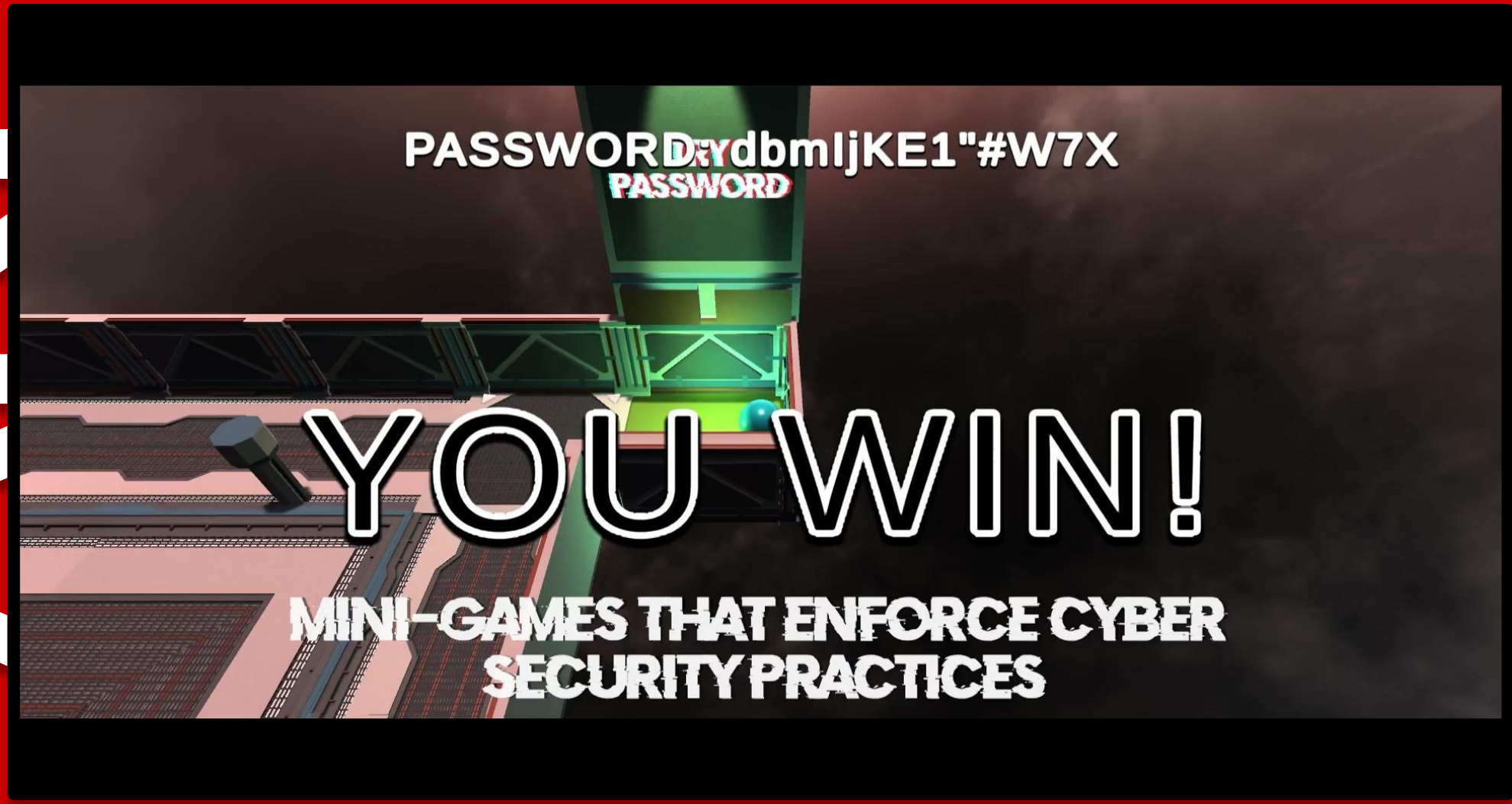
AN INNOVATIVE FIRST-PERSON, SCI-FI, CYBERSECURITY ESCAPE ROOM EXPERIENCE

ARI



DEVELOPED BY SENDHELP STUDIOS || 2021-2022 || MARIST COLLEGE

ARI

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- Through the use of an innovative first-person, sci-fi, cybersecurity escape room experience and built upon a proven Octalysis gamification framework, ARI is designed to improve user engagement and knowledge retention of cybersecurity principles and best practices
- Created as a Senior-Capping Project by Marist Students:

