

# Deliverable D: Conceptual Design

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## **Introduction**

The Ross Video Design Challenge is a project assigned to students by the client Ross Video, in collaboration with the Ottawa Sports and Entertainment Group (OSEG). The goal is to design an innovative interface that controls the various graphical and auditory elements used during sporting events. This system is expected to be produced using Ross Video's very own program, Dashboard, which is built specifically for the purpose of modelling interfaces to be used in live events.

The production team at the TD Place Arena are constantly seeking new ways to improve the fan experience. Fan engagement is extremely important during sporting events, as are functional aspects of the control panel. The project will explore ways to integrate viewer engagement features into the arena's display system.

From the last deliverable, the team analyzed the individual needs described by the client and integrated the information derived from them, design criteria and target specifications, into a series of tables as a means of breaking down each aspect of the clients requests. Along with this, our team benchmarked similar products and observed capabilities in these products that would be beneficial to include in our own. Overall, combining these methods of analyzing the client's needs, allowed us to formulate a much more streamlined framework for the final product.

## 1. Subsystem A: Team Setup

Subsystem A refers to the tool in the panel that is employed as a means of inputting and editing the graphics associated with each of the teams. The Team Setup subsystem is to be used prior to the start of a match and allows the user to easily edit aspects of the graphics such as colour schemes for the according teams as well as logos.

### 1.1. Team Setup (Vivian)

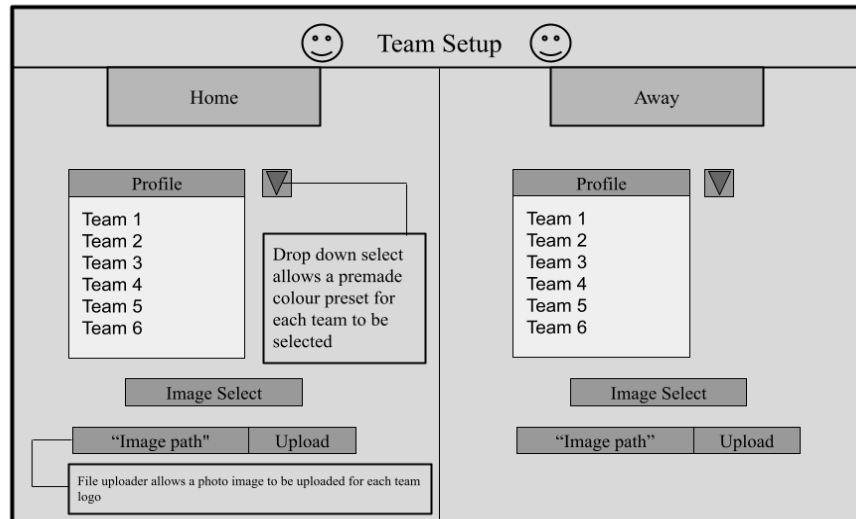
Team Setup	
Set Primary Color	Home <input type="text" value="Color Picker"/>
	Away <input type="text" value="Color Picker"/>
Set Secondary Color	Home <input type="text" value="Color Picker"/>
	Away <input type="text" value="Color Picker"/>
Set Team Logo	Home <input type="text" value="Browse"/>
	Away <input type="text" value="Browse"/>
Home Team Logo Image Preview	<input type="text"/>
Away Team Logo Image Preview	<input type="text"/>

**Figure 1. Team Setup Dashboard user interface design 1**

In this design concept, the controls for Team Setup will be on a tab of its own, tabs can be accessed via buttons on the left of the panel and will work similarly to tabs on a browser. There will be color pickers to set primary and secondary colors for both the home and away teams, each color will correspond to a color code (it may be possible to type in the color code directly if it is known, to get the exact color wanted).

Underneath it will be the option to browse files from the device and pick images for the team logos, as well as two boxes which will show the logo when uploaded as a preview of the image, which will help make sure the right file has been uploaded.

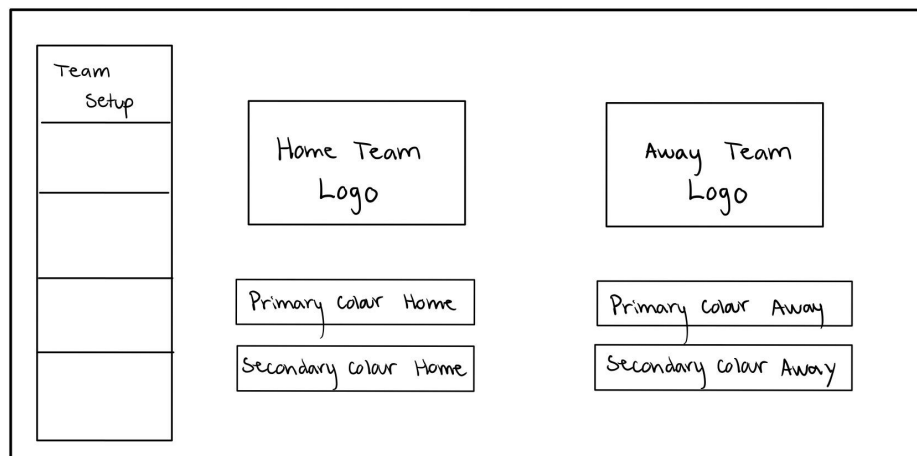
## 1.2. Team Setup (Sagnjeevie)



**Figure 2. Team Setup Dashboard user interface design 2**

This design concept features a pop-up menu for the Team Setup subsystem. As seen in figure 2, there is a dropdown bar titled Profile which contains various pre-made colour presets for each team in the OHL. The graphics are set to the colour of the profile chosen. In figure 2, below the dropdown bar, there is a file upload system which allows the user to select an image file for the logo of the corresponding team.

