Final Design Project Documentation
INF2192

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I. Design

A. Prototype

To ensure consistency, please use Google Chrome to view the prototype.

The prototype can be viewed here: https://36gd76.axshare.com/#c=2

The prototype is also supplied as a .RP file as the final submission on Portal.
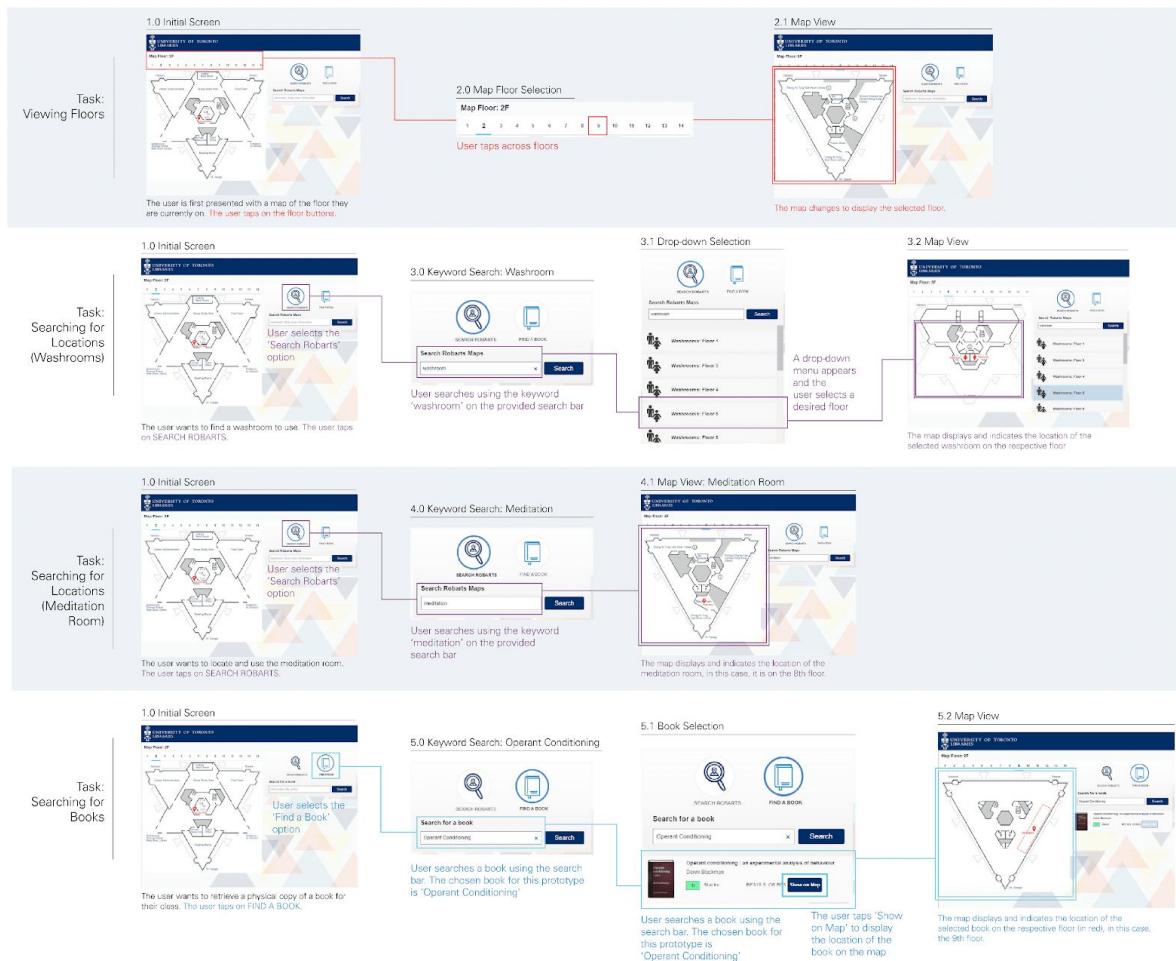
B. Prototype Workflows/Tasks

Our prototype has three main features, which can be explored through three tasks:

1. Viewing the Map
2. Search for Locations
   a. Washrooms
   b. Meditation Room
3. Search for Books

These tasks are outlined as sequential storyboards in the image on the following page. This image is also available as the final page of this document in higher resolution. It is also available at the following link:
https://drive.google.com/file/d/1CcyfymPMJLxbcZ_NET30ROI0wIhxfTZq/view?usp=sharing

Robarts Library Kiosk Prototype Storyboard

Task: Viewing Floors

1.0 Initial Screen

2.0 Map Floor Selection

Map Floor: 2F

| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |

User taps across floors

2.1 Map View

The user is first presented with a map of the floor they are currently on. The user taps on the floor buttons.

The map changes to display the selected floor.

Task: Searching for Locations (Washrooms)

1.0 Initial Screen

3.0 Keyword Search: Washroom

User selects the 'Search Robarts' option

User searches using the keyword 'washroom' on the provided search bar

3.1 Drop-down Selection

Search Robarts Maps

A drop-down menu appears and the user selects a desired floor

3.2 Map View

The user wants to find a washroom to use. The user taps on SEARCH ROBARTS.

The map displays and indicates the location of the selected washroom on the respective floor

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Task: Searching for Locations (Meditation Room)

1.0 Initial Screen

4.0 Keyword Search: Meditation

User selects the 'Search Robarts' option

Search Robarts Maps

User searches using the keyword 'meditation' on the provided search bar

4.1 Map View: Meditation Room

The user wants to locate and use the meditation room. The user taps on SEARCH ROBARTS.

The map displays and indicates the location of the meditation room, in this case, it is on the 8th floor.

Task: Searching for Books

1.0 Initial Screen

5.0 Keyword Search: Operant Conditioning

User selects the 'Find a Book' option

Search for a book

User searches a book using the search bar. The chosen book for this prototype is 'Operant Conditioning'

5.1 Book Selection

Search for a book

Operant Conditioning : an experimental analysis of behaviour

User searches a book using the search bar. The chosen book for this prototype is 'Operant Conditioning'

The user taps 'Show on Map' to display the location of the book on the map

5.2 Map View

The user wants to retrieve a physical copy of a book for their class. The user taps on FIND A BOOK.

The map displays and indicates the location of the selected book on the respective floor (in red), in this case, the 9th floor.

II. Evidence of Lean UX Approach
A. Cycle 1
i. Overview –

During the first cycle, we established and designed the backbone for our UI redesign and the core functions, which was the interactive map, map search, and book location search features.

ii. One problem statement –

The Robarts Kiosk is intended to provide library visitors with informational and navigational resources related to Robarts Library in a relevant and timely manner, especially in less staff-frequented areas of the library and during after hours.

We have observed that the existing kiosk system isn't meeting the informational needs of visitors which is putting pressure on multiple service providers to supply help and information that is out of their scope of responsibilities.

How might we improve the kiosk so that our customers are more successful based on an increased use of the kiosk, increased success of visitors to find services without redundancies, and decreased reliance on staff members?

iii. Business Assumptions –

1. **We believe our users have a need to:** Quickly and accurately find the services and resources they are looking for in the Library.
2. **These needs can be solved with:** Providing a more discoverable and relevant information kiosk that directly provides information to patrons needed in the library.
3. **Our initial users are (or will be):** Library patrons, specifically undergraduate students who are new to the Robarts Library system.
4. **The #1 value a user wants to get out of our product is:** Just-in-time, relevant information.
5. **Our users can also get these additional benefits:**
   a. Reduced number of touchpoints required to find specific items
   b. Discovery of other resources and services for them to use in the library
6. **We will acquire the majority of our users by:** Increasing the value of the kiosk. This will be done through easily discoverable kiosks that welcome users and allows them to find their way without the help of a person.
7. **We will make money by:** Not applicable.
8. **Our primary competition in the market will be:** Not applicable.
9. **We will beat them due to:** A more accessible and easy-to-use system.
10. **Our biggest product risk is:** Assuming people would want to use the kiosks instead of existing services (e.g. staff).
11. **We will solve this through:** Providing value to Library visitors through the information the Kiosk delivers.
12. **We will know we are successful when we see the following changes in the user behaviour:** Increased traffic to kiosks, reduced number of questions for ASK US information desks or other service points, the elimination of usage of paper pamphlets to find around library.
13. **What other assumptions do we have that, if proven false, will cause our business/project to fail:** Kiosks are able to provide service equal or better than that of a person, human will prefer human contact over an interface, that visitors have a lack of information, that this lack

of information is hampering visitors' participation in Robarts Library services and resources, and that the kiosk has high potential to provide this information.

iv. User Assumptions –

1. **Who is the user:** Undergraduate and graduate students and visiting academics (e.g. professors)
2. **Where does our product fit in their work or life:** As the informational resource for patrons who enter the library.
3. **What problems does our product solve:** Lack of information outside of business hours, difficulty finding specific book/service/resource in the library, lack of self-sufficiency in the library.
4. **When and how is our product used:** The Robarts Kiosk system would be simply interacted with in the Library itself. It will be on the way of a visitor's journey through the Library towards their destination.
5. **What features are important:** Search functions, map function, easy discoverability of kiosks as a physical devices, providing up-to-date contextual information.
6. **How should our product look and behave:** It should be easily visible, responsive, and noticeable to library patrons as devices as a resource to help them on using popular library services. It should also follow U of T and Robarts Library style guides for digital UI to reinforce branding of the Robarts Library.

v. A set of hypotheses for that sprint –

- We believe **staff will be resorted to less often** if **students and academics** successfully **and easily navigate the kiosk UI for their desired information** with **an improved information architecture**.

- We believe **patrons will be able to find what the need** if **they** successfully **find what they are looking for** with **a kiosk search function**.

- We believe **patrons have an easier time navigating Robarts Library** if **they** successfully **interact with the kiosk** with **a contextual map**.

- We believe **patrons will be better informed about Library services and resources** if **they** successfully **find the information** with **up-to-date display of information**.

- We believe **patrons finding specific information that they need** will be achieved if **patrons** successfully achieve **understand the labels and wordings of the Kiosk interface** with **re-labeling**.

- We believe **improved patron access to information** will be achieved if **they** successfully **acquire information from the kiosk** with **a kiosk that is available after-hours**.