Omar Dirahoui	Erin Alvarico
Dominick Avitable	Michelle Maloney
Joseph McDonough	Liyuan Jin
Bryan Mah	Scott Scherzer
Brian Sprague	Aidan Sweeney

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ARI OVERVIEW + DESIGN

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❑ NARRATIVE:

- You play as ARI, a utility droid on a space station that is tasked with saving your creators life
- As the game unfolds, ARI has to repair station systems in order to expedite their creators return to the station
- Whilst remaining on the station, the world is discovered and explained through supplemental information ARI comes across throughout the station

❑ DESIGN DIRECTION:

- ARI was designed to help create a fun and innovative way for prospective cybersecurity students and those already in the field to practice and further their understanding of Cyber practices
- Narrative is included to keep players engaged in content
- Module-based levels to keep units/subjects separate from each other for replayability

ARI INSPIRATIONS + INFLUENCES

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❑ SHAPING ARI:

- ARI is inspired from a mash up of many different games and media that have been released since the 1990's

- Some of these include but are not limited to:

Star Wars	Fallout
Star Trek	Deus Ex Machina
Mass Effect	Hardspace: Shipbreaker

❑ DESIGN DIRECTION:

- With such a broad base of Sci-Fi media, we needed to use a tool that assisted us in catering our story to suit the needs of what we aimed to accomplish.

OCTALYSIS ANALYSIS

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- Used Yu-kai Chou's Octalysis tool that measured different aspects of gamification and behavioral designs
  - GAMIFICATION: design process that places the most emphasis on creation with a focus on human development
  - OCTALYSIS: is an octagon graph which allows any user to input their own values based on how well they feel a game meets each category on a scale of 1-10
- Accomplishment, Avoidance, Empowerment, Epic Meaning, Ownership, Scarcity, Social Influence, and Unpredictability

https://yukaichou.com/gamification-examples/octalysis-complete-gamification-framework/

OCTALYSIS ANALYSIS

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- Each team member created a report to calculate group average
  - Data allows the team to decide what aspected need more work and where to best focus our attention to produce the most compelling game
- Average scores calculated below after collecting data from all team members
- ARI received an average of at least 7.9 in all but 3 categories

Epic Meaning	Empowerment	Social Influence	Unpredictability	Avoidance	Scarcity	Ownership	Accomplishment
8	8.6	6.8	7.2	8.4	7.9	3.1	8.2

OCTALYSIS UNPREDICTABILITY

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❑ UNPREDICTABILITY - 7.2

- **SCORING: for this is described as “not knowing” what will happen next. This then results in your brain desiring to know what will happen next, leading to a better experience while playing.**
- **In providing an air of mystery or randomness to the result of an action/game space can excite and further replayability.**
- **The lower score for this category is due to a lack of replayability at the moment, but this can be easily remedied by adding more random elements to the minigames.**

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OCTALYSIS SOCIAL INFLUENCE

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❑ SOCIAL INFLUENCE - 6.8

- **SCORING: for this is described as anything that provides the ability to relate a portion of the game to the player. Encompasses all social elements that drive people, including competition.**
- **All members recognize that the game is built to teach cybersecurity practices, so the user can further their understanding.**
- **Lacking in this category as current implementations do not include comparisons to other peers other than the scoring system for post/pre quizzes. A leaderboard can be implemented to bump up the score.**

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OCTALYSIS OWNERSHIP

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- **OWNERSHIP - 3.1**
  - **SCORING: Examples of ownership in game involve accruing currency, or being able to design your own character, either from the ground up or with unlockable cosmetics.**
  - **Features that exhibit ownership is the in the planned badge/achievement system.**
  - **Other potential ideas for adding customization options to ARI are, unlockable skins or color palettes, which can boost this score.**