## 1.3. Team Setup (Emma)



**Figure 3. Team Setup Dashboard user interface design 3**

This design concept involves the team setup data being accessible through its own tab. The tabs for all sections can be accessed by clicking the buttons on the left. This tab features the basic information for both the home team and the away team. The team logos will be added via image uploads from computer files. The primary and secondary colours will be set via simple colour pickers.

## 2. Subsystem B: Goalie Matchup

Subsystem B refers to the tool in the panel that is used as a means of editing and inputting information pertaining to the goalies during the Goalie Matchup phase, prior to the start of the match. In unison with live video feed, the Goalie Matchup subsystem allows the user to easily and quickly input goalie stats and personal information for each team.

### 2.1. Goalie Matchup (Vivian)

	<input type="button" value="Upload File"/> <input type="text"/> <input type="button" value="Browse"/>	
	<input type="button" value="Read File"/>	
Goalie Matchup	<input type="text" value="Goalie 1"/> <input type="button" value="v"/>	<input type="text" value="Goalie 2"/> <input type="button" value="v"/>
	Name: <input type="text"/>	Name: <input type="text"/>
	Statistics	Statistics
	GAA: <input type="text"/>	GAA: <input type="text"/>
	Save %: <input type="text"/>	Save %: <input type="text"/>
	<input type="text" value="Image"/> <input type="button" value="Upload"/>	<input type="text" value="Image"/> <input type="button" value="Upload"/>
	<input type="text"/> <input type="button" value="Browse"/>	<input type="text"/> <input type="button" value="Browse"/>

**Figure 4. User interface for goalie matchup on Dashboard.**

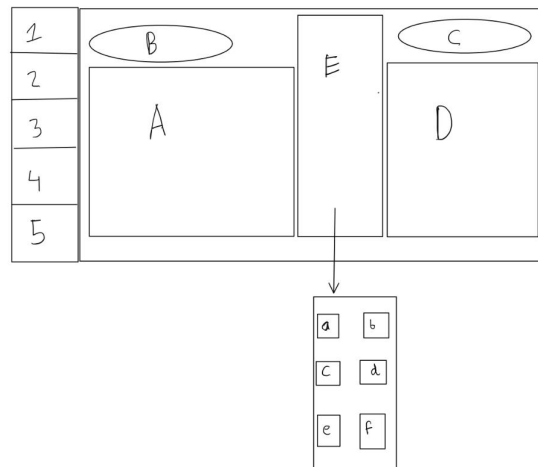
The interface for setting goalie matchup information will have a bar at the top which offers the option of fetching data from a file, and the “Read File” button will identify the name and statistics such as GAA (goals against average) and save percentage of each player. Then, the user can select a name from the list of players in the drop down menu (Labelled “Goalie 1” and “Goalie 2” in the figure above); the list will show all the players in the file that was uploaded, but selecting a name will autofill the boxes underneath. It will be possible to manually type information into the boxes in case of an error or a sudden change in player. Underneath the text boxes there will be the option to upload an image for each goalie, like a portrait or their team logo for example.

## 2.2. Goalie Matchup (Emma)

**Figure 5. User interface for goalie matchup on dashboard design 2**

All the information concerning goalie matchup will be accessible via its own tab on the left. An image specific to each goalie, such as their team logo, jersey number or portrait, will be uploaded from computer files. The name, goals against average, and save percentage will be filled via two separate file uploads, one for each goalie.

## 2.3 Goalie Matchup (Sahibjot)



**Figure 6. Goalie matchup interface**

The buttons with the numbers on the right are the subsystems. For example, 1 represents goalie matchup and the capital letters “A”, and “D” upload live feed of goalies on each team. Then in “B” and “C”, upload the team logo. At “E”, it compares the goalies' stats such as saves, goals allowed and career wins. Enter the stats in the lower case letters.



### 3. Subsystem C: Standings/Stats

Subsystem C refers to the tool in the panel that is used for displaying statistical information about each player on a team prior to the start of the match. The Standings/Stats subsystem allows the user to quickly and easily input information about the individual game stats of each player such as, points, goals and assists as well as individually edit any one of these pieces of information.

#### 3.1. Standings/Stats (Sagnjeevie)

The interface is titled "Standings/Stats" with smiley face icons on either side. It is split into two main sections: "Home" on the left and "Away" on the right. Each section contains a table of player statistics and a search bar.

