

Technical Details

By Garrett Clausen

Description of Systems

❖ Gameplay

- **Battle Arena** - Battle Arena gameplay will consist of a five versus five capture the flag style game. Each Guild's goal is to destroy the other Guild's Container. In addition to battling through the other Guild's defense, Guilds will need to battle through waves of Imps flowing down each path and disable two towers per path. After clearing the other Guild's defensive towers, the Guild has now reached the rival Guild's Base. Once there, the Guild must disconnect all three Anchors from the Container. This will allow them to damage the Container. Once the Container is vulnerable, it can be attacked directly and destroyed. The first Guild to destroy the other's Container wins.

During a Battle players will collect Ether by defeating opposing players, Imps, monsters and towers or by completing missions. This Ether can be used to upgrade Armor Sets during battle. These upgrades will be built on an upgrade tree forcing the Player to make decisions about which upgrades to spend their Ether on in battle.

While most of the action occurs on the paths between bases, the off path areas contain features that may help change the tide during Battle. Each off path area will have a Monster Room where monsters have been spawned in. These monsters will be designed to require multiple players for a quick defeat but can be defeated by a skilled individual. The Guild that defeats the monster will receive a temporary attack bonus and receive an amount of Ether for their trouble. The off path areas will also include call boxes which will be part of scavenger hunt missions where a player will need to interact with a given number of boxes spread across the Arena in order to get a reward.

Players will need to return to their home base in order to respawn and reenter the fight when defeated in Battle, . Players will lose a percentage of their Ether but keep any upgrades that they have already purchased.

- **Practice Area** - Practice Areas are designed to be shorter lower cost experiences that new players can use to get a taste of the experience and returning players can use to improve their skills. Additionally, these spaces give players who could not or did not want to join a Guild for a battle in the Arena. These spaces will allow for 1-5 player experiences. When a player or group enters a practice area they will be able to select their experience from a range of options.
 - **Minigames** - These games are short timed experiences where players would use specific skills to perform a gamified task. Some examples would be target practice, brick breaking or a rally based game.

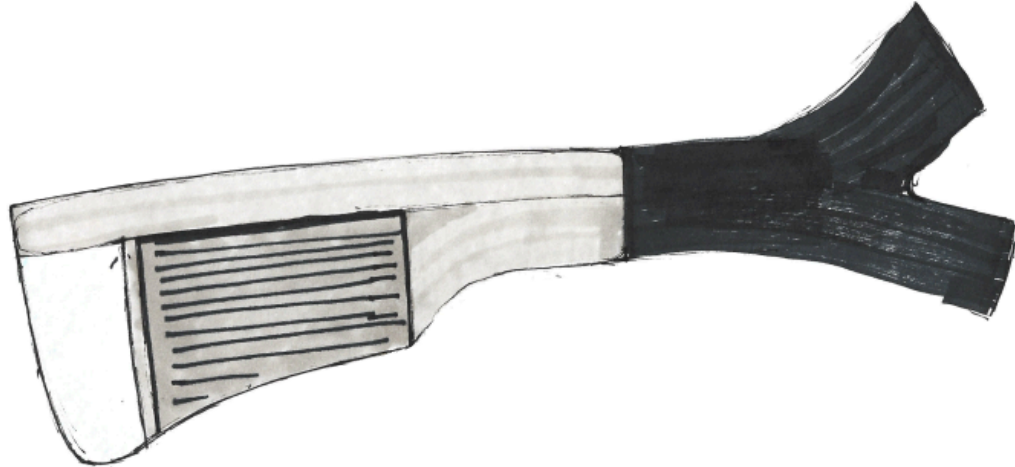
- **Monster Gauntlet** - In this mode players will battle one monster after the other with increasing difficulty. The challenge comes as minimal health is given throughout and there is little time to recalibrate between one monster and the next.
- **Duals** - In this mode players will have one on one or two on two battles. This gives a way to have small scale battles in a more controlled setting. This allows players who want this practice specific scenarios.

The dividing walls in the Practice Areas will be collapsable. This will allow for birthday or company parties to be held in these larger private rooms, without requiring a large room to sit empty and unused most of the time. Pricing would be set at the rate required to cover the revenue that the converted Practice Areas could have brought in during the same period of time.

