CMPT 276: Group 23

One Direction Ltd.'s

Issue Tracking System

Release 2

Release Date: 2024-06-19

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Release History:

Release 1: 2024-06-07
-Software requirements specifications released

Release 2: 2024-06-19
-User manual released

Release Table

RELEASE TABLE PAGE						
Configuration Item:	Version	Number of Each Configuration Item in:				
	Rel. 1	Rel. 2	Rel. 3	Rel. 4	Rel. 5	Rel. 5A
Documents:						
Requirements Spec	1	1				
User Manual		1				
Architectural Design						
Modules (Main first, then alphabetical):						
GeeWiz.mod						
libA.def						
libA.mod						
libB.def						
libB.mod						
libC.def						
libC.mod						
Other Files						
makefile						
DemoData						

Document Version History

Version 0 - Original by One Direction Ltd. 2024-06-07

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1. Introduction

1.1: Welcome Message

Welcome to One Direction's Issue Tracking System! Thank you for purchasing our product, we know you will not regret it. Our Issue Tracking System will allow you to enter the world of automation, where you will see productivity like never before. Forget the stacks upon stacks of papers you once had to deal with. Now, you will be able to see all of your tasks and their statuses in one place. Great for logging bug fixes, new features, and updates, as well as simplifying the management process for those involved! This user manual guides you through our software, so that you can become a master of your domain.

For any questions or concerns, please contact us at +1 (604)-679-2471…

1.2: System Overview

The main functionalities of our Issue Tracking System include:

- Creating a product listing
- Creating a product release
- Allowing users to request changes
- Keeping track of change items and all those who requested them
- Searching for and viewing change items
- Updating change items
- Printing reports

There are several advantages that come with these functionalities all being available in one place, some of which include…

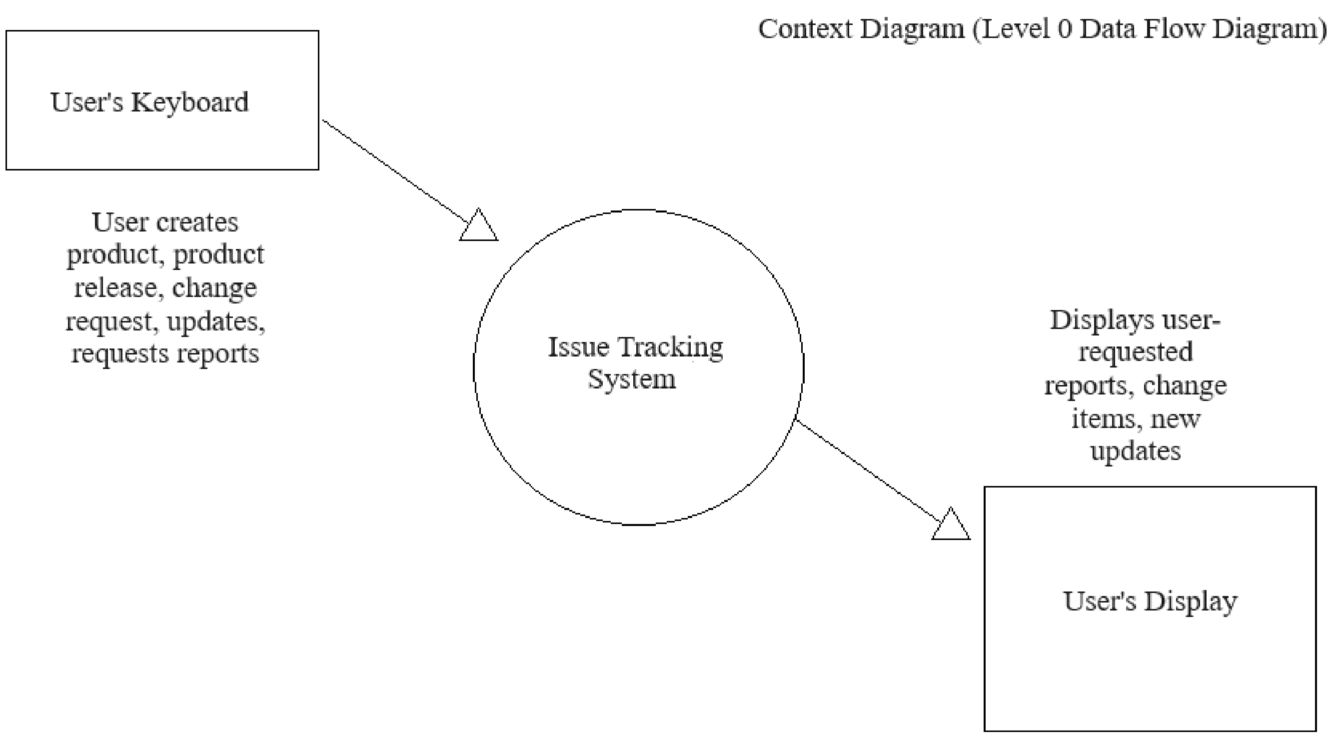
- Increased productivity
    - Without this software, many of the tasks listed above would have to be done by hand. Doing tasks by hand/on paper is not only much slower to process, it also must go through many people before being properly assigned to the right person to work on the issue being tracked.

- Eco-Friendly
    - Eliminating the use of paper allows this software to aid in helping the environment.

- Organized
    - Some might think that seeing everything all in one place is disorganized, but that is far from the truth. Imagine being able to request the information you want to see with the click of a button. Now imagine having to sift through a bunch of files to see the same information…

- Direct feedback from customers
    - Although customers do not physically use the software, they are still able to create requests through customer service representatives. Feedback from customers is essential to a company's growth, having the means to do this is an advantage given to any company that uses our software.

The following diagram helps to illustrate how data flows through our software, allowing you to put into context the ease and advantages of using our software…



1.3: Typographical Conventions

There are a few typographical conventions to get familiar with before continuing with this user manual…

- **ENTER**: The word “ENTER” in all capital letters suggests a user to type in whatever information they need to, then pressing the <enter> button on the keyboard.