Player	Points	Goals	Assists
Player 1 ▾	6 ▾	5 ▾	5 ▾
Player 2	3	4	4
Player 3	2	3	3
Player 4	1	2	2
Player 5	0	0	0
Player 6	0	0	0

Search

Link from OHL website for team can be imported into spreadsheet-like table

Player	Points	Goals	Assists
Player 1 ▾	6 ▾	5 ▾	5 ▾
Player 2	3	4	4
Player 3	2	3	3
Player 4	1	2	2
Player 5	0	0	0
Player 6	0	0	0

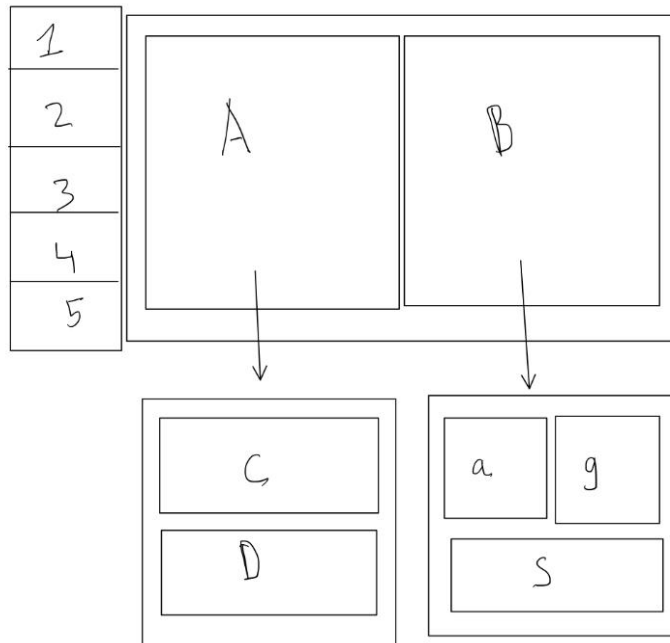
Search

Each individual cell can be edited and dropdown arrows show all possible entries for that category

**Figure 7. Team Setup Dashboard user interface design 1**

This design concept features a pop-up menu for the Standings/Stats subsystem. The menu displays a search bar as can be seen at the bottom of Figure 7. The search bar accepts a link as a parameter and when the search button next to the search bar is clicked, information regarding the stats of the individual players are parsed into the spreadsheet-like table. In the table, each cell in a category, such as the "Player" category displayed in Figure 7, is capable of holding an array of data from that specific category. Therefore, using the dropdown arrow in each cell, the user can access all the information from the link provided regarding that category, and make edits when necessary.

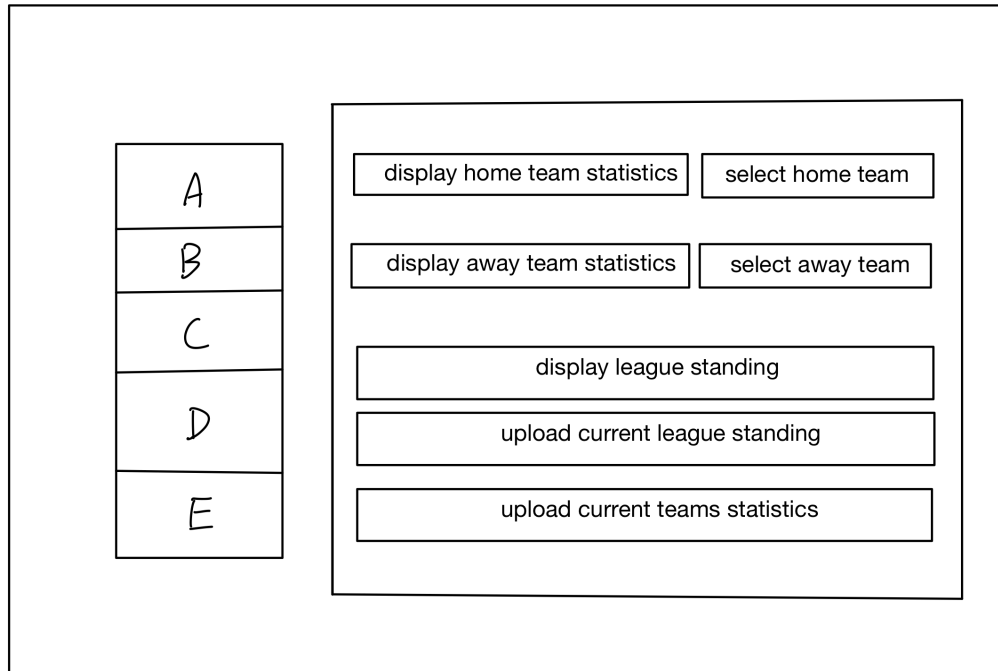
### 3.2. Standings/Stats (Sahibjot)



**Figure 8. Standing and stats.**

The numbers on the right represent the five subsystems. For example, one will represent the subsystem standing and stats. Then the capital letter “A” represents standing, and “B” represents team stats. For standings, you then upload conference standings in “C” and division standings in “D”. For teams stats, you upload assists in “a”, goals in “g”, and saves “S” with their rank in the league for each stat.