❖ Augmentation Suit

The Augmentation Suit will consist of 6 or 7 components depending on the Armor Set the player selects. The following is a list of the Augmentation Suit components with descriptions of each. After some initial research the system will likely be built off of the Magic Leap 2 as the Magic Leap is already designed with the computer and battery pack separate from the headset and offers a developer package.

- **Headset** - The main job of the headset is to project the AR holograms for the player to see and game audio to the player ensuring an exceptional player experience. Additional features of the headset will include a camera, a microphone and an accelerometer. The camera is used to record battles for player use, see **Mobile Application - Media** section of this document for more information. The microphone will be used so that Guild members can communicate with each other during Battles in order to coordinate strategy and give encouragement. Additionally, the microphone input will be packaged with the video. Finally, the Accelerometer will be used to anchor the Armor Set head dress to the player preventing the Armor and player from being in different locations.



The Headset will be designed to be comfortable while wearing for long periods of time while active. One key aspect of this design is using a single split strap that runs behind the players head similar to swim goggles. This allows players with longer hair to put their hair in a ponytail or bun that is centered on their head and still play comfortably.

- **Backpack** - The backpack will be where the computer and battery for the Augmentation Suit are housed. This allows for a heavier computer and battery than is available on current commercial AR Goggles. Additionally, it moves the heat that this system will generate away from the players face and head. While also including an accelerometer this component's job is mostly to take the inputs from the rest of the Augmentation Suit, package them and send them to the Central Computer for further processing. The backpack also receives data from the Central Computer and renders outputs for the headset to display.
- **Weapons** - These are the controllers that players will use during Battles. They will include the following buttons: a trigger to fire your weapon and select items within menus, a menu button, and up/down navigation buttons. Additionally, the weapons will include an accelerometer and tactile feedback to enhance the player experience.

There will be multiple configurations of the weapons components depending on which Armor Set is selected. These options are one large weapon, one small weapon, or two small weapons. The physical weapon controllers will be designed with a quick disconnect at the Backpack connection allowing for employees to quickly swap weapons for players between experiences when they would like to play a new Armor Set. Small and large weapons controllers will be functionally identical, the difference will be their appearance to the player. The small weapon controller is designed for use in a single hand while the large weapon controller is designed for two hand use during battles.

- **Shoulder Pads** - With two shoulder pads per Augmentation Suit they will only contain accelerometers and act as anchors for the Armor Set shoulder pads. These

are included to assist in making the Augmentation Suit more comfortable for players.

- **Chestplate** - The chestplate will also only contain an accelerometer for anchoring the Armor Set chestplate. This is included to assist in making the Augmentation Suit more comfortable for players.

The Augmentation Suit will be engineered with the following goals in mind, functionality, durability and repairability. Functionality will ensure that the user experience is consistently outstanding. The focus on user experience will help to establish returning players and better word of mouth marketing for the experience. Durability will help improve the user experience as well by preventing equipment failures during battle. As an added bonus, more durable Augmentation Suit components will help to reduce MBA's negative environmental impact by reducing the waste produced from broken parts and reducing the carbon impact associated with replacing components. Finally, no matter how well the Augmentation Suit is designed, eventually some part of it will break. When this inevitably happens, repairable components will allow for reduced waste by allowing for only the broken parts to be replaced instead of an entire component or entire Augmentation Suit.

❖ **Central Computer** - The game will run off of a central computer system, delegating only minimal tasks to the player's Augmentation Suits. This will allow the game to be run at higher speeds and longer times between recharge of Augmentation Suit batteries or lighter batteries on the suits. This computer will establish and maintain connection with all ten player Augmentation Suits over a Local Area Network (LAN). The central computer will handle the following,

- **Inputs** - The inputs coming into the central computer will be Augmentation Suit piece locations/acceleration data, player inputs and player audio and video.
- **Outputs** - The outputs from the Central Computer to the Augmentation Suits will be the player statuses, game statuses, Armor Set location to be rendered, and Guild audio communication.
- **Internal Computations** - The computations that the central computer will handle include but are not limited to tracking game and player statuses, calculating and updating the position of Armor Sets, projectiles and effects and tracking player interactions.