- **Boldface:** Boldface is used for titles and headers, as well as in the instructions to indicate the information a user must enter into a prompt.

- **`Courier New font:`** The Courier New font is used for showing what will be displayed on screen when using the software. It will also be used for commands and file locations, essentially general UI elements.

- **Quotation Marks:** Quotation marks will be used to show users a prompt that may appear on screen when executing a function. They will often be used with the Courier New font.

- **Parentheses:** Parentheses will be used for giving extra detail/information about an instruction or menu prompt.

2.0 Installation Guide

2.1 System Requirements

Before installing the Issue Tracking System (ITS), ensure that your system meets the following minimum requirements:

- **Operating System:** Windows 10 or later
- **Processor:** Dual-core processor (25 MIPS) or higher
- **RAM:** Minimum 8 GB
- **Storage:** At least 100 GB of available disk space
- **Network:** Ethernet connection with standard TCP/IP support

2.2 Installation Steps

Step 1: Run the Installer

1. Locate the downloaded installation package (typically named `ITS_Setup.exe`) in your Downloads folder.
2. Double-click the `ITS_Setup.exe` file to launch the installer.

Step 2: Follow the On-Screen Instructions

1. **Welcome Screen:**
    - Click "Next" to proceed.
2. **License Agreement:**
    - Read the End-User License Agreement (EULA).
    - If you agree with the terms, select "I accept the agreement" and click "Next".
3. **Select Installation Folder:**
    - Choose the destination folder where ITS will be installed.
    - The default location is `C:\Program Files\ITS`.
    - Click "Next" to confirm the location.
4. **Select Components:**
    - Choose the components you wish to install (e.g., ITS Application, Documentation, Database).
    - Click "Next" to proceed.
5. **Create a Start Menu Shortcut:**
    - Choose whether to create a Start Menu shortcut for easy access to ITS.
    - Click "Next" to continue.
6. **Ready to Install:**
    - Review your installation settings.
    - Click "Install" to begin the installation process.

Step 3: Complete the Installation

1. **Installation Progress:**
    - Wait for the installation process to complete. This may take several minutes.
2. **Installation Complete:**
    - Once the installation is finished, you will see a confirmation screen.
    - Click "Finish" to exit the installer.

2.3 Initial Setup

Step 1: Launch the ITS Application

1. Open the Start Menu and navigate to the "ITS" folder.
2. Click on "ITS" to launch the application.

Step 2: Initial Configuration

1. **First-Time Setup:**
    - When you launch ITS for the first time, the system will perform an initial configuration.
    - This includes setting up necessary directories and initial data files.
2. **Create Admin Account:**
    - You will be prompted to create an admin account.
    - Enter the admin username, password, and contact details.
    - Click "Create Account" to finalize the admin account setup.
3. **Initialize Data Files:**
    - The system will check for existing data files.
    - If no data files are found, you will be prompted to create new ones.
    - Follow the prompts to initialize the system with sample data or empty files.
4. **Configuration Complete:**
    - Once the initial setup is complete, the ITS main menu will appear.
    - You can now start using the ITS to manage issues and feature requests.

Step 3: Verifying the Installation

1. **Login to Admin Account:**
    - Use the admin credentials created during the initial setup to log in to the ITS.
    - Verify that you can access the admin dashboard and all functionalities.
2. **Create a Test Issue:**
    - Navigate to the "Submit Issue" menu and create a test issue to ensure the system is functioning correctly.
    - Verify that the issue appears in the "View Issues" list.
3. **Generate a Report:**
    - Navigate to the "Generate Reports" menu and create a report to ensure the reporting functionality is working.

Step 4: Backing Up Initial Configuration

1. **Navigate to Backup Menu:**
   - From the main menu, select the "Backup" option.
   - Follow the prompts to create a backup of the initial configuration and data.
2. **Store Backup Securely:**
   - Save the backup file to a secure location, such as an external hard drive or cloud storage.

3.0 User Interface Overview

3.1: Explanation of the UI layout and navigation.

This section will give a brief overview of the menu of our issue tracking system (ITS) and how a user would typically navigate the system. Generally, it will be a text only scrolling terminal, where the screen does not clear for each subsequent screen.

When you launch the ITS, the main menu will appear:

```
Main Menu:
1) Create Product
2) Create Product Release
3) Create Change Request
4) Query Item to Screen
5) Update Item
6) Print Report
0) Quit
Enter selection:
```

All menu selections will be numbered and the user can enter the number selection they want from the keyboard. Every entry by the user must be followed by pressing <ENTER>. Upon main menu selection, the appropriate submenu will appear and allow the user to complete the desired function (refer to 4.3-4.8). If needed, the user will be able to <BACKSPACE> their selection to correct errors before they press <ENTER>.

Each of the menu functions (create product release, create change request, etc.) will have the option to quit, allowing the user to back out and exit. Once the user chooses to quit, they will be prompted again with a yes or no, to allow them to confirm again.

E.g.

```
Confirm quit? (Y/N): Y
```

If the user quits from any point other than the main menu, they will be brought back to the main menu. If the user quits from the main menu, they will not be prompted again, and the following message will appear:

```
Thank you for using our issue tracking system.
```

Yes or No Question:

In general, when the user is prompted with a yes or no question, the user needs to only type Y for yes or N for no and press <ENTER>.

E.g.

