Queen's UNIVERSITY

Group 8:
Assignment 2 Report

Requirements Document

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Course Project
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1. Introduction

The Ice Climate and Environment Laboratory (ICELab) at Queen's University manages and compiles data from a network of four high-latitude Arctic weather stations that are currently used by Arctic researchers at Queen's University. However, the lab would like to make these data available to other students and researchers at Queen's, as well as the larger scientific community, so that their research and projects can use them. In this project, we are building a web-based real-time data browser that addresses the problem of the general public having difficulty accessing scientific findings and research data shared by Arctic researchers, and engages people in the community by making the data better understood and accessible.

2. User Group

The project target user group is the community that are interested in Arctic Climate and Environment. They should be familiar with using internet browsers because the system is deplored on websites. Since there will be adaptation to the website, this system will be smart phone friendly and people could simply get access to the system through their phone or other mobile device. In terms of other required software packages, an Acrobat Reader, Excel, and notepad could be needed because the researching data or analyzed data will be exported in pdf or .csv format.

User Group	**Description**
ICELab Administrator (Professors)	The ICELab Administrator is the group responsible for providing and maintaining the data and regularly reviewing the population of visitors to the site. They are highly skilled and therefore only need to provide help in using the site initially. There are no additional packages to install for this.
Queen's University Students	Queen's students are those who wish to download Antarctic data for use in completing coursework, and they need to use their own queens account to log in. However, they are very computer literate so they do not need additional help to access the site
Arctic Environmental Researchers	Arctic Environmental Researchers is a group of people who want to use Antarctic data for scientific purposes. They can select the time period for data and generate

	graphs from the web page, as well as view the latest data. They are also very familiar with the technology and do not need additional guidance.
Arctic Environment Enthusiast	Arctic Environment Enthusiast is a group of people who want to use data for their personal interests, such as generating their own weather logs. They can also download and search the data at any time, but need permission from the administrator. They do not need to download additional packages and are considered to be skilled computer users.

3. Context of Operation

Since what we are building is a web page, the location and environment usage scenario can be anywhere that has access to an internet connection, as all web pages do. Users will need to have, but are not limited to, electronic devices with modern resource managers and computers that support frameworks such as Node.js and React.js. Users will typically use this web page in quiet environments, such as study desks and libraries. But there are no restrictions on these, as long as the internet connection is stable, users can log in and use the web page whenever they wish.

4. Current Processes

For now, although there are websites that provide climate data, it is still difficult for researchers to access data and statistics for a given period. Take the website HOBOlink, for example. Users will be asked for a username and password when accessing the site. Only after users have logged in successfully can users use the functions on the website. The site provides researchers with four functions: Dashboard, Device, Data, and Calculated Channel. The site feature is the Dashboard, which allows users to create, edit and view custom pages with graphics, charts, and widgets. Devices and Data belong to the essential functions of the website. The devices consist of four main parts: overview, graph, log, and export. First, the overview includes today's climate information and device information. The graph part is line charts of the past day, week, and month's climate information. Logs provide information about the running status of sensors. The export part is to output the data in the device to users in.csv format. Different from exporting data from one device, users can export data from different devices in the Data function. In addition, the Data function also includes data delivery and data feed. Users can use data delivery to allow HOBOlink to export data automatically in a planned way, such as

via email. Users can also periodically push their station data to designated software through the data feed. The Calculated Channel is relatively particular. Originally it belongs to the internal part of the Dashboard. Now, as a separate function, mainly for reference evapotranspiration. Users can set, edit, or delete channels.