### 3.3. Standings/Stats (Zhaoxin)



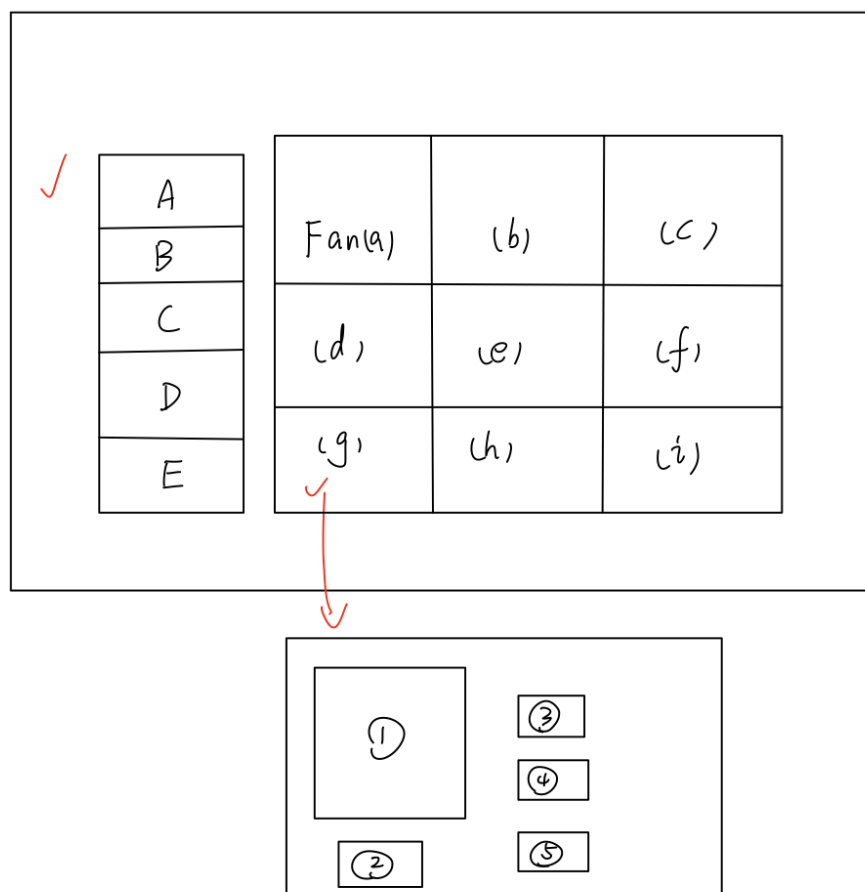
**Figure 9. League standing and team statistics**

In the figure 9., the UI will show two things. On the left, we have a column of the subsystems buttons (A = Fan birthday, B = Stat/Standing, C = Team setup, D = Goalie Matchup, E = Three stars). After the operator clicks the button B, they will be able to see the buttons demonstrated on the right side of figure 9. It includes the function select and display home/away team statistics button, and it also provides the display league standing button. Those buttons satisfied the client requirement. This UI also includes an upload option from the website which helps the operator update the information manually.

## 4. Subsystem D: Fan Birthdays

Subsystem D refers to the tool in the panel that is used for controlling the information displayed regarding fan birthdays during breaks and half-time. The Fan Birthdays subsystem allows the operator to enter certain parameters such as the name of the fan whose birthday it is as well as a small message.

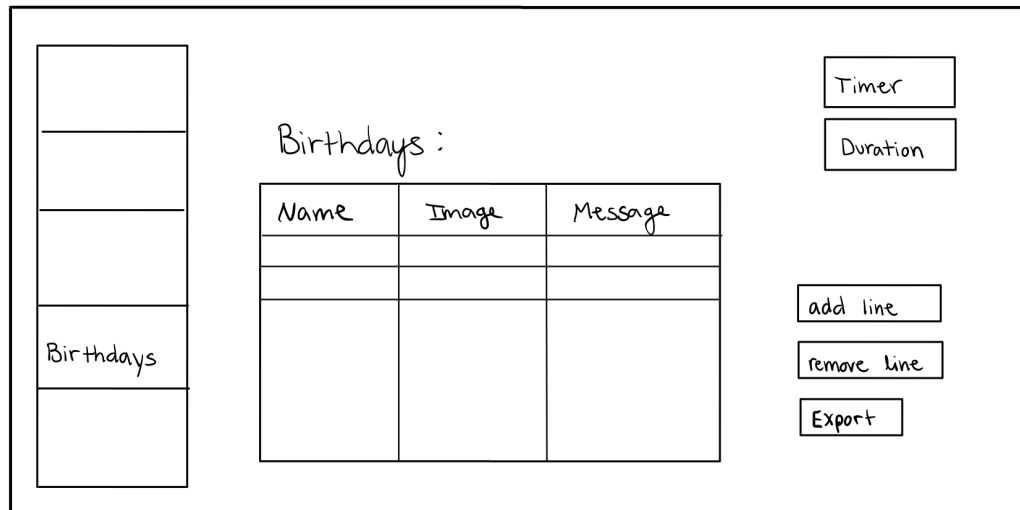
### 4.1. Fan Birthdays (Zhaoxin)