`Confirm Submission? (Y/N):` `Y`

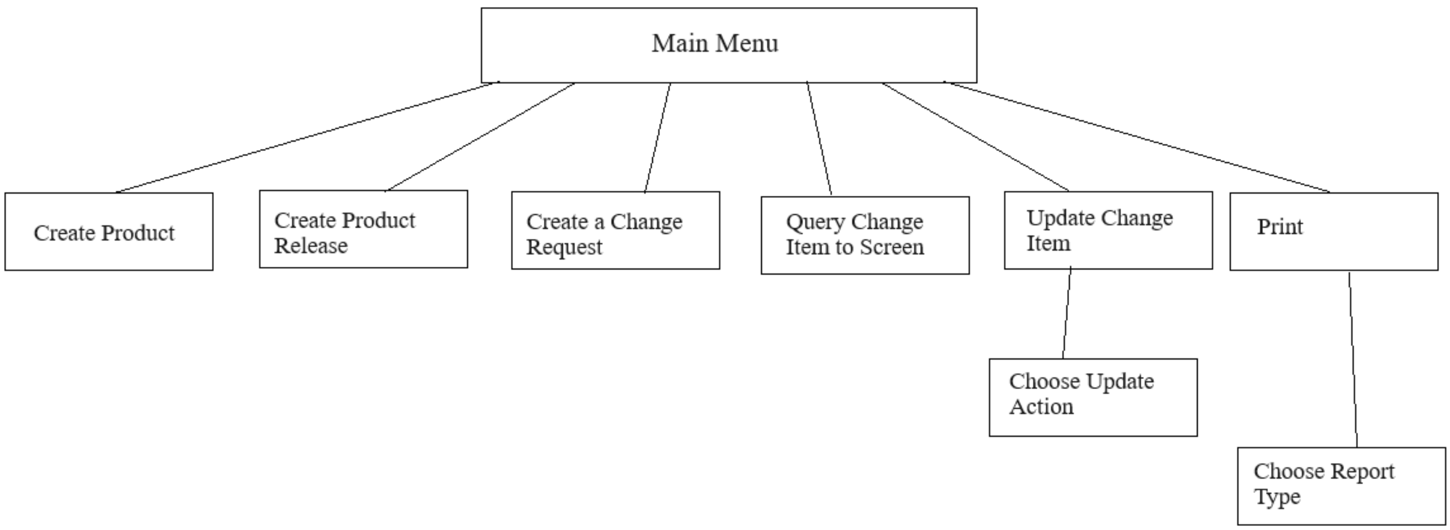
Data Entry:

In general, when the user is prompted to enter something other than a numbered menu selection (e.g., a name), the system will show a command of what needs to be entered as well as the maximum length. The user will type their entry next to the prompt and hit <ENTER> when they are ready to move on.

E.g.

`Enter name (max 30 char):` `Spongebob Squarepants`

4.1: Menu Tree



*Note: The dynamic lists within each menu item are not listed here. Please refer to section 4.0 to see specific menu prompts/dynamic lists.

<u>Main Menu</u>

```
Welcome! Please choose one of the options below…

     1)    Create Product
     2)    Create Product Release
     3)    Create a Change Request
     4)    Query Change Item to Screen
     5)    Update Change Item
     6)    Print
     0)   Quit
Enter your selection:
```

<u>Choosing 1 in the main menu brings up the following prompt:</u>

`“Enter the product name: ”`

<u>Choosing 2 in the main menu brings up the following prompts:</u>

`“Enter a product: ”`
`“Enter releaseID: ”`
`“Enter release date (yyyy-mm-dd): ”`

<u>Choosing 3 in the main menu brings up the following conditional workflow:</u>

Check if user has used the software before:
`“Is this the first time submitting a request? (y/n): ”`

- Yes: Proceed to step 3.1
- No: Proceed to step 3.2

Step 3.1: Create Profile
Ask if user is an employee or a customer:
`“Are you a customer (C) or an employee (E)?: ”`

- Employee: Prompt user to enter full name, email, phone number, department name
- Customer: Prompt user to enter full name, email, phone number

Proceed to step 3.2

Step 3.2:
Prompt user for change request information:
`“Please enter your email: ”`
`“Please choose a product: ”` (user chooses from list of products displayed)
`“Please enter the product’s releaseID: ”`
`“Please enter the date (yyyy-mm-dd): ”`
`“Please indicate a priority level: ”` (user chooses from list of priority levels)

List of changeIDs of change items for the product is displayed, user is asked if their changeID is shown.
`“Is the changeID corresponding to your request shown? (y/n): ”`

- Yes: Ask user to enter changeID
  `“Please enter the changeID: ”` (user chooses from list of changeIDs)
- No: Proceed to step 3.2.1

  Step 3.2.1: Create a new change item
  Prompt user for change item information:
  `“Please choose a product: ”` (user chooses from list of products displayed)
  `“Please enter a change description (max 50 char.): ”`
  `“Please enter an anticipated release, or N/A if not`

```
applicable: ”
“Please choose the state of this change item: ”
```
(user chooses from list of possible states):
```
        1) Reported
        2) Assessed
        3) Cancelled
        4) In Progress
        5) Done
```

After changeID is chosen, or a new change item is created. The user will go back to seeing the list of changeIDs, then be asked to choose one.
`“Please enter a changeID: ”` (user chooses from a list of changeIDs)

The change request is complete.
`“Change request complete.”`

<u>Choosing 4 in the main menu brings up the following prompts:</u>

```
“Choose a product: ”
“Choose a changeID: ”
```

<u>Choosing 5 in the main menu brings up the following submenu:</u>

```
Choose update action

     1)   Update status
     2)   Update description
     3)   Update anticipated release
Enter your selection:
```

<u>Choosing 6 in the main menu brings up the following submenu:</u>

```
Choose report type

  1) All change items for a product that are not done and not
     canceled.
  2) All customers/staff who need to be notified when a change has
     been implemented.
Enter your selection:
```

<u>Choosing 7 in the main menu exits the program</u>

<u>Choosing 1 in the “Update Change Item” submenu brings up the following prompts:</u>

`“Choose a product: ”` (user chooses from list of products)
`“Choose a changeID: ”` (user chooses from list of changeIDs)
`“Enter new status: ”`

<u>Choosing 2 in the “Update Change Item” submenu brings up the following prompts:</u>

`“Choose a product: ”` (user chooses from list of products)
`“Choose a changeID: ”` (user chooses from list of changeIDs)
`“Enter new description (max 50 char.): ”`

<u>Choosing 3 in the “Update Change Item” submenu brings up the following prompts:</u>

`“Choose a product: ”` (user chooses from list of products)
`“Choose a changeID: ”` (user chooses from list of changeIDs)
`“Enter new anticipated release: ”`

<u>Choosing 1 in the “Choose report type” submenu brings up the following prompt:</u>

`“Choose a product: ”` (user chooses from list of products displayed)

<u>Choosing 2 in the “Choose report type” submenu brings up the following prompts:</u>

`“Choose a product: ”` (user chooses from list of products displayed)
`“Choose a changeID: ”` (user chooses from list of changeIDs displayed)

4.2 How the Section is Organized

To simplify the wordings in the instructions, ENTER an input would imply typing the input in and then pressing ENTER. e.g.