- We believe **improved patron access to information** will be achieved if **they** successfully **acquire information from the kiosk** with **a kiosk that is always on (i.e. doesn't fall asleep every 3 mins)**.

vi. A proto-persona –

Florence

	Age: 20
	Gender: Male
	Occupation: 2nd Undergraduate student
	Major: Psychology
	Other details:
	International student
	He is new to Toronto
	Part time job at Second Cup
	He does not use the library a lot

Needs
- Finding certain books for his classes (required readings, reference material)
- Locating study spaces

Obstacles
- Few friends
- Unfamiliar with the new city - especially unfamiliar with UofT spaces
- Undeveloped mental model of library system and of Robarts Library

Desires
- Wants to pass his classes, wants to be able to focus on studies
- Doesn't want to spend all of his time at the Library

vii. A table of hypotheses for that sprint –

WE BELIEVE THAT:			
We will achieve	… if this user …	… can achieve…	…with this feature
[business outcome]	**[persona]**	**[user outcome]**	**[feature]**
staff will be resorted to less often	students and academics	navigate the kiosk UI for their desired information	an improved information architecture
patrons will be able to find what the need	patrons	find what they are looking for	a kiosk search function
patrons have an easier time navigating Robarts Library	patrons	interact with the kiosk	an interactive map

patrons will be better informed about Library services and resources	patrons	find the information	up-to-date display of information
patrons will find specific information that they need	patrons	understand the labels and wordings of the Kiosk interface	re-labeling
improved patron access to information	patrons	acquire information from the kiosk	a kiosk that is available after-hours
			a kiosk that is always on (i.e. doesn't fall asleep every 3 mins)

viii. Evidence of Design (e.g., Six-up, sketches) –

Preliminary Sketches from In-Class Workshop:

Workflow Sketches:

Floor 1

WASH

Washrooms
Building Facilities — F 1

Washrooms
B — F — F 3

F 4

F 5

F 8

F 9

F 10

UofT Lib

Floor 1

Search Robarts...

UofT Lib

Please note that these washrooms are not wheelchair-accessible. The 1st floor's wheelchair-accessible washrooms are located near room 1008.

First Sprint/Cycle UI:
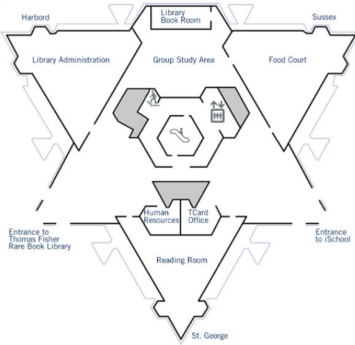
University of Toronto Libraries — MAP

| 1F | 2F | 3F | 4F | 5F | 6F | 7F | 8F | 9F | 10F | 11F | 12F | 13F | 14F |

CURRENT: 2F

Harbord · Library Book Room · Sussex
Library Administration · Group Study Area · Food Court
Human Resources · TCard Office
Entrance to Thomas Fisher Rare Book Library · Reading Room · Entrance to iSchool
St. George

INFORMATION

select a location

Search map 🔍

University of Toronto Libraries — LIBRARY SERVICES

Search for Services 🔍

Navigation icons (sidebar): Map · Library Services · Find a book · Hours

University of Toronto Libraries   **FIND A BOOK**

Find a book in the stacks using a call number. ⓘ

Once you've found a book in the library catalogue that is in Robarts stacks, look at the first letter(s) of the call number to know which floor to go to.

Once you get to that floor, look at the ends of the shelf rows to find the section that has your book.

Click one of the buttons below to be taken to a map of stacks on that floor:

9th Floor	10th Floor	11th Floor	12th Floor	13th Floor
AC-AZ B-BX C-CT D Oversized	DA-DX E F-FC	G-GV H-HX J-JZ K-KZD	L-LT M-MT N-NX P-PM	PN-PT TR,TT U-UH V-VM Z4-Z701 Z5939-Z8309.35

Map

Library Services

Find a book

Hours

ix. Evidence of Research/Testing and Learning (lean evaluation) –
Research/Testing Approach Used:
During this stage, we conducted usability testing of our system with a laptop. We had two participant pools. The first was the students at the iSchool, who were used for informal testing. The second was the undergraduate students at the Robarts Library. We tested over 8 students from this group. For this group, we used incentives from the Robarts Library ($5 Starbucks gift cards).

What we learned:
Personal Learning:
- Brainstorm is useful in a group to develop as many as feature we can in the first around of paper prototypes
- It was difficult to recruit students because they were often busy with their own work. $5 did not seem to be a strong enough incentive for many of them to participate.
- Actively recruiting potential participants in the moment was difficult with time frame of exam preparation under academic time schedule.

About the Prototype Design:
- **People still can't understand call numbers**: When users were presented the first letter of the call number, some of the users interpreted the call number's letters as the letter to be the author first/ last name or the first letter of the book title. Users do not associate the letters on the UI to be the call numbers.
- **People didn't use the "?" button:** Our participants did not notice or use the "?" button that is located next to the label "Find a book in the stacks using a call number", meant to provide further help/information for users who need it. Clicking this button would bring up instructions on how to locate the call number in One Search.
- **No one was reading the instructions:** We displayed the catalogue system in three steps in the UI to explain the letter according to the call number. However, users stills don't understand the meaning of the letters and make their own assumption of the letters. Therefore, we can conclude that no one reads the instructions that are based on text.

Takeaways and next steps for next cycle and/or the future:
- **It is hard to recruit users on site.** Consider options that does not require active recruitment of participants, such as deploying the MVP and using observations for evaluation.
- **Consider options to make the "?" button more visible**: This could be done by relocating the "?" button so it is more noticable in the UI as a source of further information. Also to provide more visibility, changing the colour or size of the icon may make users more likely to find the button.
- **Simplify the instructions for using the catalogue system:** Reducing the amount of instructions given for using the catalogue system may increase the amount of people reading them.

B. Cycle 2
i. Overview –

In Cycle 2, we fine-tuned our UI design from Cycle 1. The problem statement, business assumptions, user assumptions, and proto-persona did not change much between the first and second sprint/cycles. these aspects were still valid and could be carried over and/or they had still been working on addressing them based on what we learned from usability testing and validation.

ii. One problem statement –

Same as in Cycle 1.

iii. Business Assumptions –

Same as in Cycle 1.

iv. User Assumptions –

Same as in Cycle 1.

v. A set of hypotheses for that sprint –

Everything from Cycle 1, including:

- We believe **improved patron access to information** will be achieved if **they** successfully **acquire information from the kiosk quickly** with **a kiosk that has short instructions**.

vi. A proto-persona –

Same as in Cycle 1.

vii. A table of hypotheses for that sprint –

Everything from Cycle 1, including:

WE BELIEVE THAT:			
We will achieve	… if this user …	… can achieve…	…with this feature

[business outcome]	[persona]	[user outcome]	[feature]
improved patron access to information	patrons	acquire information from the kiosk quickly	a kiosk that has short instructions

viii. Evidence of Design (e.g., Six-up, sketches) –

Second Sprint/Cycle UI:
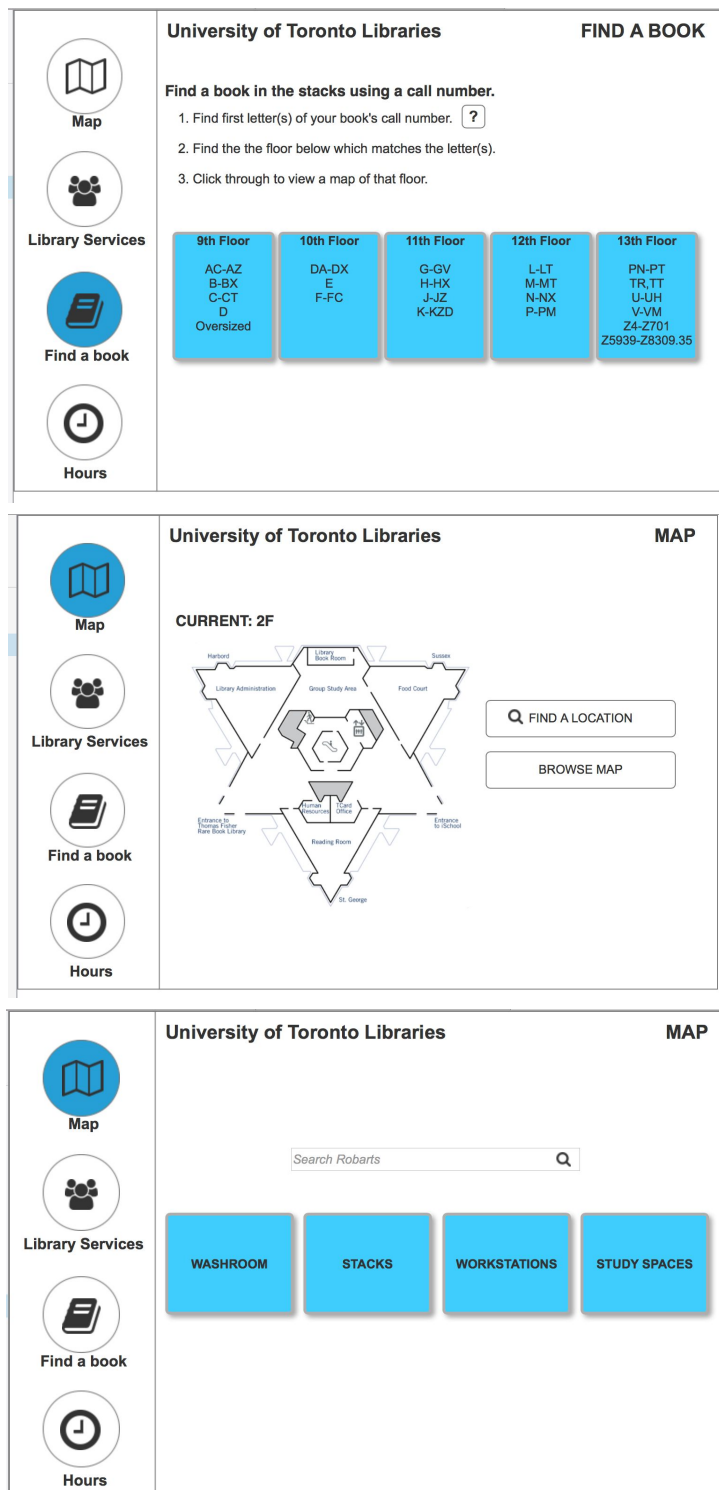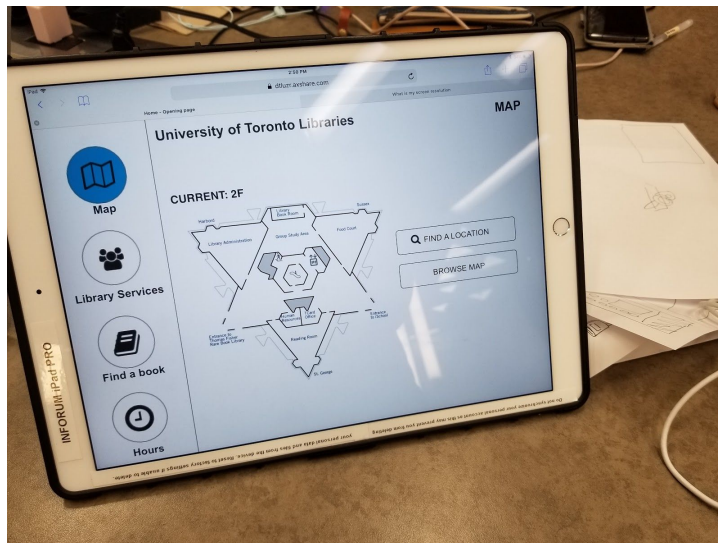
Second Sprint/Cycle Images from Testing:

