



FAMU-FSU COLLEGE OF ENGINEERING

ECE Information Kiosk Presentation 2

Team 2 (EE), Team 26 (ME)

Our Team



Michigun Joseph
Lead ME



Brian Baker
Team Leader



Guido De Souza
Financial Advisor



Jose Pacheco
Lead EE



Macklin Tweedie
Lead CpE

Our Team



Adonis Costa
Design ME



Mikaela Mitchell
Computer Science



Ashley Shorter
Computer Science



Jose Arita
Lead IME

Wall Mounting

- Safely constrains to wall
- Allows for adjustment
- Cost effective brackets



Figure 1. Adjustable mount[3]



Figure 2. Stationary mount[3]

Wall Mounting

- U.S. Access Board
 - Cane space max.
- Restrictions
 - Sliding
 - Rotation
 - No tilting

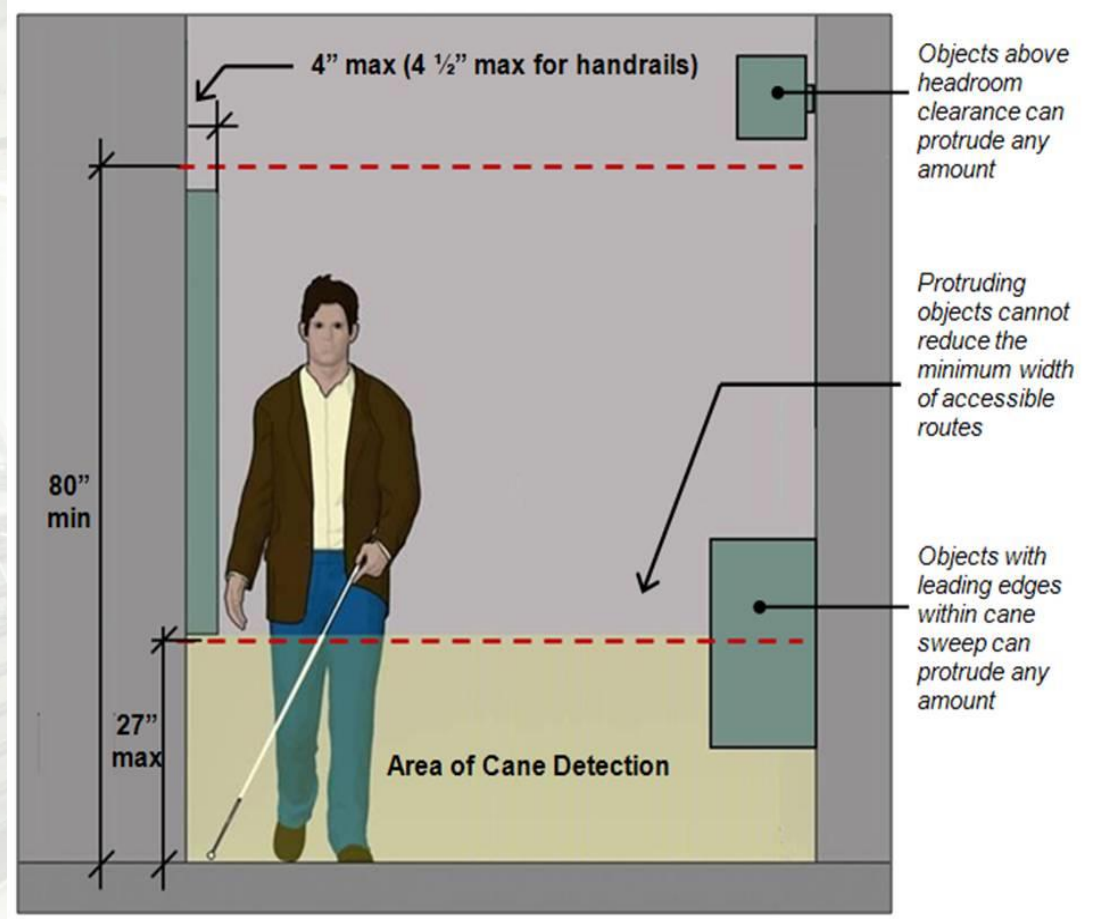


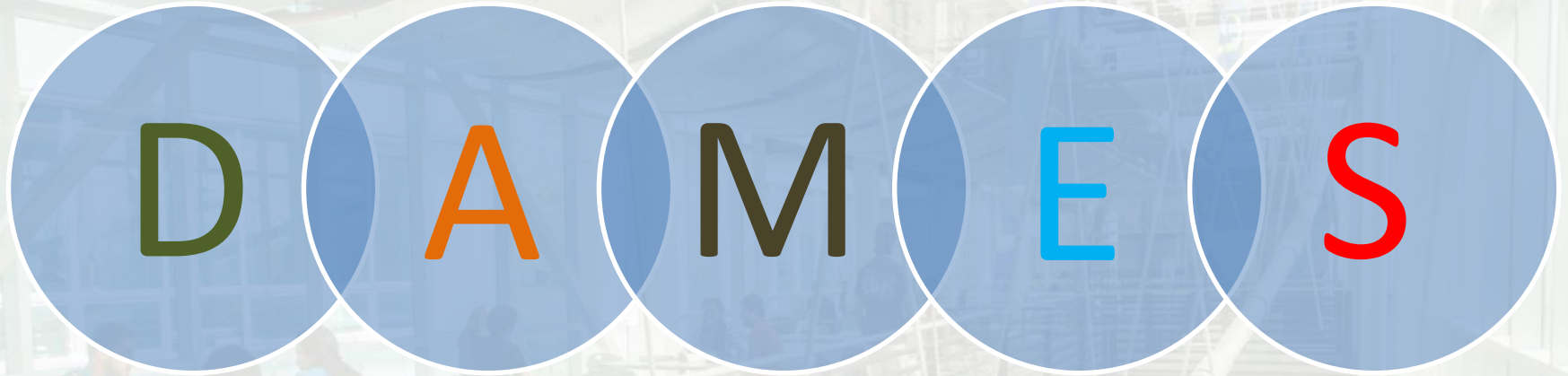
Figure 3. Access Board regulations^[1]

Wall Mounting

- In Wall Mounting for ECE Hallway
 - Not plausible
- Wall Extension
 - 9.5 in. available space
 - Cost to extend wall



DAMES Model Analysis



Define Problem

Analyze Details

Make Search of Solutions

Evaluate Alternatives

Specify Optimum Solution

Ergonomic Guidelines

DAMES Model Analysis