`ENTER your email:` `abc7@onedirection.ca`

This section assumes that you know how to operate menus. That is, when you are asked to ENTER 1 in the main menu, you would know what to do.

Reminder: All User Cases explained in the following subsections start from the main menu, which is going to be displayed as:

```
Main Menu:
1) Create Product
```

```
2) Create Product Release
3) Create Change Request
4) Query Item to Screen
5) Update Item
6) Print Report
0) Quit
Enter selection:
```

To avoid redundancy, the Main Menu illustration is going to be shortened in the step by step guides since it always appears on the first step. "`...`" indicates that the rest of the menu is not being displayed. Some examples could be:

1. ```
   Main Menu:
   1) Create Product
   ...
   Enter selection:
   ```

2. ```
   Main Menu:
   ...
   4) Query Item to Screen
   ...
   Enter selection:
   ```

3. ```
   Main Menu:
   ...
   6) Print Report
   ...
   Enter selection:
   ```

Important: The procedure will have the following format:

<Step Number>) ENTER <a specific input suitable to the context> <An illustration of what is expected to be seen on the system screen>
   ```

4.3: Create a Product

Main Menu:
```
Welcome! Please choose one of the options below…

      1)    Create Product
      2)    Create Product Release
      3)    Create a Change Request
      4)    Query Change Item to Screen
      5)    Update Change Item
      6)    Print
      0)   Quit
Enter your selection:
```

- ENTER “1” in the main menu to create a product.
  “Enter your selection: **1**”

- The following prompt will appear, asking for a product name. ENTER **your desired product name.**
  “Enter the product name: **New Product**”

- A message will appear to confirm the creation of a new product. You will automatically be taken back to the main menu.
  “Product has been created.”

4.4: Create a Product Release

Main Menu:
```
Welcome! Please choose one of the options below…

      1)    Create Product
      2)    Create Product Release
      3)    Create a Change Request
      4)    Query Change Item to Screen
      5)    Update Change Item
      6)    Print
      0)   Quit
Enter your selection:
```

- ENTER “2” in the main menu to create a product release.
  “Enter your selection: **2**”

- A prompt will appear, asking for a product name. ENTER **the name of the product** you are creating a release for.
  `“Enter a product: `**`New Product`**`”`
  (*note: the product must already exist)

- A prompt will appear, asking for a releaseID of the product. ENTER the **product's releaseID**.
  `“Enter a releaseID: `**`1.2`**`”`

- A prompt will appear, asking for the release date of the product. ENTER the **release date** of the product.
  `“Enter release date (yyyy-mm-dd): `**`2024-06-19`**`”`

- A message will appear to confirm the creation of a product release. You will automatically be taken back to the main menu.
  `“Product release has been created.”`

4.5: Create a Change Request

Creating a change request will have a few different steps depending on who the user is. For this reason, please refer to the subsections pertaining to your situation as a user creating a change request.

4.5.1: Specific Instructions for New Users

Main Menu:

```
Welcome! Please choose one of the options below…

     1)   Create Product
     2)   Create Product Release
     3)   Create a Change Request
     4)   Query Change Item to Screen
     5)   Update Change Item
     6)   Print
     0)   Quit
Enter your selection:
```

- ENTER “3” in the main menu to create a change request.
  `“Enter your selection: `**`3`**`”`

- A prompt will appear, asking if this is the user's first time submitting a change request, ENTER "y" to answer "yes".

`"Is this the first time submitting a change request? (y/n):` **`y`**`"`

- A prompt will appear, asking if the user is an employee or a customer service representative. If you are an employee ENTER "E", if you are a customer, ENTER "C".
  `"Are you a customer (C) or an employee (E)?:` **`E`**`"`

    - *Note: For employees, an extra prompt will appear, asking for them to ENTER their department name. Customers do not have this prompt.

- A prompt will appear (for both customers and employees), asking the user to ENTER their email.
  `"Please enter your email:` **`firstlast@gmail.com`**`"`

- A prompt will appear (for both customers and employees), asking for them to ENTER their full name.
  `"Please enter your full name:` **`First Last`**`"`

- A prompt will appear (for both customers and employees), asking for them to ENTER their phone number.
  `"Please enter your phone number (+1 (123)-456-7890):` **`+1 (111)-222-3333`**`"`

- A prompt will appear (for employees only), asking for them to ENTER their department name.
  `"Please enter your department name:` **`Finance`**`"`

- A message will appear, confirming the creation of a new user.
  `"New user has been created."`

4.5.2: Specific Instructions for Returning Users

Main Menu:

```
Welcome! Please choose one of the options below…

     1)   Create Product
     2)   Create Product Release
     3)   Create a Change Request
     4)   Query Change Item to Screen
     5)   Update Change Item
     6)   Print
```

```
      0)   Quit
Enter your selection:
```

- ENTER “3” in the main menu to create a change request.
  `“Enter your selection: 3”`

- A prompt will appear, asking if this is the user’s first time submitting a change request, ENTER “n” to answer “no”.

`“Is this the first time submitting a change request? (y/n): n”`

4.5.3: Creating the Change Request

After indicating whether the user is a new user or a returning user, you can continue on to creating a change request.