ix. Evidence of Research and Learning (lean evaluation) –
Research/Testing Approach Used:
During this stage, we first conducted usability testing of our system with a laptop. Then, we borrowed a 13-inch iPad Pro from the iSchool Inforum, which allowed us to test the prototype with a device that resembles the long-term vision for the Kiosk (i.e. a standalone touch screen).

What we learned:
Personal Learning:
- **It was difficult to recruit users even with incentives.** This may be due to recruiting people randomly, on-site. It might have been more beneficial if we arranged a proper schedule to test with potential participants.

About the Prototype Design:
- **People were still not reading the instructions for using the catalogue system.** Despite our efforts to pare down the instructions to read for using the catalogue system, participants were still only skimming them or not reading them at all.
- **The "Library Services" and "Hours" tabs were not usually accessed** in the typical user tasks of this sprint.
- **When given the search bar, people would tend to search anything they would think of related to that subpage**, regardless of the actual search scope of the search bar. In our case, even though there were two separate options, one to "Search Robarts" and another to "Find a Book", participants were entering book titles into the "Search Robarts" search bar to try to locate their book.

Takeaways for next cycle and/or the future:
- **Remove the instructions for using the catalogue system,** and consider other ways to indicate steps to search with the catalogue system. For example, finding non-library specific terms to accommodate users who do not understand terms like "Call numbers" may be helpful. Or, providing the ability to search for a collection by author names or keywords directly within the UI of Kiosk can greatly reduce barriers for users.
- **Reduce the features available by eliminating the "Library Services" and "Hours" tabs.** These options were not used much from our testing results. By eliminating these features for the time being, we can focus our efforts on the primary tasks for this sprint. These features can be added back in during a later sprint in the future.

C. Cycle 3

i. Overview –

In Cycle 2, we discovered that many elements of the UI were not working the way we had hoped. The UI was too complicated for our users in many respects. Thanks to Lean UX, we were able to find out quickly that our design was not working in a meaningful way. As a result, we had made a large overhaul of our UI design while remaining conscious of incorporating prior feedback. We validated the new design by fitting in user studies with students at the iSchool. The UI design we had at the end of this Cycle 3 was what was presented at the Showcase on Monday, April 2, 2018.

Like in Cycle 2, the problem statement, business assumptions, user assumptions, and proto-persona did not change much from the first sprint/cycles. These aspects were still valid and could be carried over and/or they had still been working on addressing them based on what we learned from usability testing and validation.

ii. One problem statement –

Same as in Cycle 1 and 2.

iii. Business Assumptions –

Same as in Cycle 1 and 2.

iv. User Assumptions –

Same as in Cycle 1 and 2.

v. A set of hypotheses for that sprint –

Everything from Cycle 1 and 2, including:

- We believe an **improved patron access to information** will be achieved if **they** successfully **and easily navigate the kiosk UI for their desired information** with **a simplified kiosk UI**.

- We believe an **improved patron access to information** will be achieved if **they** successfully **and efficiently use kiosk UI for their desired information** with **a kiosk UI that does not rely on textual instructions**.

vi. A proto-persona –

Same as in Cycle 1.

vii. A table of hypotheses for that sprint –

| WE BELIEVE THAT:			
We will achieve	… if this user …	… can achieve…	…with this feature
[business outcome]	**[persona]**	**[user outcome]**	**[feature]**

| improved patron access to information | patrons | successfully and easily navigate the kiosk UI for their desired information | a simplified kiosk UI |
| | | | a kiosk UI that does not rely on textual instructions |

viii. Evidence of Design (e.g., Six-up, sketches) –

Third Sprint/Cycle UI:
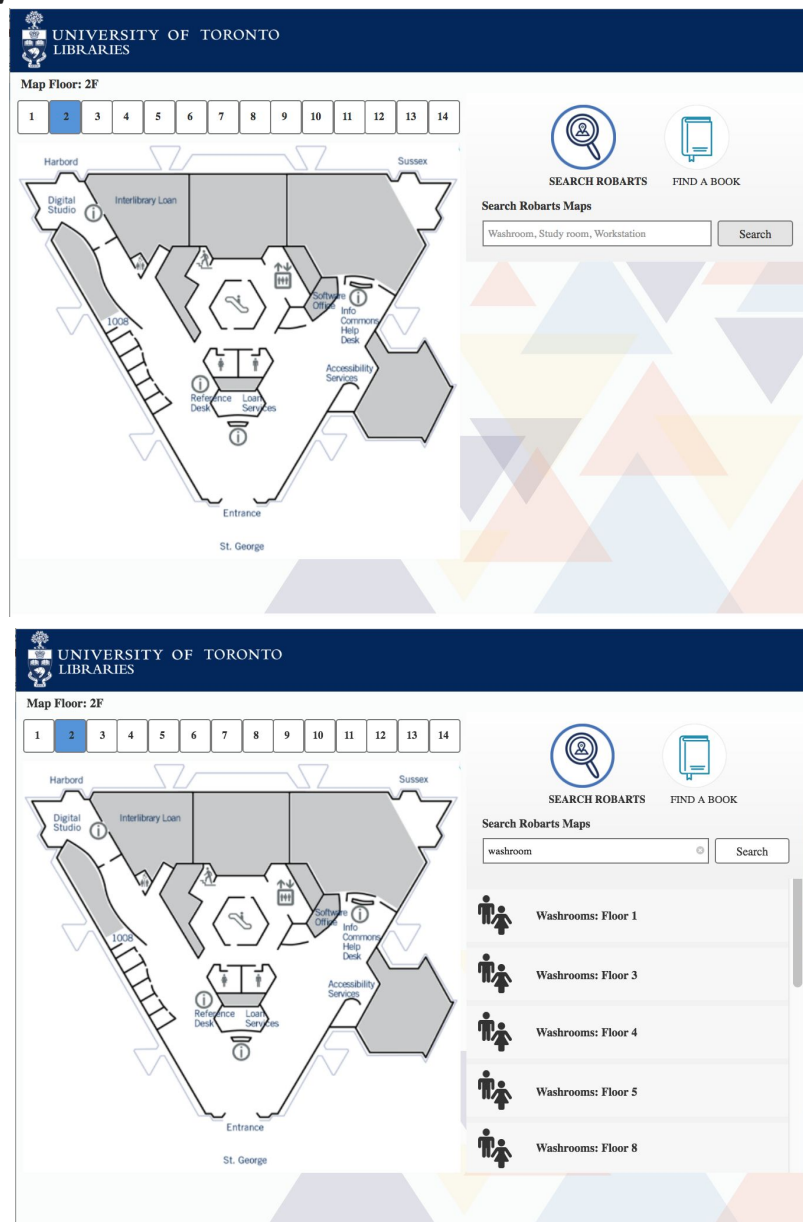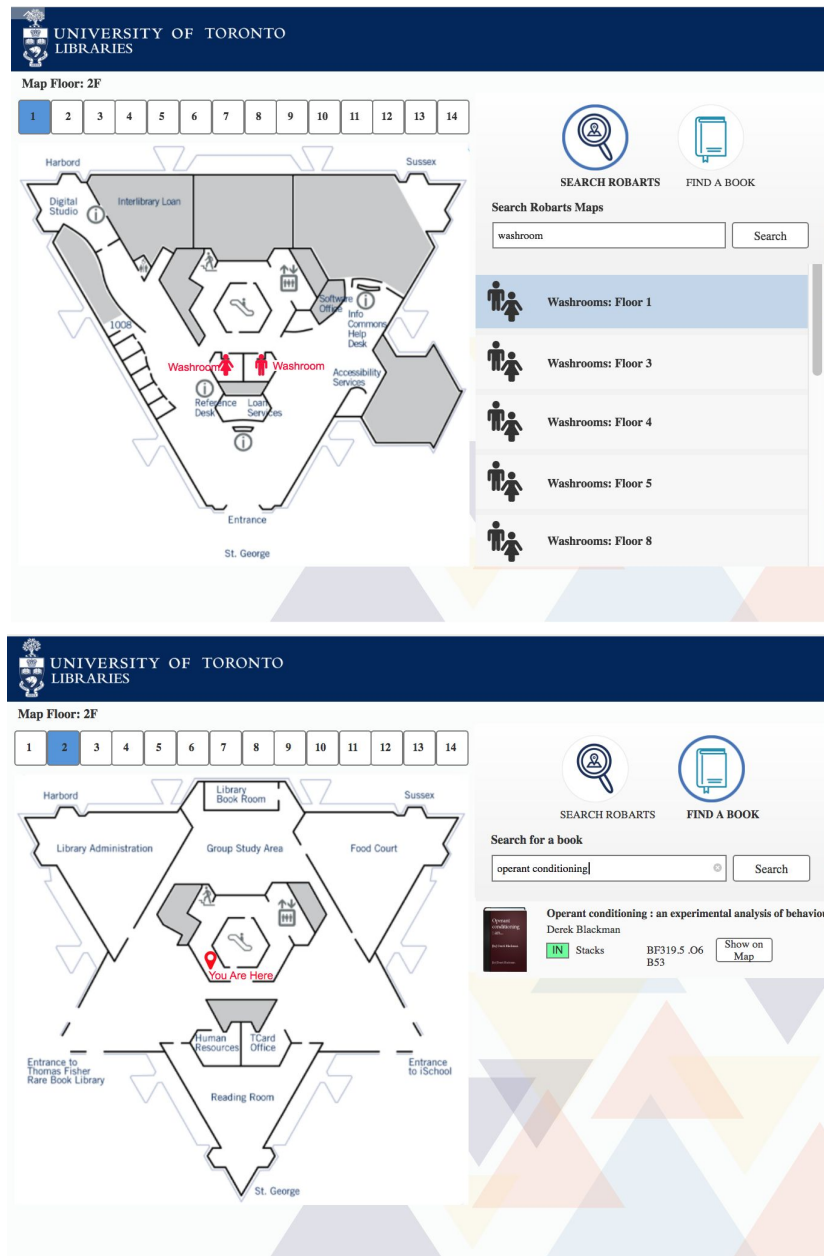
ix. Evidence of Research and Learning (Lean evaluation) –
Research/Testing Approach Used:

For this cycle, once again we asked users to test using the iPad. We did not have much time left, so we did not get a chance to test with undergraduate students at the Robarts Library. However, we managed to find MI students that were unfamiliar with the Robarts Library with whom we could conduct studies.