- **D** --> Choose an appropriate kiosk height
- **A** --> I) Population Elbow Height at Rest
Following Standard Ergonomic Guidelines:
Height: 43"--64"
Reach: 18"-22"
II) Avoiding any physical stress/strain
- **M** --> Appropriate height so that 95% of student population can use the kiosk without any physical restraint
- **E** --> Optimal Dimensions:
43.00"--45.39"
Consider Other Populations:
10.41"--10.78"
- **S** --> Specific Solution: Height-Adjustable Kiosk

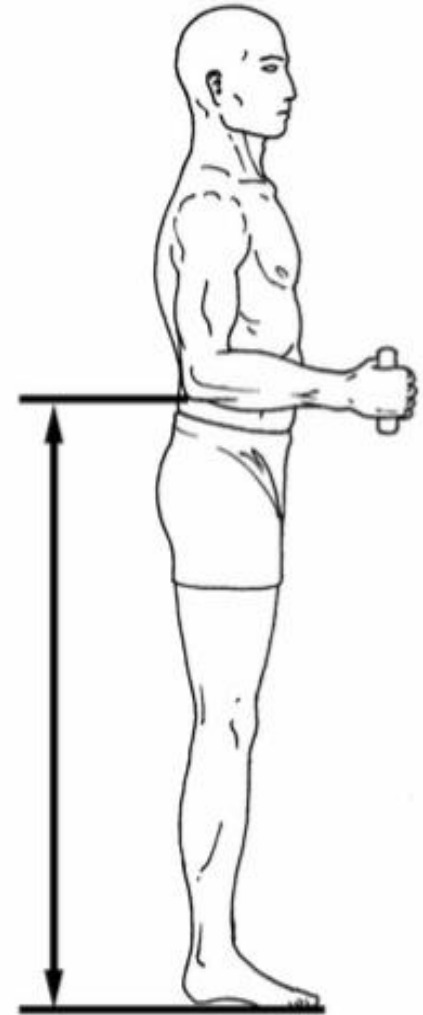
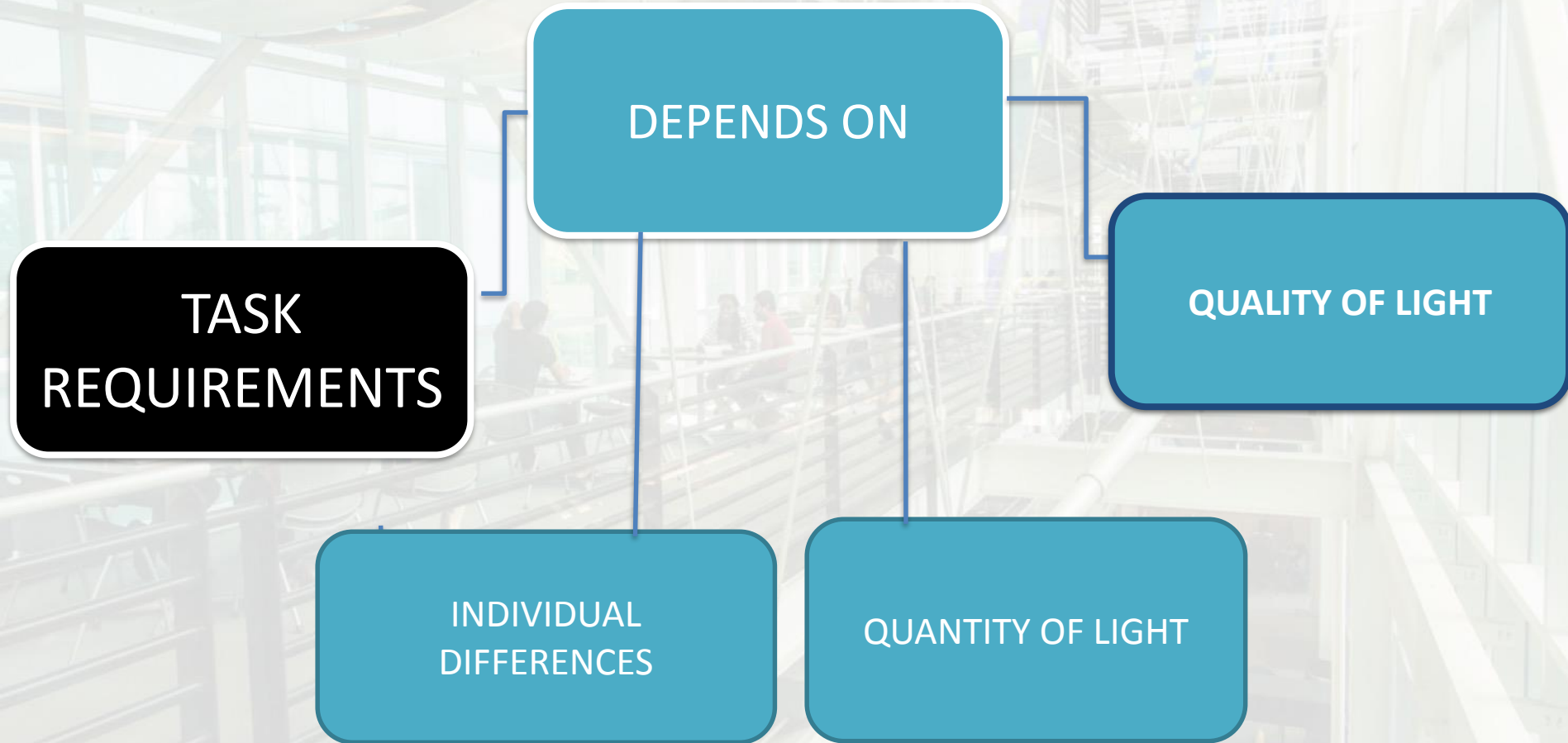