- A prompt will appear, asking to ENTER the user’s email.
  `“Please enter your email: firstlast@gmail.com”`

- A numbered list of products will appear, ENTER the number corresponding to the product you are requesting a change for.

```
Product list:
         1) Product #1
         2) Product #2
         3) Product #3
...
“Choose a product: 1”
```

(for example, if user wanted Product #1, they would enter “**1**”)

- A numbered list of releaseIDs for the product will appear, ENTER the number corresponding to the releaseID in which the change request is needed.

```
Release IDs
   1) 1.0.0
   2) 1.0.1
   3) 1.1.0
...
“Choose a product releaseID: 2”
```

(for example, if user wanted to report a change required for release 1.0.1, they would enter “**2**”)

- A prompt will appear, asking for the date of the request. ENTER the date in the format shown.
  `“Please enter the date (yyyy-mm-dd): 2024-06-19”`

- A list of priority levels will appear, ENTER the priority level of the change request.

```
Priority levels
   1) High
   2) Medium
   3) Low
“Please indicate the priority level: High”
```
(user is requesting a change of high priority)

- A numbered list of changeIDs will appear, a prompt will appear, asking if the changeID corresponding to the user’s request is shown. ENTER “y” if it is shown, or “n” if not.

```
ChangeIDs:
   1) 1.0: Change Item Description #1
   2) 1.1: Change Item Description #2
   3) 1.2: Change Item Description #2
...
“Is the changeID corresponding to your request shown? (y/n): y”
```

- If there is a changeID matching your request (i.e. you answered “y” (yes)), a prompt will appear, asking the user to ENTER the number of their changeID.

```
“Choose a changeID: 2”
```

(for example, if the user’s change request was similar to the change item with changeID “1.1”, they would enter “2”)

- A message will appear, indicating that the change request is complete.

```
“Change request complete.”
```

- If there is no changeID/change item that matches your request, you must create a new change item before completing the change request.

4.5.3.1: Creating a new Change Item

- A numbered list of products will appear, ENTER the number corresponding to the product you are making a change item for.

```
Product list:
   1) Product #1
   2) Product #2
   3) Product #3
...
“Choose a product: 1”
```

(for example, if user wanted Product #1, they would enter “**1**”)

- A prompt will appear, asking for a description of the change item. ENTER **a description**. (There is a maximum length of 50 characters).

"Please enter a description: **Change item description for new change item.**"

- A prompt will appear, asking for the anticipated release of the change item. ENTER a releaseID or "N/A" if the anticipated release is unknown.
  "Please enter an anticipated release, or N/A if not applicable: **N/A**"

- A numbered list of states of the change item will appear, ENTER the number corresponding to the state of this change item.
  1) Reported
  2) Assessed
  3) Cancelled
  4) In Progress
  5) Done

  "Please enter the state of your change item: **1**"
  (user enters "**1**" to indicate that the change item has just been reported)

- A changeID will automatically be assigned to the newly created change item.
- A message will appear, indicating that the change item has been created
  "Change item created."
- A new numbered list will appear containing the changeID of the change item that was just created. ENTER "y" to confirm that your changeID is there, and ENTER the number corresponding to the changeID to continue with the change request.
  ChangeIDs:
  1) 1.0: Change Item Description #1
  2) 1.1: Change Item Description #2
  3) 1.2: Change Item Description #2
  4) 1.3: Change item description for new item

  ...

"Is the changeID corresponding to your request shown? (y/n): **y**"

"Choose a changeID: **4**"
(user enters "**4**" because their changeID is option 4 in the changeID list)

- A message will appear, indicating that the change request has been completed.
  "Change request complete."

4.6: Query Change Item to Screen

Main Menu:

```
Welcome! Please choose one of the options below…

      1)    Create Product
      2)    Create Product Release
      3)    Create a Change Request
      4)    Query Change Item to Screen
      5)    Update Change Item
      6)    Print
      0)   Quit
Enter your selection:
```

- ENTER “4” in the main menu to query a change item to the screen.
  `“Enter your selection: 4”`

- A numbered list of products will appear, ENTER the number corresponding to the product you are querying.
  ```
  Product list:
     1) Product #1
     2) Product #2
     3) Product #3
  ...
  “Choose a product: 1”
  ```
  (for example, if user wanted Product #1, they would enter “**1**”)

- A numbered list of changeIDs will appear, ENTER the number corresponding to the changeID of the change item you are querying.
  ```
  ChangeIDs:
     1) 1.0: Change Item Description #1
     2) 2.0: Change Item Description #2
     3) 3.0: Change Item Description #2
  ...
  “Choose a changeID: 2”
  ```
  (for example, if user was querying the change item with changeID “2.0”, they would enter “2”)

- The change item will be displayed on screen.

```
-----------------------------------------------------------------------------------------------
 Product     Description    ID   First        State      Priority  Anticipated
                                 Reported                          Release
-----------------------------------------------------------------------------------------------
```

```
------------------------------------------------------------------------------------------------
Product    Change Item   1.0  2024-06-19  Reported  High      1.2.3
#1         Description
------------------------------------------------------------------------------------------------
```

4.7: Update Change Item

Main Menu

```
Welcome! Please choose one of the options below…

      1)    Create Product
      2)    Create Product Release
      3)    Create a Change Request
      4)    Query Change Item to Screen
      5)    Update Change Item
      6)    Print
      0)   Quit
Enter your selection:
```

- ENTER "5" in the main menu to update a change item
  `"Enter your selection: 5"`

- The following submenu will appear:

```
Choose update action

   1) Update status
   2) Update description
   3) Update anticipated release
Enter your selection:
```

4.7.1: Update Status of Change Item

"Update Change Item" submenu:

```
Choose update action

   1) Update status
   2) Update description
   3) Update anticipated release
Enter your selection:
```

- To update the status of a change item, ENTER “1” in the submenu
  `“Enter your selection: 1”`