What we learned:

Personal Learning:

- **We could have started in Cycle 1 with a more pared down UI** that tested on singular functions rather than multiple functions. Instead of testing with 4 menu options, we could have started with one and then gradually added more.
- **A more specific bottom-up approach could have helped our effort towards addressing specific user pain points.** Due to the wealth of qualitative data and multiplicity of service points that existed in the Robarts Library, our collective efforts could have been better utilized from a more bottom-up approach in the earlier sprints.

About the Prototype Design:

- **The function of the label "Show Me" for revealing book location was unclear.** Renamed this to "Show on Map" instead.
- **Users were confused about the direction of entry for the central escalators between Floor 1-4.** Add directional icons and name of destination floor to the escalators on map.
- **Patrons may benefit by having more specific destination information for book.** Our current UI design only gives a general location of which of the three sides of Robarts to find a book, but it may be more helpful to go into further specifics about which shelf, etc.
- **The maps are not clear.** Some user commented saying that the maps looked like basement floors. There are also inaccuracies with the map labels; for example, the "Multi-faith Room" is labelled as the "Tibetan Room" on the existing maps.

Takeaways for next cycle and/or the future:

- **Our minimal functions and design for testing (MVP) are sufficient for deployment for future field studies work.** Users seem to be responding more positively per iterative prototype.
- **Increase clarity of intent of each icons/annotations on the map** to allow users to easily find the information they need through improved visible communication methods (bigger icons, color-coded signs, etc.)
- **Adding directions to locations may be worthwhile** to further help users navigate.
- **Update the maps used in the interface** would be worthwhile as it will contribute to making the kiosk relevant, accurate, and up-to-date.
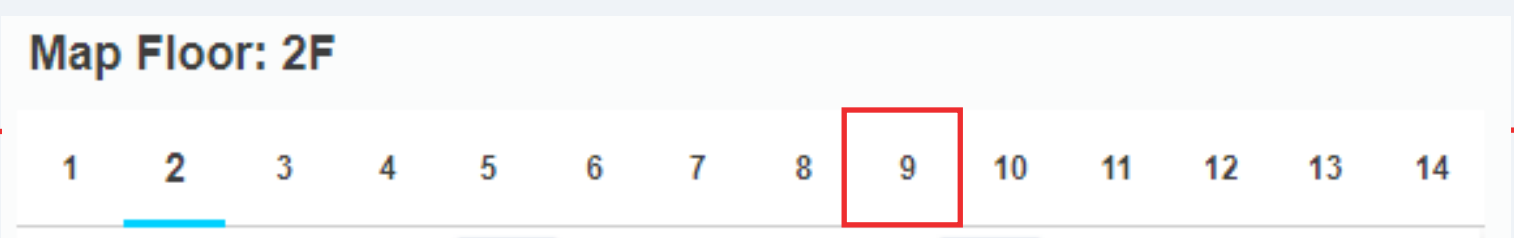
Robarts Library Kiosk Prototype Storyboard
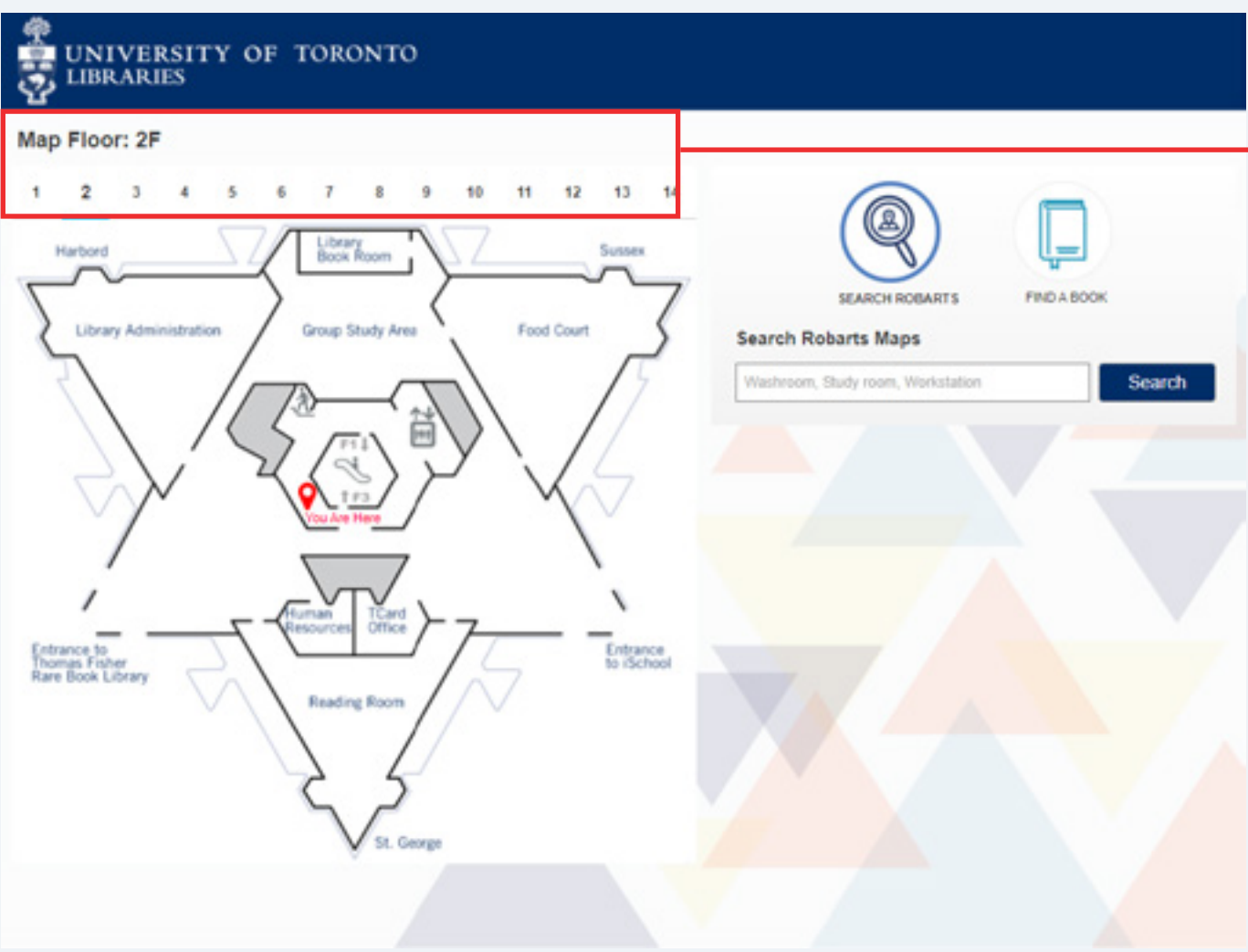
Task: Viewing Floors
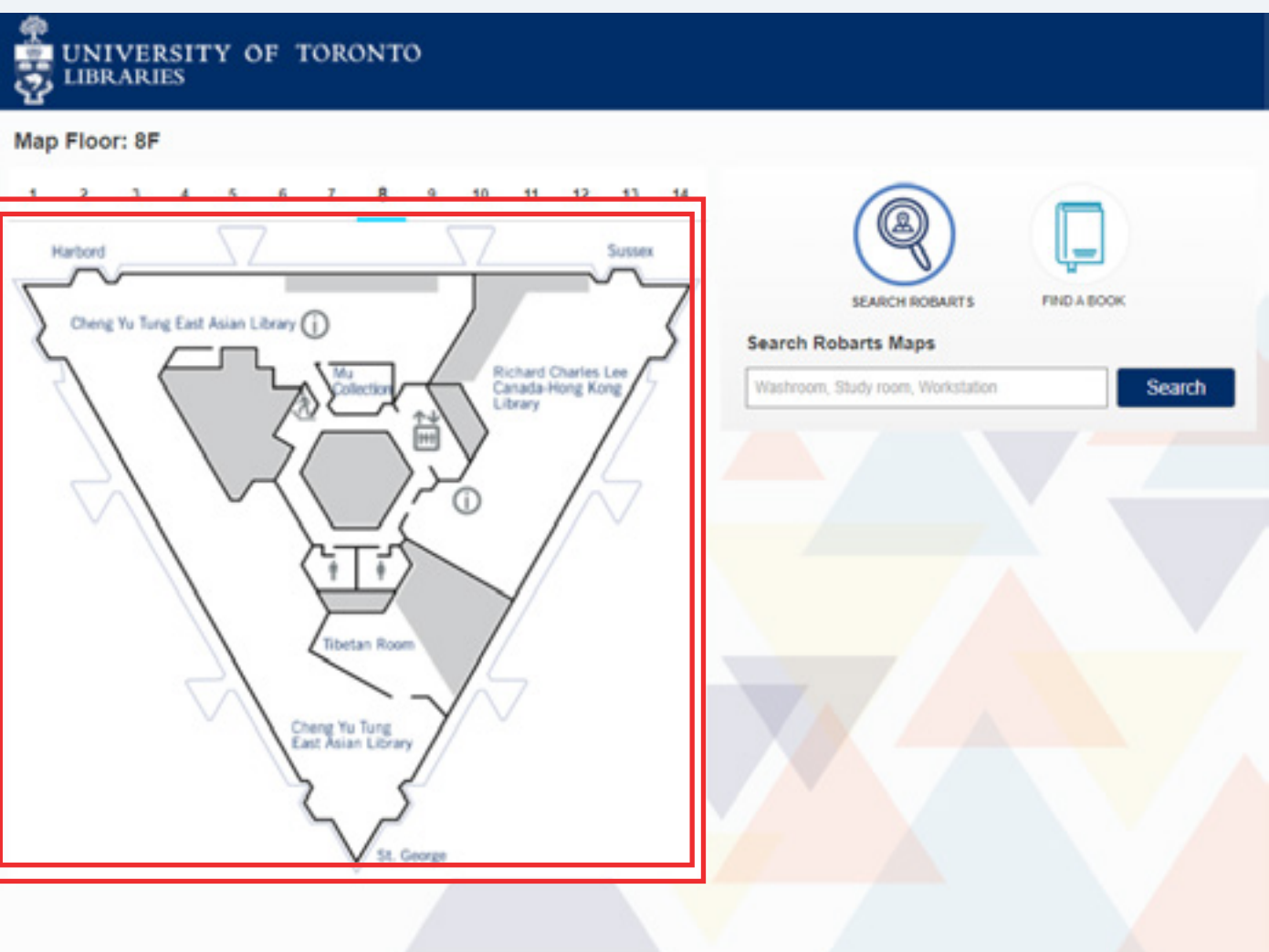
1.0 Initial Screen
The user is first presented with a map of the floor they are currently on. The user taps on the floor buttons.
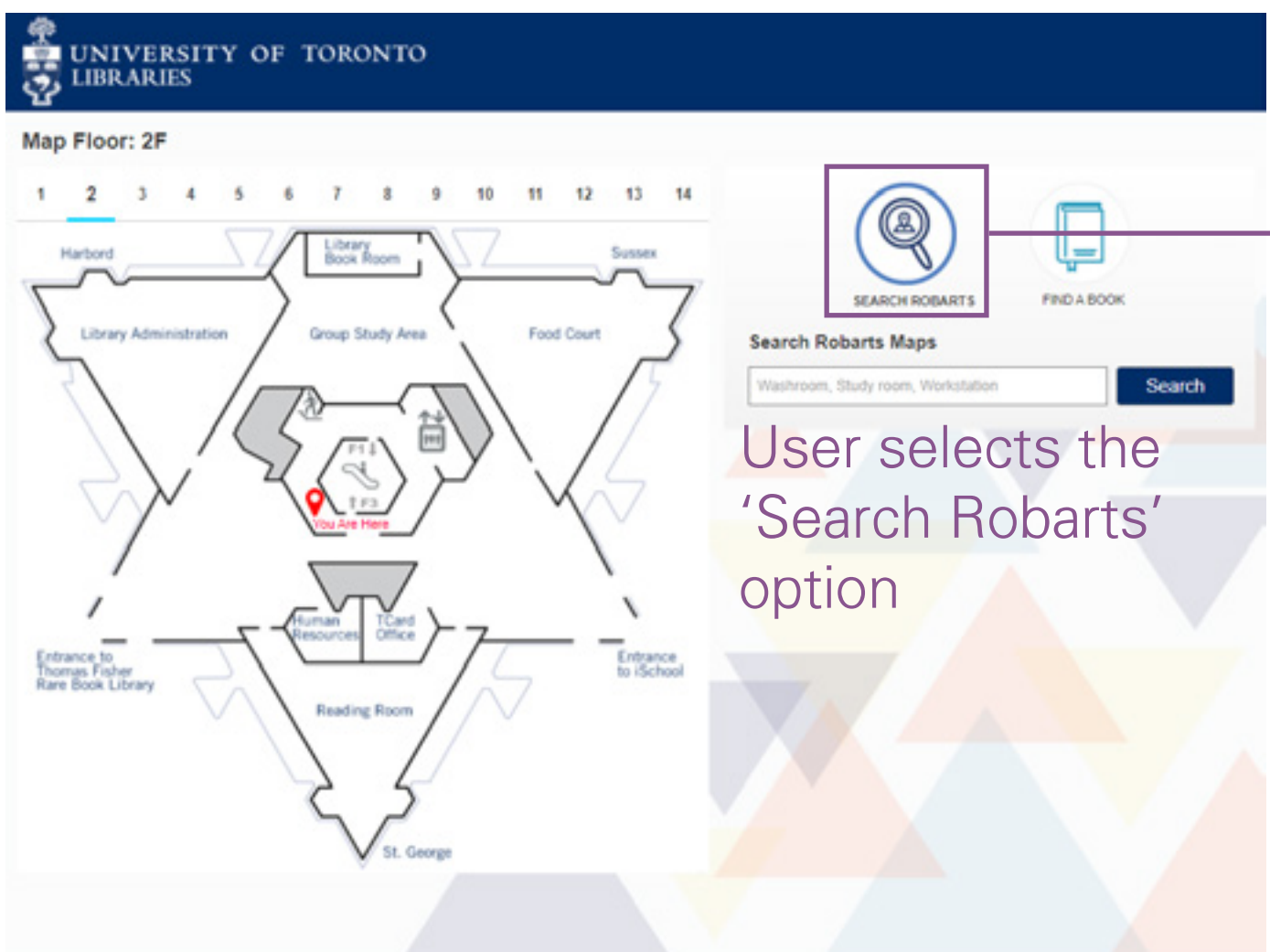
2.0 Map Floor Selection
Map Floor: 2F
1 2 3 4 5 6 7 8 9 10 11 12 13 14
User taps across floors