Figure 4. Ergonomics^[1]

Ergonomic Guidelines (Visual)



Survey

- *In order to solve the problems of our target groups we needed first to understand who they are.*
- *We divided our potential users into three main groups:*

VISITORS



STUDENTS



FACULTY



Rating of the Current Information System

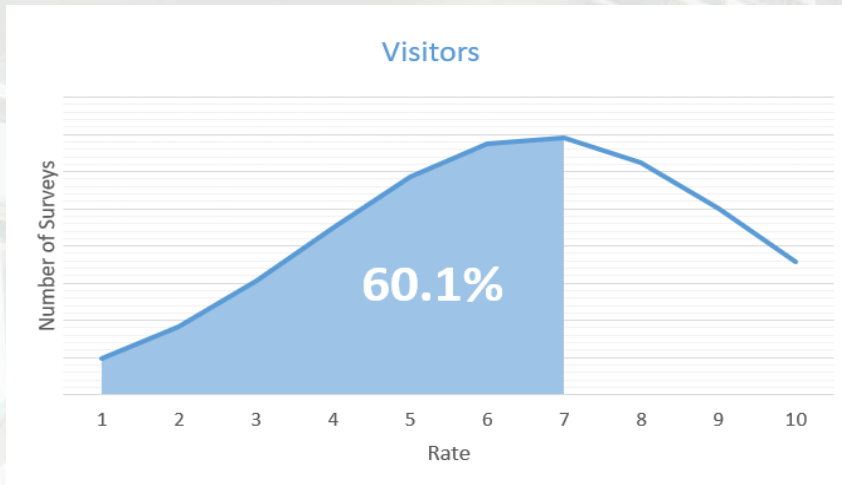


Figure 5. Visitor

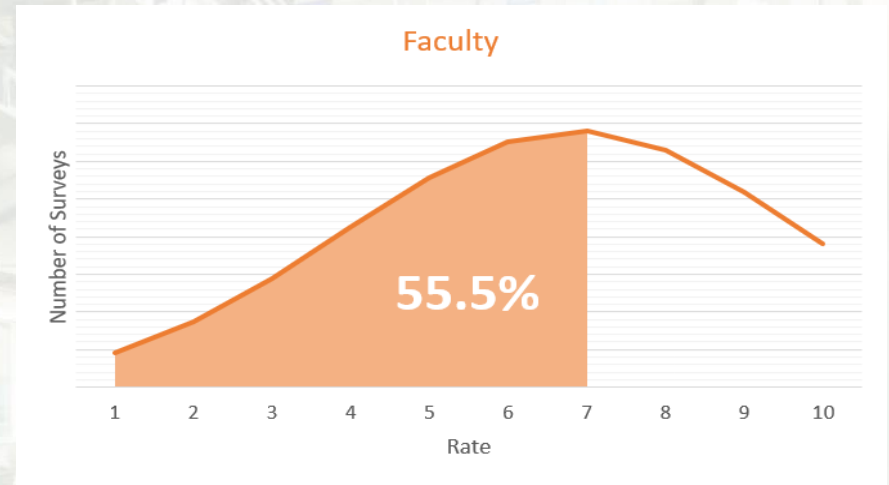


Figure 6. Faculty

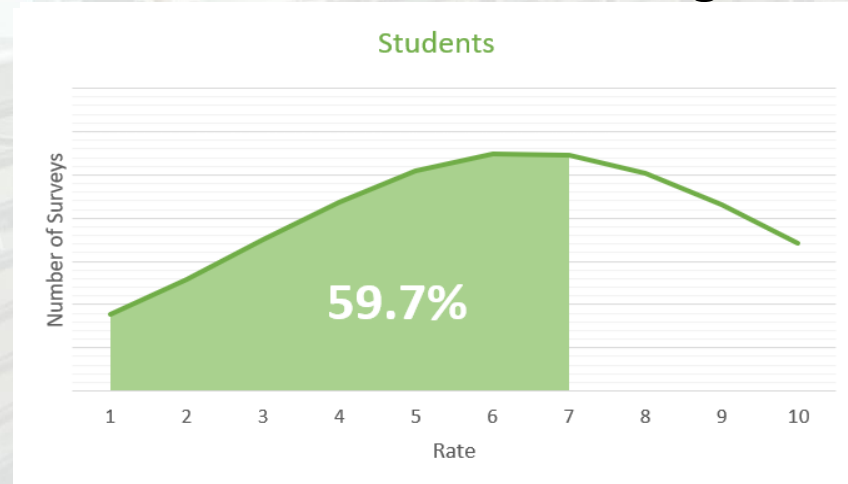


Figure 7. Students

Most Desired Features

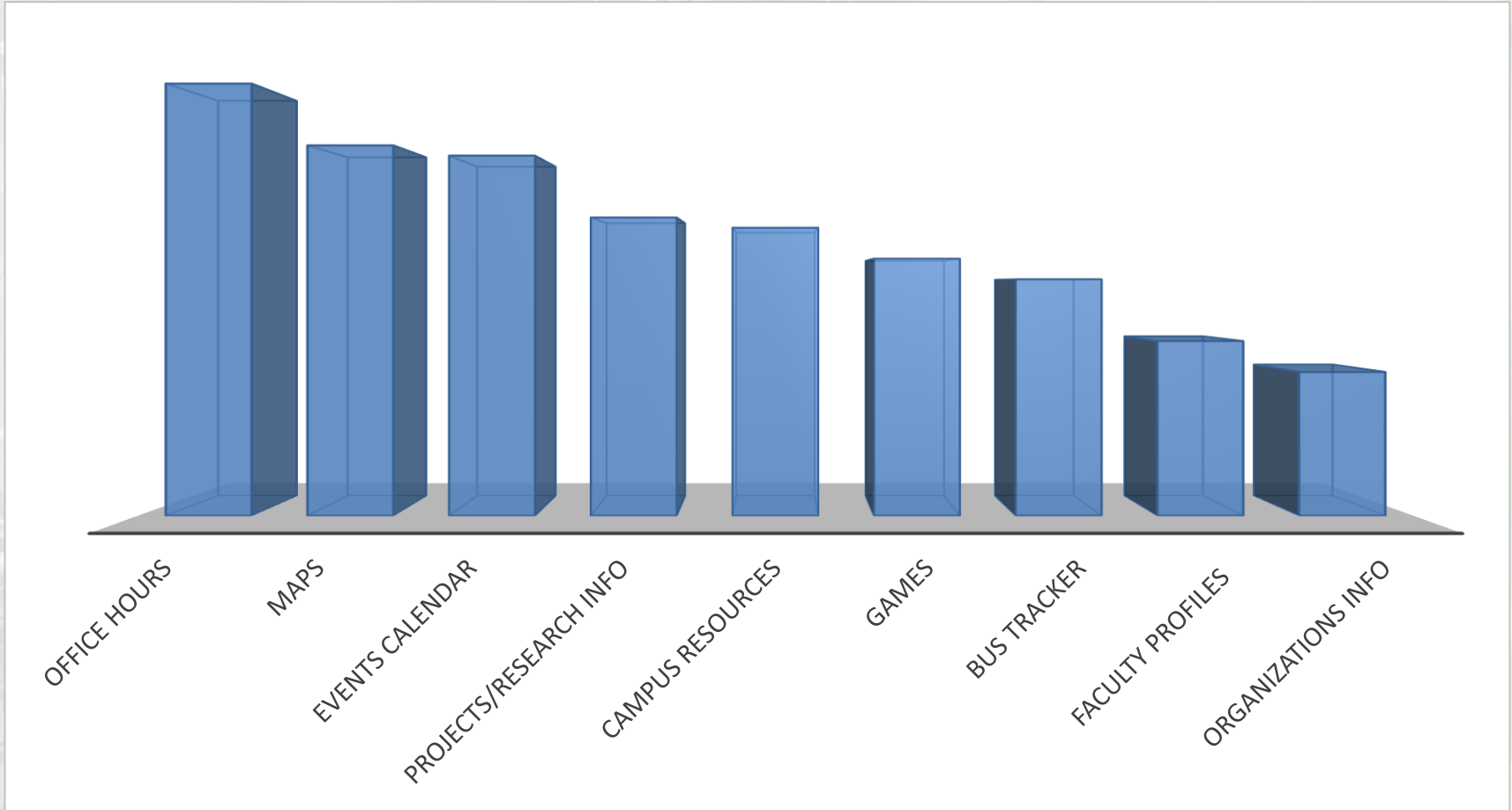


Figure 8. Desired Features Survey Results

Different Languages Support

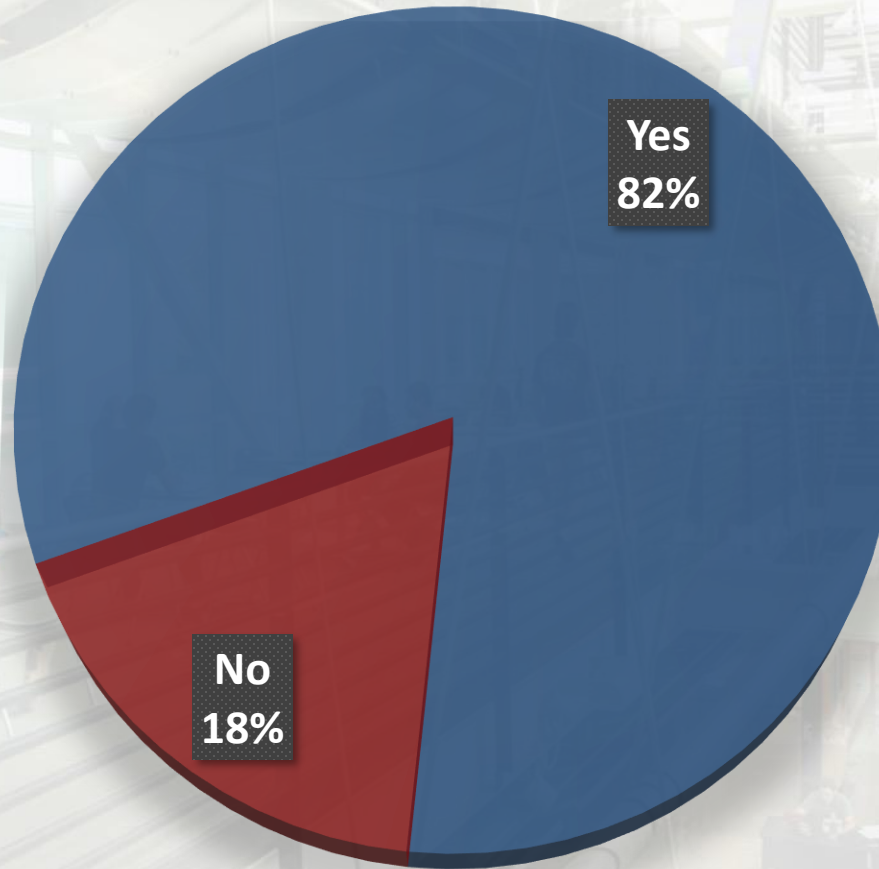


Figure 9. Foreign Language Support Survey Results

Survey Reliability

Population size:

2500

Students

150

Faculty/Staff

* Defining a **90%** Confidence Level
and a **7.5%** Margin of Error

Sample Size = **115 Surveys**

*Montgomery, D.C, 2008, Introduction to Statistical Quality Control, 6th edition

Project Needs

- A central repository for information about the college
- A way to demonstrate the technological capacity of the ECE Department
- An interactive touchscreen with visual and audio cues
- A friendly resource for visitors to learn about the ECE Department
- A way for users to schedule meetings
 - office hours, advisors, presentations
- Easily to update and manage (future-proofing)
- Kiosk will be wall-mounted but scalable to freestanding
- Securely connected to the internet
- Protected against theft or tampering