- A numbered list of products will appear, ENTER the number corresponding to the product’s change item you want to update.

```
Product list:
   1) Product #1
   2) Product #2
   3) Product #3
...
“Choose a product: 1”
```

  (for example, if user wanted Product #1, they would enter “**1**”)

- A numbered list of changeIDs will appear, ENTER the number corresponding to the changeID of the change item you want to update.

```
ChangeIDs:
   1) 1.0: Change Item Description #1
   2) 2.0: Change Item Description #2
   3) 3.0: Change Item Description #2
...
“Choose a changeID: 2”
```

  (for example, if user was updating the change item with changeID “2.0”, they would enter “2”)

- A list of statuses will appear, and a prompt will appear, asking to ENTER **a new status**.

```
Available statuses:
   1) Reported
   2) Assessed
   3) Cancelled
   4) In Progress
   5) Done
“Enter new status: Assessed”
```

- The change item will be displayed with the update

```
-----------------------------------------------------------------------------------------------------------
Product       Description    ID   First         State      Priority  Anticipated
                                  Reported                           Release
-----------------------------------------------------------------------------------------------------------
Product #1    Change Item    1.0  2024-06-19    Assessed   High      1.2.3
              Description
-----------------------------------------------------------------------------------------------------------
```

4.7.2: Update Description of Change Item

"Update Change Item" submenu:

```
Choose update action

   1) Update status
   2) Update description
   3) Update anticipated release
Enter your selection:
```

- To update the description of a change item, ENTER "2" in the submenu
  `"Enter your selection: 2"`

- A numbered list of products will appear, ENTER the number corresponding to the product's change item you want to update.

  ```
  Product list:
          1) Product #1
          2) Product #2
          3) Product #3
  ...
  "Choose a product: 1"
  ```

  (for example, if user wanted Product #1, they would enter "**1**")

- A numbered list of changeIDs will appear, ENTER the number corresponding to the changeID of the change item you want to update.

  ```
  ChangeIDs:
     1) 1.0: Change Item Description #1
     2) 2.0: Change Item Description #2
     3) 3.0: Change Item Description #2
  ...
  "Choose a changeID: 2"
  ```

  (for example, if user was updating the change item with changeID "2.0", they would enter "2")

- A prompt will appear, asking to ENTER **a new description**.
  `"Enter new description (max 50 char.): New description of issue."`
  (*note: the description has a maximum length of 50 characters)

- The change item will be displayed with the update

```
---------------------------------------------------------------------------------------------------
 Product     Description    ID    First        State      Priority   Anticipated
---------------------------------------------------------------------------------------------------
```

```
-----------------------------------------------------------------------------------------------
                                       Reported                                 Release
-----------------------------------------------------------------------------------------------
 Product #1  New              1.0   2024-06-19   Assessed   High        1.2.3
             description
             of issue
-----------------------------------------------------------------------------------------------
```

4.7.2: Update Anticipated Release of Change Item

“Update Change Item” submenu:

```
Choose update action

   1) Update status
   2) Update description
   3) Update anticipated release
Enter your selection:
```

To update the anticipated release of a change item, ENTER “3” in the submenu
`“Enter your selection: 3”`

- A numbered list of products will appear, ENTER the number corresponding to the product’s change item you want to update.

```
Product list:
         1) Product #1
         2) Product #2
         3) Product #3
...
“Choose a product: 1”
```

(for example, if user wanted Product #1, they would enter “**1**”)

- A numbered list of changeIDs will appear, ENTER the number corresponding to the changeID of the change item you want to update.

```
ChangeIDs:
   1) 1.0: Change Item Description #1
   2) 2.0: Change Item Description #2
   3) 3.0: Change Item Description #2
...
“Choose a changeID: 2”
```

(for example, if user was updating the change item with changeID “2.0”, they would enter “2”)

- A prompt will appear, asking to ENTER **a new anticipated release**.

```
“Enter new anticipated release: 1.2.4”
```

- The change item will be displayed with the update

Product	Description	ID	First Reported	State	Priority	Anticipated Release
Product #1	New description of issue	1.0	2024-06-19	Assessed	High	**1.2.4**

4.8: Print

Main Menu

```
Welcome! Please choose one of the options below…

      1)    Create Product
      2)    Create Product Release
      3)    Create a Change Request
      4)    Query Change Item to Screen
      5)    Update Change Item
      6)    Print
      0)   Quit
Enter your selection:
```

- ENTER “6” on the menu to print a report

- The following submenu will appear:

```
Choose report type

   1) All change items for a product that are not done and not
      cancelled.
   2) All customers/staff who need to be notified when a change
      has been implemented.
Enter your selection:
```

4.8.1: Report Type #1

"Report type" submenu:

```
Choose report type

   1) All change items for a product that are not done and not
      cancelled.
   2) All customers/staff who need to be notified when a change
      has been implemented.
Enter your selection:
```

- ENTER "1" in the submenu to print a report of type 1.
  `"Enter your selection: 1"`

- A numbered list of products will appear, ENTER the number corresponding to the product's change items you want to print.

```
Product list:
   1) Product #1
   2) Product #2
   3) Product #3
...
"Choose a product: 1"
```

(for example, if user wanted Product #1, they would enter "**1**")

- All change items for that product (that are not done and not cancelled) will be displayed

Product	Description	ID	First Reported	State	Priority	Anticipated Release
Product #1	New description of issue	1.0	2024-06-19	Assessed	High	1.2.4
Product #1	Description of issue	1.1	2024-06-21	In Progress	Low	N/A
Product #1	Description of issue	1.2	2024-06-23	Reported	High	1.2.4

4.8.2: Report Type #2

"Report type" submenu:

```
Choose report type

   1) All change items for a product that are not done and not
      cancelled.
   2) All customers/staff who need to be notified when a change
      has been implemented.
Enter your selection:
```

- ENTER "2" in the submenu to print a report of type 2.
  `"Enter your selection: 2"`

- A numbered list of products will appear, ENTER the number corresponding to the product with the change item people have requested.

```
Product list:
   1) Product #1
   2) Product #2
   3) Product #3
...
"Choose a product: 1"
```

  (for example, if user wanted Product #1, they would enter "**1**")

- A numbered list of changeIDs will appear, ENTER the number corresponding to the changeID of the change item people have requested.

```
ChangeIDs:
   1) 1.0: Change Item Description #1
   2) 2.0: Change Item Description #2
   3) 3.0: Change Item Description #2
...
"Choose a changeID: 2"
```

  (for example, if user wanted to select the change item with changeID "2.0", they would enter "2")

- A list of the names and contact information of the people who requested the change item will be displayed.