2.1 Map View
The map changes to display the selected floor.

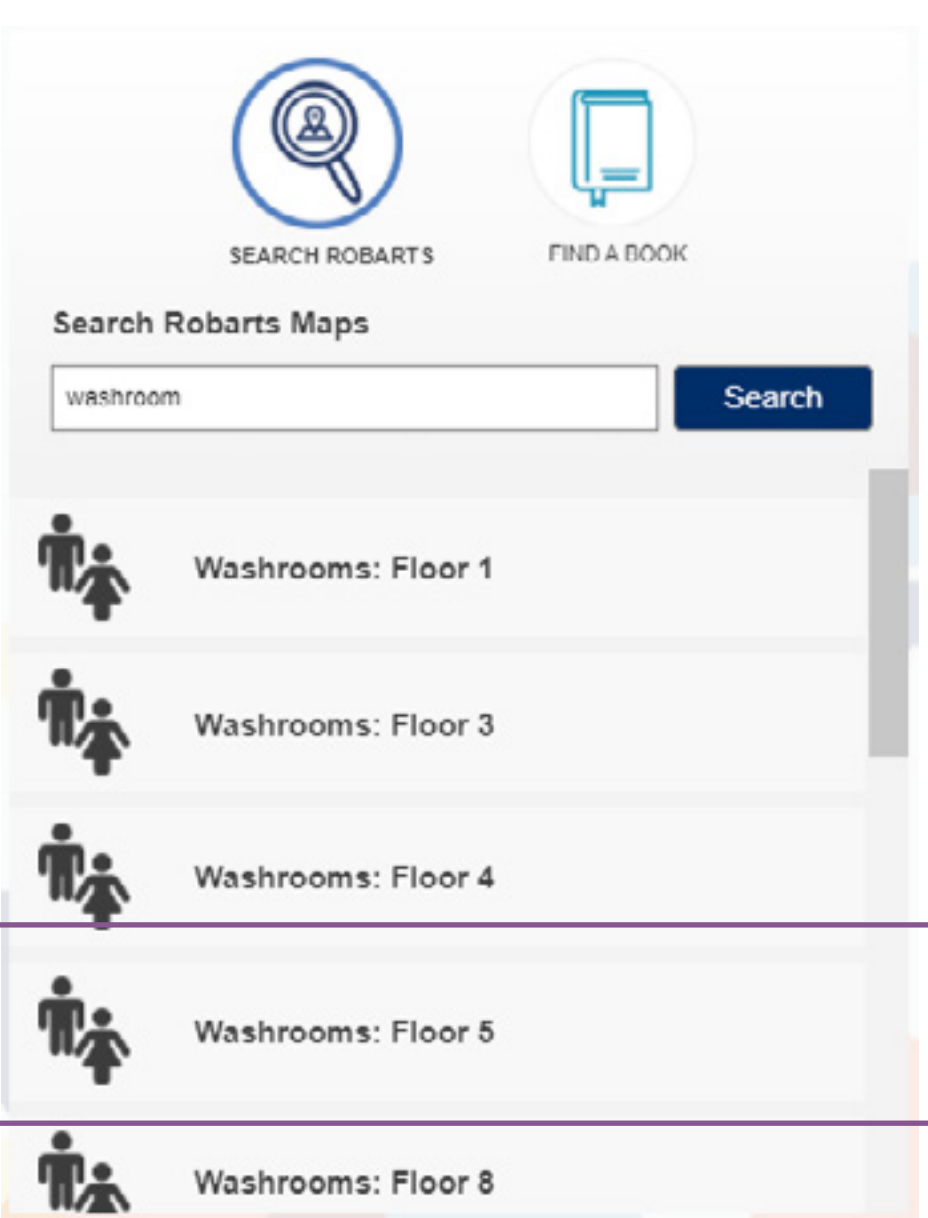**Task: Searching for Locations (Washrooms)**