Project Targets

Metric Number	Need	Metric	Imp.	Units	Marginal Value	Ideal Value
1	An Interactive Screen	Touch Screen	Very High	Inch	20"-90"	48"
2	Information Hub	Subjective	Very High	N/A	N/A	N/A
3	Internet Connection	Reliable Conection	Very High	N/A	N/A	N/A
4	Protected Against Theft & Tampering	Binary (Yes or No)	High	Condition	Wear and Tear	Impeccable
5	Wall Mounted	Center Height	High	Feet	3'-5'	4'
6	Good Experience	Subjective	High	N/A	N/A	N/A
7	Schedule Appointments	Meetings, etc.	High	N/A	N/A	N/A
8	Scalability	Subjective	High	N/A	N/A	N/A
9	Screen Display	Resolution	Medium	Pixels	1080p-2160p	2160p
10	Audio	Speakers	Medium	Decibels	40-60 dB	50 dB
11	Highlight ECE Department Innovation	Subjective	Low	N/A	N/A	N/A

Figure 10. Target Matrix

Concept Generation

Category	Option A	Option B	Option C
Information Source	College Website	Internal Storage	Remote Storage
Updatability	At Kiosk	Network	Through Website

Update Content

Update Hardware & Software

Kiosk Specific

Need Connection

Category	Option A	Option B	Option C	Option D
Connectivity	Wireless Ethernet	Wired Ethernet	USB Port(s)	Card Reader

Reliable Connection

Security & Adaptability

Concept Generation

Category	Option A	Option B	Option C
Power	AC Power	Solar Power	Battery
Manuverability	Attached to wall	Free-Standing	Portable

Location

Scalability

Wall Mounted

Category	Option A	Option B
Location	Hallway Corner	Hallway Middle
Articulation	Tilting	Raising and lowering

Location

Accessibility & Ergonomics

Concept Generation

Category	Option A	Option B	Option C	Option D
User Interface	Touchscreen	Voice Recognition	Stylus	Keyboard

Baseline Target

Upgrades

Wall Mounted

Category	Option A	Option B	Option C	Option D	Option E
Touchscreen Size (Diag.)	16-inch	20-inch	28-inch	36-inch	48-inch
Touchscreen Type	Resistive	Capacitive	SAW	IR	
Touchscreen Implementation	Overlay	Integrated			

Ideal Target



Cost vs. Performance Targets

Concept Generation

Category	Option A	Option B	Option C
OS	Android	Windows	Linux
Additional Experiences	Mobile Apps	Website Kiosk Mode	

Ideal Target



Effort Effective Scalability

Ideation

- Concept generation activity called "*Charrettes*"
- At the beginning to lower barriers between different beneficiaries – group buy-in
- Forces creativity by restricting time
 - Not at the end when rework is more costly, and time is more limited

Charrettes

- Individuals take 3 minutes to communicate concept ideas
- Be open-minded to not evaluate the concepts prematurely

Generate concept(s) that address the following project targets:

- Wow-factor
- Placement & Accessibility
- Interface (Touch or otherwise)

Concepts

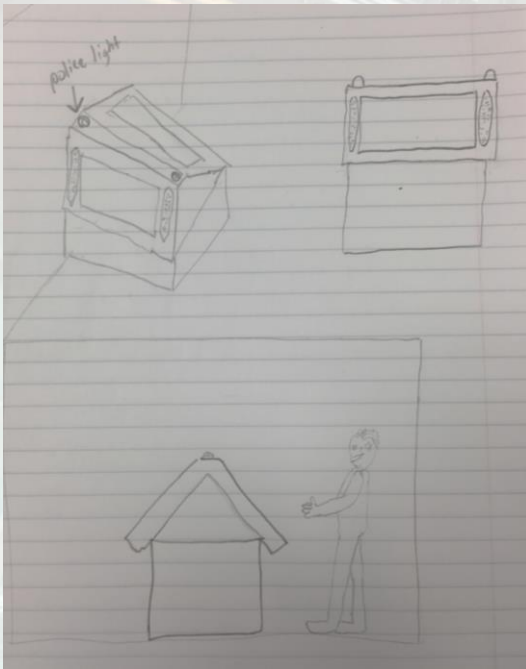


Figure 8. Concept 1

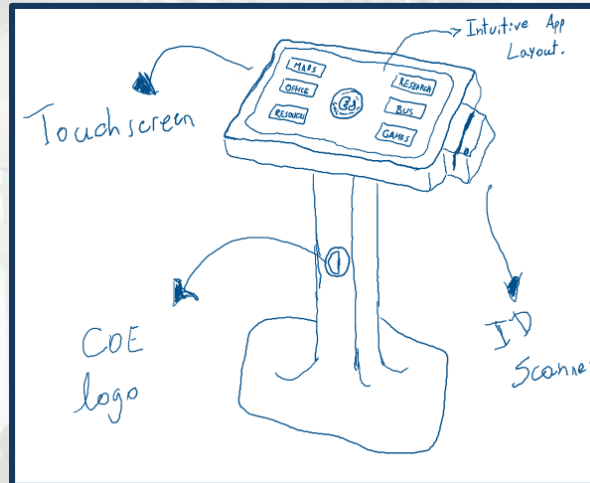


Figure 9. Concept 2

- Big thin multitouch-screen that goes from like knee high to about 6ft above ground.
- Multiple screen that acts as one multitouch-screen
- Transparent display for touchscreen