Name	Email	Phone #	Department (Employees only, N/A if customer)
Zayn Malik	zaynmalik@gmail.com	+1 (123)-456-7890	N/A
Jane Doe	janedoe@yahoo.ca	+1 (345)-555-2471	Finance
Sponge Bob	spongebob@gmail.com	+1 (777)-679-1738	N/A
First Last	firstlast@email.com	+1 (111)-222-3333	DepartmentName

4.9 Examples of Use Cases

For the following Use Cases, it is important to consider the following preconditions:

- The Issue Tracking System (ITS) is running.
- The user is logged into the system.

Use Case 1:

Customer has an issue about a product and wants to report it.

Precondition:

- Customer Service Staff is assisting the customer by navigating the program for them.

Steps of Interaction:

1. User selects the option to `Create a Change Request` from the main menu.
2. System prompts the user to enter their information.
3. User enters the customer's corresponding information.
4. System prompts the user for the issue details (type, title, description, priority) and to select the product and change ID corresponding to their request, otherwise, the system asks the user to create a new change request.
5. User successfully enters the required information.
6. System saves the issue and generates a unique issue ID.
7. System displays a confirmation message with the new issue ID.

Use Case 2:

Software engineer has progressed in fixing a bug of an existing issue and wants to update its status.

Precondition:
- The issue to be updated exists in the system.

Steps of the interaction:
1. User selects the option to `Update Change Item` from the main menu.
2. System prompts the user to select what kind of update they want to make.
3. User selects Status.
4. System prompts the user to select a product, a changeID, and to enter the new status.
5. User selects and enters information required.
6. System saves the updated issue and displays a confirmation message.

Use Case 3:

A manager engineer wants to check the progress of a specific change request of an existing product in the system.

Precondition:
- The product to be query exists in the system.
- The product has change requests.

Steps of the interaction:
1. User selects the option to `Query Change Item to Screen` from the main menu.
2. System prompts the user to select a product, and a changeID.
3. Systems successfully shows the user the information of the product's issue queried.

Use Case 4:

A manager engineer wants to generate a report of the pending change requests of all the products.

Precondition:
- There is at least one product registered in the system.
- At least one product has change requests.

Steps of the interaction:

1. User selects the option to `Print` from the main menu.
2. Systems prompts the user to enter which kind of report they want.
3. User selects `All change items for a product that are not done and not canceled.`
4. System successfully prints the information of the type of report requested.

4.10 Error Handling

Proper error handling is essential to ensure a smooth user experience and maintain data integrity in the Issue Tracking System (ITS). This section outlines how the system handles errors and provides examples of error messages and corrective actions.

4.10.1 Duplicate Issue Entry

When a user attempts to create an issue with an ID that already exists in the system, the ITS will display an error message to inform the user and prevent the duplication.

Scenario: Submitting an Issue with a Duplicate ID

Error Message:

```
Error: An issue with this ID already exists.

Please use a different ID.
```

User Action:

- The user should enter a unique ID for the new issue.
- If the ID is auto generated, the system will pro**mpt the user to retry the submission without needing to enter a new ID manually.**

4.10.2 Non-existent Issue Update

When a user tries to update an issue that does not exist in the system, the ITS will display an error message and provide options for corrective action.

Scenario: Updating a Non-existent Issue

Error Message:

```
Error: No issue found with the specified ID.

Please check the ID and try again.
```

User Action:

- The user should verify the issue ID and re-enter it correctly.
- If unsure about the correct ID, the user can use the "View Issues" option to find the correct ID.

4.10.3 General Error Messages

The ITS handles various other errors that may occur during operation. Below are some common error messages and their corresponding user actions.

Scenario: Trying to open a file that doesn’t exist

Error Message:

```
Error: Unable to open the file. The file does not exist.
```

User Action:

- Ensure the file name and path are correct.
- If the file is missing, the user can create a new file or restore it from a backup.

Scenario: Entering invalid data type (e.g., entering text where a number is expected)

Error Message:

```
Error: Invalid input. Please enter a numeric value.
```

User Action:

- Enter the correct data type as prompted by the system.
- Refer to the input guidelines provided in the prompt.

4.10.4 Handling Errors during File Operations

Errors related to file operations (e.g., reading from or writing to a file) will be handled gracefully by the ITS, ensuring that users are informed and can take corrective action.

Scenario: File Read Error

Error Message:

```
Error: Unable to read the file. Please check if the file is accessible
and not corrupted.
```

User Action:

- Verify that the file is accessible and not locked by another application.
- Check the file for corruption and restore from a backup if necessary.

Scenario: File Write Error

Error Message:

`Error: Unable to write to the file. Please check if you have the necessary permissions.`

User Action:

- Ensure that the user has write permissions for the file and directory.
- Verify that there is sufficient disk space for the operation.

4.10.5 Handling Referential Integrity Errors

To maintain referential integrity, the ITS ensures that related data entries exist before performing operations that depend on them.

Scenario: Adding a change request for a non-existent product release

Error Message:

`Error: The specified product release does not exist. Please select a valid product release.`

User Action:

- Verify the product release ID.
- Use the "View Product Releases" option to find and select a valid product release.

4.11 Examples of Handling Error Use Cases

Use Case 1: Submitting a New Issue

- User attempts to submit an issue with an ID that already exists.
- System displays the error message: "Error: An issue with this ID already exists. Please use a different ID."
- User enters a unique ID and successfully submits the issue.

