Department of Computer Science & Engineering
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System Requirements Specification
CSE 4316: Senior Design I
Fall 2015

Team Name
Product Name

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Revision History

Revision	Date	Author(s)	Description
0.1	10.01.2015	GH	document creation
0.2	10.05.2015	AT, GH	complete draft
0.3	10.12.2015	AT, GH	release candidate 1
1.0	10.20.2015	AT, GH, CB	official release
1.1	10.31.2015	AL	added customer change requests

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1 Product Concept

This section describes the purpose, use and intended user audience for the Fiducial Career Display. The purpose of this project is to build a top flat surface table with that provides user interface with needed information. The system consists of fiducial markers which will be placed on top of the surface of the table and will be able to move around the surface.

1.1 Purpose and Use

This product is meant to replace the iPad career wall in the Air Force Performance Lab. Each fiducial markers will display a career available in the Air Force. When the marker is placed on the table, an interface will appear to allow the user to page through different details about that career. Any user can walk up and pick up a maker and start interacting to explore the career description. Their objective is to change peopleś perceptions about what the Air Force does and inspire them to learn more while generating qualified leads.

1.2 Intended Audience

The intended audiences of the product include:

- The recruitment officer, who can show the information for intended audience
- The visitor, normal people who interested in the Air Force careers can look into it and find the materials they need

Note: This product was designed specifically for the Air Force Performance Lab, but it can be repurposed to other commercial uses such as museums, trade shows and so on...

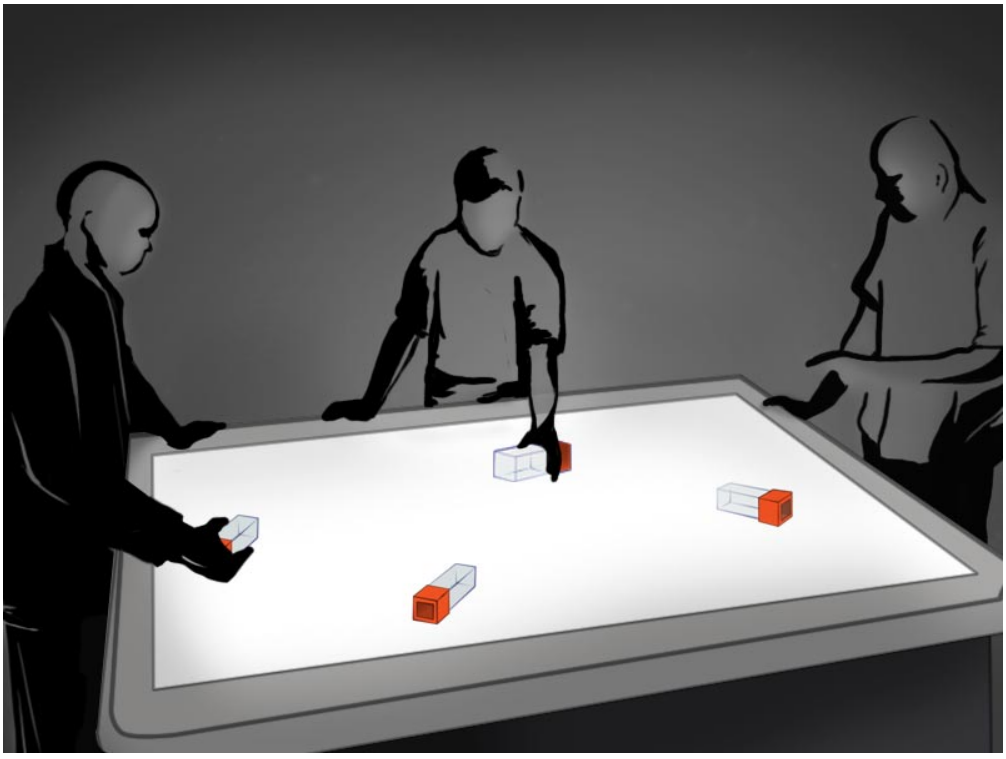

Figure 1: Table conceptual drawing [**?**]

2 Product Description

This section provides an overview of the Fiducial Career Display. A table will be constructed upon which the top surface will consist of a video display. The display will recognize specific objects played on top of it and will be able to track their movement across the surface if moved or rotated. Object recognition will be dependent on uniquely shaped or patterned markers placed on the bottom of the object. For objects placed on the surface of the table that do not contain a recognized pattern (like a fingertip), the table will treat as user interaction (touch gesture). Each marker will display the details including text, image, or videos about that career.

