Toronto Metropolitan University
Master of Digital Media

DG8010 New Frontiers: AR/VR in practice

TRAIN QUEST - Final Report

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SUMMARY:

Train Quest is an engaging and turn-based AR card game. The game puts the two players as the driver or the saboteur, with the driver trying to improve the customer experience (happiness) while the saboteur is trying to destroy it. The game's goal is for the driver to get as much happiness value from the customer as possible at the end of the game, while the saboteur aims to reduce the customer's happiness as much as possible.

In order to set up the game, players must choose their characters and receive cards corresponding to their roles. The game will involve the use of two mobile phones. The player will use one phone to scan the cards and use the AR system to find out the happiness value of the passenger corresponding to the card. The other phone will scan the green track (cards) to show the game's progress and record the passengers' happiness value at the same time.

The game involves two types of game cards: Advantage cards and Disadvantage cards. Advantage cards are played by the driver and will increase the customer's happiness to ensure a successful train ride. The disadvantage card, on the other hand, is played by the saboteur and will reduce the customer's happiness to try and sabotage the train ride. In addition, players can use wildcards to enhance their advantage. There are three varieties of wild cards, and each player has the same number of wild cards. These cards can be used to pick up extra cards, remove random opponents' cards, or erase all of their opponents' cards for that turn. If the saboteur manages to reduce the customer's happiness to zero by the end of all rounds, they win the game. Otherwise, the driver wins.

Overall, Train Quest is an exciting and engaging game that requires strategy, memory, and fortune to win. Players must choose their characters and use their cards wisely to improve or destroy the happiness value of the passengers. In addition, the integration of AR in the game can stimulate players' interest and increase their gaming experience.

Train Quest is designed for children. Following this, it includes skill building for essential tasks such as memory and strategy. Similar to card matching games, players must hold the value of each card in their mind, while continuing on with other tasks, strengthening their recollection abilities. As players are competing against each other, they must think ahead to decide when would be best to use their higher value cards, their lower value cards, and their wild cards. The AR element of the game creates novelty, and the fun 3D models add a visual element to keep players engaged and entertained.

MOTIVATION:

The original concept for this project was to give users wooden train tracks, and allow the track circuit to be built as they wished. When users then used their phone to scan the tracks, a train would appear and move along the tracks that were built, however crazy they might be. This was meant to be a way of bringing tech and newfound interest to a beloved children’s toy. However, we did not believe this suited the design guidelines of AR: because the only interactive portion of this project was to build the tracks, once this was done it was no longer interactive, and the user’s feeling of autonomy and presence was diminished as they could only watch the train follow the

track. And so the idea of giving the train scenarios to move forward or stop came to mind, and we started developing the first version of this game.

We believed a simple card game would best support this idea, as the user would have a measure of autonomy over the game, would constantly be interacting with the elements, and would feel immersed in playing the game. As a way to introduce strategy, Train Quest was created as a two player game. This would force players to plan ahead to decide which cards would be best used when to counter their opponent and achieve their goal.

TECHNICAL DETAILS:

Train Quest was created in Unity using the Android Build settings.
The cards were hand drawn and created by our team, and uploaded to Vuforia Engine to be used for AR scanning.
3D models were sourced from the Unity Asset Store and Sketchfab.
The project included scripts for various purposes such as:
(Link directly to the script folder on Google Drive: https://drive.google.com/drive/folders/1gNxi_B2jQramXjJSxT1U5E3dVoADNuTo?usp=share_link)

1. Moving the train based off the scanned track card by updating the position gradually (TargetHandlers.cs and TrainMoving.cs)
2. Reading the scanned card, pulling the happiness value from a dictionary, updating the current happiness value, and deleting this card from the dictionary to prevent repeat values (Cards.cs)
3. Update the UI (TargetHandlers.cs)

LESSONS LEARNED:

While designing and developing our game, we gained valuable technical skills to create AR board games. We also learn several crucial lessons that will help us in future game development.

Simplicity adds accessibility: We were excited about incorporating AR technology into our game in the initial design stage. However, our ambitious vision and optimism about what we could achieve within our limited timeframe proved challenging. We learned that simplicity is often the better approach in game design. While complex features can add interest, they can also lead to confusion and limit accessibility, particularly for younger audiences.

Project management: This intense course has proposed many challenges for project management in a collaborative manner. After we finalize our design direction. We learn to set a clear goal and identify the milestones for the project is crucial. This will help everyone on the same page and align our vision together. A well organized plan with detailed and concise actionable artifacts in forward would ensure the progress is being made towards the final product.