Figure 10. Concepts 3, 4, and 5

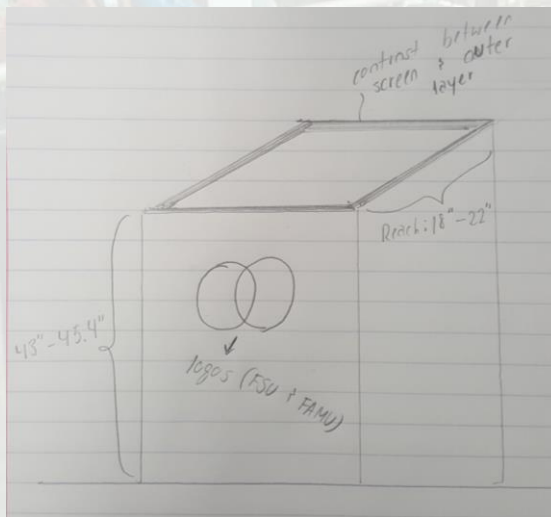


Figure 11. Concept 6

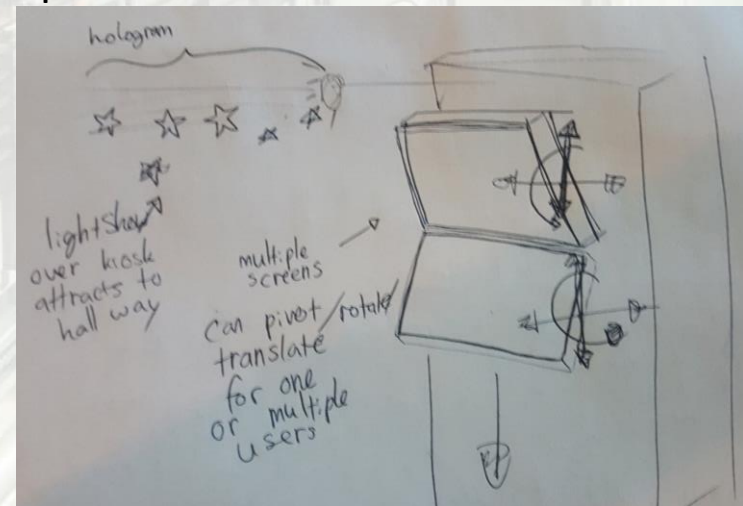


Figure 12. Concept 2

Charrettes Result

- Communicate with the group individual ideas
 - What sticks out to you?
 - How is the wow-factor addressed?
- Based on the feedback, generated concepts may be lightly revised.
- Other charrette rounds may be conducted

Early Cost Comparisons

Item	Size	Description	Cost	Shipping
4K Multi-Touch Screen Overlay	48"	6 Touch Points	\$904.57	\$75
4K Screen	48"	2160p	\$300-\$700	
Touch Screen Monitor	48"	6 Touch Points	\$4,699	\$500
4K Multi-Touch Screen Overlay	70"	6 Touch Points	\$1,548.07	\$175
4K Screen	70"	2160p	\$1,500-\$3,000	
Touch Screen Monitor	70"	6 Touch Points	\$9,999	\$1,000

Figure 11. Cost Comparisons

System	Price
48" Overlay System	\$1,300+
48" Touch Monitor System	\$5,200+
70" Overlay System	\$3,300+
70" Touch Monitor System	\$11,000+

Figure 12. Overall Costs

Software Interface

- Android allows for extreme flexibility
- Kiosk will run Android
 - Default state will be inside Android application
 - App will reference HTML and CSS
 - Hyper Text Markup Language and Cascading Style Sheets
 - Visitors will be able to reference the kiosk interface at home by selecting option from COE Homepage

Accessing Website Content

- Most data would be accessed from main COE website
 - New website is being built in Drupal
 - Open source back-end framework
 - Drupal allows for other entities to access content
 - We will use "fully decoupled" Drupal
 - Full access with installation of API on kiosk
 - Will require integration with JavaScript

Other Content

- Data specific to kiosk would be stored separately
 - Games, interactive maps
- Additionally, calendar system could be implemented
 - Professors could update their schedules and accept meeting requests
- Both could be updated remotely