2.1 Features & Functions

Hardware features:

- A semi-transparent acrylic board that make the table top as well as interactive display.
- An infrared camera used to capture the input from the user.
- A short throw projector mounted below the table to provide the interactive display.
- A computer to run the recognition and application softwares.
- A Fiducial marker that will represent a career. When a marker is placed on the table, an interface will appear to allow the user to page through different details about that career.

Software Features:

- Movable modular interface.
- Automatic orientation based on position on table.
- Navigable content.
- Logo screen when not engaged.
- Transitions in and out when marker is introduced and removed.
- Track type of markers on the table.

2.2 External Inputs & Outputs

Table 2: Input & Output

Name	Description	Use
Input		
Fiducial Marker	Fiducial markers which can be tracked from a camera and interpreted using software.	Place on top of the table for activating career choice menu
Finger touch	Human finger on the table surface	Use to select and interact with the menu
Output		
Display	A semi-transparent tabletop capable of display	Projected the screen to the table surface
Sound	Audio source	Play on input and media request

2.3 Product Interfaces

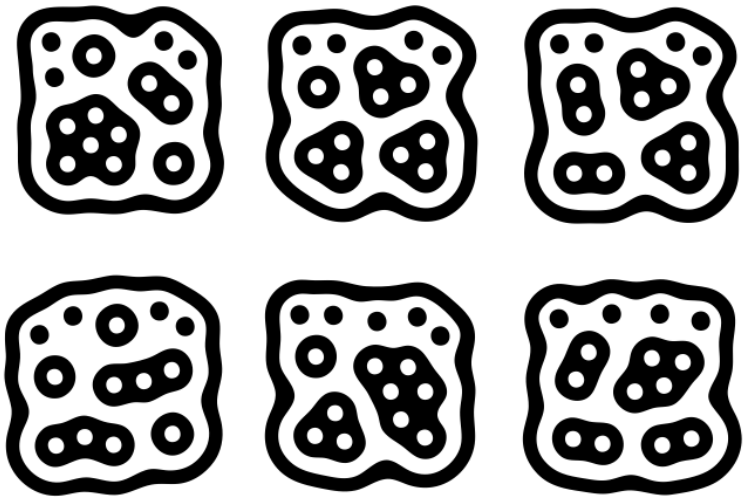

Figure 2: Fiducial pattern examples

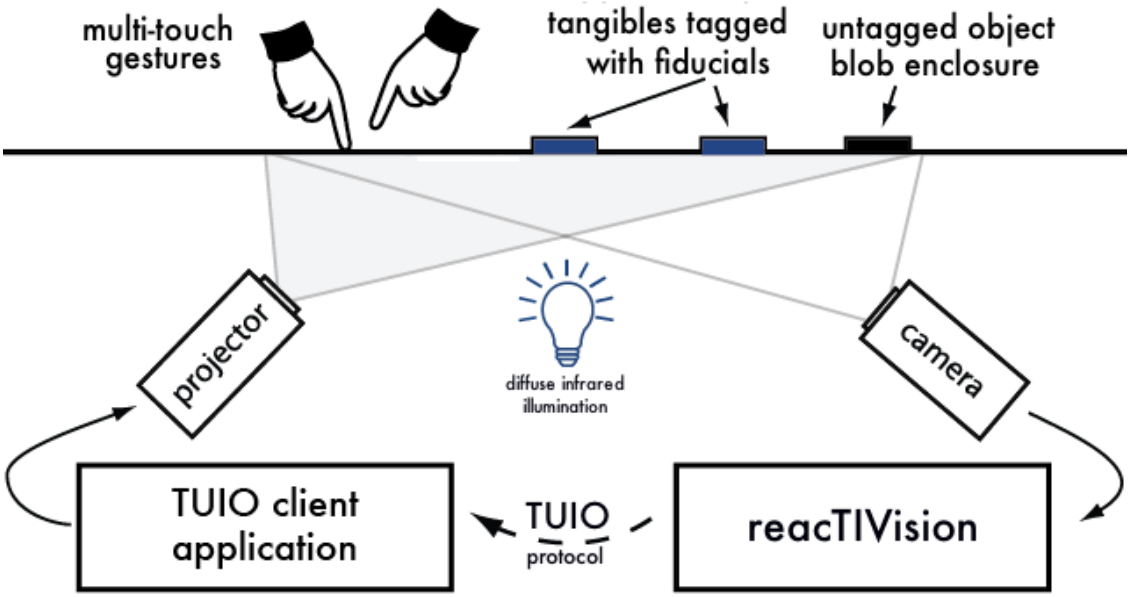

Figure 3: Table concept

Figure 4: Round table concept

Figure 5: Round table concept [**?**]