**Figure 10. User interface (UI) for Fan birthday**

On the top of the figure 10., the UI will show two things. On the left, we have a column of the subsystems buttons (A = Fan birthday, B = Stat/Standing, C = Team setup, D = Goalie Matchup, E = Three stars). When we click on button A (Fan birthdays), the operator will see nine different names of the fans who are having birthdays on the Match day. The operator will click on one of the nine buttons (from a to i), then he/she will see a new panel covering the 3 by 3 fan name panel. The operator will have five different choices (① = the picture of the Fan, ② = back to the 3 by 3 fan name panel, ③ = display Fan name on the screen, ④ = age/fan hobby, ⑤ = birthday message)

## 4.2. Fan Birthdays (Emma)



**Figure 11. Dashboard user interface for Fan Birthdays design 2**

The interface for fan birthdays is found through its unique tab on the left side of the dashboard setup. This tab features a chart that can be filled by the buttons to the left of it. A line can be added to include all the necessary information, such as name, image, and message, for each birthday. Any birthdays can be removed very quickly via the “remove line” button if deemed necessary. There is also a button available to export the data in the table. Buttons in the top right-hand corner of the screen will be used to set the total time of the entire birthday montage and the duration of each message will be adjusted accordingly depending on the number of fan birthdays.

### 4.3. Fan Birthdays (Sagnjeevie)

The image shows a user interface design for a 'Fan Birthdays' dashboard. At the top, there is a header bar with a smiley face icon on the left, the text 'Fan Birthdays' in the center, and another smiley face icon on the right. Below the header, the main content area contains several elements: a text input field labeled 'Fan Name'; a smaller text input field labeled 'First Name , Last Name' positioned to the left of a dark grey button labeled 'Display Name'; a text input field labeled 'Birthday Message'; and a dark grey button labeled 'Display Message' positioned below the 'Birthday Message' field. At the bottom of the main content area, there is a large, empty rectangular box, likely intended for displaying the results of the user's actions.

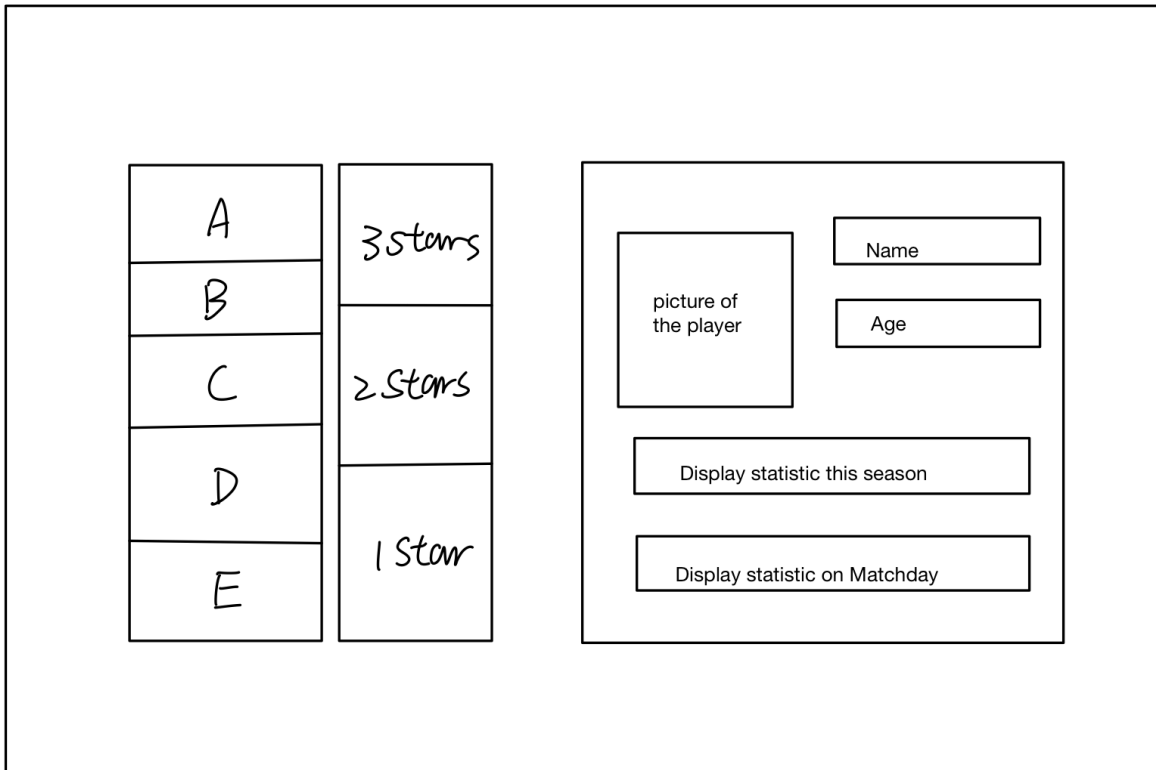
**Figure 12. “Fan Birthdays” Dashboard user interface design 3**

This design concept features a pop-up menu for the Fan Birthdays subsystem. As can be seen in figure 12, a text box labeled “Fan Name” takes string parameters. The fan’s name is to be entered here by the user and then the button “Display Name” is to be pressed. Below this, another text box labeled “Display Message” can be seen. This text box allows the user to enter a curated birthday message for the fan and afterwards the “Display Message’ button above the text box is to be pressed.