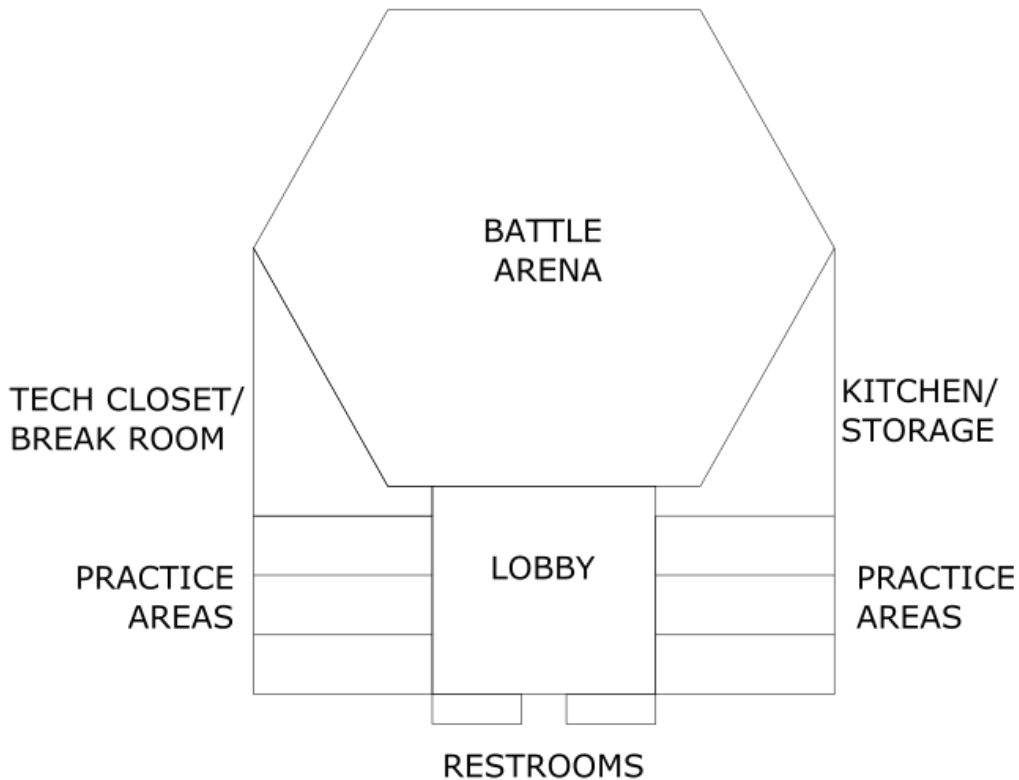
The Practice Areas will each have their own dedicated Central Computers. While performing the same functions as the Arena computer they will cover less players and less area allowing them to be less powerful and therefore smaller than their Arena counterpart.

Facility

The proposed Multiplayer Battle Arena location will be a 43,000 sq ft facility consisting of 3 main areas with 3 supporting areas.

❖ Main Areas

- **Battle Arena** - 24,000 sq ft - The Battle Arena is the main experience offered and is a hexagonal shape 195 ft long and 160 wide. The Battle Arena contains a built physical environment and twenty game pieces. During the game additional AR effects will be added on top of this physical environment.
- **Practice Areas** - 72,000 sq ft - 6 x 1,200 sq ft - The Practice Areas will be empty rectangular rooms. These rooms will function as blank canvases for Practice Area experiences to be built in using the Augmentation Suit.
- **Lobby** - 5,250 sq ft - The Lobby will be a multipurpose space where players can congregate before, after and between battles and practice sessions. The Lobby will contain the following key features.
 - **Entrance Gate** - While being the visual focus point for the Lobby, the Gate will have some technical functionality as well. When booting up the Augmentation Suits the Gate will be the calibration point for the AR effects. From the player's perspective runes on the Gate will begin to glow, if this glowing is in the correct place the suit is ready to go. If the glowing is off target then the suit needs to be recalibrated.
 - **Armor Set Displays** - These displays will be cylindrical tubes with a posed mannequin inside. In order to display the Armor Sets a wiper screen system similar to the displays found in Disney's Guardians of the Galaxy: Cosmic Rewind que. This will give the display a mysterious magical impression and keep the translucent characteristic of the Armor Sets that the AR Headset causes.
 - **Quartermasters Desk** - This will be where players pick up and turn in their Augmentation Suits before and after battles or practice sessions.
 - **Tavern** - Players can purchase food and drinks from the tavern to enjoy while spending time in the Lobby. All items will be sold in reusable dishes or aluminum packaging to allow for recycling. Ideally, a nearby local restaurant will be partnered with, supplying a ready to eat or minimal prep required menu. Additionally, this menu will make the attempt to accommodate as many allergies and dietary restrictions as possible.



