Preliminary Design Review

Team Castle Quest

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Team Castle Quest

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What’s the Problem?

- Game play is no longer group-centric
- Video games, phone/ipad games are often single player
- Lack of social interaction in current games
- Virtually multiplayer, physically singleplayer
How significant is the problem?

- Entertainment gaming has shifted to online gameplay
- We can’t even play together in the same apartment
Context: effect on individuals?

- Stereotype surrounding individuals who spend their time online being unable to have healthy social interactions
- Having time with others helps the development of empathy
Context: Effect on groups?

- Game companies and rating sites have expanded the idea that single player is the funnest experience.
- Board game market has grown.

2015-2019 GLOBAL GAMES MARKET

<table>
<thead>
<tr>
<th>Year</th>
<th>Smartphone</th>
<th>Tablet</th>
<th>Handheld</th>
<th>TV/Console</th>
<th>Casual Webgames</th>
<th>PC/MMO</th>
</tr>
</thead>
<tbody>
<tr>
<td>2015</td>
<td>24%</td>
<td>30%</td>
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<tr>
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<td>2019</td>
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<td>27%</td>
<td>10%</td>
<td>8%</td>
</tr>
</tbody>
</table>

Source: Newzoo | Q2 2016 Update | Global Games Market Report Premium
newzoo.com/globalreportpremium/
Requirements Analysis: Specifications

- Meet child safety standards of Consumer Product Safety Commission
- Game should fit into a 1ft$^3$ container
- Game should weigh < 5 lbs
- 10+ hours battery life
- Durability to survive transport and repetitive construction/deconstruction
- Support for up to 4 players
- Simple, intuitive gameplay mechanics
- Inexpensive
- Fun to play
Design Alternatives

- **JackBox.tv**
  - Brought people together to play a game
  - Main focus is phones and TV
- **Pokemon Go**
  - Brought people outside
  - Encouraged urban exploration
  - Repetitive gameplay and technical issues
  - Quick decline in active users
Our Solution: Castle Quest

- Electronic board game from the early 80’s
- Revamp, reinvent, and modernize gameplay and design
- Provide encouragement and excitement around a table
- Potentially work with original creators (Milton Bradley)
- The object of the game is to amass an army, collect the three keys to the Tower, and defeat the evil within
Requirements Analysis: Inputs and Outputs

Inputs

- Power
- Touch Display
- Buttons on board

Outputs

- Data via display
- Castle rotation
- Game progression
- Social Development
- FUN
Our Solution: Block Diagram
Power Supply and Management

- **Requirements**
  - Various voltage requirements within Castle
    - Motors, Screen, Data processing

- **Implementation**
  - Custom circuit board for power distribution
  - Amplification and attenuation of voltage as needed
UI

- **Requirements**
  - Easy to use
  - Natural, intuitive

- **Implementation**
  - Buttons
  - Touch Display
  - Mini LCD
Gameplay/Processing

- **Requirements**
  - Fast action
  - Fun gameplay
  - Accurate game information

- **Implementation**
  - Java, Python
  - Raspberry Pi
Memory Management

- **Requirements**
  - Quick to load game
  - Quick to save game
  - Easy to insert and remove

- **Implementation**
  - Removable USB drive
  - Designed to look like part of the Castle
## Estimated Budget

<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
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<tbody>
<tr>
<td>Raspberry Pi</td>
<td>Free (recycled from previous project)</td>
</tr>
<tr>
<td>Castle - 3D printing</td>
<td>&lt; $50</td>
</tr>
<tr>
<td>Board</td>
<td>$20</td>
</tr>
<tr>
<td>PCB</td>
<td>$20</td>
</tr>
<tr>
<td>Touch Screen</td>
<td>~$50</td>
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<tr>
<td>LCD</td>
<td>$25 x 4 = $100</td>
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<tr>
<td>Battery</td>
<td>$15</td>
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<tr>
<td>Memory (USB, SD etc)</td>
<td>$60</td>
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<td><strong>Total:</strong></td>
<td><strong>$315</strong></td>
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Our Development Process

Project Goals

- Establish gameplay mechanics
- Research required materials
- Compile technical specifications and order parts
- Build prototype Castle
- Functional one-player demo
- Prototype board and UI designed for debugging
- Final Castle
- Full four-player game
- Rotational axis
- Final board and UI design

Stretch Goals

- Wireless connectivity to Castle
- Online server with leaderboard and player stats
MDR Deliverables

- Prototype Castle Model
- Prototype game board and UI
- Finalized gameplay
- Code system overview
- PCB design - breadboard mock-up
QUESTIONS?