Balancing AR integration in board games: It is important to balance gameplay and AR features in the game experience. AR technology can enhance the game's immersion and engagement. It is an interesting component to incorporate AR cameras and board games together. While AR can

provide a unique and immersive experience, it should be used to complement and enhance the core gameplay rather than overshadow it. Our primary objective of the game is to provide an enjoyable and engaging gameplay experience to the players. In this session, we learn to implement Augmented Reality's virtual visibility component to create meaningful gameplay. (reveal points in AR)

Feedback and Testing: During the showcase, we saw the players reactions. We have learned that we should always conduct extensive testing and prototyping during the game design stage. The prototype tested with a larger group of players approaching the game for the first time would allow us to get feedback on the gameplay, balance, and overall fun factor of the game. Based on the feedback, adjustments can be made to the game mechanics and design to make it more engaging. Understanding their confusion and pain points would let us identify player experience and emotional shifts during the gameplay.

FUTURE PLANS

In the future iterations, we aim to develop a more well rounded game experience for both the driver and saboteur. In the current stage, we have developed a five round AR train game in which players use one phone to scan all the cards to progress the game, and another phone to view the values of each card. However, this can be a little difficult to juggle. For our next steps, we will focus on the (a) user experience: expand the gameplay and obstacles to increase strategy and competitiveness in the game (b) user interface: create end to end UI that combines the two phones' functions and allows for networking between the two players' phones and (c) marketing: to create a sustainable revenue stream from the game.

<u>NEW PLACES, NEW TRACKS, NEW PACKS</u>
Expanding the game with more tracks and new card packs based on different scenarios or themes could be a great way to keep players engaged and excited about the game. For example, adding a Christmas or Halloween theme could make the game more seasonal and relevant, and players may be more likely to play the game during those holidays. Introducing new tracks or city scenarios could also add more variety to the game and make it more interesting for players, which can be related to different locations or cultures, making the game more educational.

We plan to release new card packs and DLC scenes in the future, including but not limited to:
(1) Galaxy Sky Tour: Head to space and build tracks to different galaxies with out of this world features and images.
(2) World Tour of Culinary Exploration: Add food-themed cards as a new win condition and allow single player mode in this DLC. Build tracks in different cities around the world and add new trains that feature decorations from different cultural backgrounds.
(3) Halloween: Candy Battle!: Face off with friends! Including a multiplayer mode for up to 4 players (allowing for up to 2 drivers and 2 saboteurs) players compete for candy as a new win condition. Tracks and trains will feature Halloween-themed decorations.
(4) Winter Wonderland: Drive through snowy landscapes and see a beautiful white wonderland with winter-themed elements such as snowflakes and ice sculptures.

(5) Time Travel: Travel through the centuries to visit the past and future with period-specific elements like knights and cowboys.

ROGUE-LIKE FEATURE

By incorporating a rogue-like feature to Train Quest, the game can offer a greater level of challenge and excitement for players. This feature could introduce unexpected and unpredictable events that impact the gameplay, such as random delays, the train that suffered damage at the beginning, and thieves among mid-board passengers. Those random events will cause failures that players must overcome using their cards or make a new strategy for the next turn. The event system would not only increase the game's replayability but also add a layer of complexity and depth to the gameplay.

SINGLE-PLAYER MODEL

Making Train Quest a single-player game can be done by incorporating an AI opponent that takes on the role of the saboteur. The AI opponent can have varying levels of difficulty, allowing the player to choose the level that suits their game abilities. The player can then use their strategy and card playing skills to try and outwit the AI opponent and achieve the goal of improving the customer's happiness. However, since the game is designed for children, it is important to keep the difficulty level at an appropriate level so that it remains challenging yet not too frustrating.

FUTURE IMPROVEMENT: DEVICE COMBINATION & NETWORKING

Combining the two phones' purposes into one device and allowing for networking between two players' phones. Combining the functions of the two phones, used for scanning cards and tracking game progress respectively, would simplify the game's mechanics and increase convenience for players. Additionally, allowing players to connect and play against each other remotely, using Bluetooth, Wi-Fi, or mobile data networks, could expand the game's audience beyond just two players in the same physical location. This would increase accessibility, while also introducing new features such as online leaderboards and achievements to incentivize players to continue playing and competing against others.

PROFIT

The profitability of Train Quest will depend on several factors, including the target market, pricing strategy, and marketing efforts. To generate revenue, the game can explore various options such as in-app purchases, offering players the chance to purchase additional advantage or wild cards, which can enhance their chances of winning. The integration of ads into the game can also be a potential revenue stream by allowing advertisers to reach your audience. A premium version of the game, featuring new scenarios, tracks, or cards, can also be offered for a one-time fee or subscription. Additionally, creating physical merchandise based on the game's characters or cards can serve as an additional source of income. The ultimate success of Train Quest will depend on its ability to attract and retain players, as well as the effective implementation of these monetization strategies.

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