## 5. Subsystem E: Three Stars

Subsystem E is used to display the three best players statistics at the end of the matchday. As a tradition of the Hockey game, the operator can use this panel to display the players information and their statistics for audiences.

### 5.1. Three Stars (Zhaoxin)



**Figure 13. Three star subsystem**

In figure 13. On the left, we have a column of the subsystems buttons (A = Fan birthday, B = Stat/Standing, C = Team setup, D = Goalie Matchup, E = Three stars). After the operator clicks the button E, he will be able to see the column in the middle of figure 13. Which include three option 3,2,1 stars buttons. Then, the operator can click one button and he will be able to see the detailed information of the player he wants to display. On the right, multiple options are available for the operator to show on the screen, for example statistics on the match day, or the average of the season.

## 5.2. Three Stars (Sahibjot)

1	
2	
3	
4	
5	

**Figure 14. Interface for three stars.**

The buttons with the numbers on the right are the subsystems. For example, number 1 represents the three-star subsystem. At the capital letters “A”, “B”, and “C”, you upload the picture of the three stars of the games. Numbers underneath the capital letters represent the number of stars that will be uploaded in that space. Finally, the lowercase letter means where the player's names and the team will be written.

## 5.3. Three Stars (Vivian)

	<input type="button" value="Upload File"/> <input type="text"/> <input type="button" value="Browse"/>
	<input type="button" value="Read File"/>
3 Stars	Name: <input type="text"/> <input type="button" value="v"/> Image: <input type="text"/> <input type="button" value="Browse"/> <input type="button" value="Image Preview"/>
	Name: <input type="text"/> <input type="button" value="v"/> Image: <input type="text"/> <input type="button" value="Browse"/> <input type="button" value="Image Preview"/>
	Name: <input type="text"/> <input type="button" value="v"/> Image: <input type="text"/> <input type="button" value="Browse"/> <input type="button" value="Image Preview"/>

**Figure 15. User interface of Three Stars on Dashboard.**

The three stars control panel will show an upload file option similar to the goalie matchup user interface from Section 2.1. Once a file is selected and the “Read File” button is pressed, the system will identify the information of all the players and the user will be able to select a name from the drop down menu for each section.

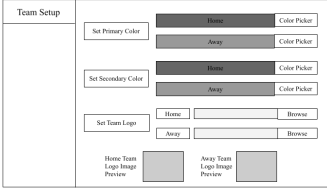
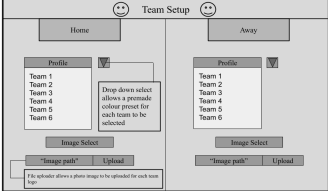
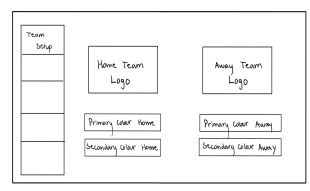
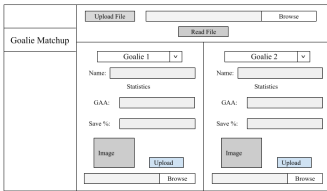
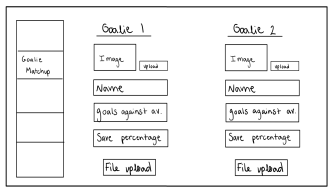
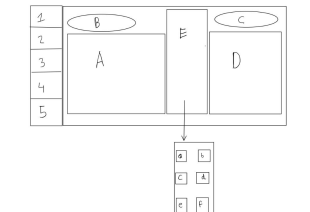
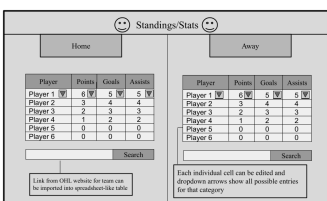
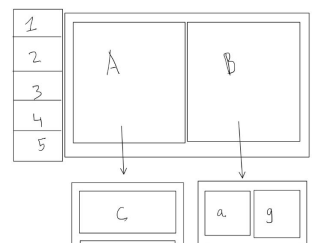
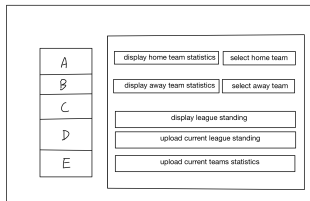
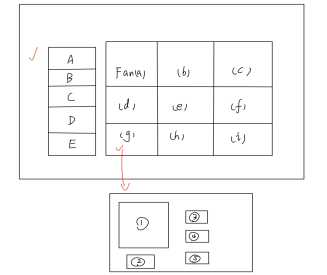
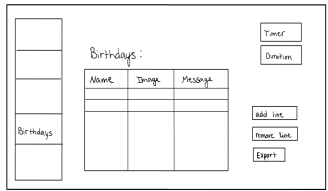
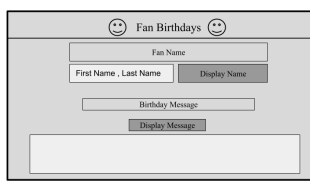
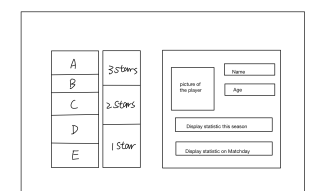
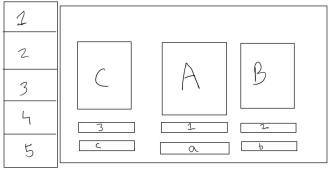
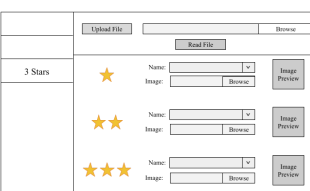
Alternatively, if all the player information was already uploaded in a file for a different subsystem, this tab could use the same file uploaded in another tab as its information source. Then the user would select a name from the drop down menu.

