Problem Statement (Can always Be adjusted):

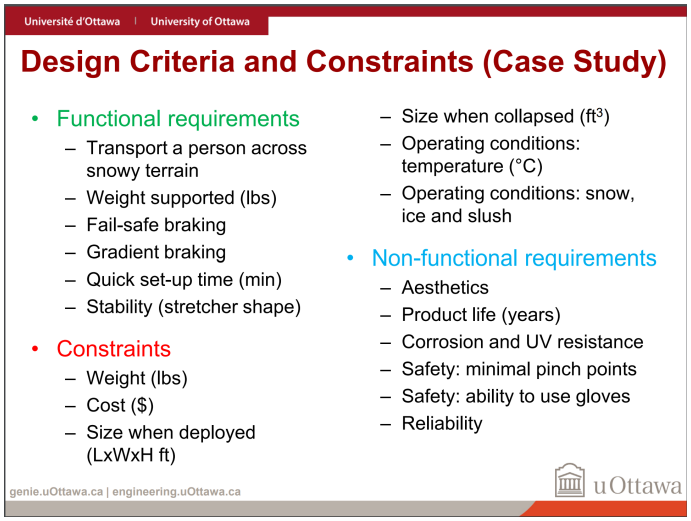
"A need exists for Ross video and Ottawa Sports and Entertainment group to have an extraordinary visual display that is innovative, organized and fast to keep the audience engaged and entertained during the game using an easy to modify, control and combine user interface that displays data in a fraction of a second in order to manage the Ottawa 67s Scoreboard Show."

Clients Needs (Can be expanded on always):

- Exciting designs that are engaging for all audiences
- Interesting statistics of teams for fans
- Easy access and preparation for everything our clients want displayed on the big screen
- New games and entertainment to get the audience interested and cheering for the game
- Sleek design for home and away teams
- Organized content to keep the audience engaged
- Eye catching video animations
- Change of content on the fly to keep the audience entertained
- Some make noise animations
- Activities that engage fans of the Ottawa 67s to participate during the game.

Previous User Benchmarking (More would be great - was hard to find):

- **Score vision** has products that are interactive, and they catch the eyes of the fans instead of just being a scoreboard. They are a great way to keep fans and parents updated on the events they can't be there in person. They are very flexible and versatile.
- **Ross video** products are very easy to set up and configure. They helped give a new edge which was great for them, the stadium and the sponsors. They have a very powerful way to run ribbon boards. Their products can synchronise multiple systems to make workflow simpler.



This slide shows examples of design criteria that we will need to apply the same general knowledge for the first part.

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Examples: Technical vs User Benchmarking

- Technical Benchmarking:
  - Internet Search (product specifications)
  - Other?
- User Benchmarking:
  - Review "similar" users or users for "similar" products
  - Ideally, you would get feedback from "early adopter" types of users (or, directly, from your own test users)
  - Internet Search (Amazon reviews, blogs)
  - Other?

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Benchmarking

Rescue Device / *Specifications*	*Edge SD*	*Model 100*	*Franco Garda Stretcher*
Company	Edge Rescue	Cascade Rescue	TSL Rescue
Cost	$1,764 (CAD)	$1,916 (CAD)	$9,400 (CAD)
Weight	51 (lb)	65 (lb)	40 (lb)
Stored Size	96.5 x 8 x 12 in	91 x 21.5 x 5 in	41.5 x 21 x 10 in
Braking System	Chain Brake	Chain Brake/Parking spike	Rope (Chain) Brake
Steering Assistance	None	None	Flex rubber joints

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Setting Target Specifications

- From the list of design criteria and based on benchmarking, set target specifications by defining ideal and acceptable values

Examples (ideal "perfect world" values or range of values):
- Exactly X
- A list of discrete values
- The "sweet spot" in a range of values

Examples (marginally-acceptable "on the edge" values):
- At least X
- At most X
- Between X and Y
- No worse than…

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Ensure that each identified need has at least ***one*** design criterion which can be used to measure the ability of different solutions to satisfy that specific need. Note that one design criterion can be used for multiple needs. A comprehensive set of design criteria must be generated to avoid missing key or critical design parameters. The tables developed in the lecture can be used as a guide for doing this. This should be a maximum of 5 pages.

Everything above will be deleted before submission, it is just for easy reference.

Design Criteria: (functional and non-functional requirements, as well as constraints (and metrics, where appropriate)

Need	Design Criteria
• Represent teams on the screen	• Logo specifications (px) • Choice of colour
• Interesting standings/statistics of teams for the fans	• Maximum number of variable • Size of graphics (px) • Colour of each graphic
• Easy access and preparation for everything our clients want displayed on the big screen	• Configurable/well defined panel • Maximum access time (s) • Display of information(blocks, by search)
• New games and entertainment to get the audience interested and cheering for the game	• Image dimensions (px) • Maximum noise limit (Hz)
• Sleek design for home and away teams	• Colour (red, white,green) • Shape of design (round, square,triangle) • Max size (Inch)
• Organized content to keep the audience engaged	• Number of animated contents • Weight of each content (px) • Duration of each (s)
• Eye catching video animations	• Number of video animations • Duration of each (s) • Speed limit (Hz) • Choice of content (historical,fun,based on past games)
• Make noise animations	• Amount of make noise animations (<15) • Duration of each (s) • Format (video,image,etc.) • Conversion Specifications (JPeg,HD)
• Activities to engage the fans	• Timing / start and end time (s) • Number of activities
• Change of content on the fly to keep the audience entertained • Rapidity and ease of use	• Max/Minimum speed (Hz) • Access time limit (s)