1.0 Initial Screen
The user wants to find a washroom to use. The user taps on SEARCH ROBARTS.

User selects the 'Search Robarts' option
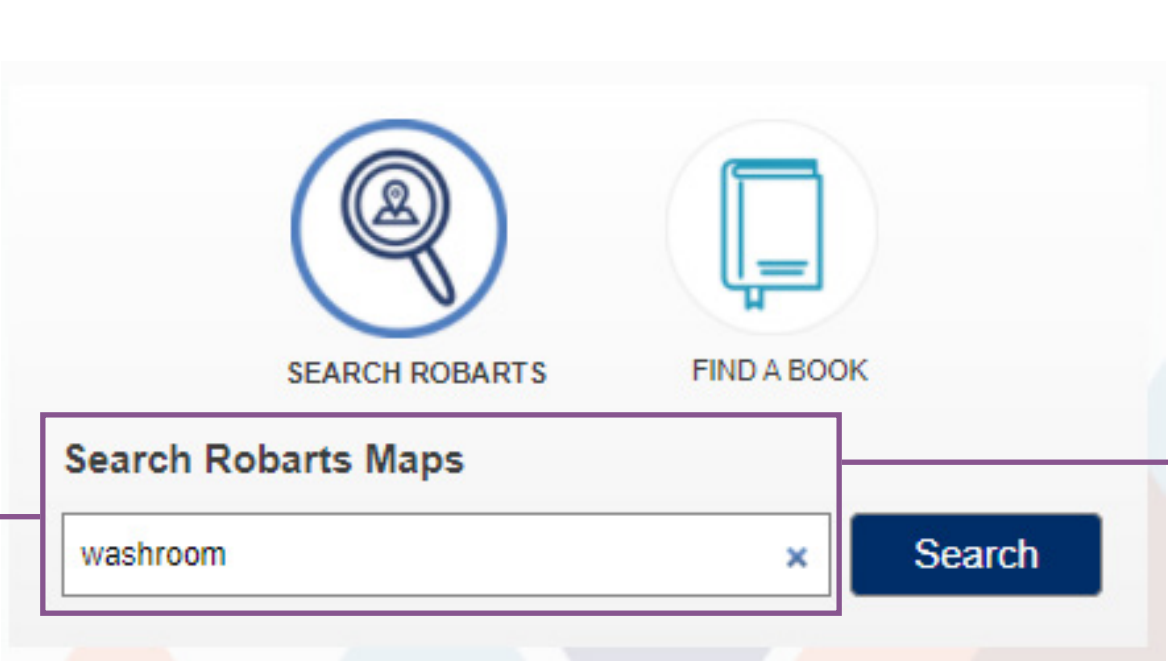
3.0 Keyword Search: Washroom
Search Robarts Maps
washroom
User searches using the keyword 'washroom' on the provided search bar. Other similar keywords may be entered, such as the plural form or 'bathrooms'.

3.1 Drop-down Selection
SEARCH ROBARTS   FIND A BOOK
Search Robarts Maps
washroom   Search
Washrooms: Floor 1
Washrooms: Floor 3
Washrooms: Floor 4
Washrooms: Floor 5
Washrooms: Floor 8
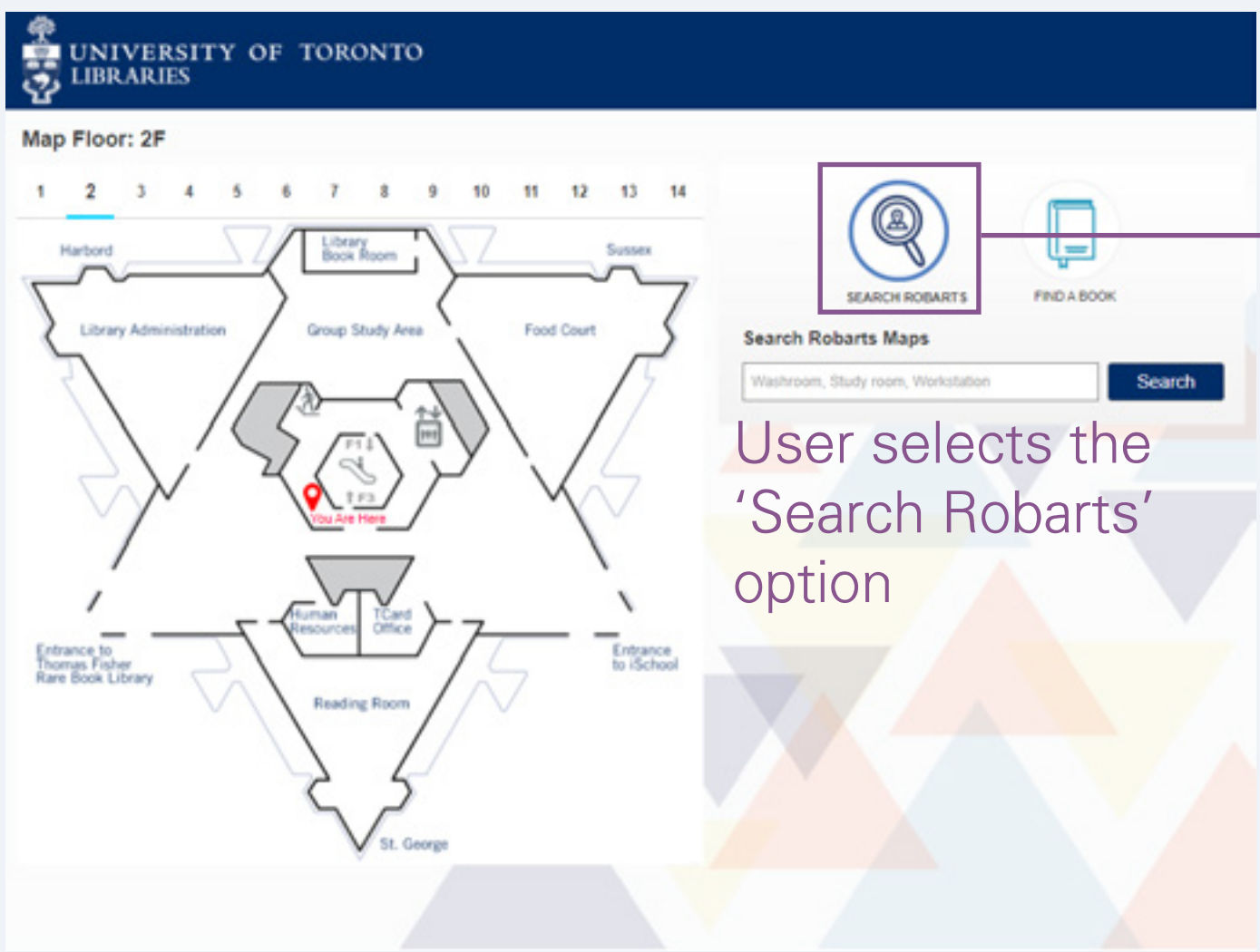A drop-down menu appears and the user selects a desired floor

3.2 Map View
The map displays and indicates the location of the selected washroom on the respective floor
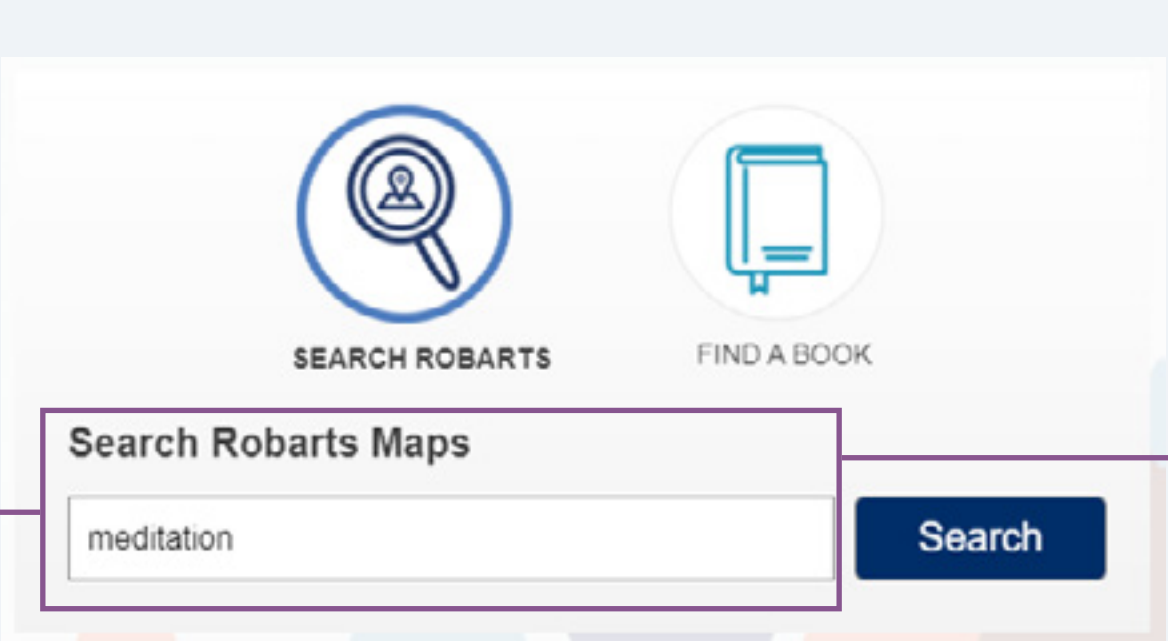

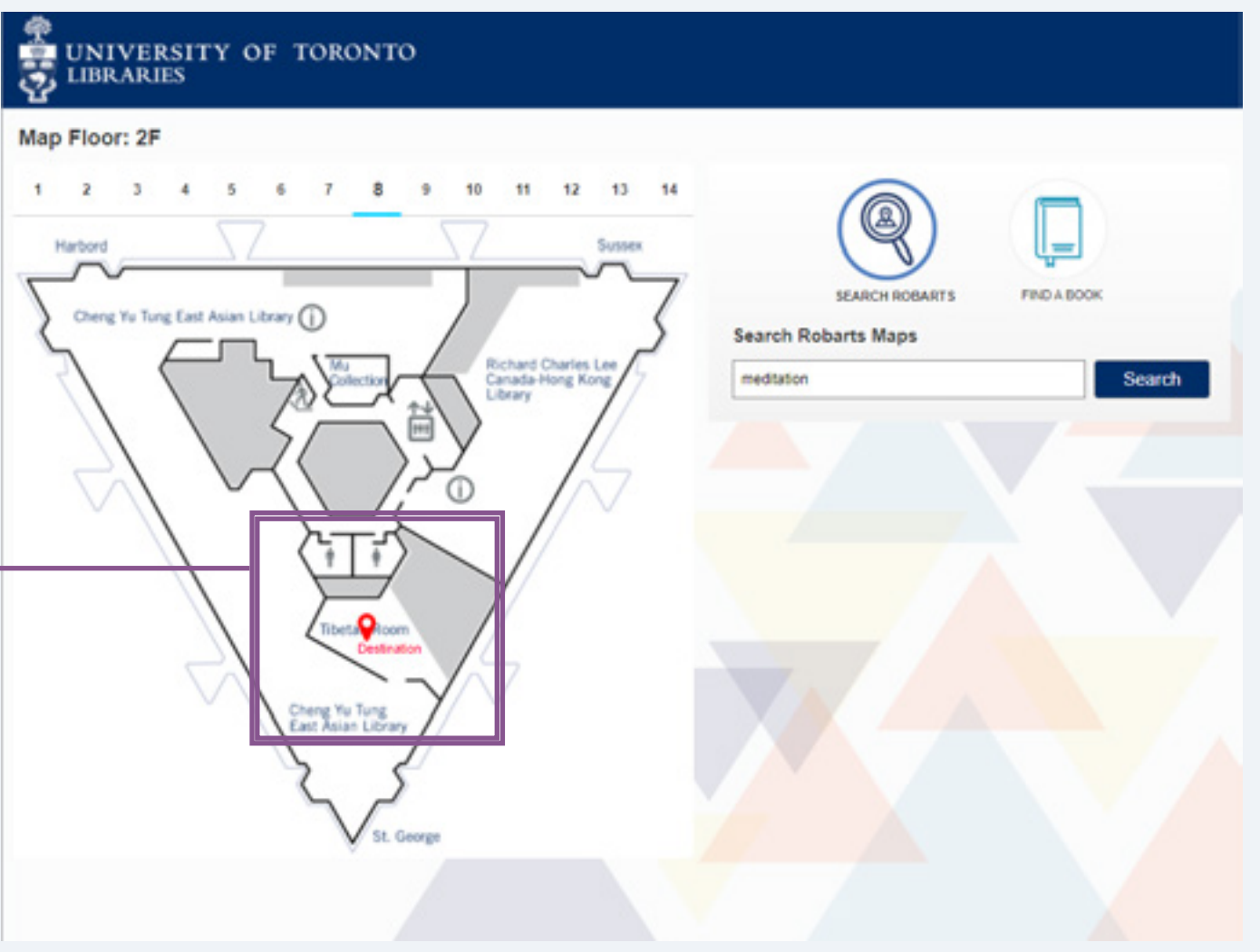**Task: Searching for Locations (Meditation Room)**