3 Customer Requirements

Include a header paragraph specific to your product here. Customer requirements are those required features and functions specified for and by the intended audience for this product. This section establishes, clearly and concisely, the "look and feel" of the product, what each potential end-user should expect the product do and/or not do. Each requirement specified in this section is associated with a specific customer need that will be satisfied. In general Customer Requirements are the directly observable features and functions of the product that will be encountered by its users. Requirements specified in this section are created with, and must not be changed without, specific agreement of the intended customer/user/sponsor.

3.1 Requirement Name

3.1.1 Description

A detailed description of the feature/function that satisfies the requirement. For example: *The box will be slate blue. This specific color is required in order to ensure that the box matches other similar boxes in the Box Systems Premium line of products. Slate blue is specified as #007FFF, using six-digit hexadecimal color specification.* It is acceptable and advisable to include drawings/graphics in the description if it aids understanding of the requirement.

3.1.2 Source

The source of the requirement (e.g. customer, sponsor, specified team member (by name), federal regulation, local laws, CSE Senior Design project specifications, etc.)

3.1.3 Constraints

A detailed description of constraints on satisfying the requirement (e.g. one such constraint might be: *The specified color must be commercially available in paint capable of adhering to the material of which the box is manufactured. (See customer requirement 3.x for production material specification.)*

3.1.4 Standards

A detailed description of any specific standards that apply to this requirement (e.g. *NSTM standard xx.xxx.x. color specifications [**?**].*)

3.1.5 Priority

The priority of this requirement relative to other specified requirements. Use the following priorities:

- Critical (must have or product is a failure)
- High (very important to customer acceptance, desirability)
- Moderate (should have for proper product functionality);
- Low (nice to have, will include if time/resource permits)
- Future (not feasible in this version of the product, but should be considered for a future release).

3.2 Requirement Name

3.2.1 Description

Detailed requirement description...

3.2.2 Source

Source

3.2.3 Constraints

Detailed description of applicable constraints...

3.2.4 Standards

List of applicable standards

3.2.5 Priority

Priority

4 Packaging Requirements

Include a header paragraph here. Packaging requirements are those requirements that identify how the delivered product will be packaged for delivery to the end-user; or how it will "look" when finished and delivered. For example, you might specify that the software required for operation will be pre-loaded on the hard drive, delivered on CD/DVD, or available via download. Software might be customer installable, or not, etc. Hardware components could be all in a single package, provided as a "bag of parts" to be assembled/installed by the user, painted a certain color, logos affixed, etc. Care should be taken not to duplicate requirements found in other sections of this document.

4.1 Requirement Name

4.1.1 Description

Detailed requirement description...

4.1.2 Source

Source

4.1.3 Constraints

Detailed description of applicable constraints...

4.1.4 Standards

List of applicable standards

4.1.5 Priority

Priority

5 Performance Requirements

Include a header paragraph specific to your product here. Performance requirements address items such as: how fast specific critical operations must complete; how long it takes to start/stop activities; how long the battery must last; maximum time it must take to set up; etc.

5.1 Run smoothly during usage

5.1.1 Description

Detailed requirement description...

5.1.2 Source

Source

5.1.3 Constraints

Detailed description of applicable constraints...

5.1.4 Standards

List of applicable standards

5.1.5 Priority

Priority

5.2 Respond to the user input quickly

5.2.1 Description

Detailed requirement description...

5.2.2 Source

Source

5.2.3 Constraints

Detailed description of applicable constraints...

5.2.4 Standards

List of applicable standards

5.2.5 Priority

Priority

5.3 Power up and shut down upon user activation

5.3.1 Description

Detailed requirement description...

5.3.2 Source

Source

5.3.3 Constraints

Detailed description of applicable constraints...