• Fan Birthday	• Image dimensions (px, L, W, H) • Amount of graphics • Set duration (s) • Age/Name/History or Background
• Ottawa 67's to participate during the game	• Number of supporters • Age group /Background
• Exciting designs that are engaging for all audiences	• Choice of song • Choice of animation • Number of designs
• Representation of each teams goalie	• Maximum variables size
• Represent sponsor elements	• Number of sponsor elements • Maximum size and variable (Inch)
• Sponsor Bugs	• Number of sponsor bugs • Size of bug (Inch)

Functional Requirements	**Non-Functional Requirements**	**Constraints**
• Design logo specifications of home and away teams • Maximum speed limit of animations • Duration of animations and birthday messages • Amount of space of variables for team statistics • Number of sponsor bugs • Size of graphics • Maximum speed limit to access and display information • Timing of events • Maximum space of variables • Maximum and Minimum song limits	• Choice of colour of home and away teams • Choice of song for animations • Choice of Lighting • Reliability (easily used and configured by other people)	• Maximum and minimum timing of events (15s-30s) • Number of animations (8-14) • Number of sponsor bugs (2-4) • Number of different full page sponsors (6-8) • Configurable panel for any game and stats (name changes, number of stars) • Birthday specifications: # of people (<5), duration of message (15s each) • Easy data entry (Max storage size) • Size of video, graphics, and images (px) • User panel made in dashboard

Technical Benchmarking and Update User Benchmarking: (i.e. researching existing products that already satisfy one or many of the interpreted needs, and user perceptions of similar products)

Multiviewers:

Company Name	Input	Output	Prices(CAD)
Kramer	6-SD/HD/3G HD−SDI with loop on BNC connector.s	1 HDMI, 1 CV on a BNC connector (for 720p @50Hz and 1920p @50Hz the output is PAL, for 720p @59.94/60Hz and 1920p @59.94/60Hz the output is NTSC)	6,294.32
FOR.A	HD-BNC x 16 3G-SDI: 3.0 Gbps (Up to 5C-FB 70 m) HD-SDI: 1.5 Gbps (Up to 5C-FB 100 m)	**75Ω BNC (4K output supported in SQD or 2SI display of 3840 x 2160 signals) Quantization: Y: 10-bit, C: 10-bit (4: 2: 2) ·BNC x 1 (12G-SDI)(3G/HD-SD**	**3,005.82**
Grass Valley	**2x QSFP28 both configured as 2x 50 GbE ports Each 50 GbE RX link supports up to 12x 3G IP input streams**	2x QSFP28 (as per IP inputs) First QSFP28 TX-link supports 8x 3G IP output streams Second QSFP28 TX-link supports 4x3GIPoutputstreams	5,022.76
Ross Video	9 (16×16 HD BNC + 2AUX I/O Ports) slots 1-8; FLEX slot 16×16 HD BNC only	**9 (16 SFP ports + 2AUX I/O Ports) slots 1-8; FLEX slot 16 SFP ports only**	**3,500.65**

Target Specifications: (numerical values or a range of values which represent reasonable product attributes) such as minimum or maximum weight, speed, dimensions, etc.

	Design Specifications	Relation (=,>,<)	Value	Units	Verification Method
	- Functional requirement				
1	Display logo and name of home and away teams	=	2	N/A	Test
2	Replay video highlights and clips	=	Yes, when important plays happen	Seconds or minutes	Test
3	Display animations and birthday messages	=	Yes, between plays	Seconds or minutes	Test
4	Must be able to run for the entire game	<	4	hours	Test
5	Display team statistics	=	yes	Specific to the statistic	Test
6	Display sponsorship ads	<	15	seconds	Test
7	Maximum and minimum song song time limits	=	5-10	seconds	Test
8	Size of graphics	<	The size of the screen	Inches or feet	Test
9	Configurable panel for any game and stats (player changes, three stars)	=	yes	N/A	Test
10	Maximum speed limit of animations	=	200-400	milliseconds	Test

Client Meeting Reflection: Reflect on how the client meeting impacted the development of your design criteria and specifications, when deciding on the relative importance of your criteria and explicitly state any updated needs that have changed from deliverable B

After meeting with the client, it was easy for us to recognize the importance of organization when it comes to the design of the entertainment display. Having organization as one of the design criteria is crucial as many of the other needs will only work/ run smoothly if the panels and designs are prepared properly and/or labelled. It is a must for knowing what buttons to press and in what order, so that the correct images (ie: scores, stats, lineups, etc) are displayed on the screen in a timely manner. The designs that we create also must have a sleek and tidy look to them rather than a messy “unfinished” look. Organization as a whole plays a huge role in the fans' experience with the game and needs to be one of the priorities in our design criteria as it has the potential to make or break the viewing experience and is the basis for many of the other client needs.

Additionally, the animations and images that we create for the entertainment display are also very important for many reasons. Of course, without the visual aspect of the viewing experience, there wouldn’t be much to show on the screen which completely defeats the purpose of the project. As mentioned before, our designs for the images and animations need to be organized as they are what will keep the fans engaged and what will allow us to “interact” with them. However, there are also many variables that we must take into account when creating the images and clips such as: the measurements of the images, the number of pixels, the colour, the timing/duration, upload speed. Having Ross Video talk to us about how all of those components play a role in presentation allowed us to set up our constraints and needs for the design criteria and create a better overall plan.