1.0 Initial Screen
The user wants to locate and use the meditation room. The user taps on SEARCH ROBARTS.

User selects the 'Search Robarts' option
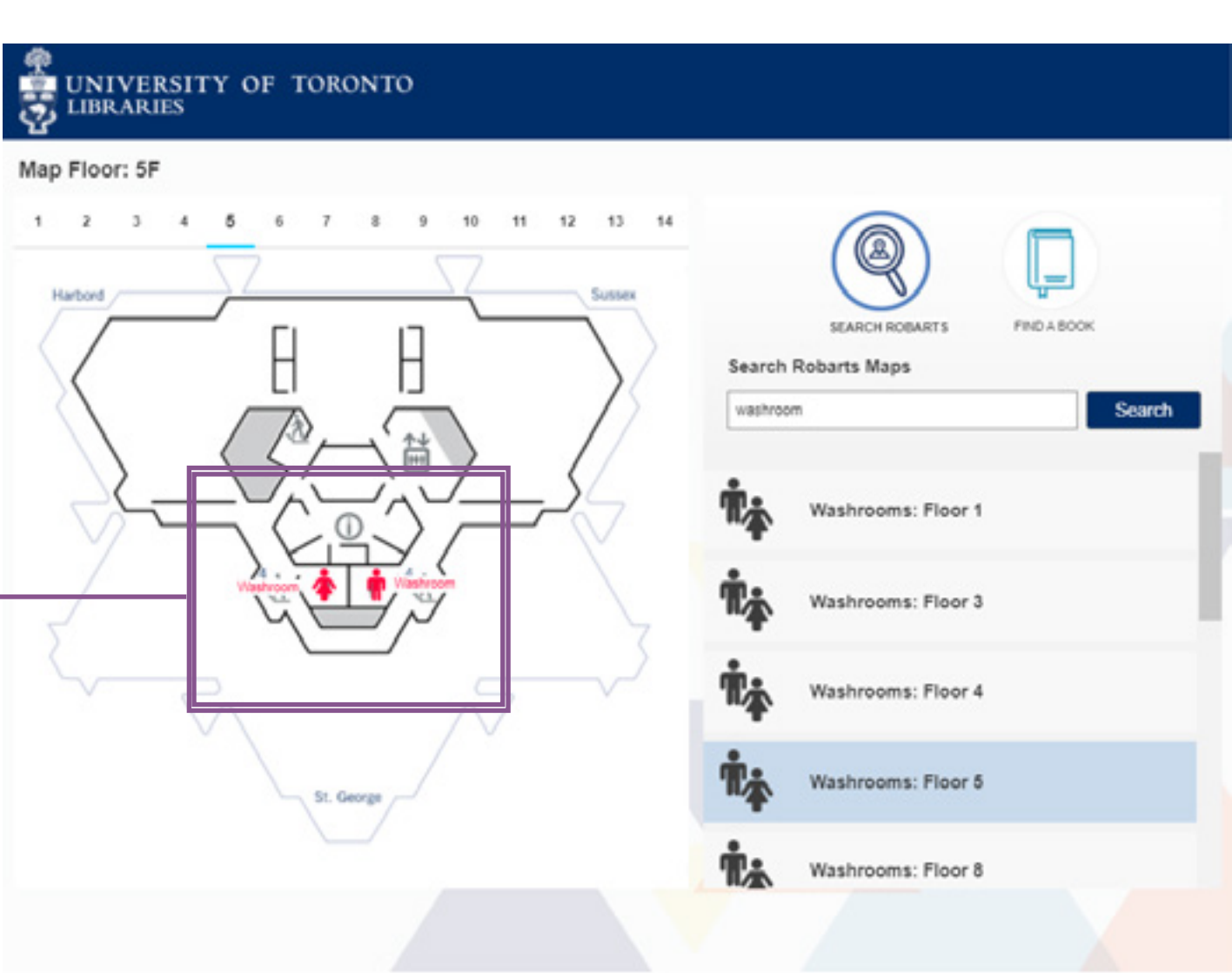
4.0 Keyword Search: Meditation
Search Robarts Maps
meditation
User searches using the keyword 'meditation' on the provided search bar.
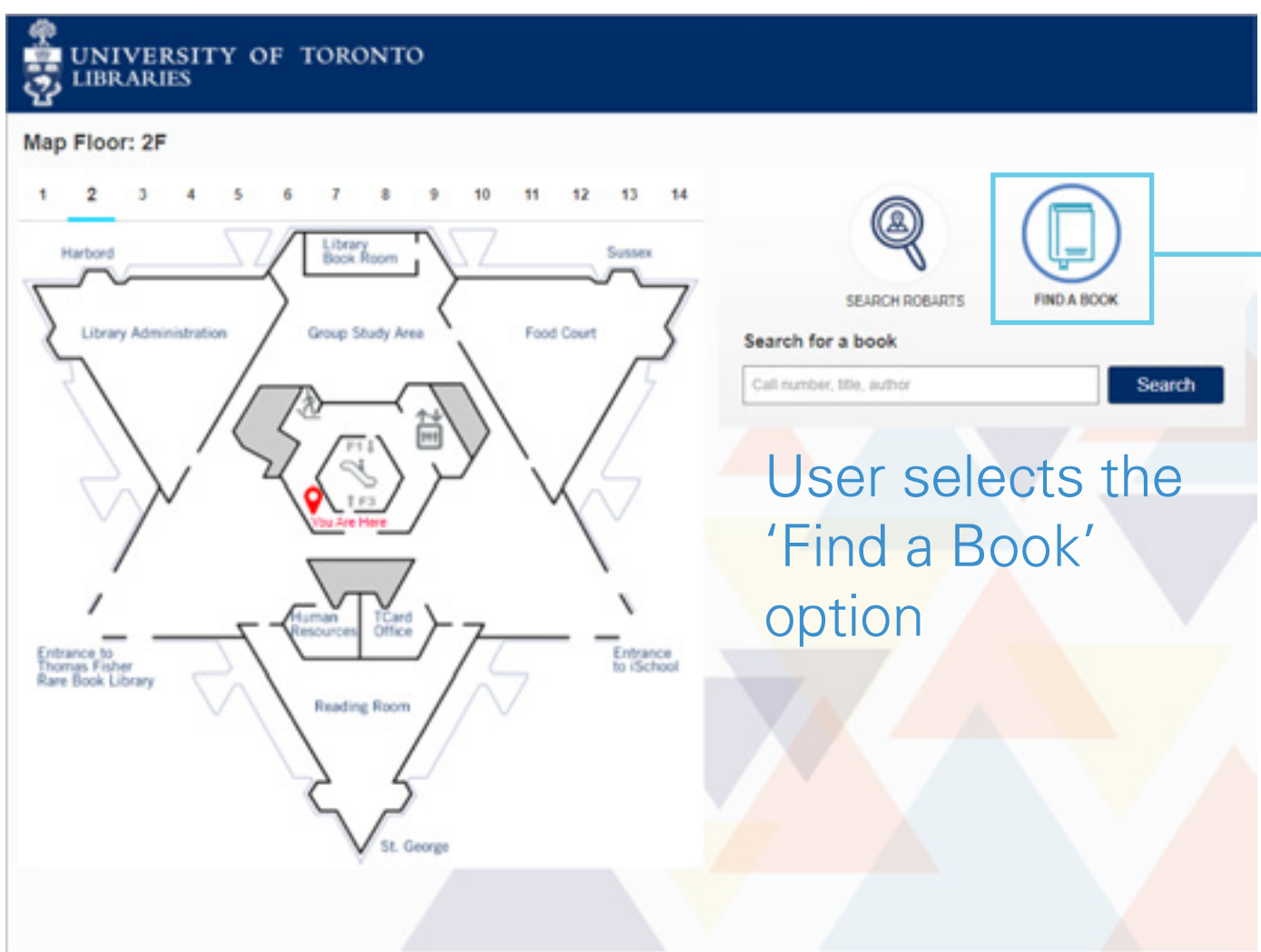
4.1 Map View: Meditation Room
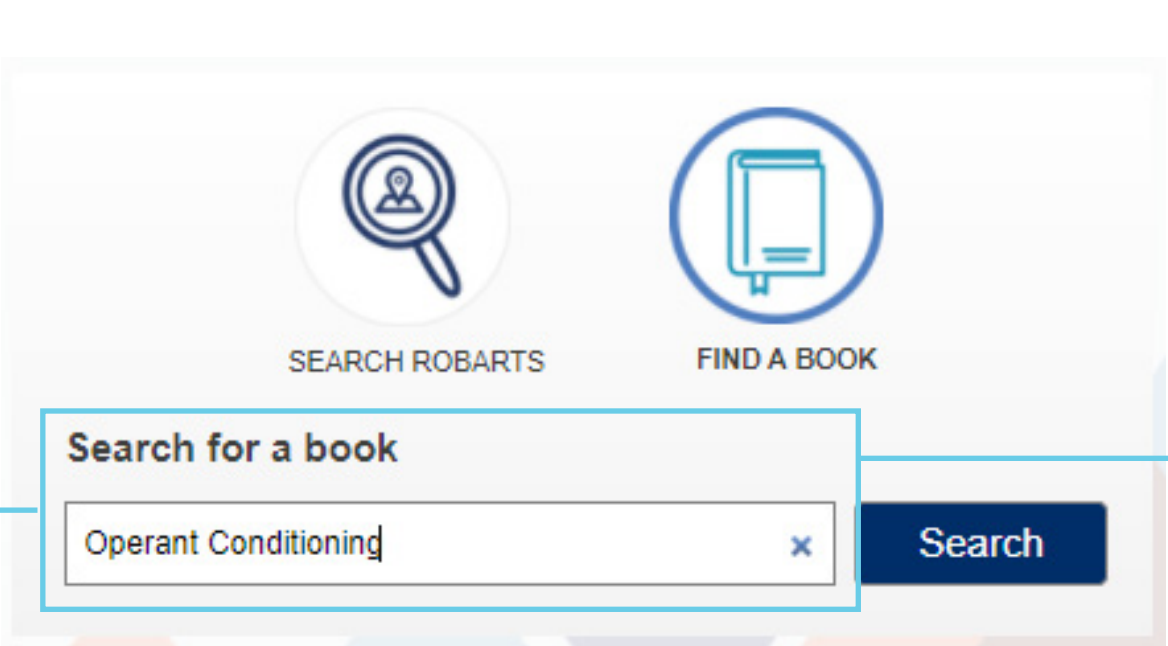The map displays and indicates the location of the meditation room, in this case, it is on the 8th floor.