Underneath each player name there will also be the option to upload an image of each player, along with a box which shows a preview of the image to the right of the screen.



# Summary

**Table 1.** Summary of Design Concept options for each subsystem.

	Design 1	Design 2	Design 3
<b>A</b>	 <p>(1.1)</p>	 <p>(1.2)</p>	 <p>(1.3)</p>
<b>B</b>	 <p>(2.1)</p>	 <p>(2.2)</p>	 <p>(2.3)</p>
<b>C</b>	 <p>(3.1)</p>	 <p>(3.2)</p>	 <p>(3.3)</p>
<b>D</b>	 <p>(4.1)</p>	 <p>(4.2)</p>	 <p>(4.3)</p>
<b>E</b>	 <p>(5.1)</p>	 <p>(5.2)</p>	 <p>(5.3)</p>

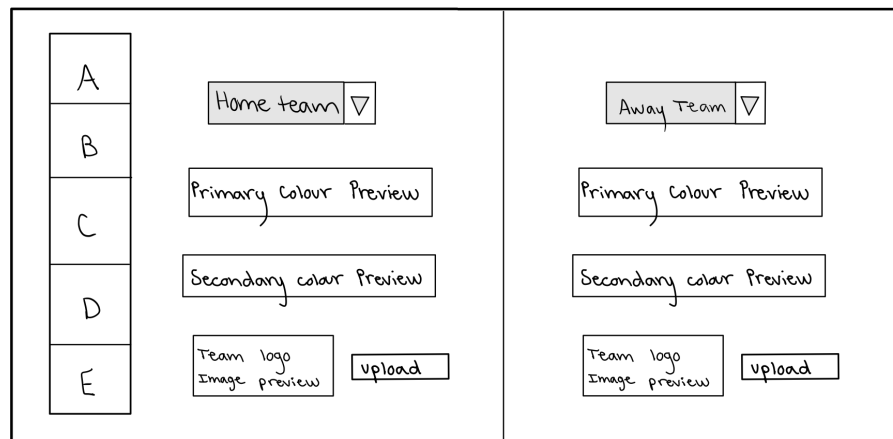
## Evaluation and Modifications

There are certain benefits and drawbacks to each concept that need to be considered before a final function design is settled on.

### Subsystem A

Subsystem A is the Team Setup user interface; design concept 1.2 works based off of a dropdown list that has the information for each team already inputted, allowing for the necessary team to be quickly selected and for the colour graphics and team logo to appear accordingly. This design is very beneficial in the event of any last minute changes and can be configured very efficiently. In comparison, designs 1.1 and 1.3 both use file uploads for the team logos and colour pickers that need to be changed manually for every team. This makes the setup longer and not as efficient to modify quickly for last minute changes. Design 1.1 shows a preview of the team logo uploaded which helps ensure that the correct file was uploaded.

Through combining various elements of these designs, a modified concept was created (1.4):



**Figure 16.** Modified Concept for Team setup Subsystem A

This design combines key aspects from all the previous concepts to maximize on the benefits and limit any drawbacks as described above. The teams are chosen via the dropdown list and will display their pre-set colour graphics. The team logos are uploaded through an image upload from computer files.

### Subsystem B

The design concepts for the Goalie Matchup user interface are examined in subsystem B. Design 2.2 allows for all the necessary goalie statistics to be added via file uploads and a photo to be added via an image upload. One drawback is that this has to be configured manually for each game, however, the file upload does speed up the process. Idea 2.3 works in a similar manner with separate uploads. The plan is to incorporate live video feed of each goalie which is a potential drawback considering access to the cameras may not be possible. Design 2.1 provides

a dropdown list with each goalie and their statistics. This is very beneficial and allows all of the information to be setup prior to game time and to just simply choose the required goalies for each game without having to complete separate file uploads each time.

### Subsystem C

Subsystem C focuses on designing a user interface to display the standings and statistics of various teams. Concept 3.1 inputs all the data into a spreadsheet display from a link. It uses a dropdown feature to display all the information for each category and allows for last minute edits to be made. There are many benefits to having a design function in this manner. It allows the user to make last minute adjustments and gather all the information quickly. Design 3.2 uses separate file uploads to provide each section of the required data. This is faster than inputting manually, however, not as efficient as using a single link. A key drawback is that all of the data would need to be reuploaded if any small changes were made. Design 3.3 uses an upload from a website to gather the statistics yet has multiple different buttons that each require separate programming.