❖ Supporting Areas

- **Technology Closet/ Break Room** - 2,400 sq ft - The technology closet will house the central computers for the Battle Arena and all Practice Areas. The Augmentation Suits will also be stored in this space when not in use. Due to its large size and required cleanliness, the space will also function as a break room for employees.
- **Kitchen/ Storage Closet**- 2,400 sq ft - Food that needs to be prepared will be prepared in this area. Space not functioning as a kitchen will be used to store facility maintenance supplies.
- **Restrooms** - 1,750 sq ft - The restrooms will be six single stall restrooms with a high efficiency toilet and a proximity sensing sink to minimize water consumption. The restrooms will be single stalls to solve two problems. First, it will prevent empty stalls while there is a line for the restrooms because anyone can go into any restroom. Then, it also prevents any dilemma for what restroom gender non-conforming people can use when patroning MBA regardless of location.

With this being such a large facility and the experience consuming such a large amount of electricity, care must be taken to reduce the environmental impact. To ensure a comfortable temperature for this active experience, geothermal heat pumps will be used. This regulates the temperature while reducing the energy consumption required for heating and cooling and

eliminates the concern of refrigerant leaks and the negative environmental impacts they pose. When it comes to the power supply, municipalities with higher amounts of renewable energy will be prioritized compared to ones without it. If the experience is built as a stand alone facility solar panels will be installed on the roof reducing the power required from municipal sources. If not, efforts will be made to install solar panels on the facilities used.

Mobile Application

A mobile application will be developed to work alongside this experience and improve the player experience. The mobile application used in conjunction with the experience will have the following categories and functions.

❖ General Information

- **Hours of operation** - This section will communicate location specific hours of operation. This will include special hours for holidays, events, or closures due to weather.
- **Available Armor Sets** - While there will be five Armor Sets which will be constant, an additional five Armor Sets which will change quarterly. This section of the app will be where players can get information about these Armor Sets.
- **Events and Competitions** - Players will be able to find and register for upcoming events such as tournaments or Player Driven Story competitions, see **Design Details - Experience - Story - Continuing Story**.
- **Updates** - If there are updates to the game system, Armor Set balancing, mobile application, etc. Those updates will be posted here for those who want or need the information.

❖ Account

- **Personal Information** - This will include username, email, and other identifying information used to connect digital accounts to real people.
- **Settings** - Personal settings such as volume, retinal measure, and brightness that will be automatically loaded into Augmentation Suit when Players start up their suit. Accessibility setting such as tactile feedback intensity will also be located here
- **Ranking Information** - After competing in a number of battles, players will be assigned a rank in four different categories. Location, region, country, and globally. The rank will be based on Battle Arena and Practice Area performances. The ranking will help motivate players to play more in order to improve their rank by improving their skill and earning more points towards their rankings.
- **Personal Armory** - This will be where players can find the Armor Sets and skins that they have purchased. This will let them review stats, abilities and upgrade trees of their items especially after updates have been issued to the game. This will help players develop strategy for themselves and their Guild.