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ARI TECHNOLOGY OVERVIEW

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- **GAME ENGINE: Unity (C#) version 2020.3.18f**
  - Unity Asset Store for some digital assets and art
- **DATA STORAGE & WEBSITE HOSTING : AWS**
  - API Gateway, DynamoDB, S3
- **VERSION CONTROL : GitHub**
  - Git, Github Desktop, Github LFS
- **FILE & DOCUMENT STORAGE: Google Drive**
  - Google Docs, Google Sheets, Google Slides
- **COMMUNICATION: Discord**

Main Character Design: ARI (Unity Store Asset)

ARI GAMEPLAY

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❑ GAMEPLAY LOOP:

- **OVERWORLD || Disrepaired Space Station**
  - ***(1st POV)* User navigates the space to explore and find the necessary clues to complete the minigames and level**
- **MINI-GAMES || terminals scattered around the world where user will be learn and perform Cyber Security tasks**
  - **After successful completion, will unlock the next area to progress**
- **Custom Node Based Movement**
- **Custom Designed Dialogue Manager**
- **Interactable Overworld Environment**

ARI CURRENT MODULE DESIGNS

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❑ Currently three cybersecurity levels are mapped out + a tutorial stage

- TUTORIAL - Game Controls, Game Environment + Bad Practice
  - Node Movement, Interaction, Plugging a random USB into a computer
- Planned NOVICE levels:
  - LEVEL 1 - Password Protection
    - Good password practice, ciphers and MFA
  - LEVEL 2 - Internet Fraud
    - Phishing, social engineering and DDoS attacks
  - LEVEL 3 - Network Security
    - Defense in depth, malware, worms and firewalls

ARI MODULE DESIGNS IN-DEPTH

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Level 1 - Password Protection

- Good Password Practices
  - Roll-A-Ball minigame
- Cryptography
  - Caesar cipher minigame
- Multi-factor Authentication
  - Finding phone: lock-picking minigame

Level 2 - Internet Fraud

- Email Phishing
  - Select the legitimate email
- DDoS punishment if wrong email selected
- Social Engineering
  - User is given word blocks and required to create a phishing email

Level 3 - Network Security

- Defense in Depth
  - Frogger minigame
- Firewalls
  - Temple Run/Subway Surfer style minigame
  - Firewall blacklisting punishment
- Malware & Worms
  - Asteroids style minigame called “VM”

GAMEPLAY IN-GAME EXAMPLES

GAMEPLAY

OVERWORLD

MINI-GAME

TERMINAL HACK

MINI-GAME

CRYPTOGRAPHY

ARI DEVELOPMENT PROCESS

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- Originally, three levels were drafted for each tier of difficulty *(novice, proficient, expert)* along with a tutorial level (overworld navigation)
- Covered topics like bad practice, password protection, internet fraud, and network security *(introductory/novice units)*
- Due to time constraints, only the tutorial and first level were implemented
- CHALLENGES:

Out of the CS + Cybersecurity capping groups, there were NO CLEAR OR DEFINITE MILESTONES for a game-oriented product.

NO ART DEPARTMENT: heavy-programming and design developers, which led to the team utilizing free Unity assets to be placeholders for the game environment and characters.

UNBALANCED TEAM: 2 out of 10 members had solid, prior game development experience.

This led to the team taking the planning/pre-production phase (2-3 weeks) and teaching others how to utilize developer tools (Visual Studio Code, Unity, Github).