### Subsystem D

The user interface for fan birthdays is considered in subsystem D. Conception 4.1 uses nine separate buttons, one for each potential fan's birthday, and uses a popup to add the name, image, and message specific to each fan. A benefit of this design is the organizational aspect and ease of use. A downside is that this design is currently restricted to nine fan birthdays and would need to be modified if there were more than nine. Option 4.2 also has a popup system. It is easy to configure and allows all the necessary information to be added. Design 4.3 uses buttons to fill a table. This allows for any number of birthdays to be added and removed as necessary. A drawback of all of these designs is that the information needs to be uploaded manually each time.

### Subsystem E

The Three Star design concepts are compared in row E. Suggestion 5.3 uses a dropdown element to choose the player's name and can use player information already inputted into other subsystems. This saves time and prevents unnecessarily repeating the same manual inputs. In concept 5.2, each player's name is written manually which is less efficient than the dropdown list. Idea 5.1 uses a button to display the information for each star rating. This is more efficient than a manual input but would require constant reconfiguration for each game.

## Comparison

**Table 2.** Systems created from mixing and matching different subsystems.

	Subsystem A Team Setup	Subsystem B Goalie Matchup	Subsystem C Standings/Stats	Subsystem D Fan Birthdays	Subsystem E Three Stars
System Option 1	Graphical Colour elements controlled by pre-made colour	Dropdown list available to choose specific goalie and all	A link from the OHL website parses stats information into	Fan information is input by hand along with a personalized	Player information is either uploaded from a file or

	presets for each team and images can be uploaded for team logo. (1.4)	goalie statistics are provided via file uploads as well as a unique image through an image upload. (2.1)	a table, where each piece of information can be edited. (3.1)	message and displayed with a button press (4.3)	selected through dropdown from previous upload and player photo is added through image upload. (5.3)
<b>System Option 2</b>	Colour elements chosen via colour pickers based on unique colour code and team logos uploaded from computer files. (1.1)	Goalie statistics filled via file uploads and photos displayed by means of a separate image upload. (2.2)	The standing shows conference and division standings provided from OHL standings upload. (3.3)	Fan birthday information provided in the form of a table that is filled by buttons. (4.2)	Three star players statistics can be displayed via clicking buttons (5.3)
<b>System Option 3</b>	Team logo uploaded via files and colour chosen through colour pickers. (1.3)	Live feed of players uploaded in the interface, and comparing their stats which are uploaded from OHL. (2.3)	The standing shows conference and division standings provided from OHL standings upload. (3.2)	The information for each fan's birthday can be curated by clicking on one of nine separate popups and inputting the specific data for that birthday. (4.1)	Three star player names are manually added into the interface. (5.2)

## Final Selection

**Table 3.** Selection matrix comparing system options 1 to 3.

Importance Multiplier (1-3)	Criteria	System Option 1	System Option 2	System Option 3
3	Displays a combination of graphics and text	Yes	Yes	Yes
3	Configurable display	Yes	Yes	Yes
3	Efficient configuration	Yes	Yes	Mediocre
3	Ability for fast last minute edits	Yes	Somewhat	Somewhat
2	Built in sponsor features	No	No	No
3	Simple and user friendly	Yes	Yes	Yes
1	Cost	free	free	free
2	Can set correct screen ratio	Yes	Yes	Yes

3	Makes aesthetically pleasing displays	Yes	Yes	Yes
<b>Total Score</b>		<b>42</b>	<b>39</b>	<b>36</b>

■ 2 points (good)    ■ 1 point (okay)    ■ 0 points (not good)

Based on the selection matrix evaluation, the best global concept is system option 1. This is primarily due to two main benefits that make it stand out from the other systems: it can be configured very efficiently and has the ability to make quick last minute modifications. These two criteria are especially important for creating a user interface fit for the very fast paced environment that it will be used in. Systems 1 and 2 can both be setup fairly quickly whereas some of the concepts in system 3 require manually inputting certain data which makes the configuration slower. This would make systems 1 and 2 favourable in comparison. There are many built in features in the designs present in system 1 that allow for the information to be quickly edited as is necessary, these same elements are simply not present in the same manner for systems 2 and 3 thus making them inferior in this important category. This all points to system 1 being the overall best functional solution.

## Conclusion

Design concepts were proposed for five different user interfaces on Dashboard, with each pertaining to a specific client requirement. The designs presented by each teammate were compared and contrasted. The benefits and drawbacks of each were used to create new and modified subsystem designs that integrated a variety of ideas. All of these concepts were brought together to formulate three distinct global system options. A selection matrix, using predefined design criteria, was used to determine the most ideal collection of subsystems. The most suitable system was determined to be system 1. This process is very helpful in creating the best possible solution that meets every necessary requirement. All of the work done in previous deliverables such as defining user needs, benchmarking, creating target specifications, and defining design criteria were pivotal to the thought process behind these designs. These designs are building up to the creation of an innovative interface that is user friendly, easily configurable, and encourages crowd engagement.