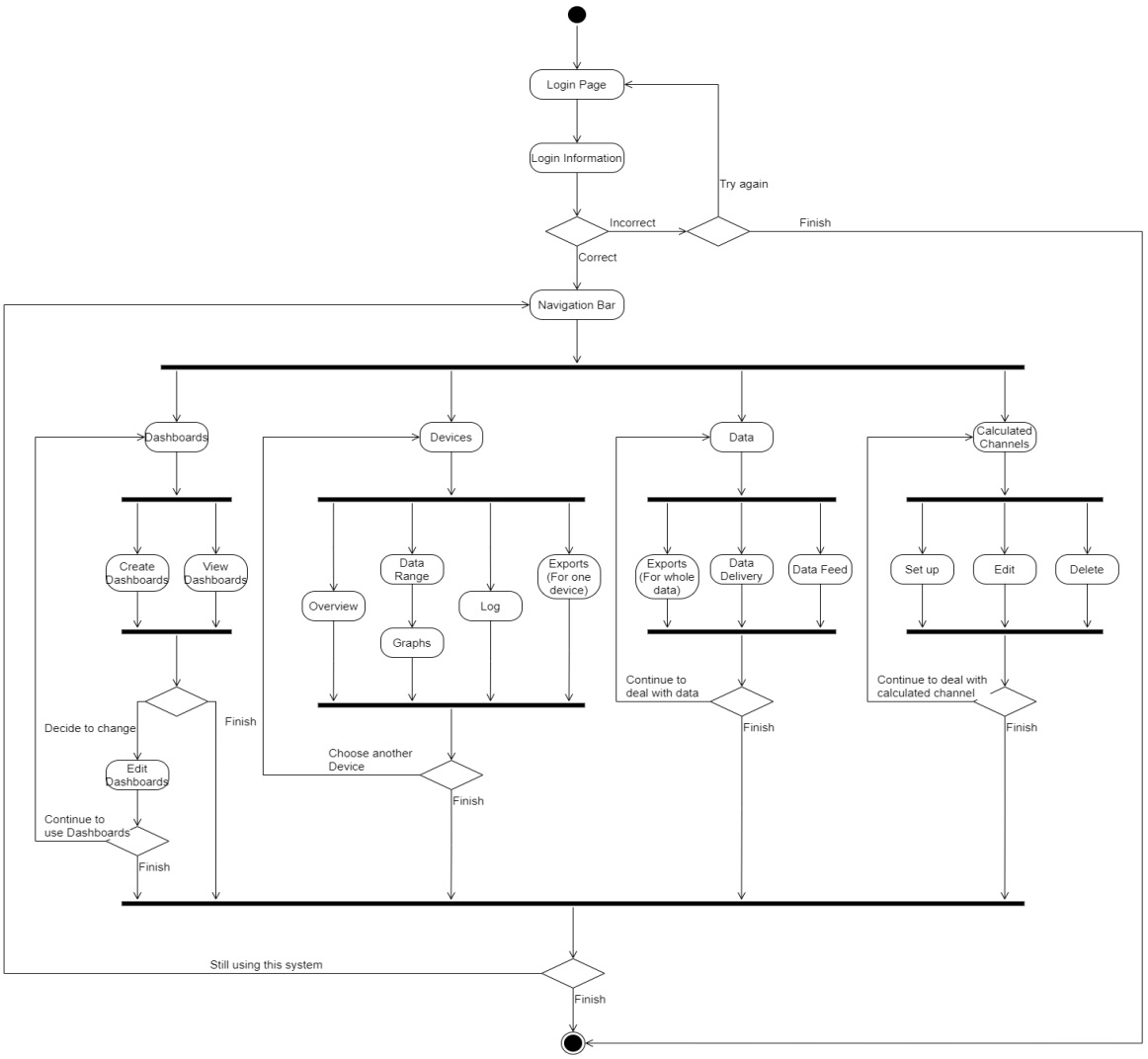

Figure 1: The activity diagram of HOBOlink.

5. Roles

Roles	Description
Website Designer & maintainer:	These people are required to build a website that fits the requirements of the customer(Transfer data to various graphs), and ensure the website is running stably. Administrators should ensure the privacy of users and user data should not be leaked or used for illegal purposes.
Website administrator & Data manager:	They are responsible for the occasional manual upload and maintenance of data. They are also responsible for setting the rules of data use for the website.They can track the information of the user who downloads the data. They also should follow the privacy terms set by the government when tracking user's personal information.
Visitor(student&Researchers):	Without registration, visitors can only search data but not download data. Visitors should follow the rule set by the administrator when using or propagating data. An example of rules refers to "Downloaded data can only be for academic purpose only".

6. Functional Requirements

Id	Priority	Requirement	Description

R1	Critical	New users can create an account	Anyone accessing the Web-based Real-time Data Explorer over the Internet can create an account giving them privileges to access research data and navigate in a graphic UI. If the user wants to download the data, they have to register the account
R2	Critical	Administrator can create admin account	Only Arctic researchers or explorer developers can access to the administrate page The website should only let Arctic Researchers or Explorer Developers create administrator accounts.
R3	Critical	Data graphical interfaces shall include multiple processing methods	The UI contains slide bars. Research data could be sorted in time order (day, month, year). Time Period should be included. Basic statistical information like max, min, average, median etc, these values can be taken into account.
R4	Critical	Users can download research data	Administrator allows users to access scientific data and download these data according to time period or other categories.
R5	Critical	Administrator can upload data to the system	Arctic researchers can upload data to the explorer and these data can be viewed by others.
R6	Critical	Users can perform simple statistical analyses	As users select out their preferred research data set, they could easily use built-in

			functions to find out statistical values like mean or standard deviation etc.
R7	Critical	Users select research data of their preferred period	Since the uploaded research data has been collected from 20 years ago, users do not need to view the data over 20-years but their could select data of their preferred period
R8	Important	Administrator track user behavior	The Administrator of the system should have the right to monitor user's action through the system in order to prevent any malicious actions.
R9	Optional	Online Frequent Questions Survey	Come up with a list of questions that people are interested in. (17 years data not easy to analyze)
R10	Optional	Illustrated Research Data Delivery	A map of the area that contains research sites showing info like temperature, wind directions, humidity and snowfall etc.

7. Non-Functional Requirements

7.1 Usability Requirements:

USE-1: 80% of the new users shall be able to successfully download a set of data in their first try.

7.2 Performance Requirements:

PER-1: The system shall allow more than 10 users to download or view the data at the same time.

PER-2 the download of data should not take over 1 min on a 50 MBPS Internet connection.

7.3 Security Requirement:

SEC-1: the users shall not be able to edit or upload the data.

SEC-2: The registered users shall only view the data.

SEC-3: Only the administrator shall upload the data.

SEC-4: the administrator shall be able to view the download logs of the data.

7.4 Availability Requirements:

AVA-1: the system shall be available at least 95% between 8:00-24:00 and more than 90% of the time between 0:00-7:59. Excluding maintenance periods.

7.5 Maintainability Requirements:

MAN-1: A single maintenance process shall take no longer than 48 hours.

8. Glossary

Node.js: it's a JavaScript runtime built on Chrome's V8 JavaScript engine.
React.js: it's an open-source JavaScript framework and library developed by Facebook

9. Contribution

Requirement Document

Yucan Li - Introduction, functional requirement, context of operation
Zhibing Liu - Context of operation, user group, roles
Huilin Xu - Introduction, user group, roles
Wenran Hou - Current Process
Yiming Zheng - Non-functional reqruirement

Requirement Presentation

Huilin Xu - Introduction, user group
Zhibing Liu - Context of operation, roles
Wenran Hou - Current Process
Yucan Li - functional requirement, summary
Yiming Zheng - Non-functional reqruirement, summary