Use Case 2: Updating an Issue

- User tries to update an issue that does not exist.
- System displays the error message: "Error: No issue found with the specified ID. Please check the ID and try again."
- User verifies and corrects the issue ID, then successfully updates the issue.

Use Case 3: Generating a Report

- User tries to generate a report but encounters a file write error.

- System displays the error message: "Error: Unable to write to the file. Please check if you have the necessary permissions."
- User ensures they have write permissions and sufficient disk space, then successfully generates the report

5.0: Backup Procedures

5.1: Backup Steps: How to back up the ITS data.

Regular backups are recommended to protect data from loss or corruption. The data from the ITS can be backed up using the operating system's commands to an external hard drive or internal directory:

1. *Connect the External Hard Drive:
    - Connect hard drive if backing up externally
    - *Not needed if backing up to an internal drive
2. Locate the ITS Data Directory:
    - By default, ITS data is stored in the following directory:
        - Windows: `C:\ITS\data`
3. Open Command Prompt:
    - Press `Win + R` to open the Run dialog box.
    - Type `cmd` and press <ENTER> to open the Command Prompt.
4. Copy the Data Directory:
    - Use command prompt to copy the entire data directory to your chosen backup location
        - `C:\ITS\data:` The source directory you want to copy.
        - `D:\ITS_Backup\data:` or `E:\ITS_Backup\data:` The destination directory where the data will be copied if it is to an external hard drive vs internal directory
        - `/E`: Ensures all subdirectories (including empty ones) are copied.
        - `/I`: Assumes the destination is a directory if it does not exist.
    - Full command for backing up to an external hard drive:
        - `xcopy C:\ITS\data D:\ITS_Backup\data /E /I` and press <ENTER>
    - Full command for backing up to an internal directory:
        - `xcopy C:\ITS\data E:\ITS_Backup\data /E /I` and press <ENTER>
5. Verify the Backup:
    - Ensure that the files have been copied correctly to the backup location.

5.2: Restoration Steps: How to restore ITS data from a backup.

If you need to restore your ITS data from a backup, follow these steps:

1. *Connect the External Hard Drive:
    - Connect hard drive if restoring externally

    - *Not needed if restoring from an internal drive
2. Locate the Backup Directory:
    - Navigate to the directory where your backup is stored.
3. Open Command Prompt:
    - Press `Win + R` to open the Run dialog box.
    - Type `cmd` and press <ENTER> to open the Command Prompt.
4. Copy the Backup Data to the ITS Data Directory:
    - Use command prompt to replace the existing data directory with your backup copy
        - `D:\ITS_Backup\data:` or `E:\ITS_Backup\data:` The destination directory where the data will be copied if it is to an external hard drive vs internal directory
        - `C:\ITS\data:` The source directory you want to copy.
        - `/E`: Ensures all subdirectories (including empty ones) are copied.
        - `/I`: Assumes the destination is a directory if it does not exist.
        - `/Y:` This option suppresses prompts to confirm overwriting existing files in the destination directory.
    - Full command for restoring from an external hard drive:
        - `xcopy D:\ITS_Backup\data C:\ITS\data /E /I /Y` and press <ENTER>
    - Full command for restoring from an internal directory:
        - `xcopy E:\ITS_Backup\data C:\ITS\data /E /I /Y` and press <ENTER>
5. Verify the Restoration:
    - Open the ITS to ensure that the data has been restored correctly and is functioning as expected.

7.0 Glossary

Admin Account: An account with administrative privileges, allowing the user to configure the system, manage users, and perform high-level tasks.

Anticipated Release ID: An identifier for a future version of a product release that is expected to contain specific changes or fixes.

Backup: The process of copying and archiving data so it may be used to restore the original after a data loss event.

Command Prompt: A command-line interpreter application available in most Windows operating systems.

Components: Individual parts of the software system that can be installed or managed separately.

Configuration Complete: A status indicating that the initial setup and configuration of the system have been successfully finished.

Data Entry: The act of inputting information into the system through various user interfaces.

Data Files: Files that store the information used and generated by the ITS, such as issues, users, and product releases.

Database: An organized collection of data, generally stored and accessed electronically from a computer system.

Duplicate Issue Entry: A situation where an issue with the same identifier is entered into the system more than once.

End-User License Agreement (EULA): A legal contract between the software application author or publisher and the user of that application.

Ethernet: A family of computer networking technologies commonly used in local area networks (LAN), metropolitan area networks (MAN), and wide area networks (WAN).

External Hard Drive: A portable storage device that can be attached to a computer through a USB or other connection.

File Operations: Actions performed on files such as reading, writing, copying, or deleting.

Initial Configuration: The first-time setup process that configures the system's necessary directories and data files.

Installation Folder: The directory where the ITS application and its components are installed on the computer.

Issue: A reported problem or request for enhancement in a product tracked by the ITS.

Issue ID: A unique identifier assigned to each issue for tracking purposes.

ITS (Issue Tracking System): The software application designed to track and manage issues, bug reports, and feature requests.

Main Menu: The primary navigation menu of the ITS, allowing users to access different functions of the system.

Network: A digital telecommunications network which allows nodes to share resources.

Product: A software application or component that is being tracked for issues and enhancements.

Product ID: A unique identifier assigned to each product within the ITS.

Product Release: A specific version of a product that is made available to users.

Prompt: A message displayed to the user to enter data or make a selection.

Referential Integrity: A property of data stating that all its references are valid.

Release Date: The date on which a specific version of a product is made available.

Resolved Issues: Issues that have been fixed and closed.

System Requirements: The necessary hardware and software specifications needed to run the ITS.

TCP/IP: A set of communication protocols used for the Internet and similar networks.

Terminal: A text input/output environment that allows users to interact with the system.

User: An individual who uses the ITS to report or manage issues.

User Interface (UI): The space where interactions between humans and machines occur, in this case, the ITS application.