- **Gold** - Gold will be used as an alternative in app currency. Effectively working as a reward system for repeat players. After battles or practice sessions, players will earn some amount of gold which will be added to their account. This gold can be spent in the shop on Armor Sets and skins, or it can be saved up for long enough to be redeemed for free entry into the Arena

❖ Scheduling

- **Battle Arena and Practice Area Scheduling** - This will be the most convenient way for players to schedule time in the Battle Arena. They will come into the app, select a time slot that is not yet booked and purchase their ticket to play.
- **Guild Building** - This will be an in-app way to communicate with other players in or around the Arena you are looking to battle in and coordinate times to play ensuring that Guilds stay at the full 5 players at all times.

❖ Shop

- **Armor Sets** - The five Armor Sets available on a rotating basis will be available for purchase through the shop even after they have been pulled from the current available roster. This will allow players to retain access to Armor Sets that they enjoyed playing, even if the Armor Set is not part of the current playable roster.
- **Skins** - These are cosmetic variations on Armor Sets. While they do not provide any change to the functional abilities of the Armor Sets they allow players to feel a sense of personalization.
- **No Loot boxes** - While random loot boxes can be lucrative financially, they end up acting as a form of gambling. This can lead to children gambling and has begun to face significant regulation in a number of jurisdictions. This leads me to have decided that they should not be included in the business of Multiplayer Battle Arena.

❖ Media

- **AR Photos** - In order to see the augmented reality effects in photos it will need to run through the MBA system. In addition to accessing the group photo taken before each match used to calibrate the system, this section of the app will allow people to take photos of their parties with the AR effects included.
- **Video Replay** - The camera and internal microphone included in the headset will capture video and be processed to include an overlay of the AR effects during battles and practice sessions. This video can be reviewed by players and then if they would like to own the video, they can purchase it. This will allow players to share clips of their battles, allowing them to build followings and provide free marketing for the Multiplayer Battle Arena.
- **Battle Highlights** - The video captured in the Video Replay system and will be automatically clipped down to provide a game highlight reel. This will also be available for purchase at a lower price than the full Video Replay.

Staffing

For multiplayer battle Arena to function as desired and provide the best possible experience two types of teams will be required. The Central Office team and Operations teams at each operating location. The Central Office will be responsible for game updates, logistics and strategy. The Operations team will consist of 4 main roles

Host - The host will check in players as they enter and make sure they have any information they may need about their experiences.

Game Master - The Game Master is responsible for ensuring that players are ready to enter the Arena and Practice Areas at their allotted times and tracking game status to assist with game resets or malfunctions.

Quartermaster - The Quartermaster distributes Augmentation Suits to players before battles or practice sessions as well as collecting them after. The Quartermaster is also responsible for cleaning and maintaining the Augmentation Suits.

Tavern Keeper - The Tavern Keeper takes orders, cooks food and serves both food and drink.

In addition to these four roles a management structure will be required to keep the location running smoothly and coordinate with the Central Office team.

Scheduling Operations

As discussed in the **Mobile Application section** player scheduling will be done mostly in the Mobile App with in person or over the phone scheduling also being available. MBA locations will open in mid to late morning, 9am - 11am and run until the early hours of the morning, 12am - 2 am. The following will be the proposed time based information for the offered experiences.

❖ Battle Arena

The Battle Arena will be booked for half hour experiences with individual battles being designed to be 15 minutes long. This allows most Guilds to get in at least one full battle and maybe squeeze in a second. Time slots will be available to reserve on the hour and half hour.

❖ Practice Areas

Practice areas can be reserved for between 15 and 30 minute blocks. In these blocks the minigames played will be on average 5-10 minute experiences. This allows players to try a number of minigames or try the same one multiple times during one practice session.

Both the Battle Arena and Practice Areas will also have a waiting list for players that would like to spend more time in one of the experiences offered the option to do so without having to have scheduled back to back blocks of time and makes room for walk up players.

Scalability

Multiplayer Battle Arena locations can be modified from the originally proposed arrangement in order to scale the facilities up or down. This would be accomplished by adding or removing Practice Areas and Arenas. The smallest Multiplayer Battle Arena location could be as small as 2 practice areas and a bare bones lobby, approximately 3200 sq. ft. To scale up the facility practice areas and/or an Arena can be added in order to expand the facility and accommodate more patrons at once.