This Semester Moving Forward

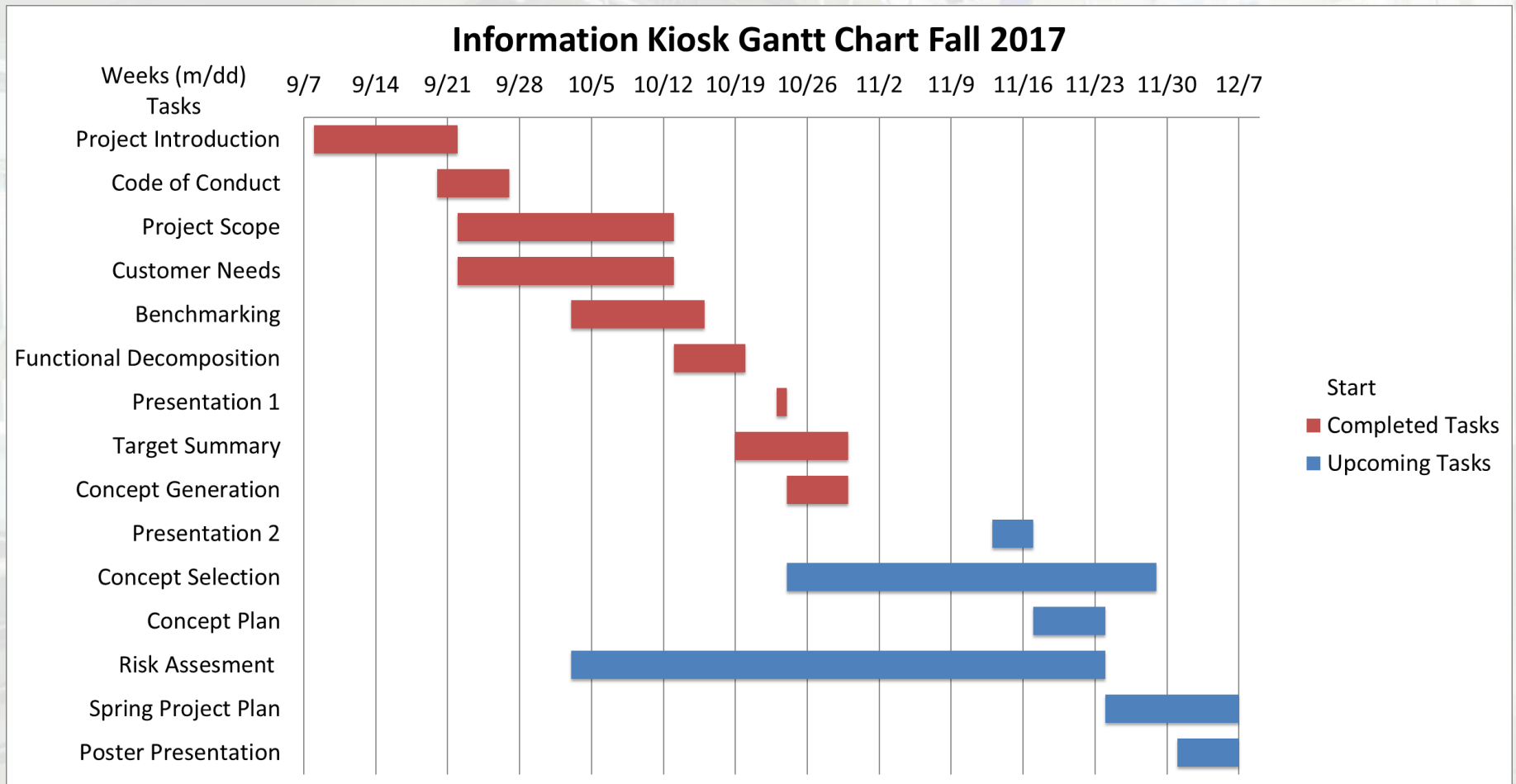


Figure 13. Gantt Chart

References

1. "Protruding Objects." *United States Access Board*. Web. <<https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/guide-to-the-ada-standards/chapter-3-protruding-objects>>.
2. "Accessible Routes." *United States Access Board*. Web. <<https://www.access-board.gov/guidelines-and-standards/buildings-and-sites/about-the-ada-standards/guide-to-the-ada-standards/chapter-4-accessible-routes>>.
3. "Design Charrettes." *NNGroup*. <<https://www.nngroup.com/articles/design-charrettes/>>
4. "Picture." *Shopify*. Web. <<https://cdn.shopify.com/s/files/1/2128/0431/products/412YVEC51UL.jpg?v=1498799080>>
4. Montgomery, D.C, 2008, Introduction to Statistical Quality Control, 6th edition, Wiley. (ISBN 978-0-470-16992-6)
5. <<http://crunchytech.com>>.
6. "Anthropometric Data." Web. <<https://multisite.eos.ncsu.edu/www-ergocenter-ncsu-edu/wp-content/uploads/sites/18/2016/06/Antropometric-Detailed-Data-Tables.pdf>>

Questions?