5.3.4 Standards

List of applicable standards

5.3.5 PRIORITY

Priority

6 Safety Requirements

Include a header paragraph specific to your product here. Safety requirements might address items specific to your product such as: no exposure to toxic chemicals; lack of sharp edges that could harm a user; no breakable glass in the enclosure; no direct eye exposure to infrared/laser beams; packaging/grounding of electrical connections to avoid shock; etc.

6.1 Draw power from power supply

6.1.1 Description

Detailed requirement description...

6.1.2 Source

Source

6.1.3 Constraints

Detailed description of applicable constraints...

6.1.4 Standards

List of applicable standards

6.1.5 Priority

Priority

6.2 Safe for user to handle and touch

6.2.1 Description

Detailed requirement description...

6.2.2 Source

Source

6.2.3 Constraints

Detailed description of applicable constraints...

6.2.4 Standards

List of applicable standards

6.2.5 Priority

Priority

6.3 Stable and hold structure under weight

6.3.1 Description

Detailed requirement description...

6.3.2 Source

Source

6.3.3 Constraints

Detailed description of applicable constraints...

6.3.4 STANDARDS

List of applicable standards

6.3.5 PRIORITY

Priority

7 Maintenance & Support Requirements

Include a header paragraph specific to your product here. Maintenance and support requirements address items specific to the ongoing maintenance and support of your product after delivery. Think of these requirements as if you were the ones who would be responsible for caring for customers/end user after the product is delivered in its final form and in use "in the field". What would you require to do this job? Specify items such as: where, how and who must be able to maintain the product to correct errors, hardware failures, etc.; required support/troubleshooting manuals/guides; availability/documentation of source code; related technical documentation that must be available for maintainers; specific/unique tools required for maintenance; specific software/environment required for maintenance; etc.

7.1 Requirement Name

7.1.1 Description

Detailed requirement description...

7.1.2 Source

Source

7.1.3 Constraints

Detailed description of applicable constraints...

7.1.4 Standards

List of applicable standards

7.1.5 Priority

Priority

8 Other Requirements

Include a header paragraph specific to your product here. In this section specify anything else that is required for the product to be deemed complete. Include requirements related to customer setup and configuration if not specified in a previous requirement. Add any known requirements related to product architecture/design, such as modularity, extensibility (for future enhancements), or adaptation for a specific programming language. Consider requirements such as portability of your source code to various platforms (Windows, Linux, Unix Mac OS, etc.).

8.1 Requirement Name

8.1.1 Description

Detailed requirement description...

8.1.2 Source

Source

8.1.3 Constraints

Detailed description of applicable constraints...

8.1.4 Standards

List of applicable standards

8.1.5 Priority

Priority

9 Future Items

In this last section, you will reiterate all requirements that are listed as priority 5. This is repetitive, but necessary as a concise statement of features/functions that were considered/discussed and documented herein, but will NOT be addressed in the prototype version of the product due to constraints of budget, time, skills, technology, feasibility analysis, etc. Use the following format for this section.

9.1 The system shall display content for all careers available in the Air Force.

9.1.1 Description

Detailed requirement description...

9.1.2 Source

Source

9.1.3 Constraints

Detailed description of applicable constraints...

9.1.4 Standards

List of applicable standards

9.1.5 Priority

Priority

9.2 The display shall recognize fiducial markers and perform special features

9.2.1 Description

Detailed requirement description...

9.2.2 Source

Source

9.2.3 Constraints

Detailed description of applicable constraints...

9.2.4 Standards

List of applicable standards

9.2.5 Priority

Priority

9.3 The table shall design for profesional use

9.3.1 Description

Detailed requirement description...

9.3.2 Source

Source

9.3.3 Constraints

Detailed description of applicable constraints...

9.3.4 Standards

List of applicable standards

9.3.5 Priority

Priority

9.4 The delivery product shall be a perfect package

9.4.1 Description

Detailed requirement description...

9.4.2 Source

Source

9.4.3 Constraints

Detailed description of applicable constraints...

9.4.4 Standards

List of applicable standards

9.4.5 Priority

Priority

9.5 The delivery product shall be a perfect package

9.5.1 Description

Detailed requirement description...

9.5.2 Source

Source

9.5.3 Constraints

Detailed description of applicable constraints...

9.5.4 Standards

List of applicable standards

9.5.5 Priority

Priority