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

GNG 2101 – Intro. to Product Dev. and Mgmt. for Engineers

Faculty of Engineering – University of Ottawa

GNG2101, Section # Z **Date:** May 19th, 2019

Team # Z2

1. A list of client statements/observations obtained from client interviews.

- Our users have previous experience using tactile maps and other assistive methods. Such methods include tactile lettering, contrast carpeting, braille, the Right-Hear app by CNIB, guiding rails for canes along the side of a building and NFC tags (near-field communication).
- We are only designing the map of the inside of the first floor of 785 Carling Avenue. However, identifying the entrance (from the outside) is mandatory as well as the main roads surrounding the building.
- Room 118B is the Accessible and Inclusive Meeting Space. Giving users access to this specific room is the primary focus of our project.
- The iHub room and the hallway serving as a connector for staircase B, are the trickiest parts for users to navigate.
- Some visitors to the building are sometimes physically incapable of reading braille. Tactile maps can have audio components. Adding them is a good idea but our client mentioned that it is not in our scope of work.
- The bigger the size of the map, the better and easier it will be to read.
- The map should not be too detailed.
- Labelling of furniture would be a strong feature.
- The iHub is a room subject to change so it is better to refer to it using the room number instead of the name.
- Walkways, doors, pathways and emergency exits need to be labelled.
- It is strongly suggested that the map includes a legend.
- Elements of the map should be identified using tactile raised writing, braille and bilingual indications.
- The map may be stationary or portable.

In sum, our client was very flexible with the design criteria of our project which leaves us with a lot of room for creativity.

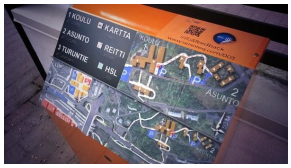
2. A list of translated and prioritized customer needs (using the five techniques shown in class: what not how, specificity, positive, attribute of the product and avoid words must and should)

- The tactile map easily guides visually impaired users around the first floor, and most importantly to room 118B.
- The tactile map identifies the entrance as well as main roads surrounding the building.
- The tactile map is easy to read.
- The tactile map indicates the room numbers.
- The tactile map includes labels for essential elements such as walkways, doors, stairwells, pathways and emergency exits.
- The tactile map contains a legend.
- The tactile map can include labelling of furniture.
- The tactile map may include an auditory component.
- The tactile map can be a stationary or portable design.
- The tactile map is durable.
- The tactile map identifies elements using tactile raised writing and braille.
- The tactile map provides bilingual indication.
- The map is sized and scaled appropriately.

3. A problem statement (what is the problem, who has the problem, and what form can the solution be)

Our team is taking on the task of creating a tactile map to help visually impaired employees and visitors who sometimes have trouble navigating the first floor of 785 Carling Avenue.

4. Benchmarking of similar products (this can be products which satisfy some or all of the needs defined above). Provide descriptions and pictures when possible!

	Tactile Maps		
Needs	Tactile map at Keskuspuisto Vocational College  	Tactile map of the Tapiola Sports Park and Sello Shopping Center surrounding the GLO Hotel for the IBSA Goalball World Championships 2014  	TactMap at BrailleTech 2016 
The tactile map easily guides visually impaired users around the first floor, and most importantly to room 118B.	Not applicable (specific to our project)	Not applicable	Not applicable
The tactile map identifies all essential elements (entrances, main roads, emergency exits, etc.)	Yes Buildings, parking, pathways, roads, etc.	All essential elements are identified including staircases and entrances, however, emergency exits are not identified.	Yes The map is very complete and even contains a tactile printed compass indicating the North.
Easy to read	Yes	Yes	Yes
Rooms are labelled using numbers	No The map focuses on campus	No Facilities are identified using	Yes Most rooms are identified using

	buildings and surrounding areas.	lettering system and names.	number. Only a few have names (i.e. “WC”, “SHOP” and “BAR”).
Contains a legend	Yes	Yes However, it is on a separate printed paper instead of being present on the map itself.	No
Includes labelling of furniture	No It is a campus map with a limited amount of detail.	No It is a global map of the Tapiola Sports Park and its facilities	No
Contains an auditory component	No	No	Yes The map is connected to a computer software that gives directions and explanations to the user when buttons on the map are pressed.
Stationary or portable?	Stationary	Both Smaller, portable versions were created for visitors and participants during the event and a larger scale one was installed in one of the sports halls.	Stationary The tactile map is paired with a computer.
Durable	Yes The map is ”3D printed in full-colour plastic which is highly durable for placement	Yes 3D printed in plastic	

	outdoors”		
Uses tactile raised writing and/or braille	Yes Both	Yes Uses “braille and elevated letters for more precise descriptions”	Yes Both
Bilingual indications	No	No	Yes French and Dutch
Appropriate size and scale	Yes	Yes	Yes

References

Tactile map at Keskuspuisto Vocational College: https://versoteq.com/work/keskuspuisto-college
Tactile map of the Tapiola Sports Park and Sello Shopping Center surrounding the GLO Hotel for the IBSA Goalball World Championships 2014: https://versoteq.com/work/espoo-goalball2014
TactMap at BrailleTech 2016: https://versoteq.com/content/tactmap-brailletech-2016

5. A list of metrics with associated units. Identify which needs each metric address.

Metric	**Unit**	**Need Addressed**
Weight	Kilograms	Portability and size
Map size	Meters	Appropriate size
Map thickness	Centimeters	Portability and size
Writing size	Millimeters	Easy to read
Map scale accuracy (margin of error)	Millimeters	Appropriate scale

6. A set of target specifications (both ideal and marginally acceptable values). Provide reasons for your choices.

Once we had compared and valued pre-existing products, we came up with a set of design specifications that are realistically possible for our solution.

	Design Specifications	Relation (=, < or >)	Value	Units
No.	**Functional Requirements**			
1.	Weight	=<	5	kg
2.	Dimension	=<	50 x 60	cm
3.	Thickness	=<	3	cm
5.	Writing size	=<	15	mm
6.	Map scale accuracy (margin of error)	=<	2	mm

Reasoning for Choice of Target Specifications

Weight: Whether our map is portable or mounted on a stand, we would like for the map itself to be lightweight.

Dimension: We would like our map to be easy to read and properly detailed. A smaller map would leave little room for detail and a legend.

Thickness: A thinner map makes for better portability.

Writing size: Writing must be clear and create no confusion for our users.

Map scale accuracy (margin of error): The accuracy of our map will determine how well users get around the location. There is little room for error in this area.

7. A reflection on how the client meeting impacted your results and the process.

The client meeting really helped us to understand the layout of the building, especially the complex and confusing areas. We also learnt that the most important goal that has to be achieved by the map; is to successfully help individuals with impaired vision navigate from anywhere on the first floor to the Accessible and Inclusive Meeting Space (room 118B). The client meeting also helped us to clear some questions we had concerning aspects we should focus on during the design of the map such as bilingual directions, emergency exits and the use of a legend. We also realized that we have much more creative freedom than we had anticipated. While speaking with the client, we got a better understanding of the needs of future users and the obstacles that they deal with on a daily basis. Hearing user stories allowed us to place ourselves in their shoes. Overall, this meeting provided us with some insightful input that were considered when translating the given information into pinpointed needs.