>10	3	Test
3	5	Easy to learn and understand	1-5	5	4	Feedback
4	4	Customizable	1-5	5	3<	Test
5	3	Configurable	1-5	5	3<	Test
6	5	Easy to use	1-5	5	4	Feedback
Non-Functional						
	3	Bilingual	#	>2	2	Observations
Constraints						
		Time	Days	<December 3	December 3	
		Money	CAD $	<50	50	

Constraints : limited access to tech, limited programming knowledge

Reflection

The client meeting was crucial in helping us understand the needs of the customer and the requirements for our products. We were able to develop a design criteria through the customer statements and established importance accordingly, to help our product adapt desirably to our client's needs. We decided that making the software easy to learn and use are among the most important priorities for our customer, based on his statements and issues with the current SensAct software. The benchmarking process allowed us to examine the industry standards for each category. Multiple software programs are available on the market to assist with user interface. Node-RED, ThingsBoard and N8n.io are all programs that will help the middle user configure the program, and contain aspects that are similar to our project. Node-RED is a programming tool for wiring together hardware devices, APIs and online services. ThingsBoard is an open-source IoT platform for data collection, processing, visualization, and device management. The currently in use, SensAct software and similar programs on the market have been labeled as complex and not user-friendly. Our main task is to improve the software and make it easily accessible for nurses and aid workers. We established ideal specifications that would make our product competitive against those on the market. Since our project is done on a smaller scale compared to our competitors, our target specifications were set based on our capabilities and focused specifically on our customer needs. Despite the time and money constraints, our device would be the most accessible and suited specifically to our client's needs, compared to our competitors. This practice gave us an overview of the ideal final product, so in future meetings, we can focus on achieving the target standards and satisfying our customer needs.

Conclusion

In conclusion, this deliverable gave us an insight to the purpose of our product, and helped us realize ideal attributes of our final product. We used our client statements to create specific needs , empathised with our client and assigned weight to our most essential needs. We classified the measurable needs as metrics and used those to perform benchmarking. Through benchmarking and setting target specifications, we were able to understand our project thoroughly. Our two main constraints are time, as this has to be completed by design date, and money. We identified the standards our project has to meet using ideal market values and set values acceptable for the scale of our project. In future deliverables, we will be using these standards to ideate and form design concepts.