ARI POLISH + LAUNCH

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- ❑ **Gather larger audience to play the game and complete our playtesting survey to gauge user feedback.**
  - **Identify what content users react positively to *(types of mini-games)***
  - **Tweak and assess mini-game difficulty & scalability *(appropriately challenge players)***
  - **Allows for bugs to be squashed before release *(polish and user experience)***
- ❑ **Utilize the data gathered from pre-post quizzes to determine how well the cybersecurity principles are being taught.**
  - **Ensure the teaching of cybersecurity principles is effective and meets the goals we have in place**

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ARI

THE ASK: PROBLEM & OUR SOLUTION

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24% OF IT WORKERS ARE UNAWARE OF BASIC SECURITY POLICIES

CYBERCRIME IS GROWING! Costs over $5B+

CYBERSECURITY VENTURES

FORRESTER

GartnerGroup

TAM FOR CYBERSECURITY TRAINING = $1.5B+

ANTICIPATED GROWTH 4X IN 3 YEARS

ARI

Competitive Position vs Top 5 Companies (90% market)

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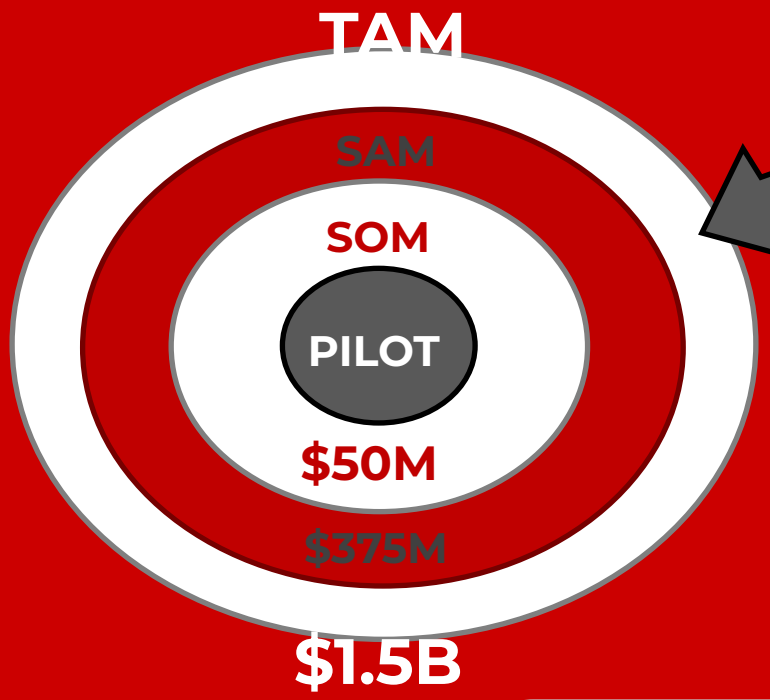
	ARI	IBM MUSE	LIVING SECURITY	KNOWBE4	CYBSAFE	INFOSEC
GAMIFICATION DESIGN	✓	✗	✗	✗	✗	✗
PROVEN FRAMEWORK (I.E. OCTALYSIS)	✓	✗	✗	✗	✗	✗
ETHICAL COMPONENTS	✓	✗	✗	✗	✗	✗
PRICE	✓	✓	✗	✗	✓	✓
TARGET MARKET (PRE-COLLEGE STUDENTS)	✓	✗	✗	✗	✗	✗
DRIVES CULTURAL CHANGE	✓	✗	✓	✗	✓	✗

ROADMAP TO SUCCESS

AN ANALYSIS OF THE CYBERSECURITY MARKET & OUR GO-TO DEVELOPMENT MAP



Next 3+ years □ 4X GROWTH!
No significant barriers to entry Annual Market Refresh!

EXIT

PARTNERSHIP
ACQUISITION
OF PRODUCT/SERVICE

PILOT

YEAR ONE
MARIST COLLEGE
$12K

ADJACENT MARKETS

CLOUD ROLLOUT

ARI ADDITIONAL RESOURCES + TESTIMONIES

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1 *“We have to do a lot of cybersecurity training at work. This would be much more fun and enjoyable”* - Open House Visitor #1

2 *“I learned enough about passwords that it made me reconsider my current methods”* - Beta Tester #15

3 *“I thought it was real good for learning about cyber security!”* - Beta Tester #8

For more information and to download the game yourself, visit: http://aricyberthink.com/

THANK YOU!

ANY QUESTIONS, COMMENTS, OR CONCERNS?

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