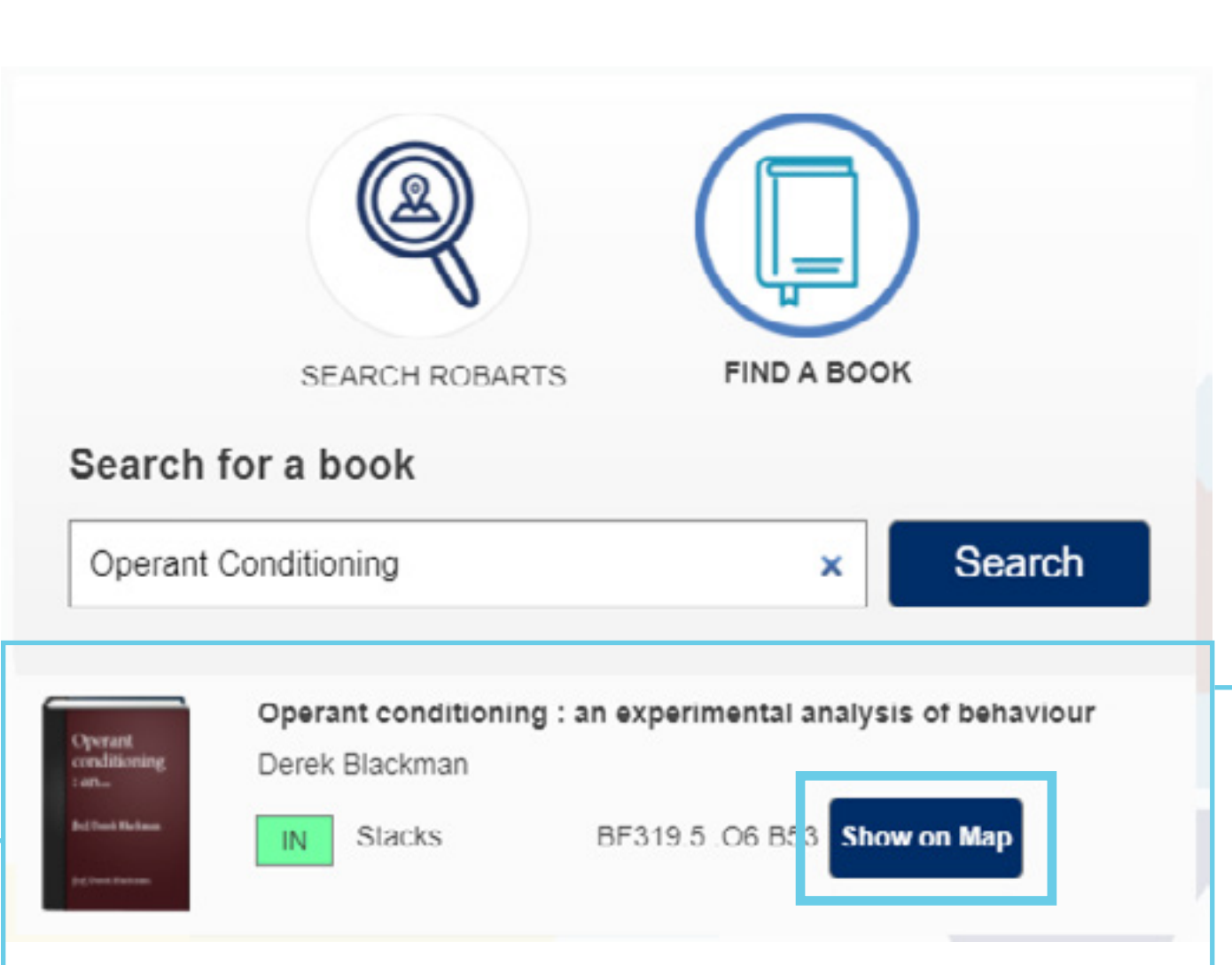**Task: Searching for Books**

1.0 Initial Screen
The user wants to retrieve a physical copy of a book for their class. The user taps on FIND A BOOK.

User selects the 'Find a Book' option

5.0 Keyword Search: Operant Conditioning
Search for a book
Operant Conditioning
User searches a book using the search bar. The keywords may contain the title of the book or the author name or the call number.
In this case, the book 'Operant Conditioning' is inputted into the search bar.
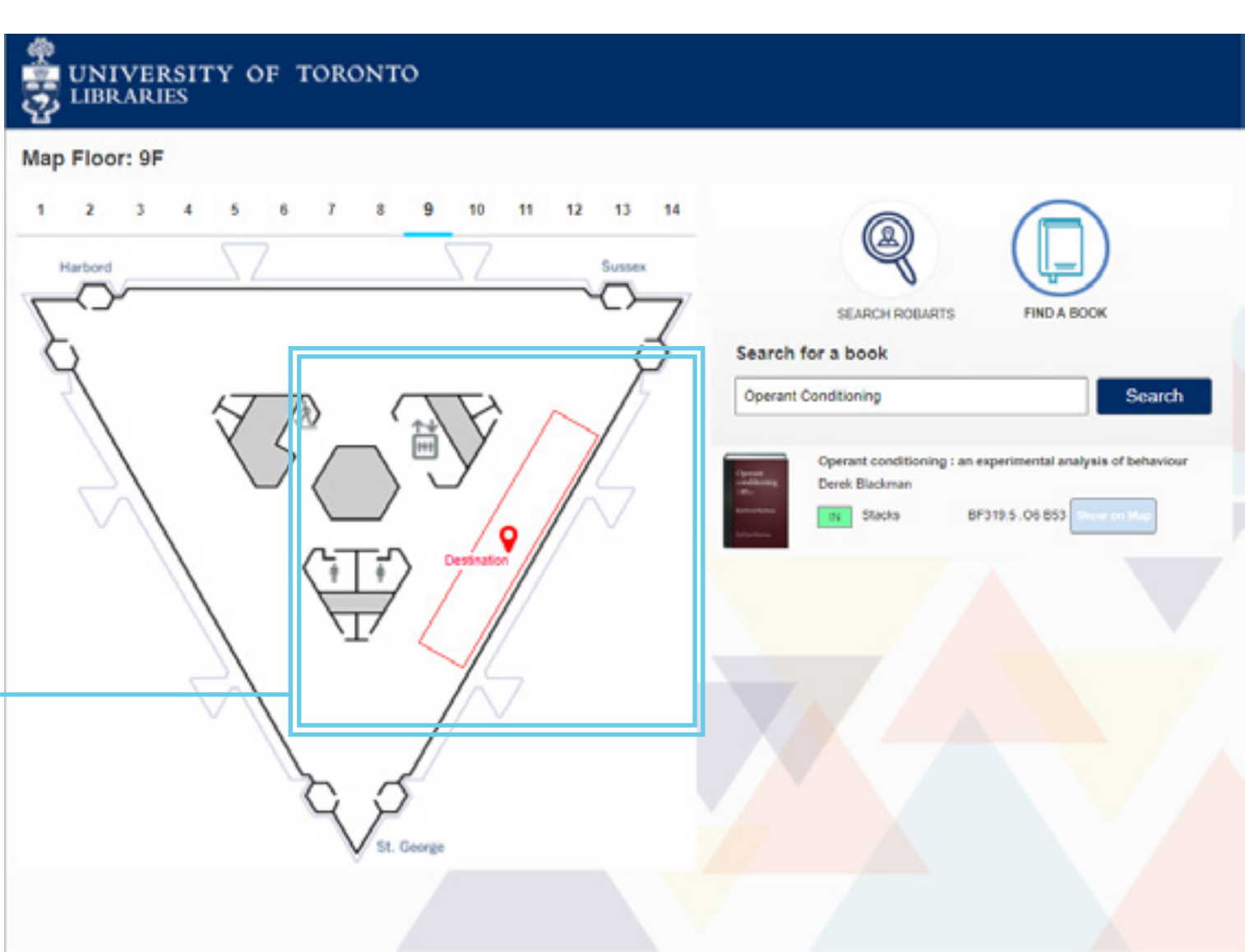
5.1 Book Selection
Search for a book
Operant Conditioning   Search
Operant conditioning : an experimental analysis of behaviour
Derek Blackman
IN   Stacks   BF319.5 .O6 B53   Show on Map
User searches a book using the search bar. The chosen book for this prototype is 'Operant Conditioning'
The user taps 'Show on Map' to display the location of the book on the map

5.2 Map View
The map displays and indicates the location of the selected book on the respective floor (in red), in this case, the 9th floor.

UNIVERSITY OF TORONTO LIBRARIES