ΧΩΡΟΕΥΑΙΣΘΗΤΑ ΠΑΙΧΝΙΔΙΑ

Επισκόπηση & Συγκριτική Ανάλυση Εργαλείων Ανάπτυξης

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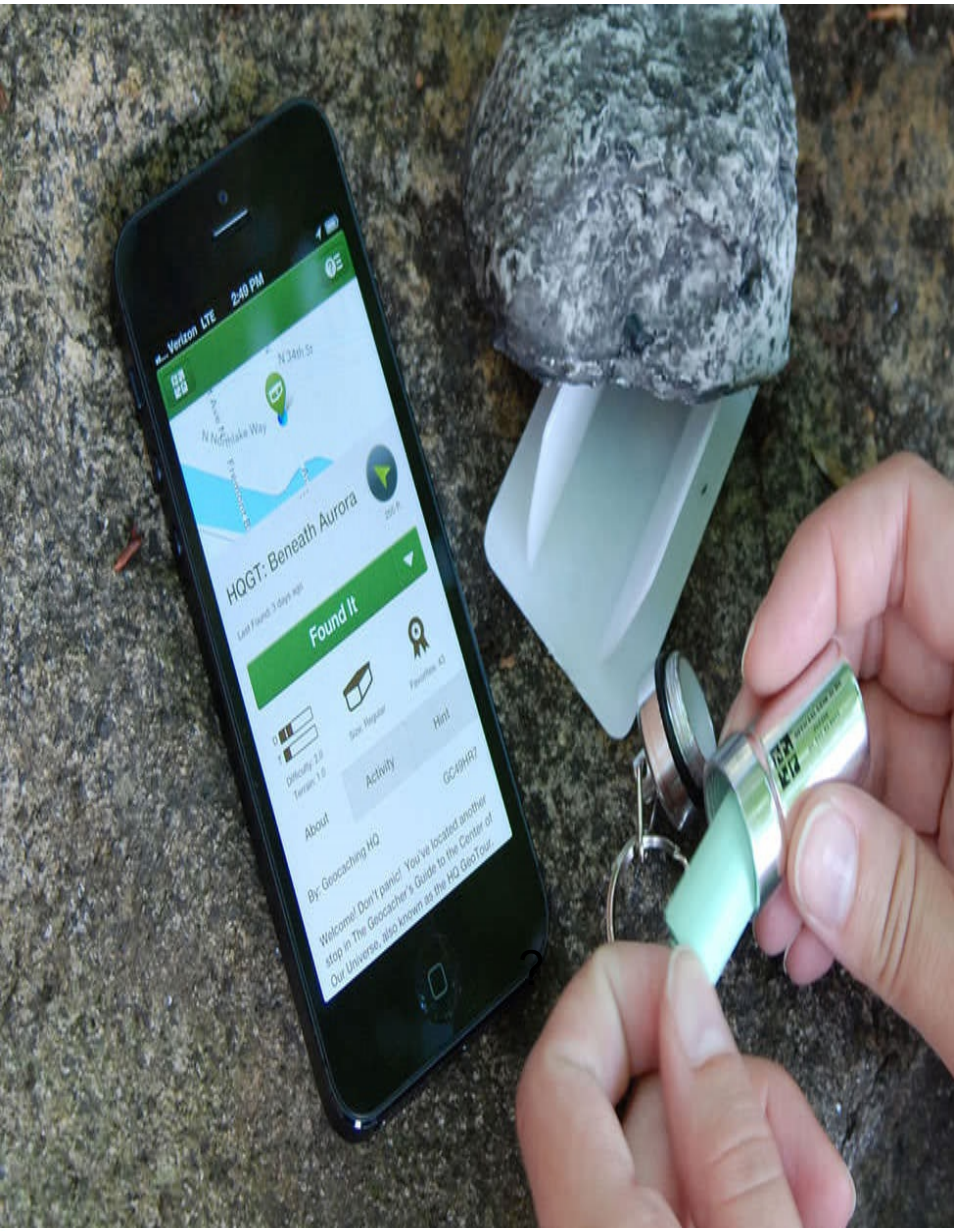
Δαμιανός Μετικαρίδης

Έναρξη

Presentation Contents



LBG Characteristics

Pervasive Computing, Positioning Techniques, Augmented Relity, Educational Purposes, Game Elements, Development Tools

TaleBlazer

Fundamental Concepts, Editor Tabs

ARIS

Fundamental Concepts, Editor Tabs

Unity/Mapbox

Fundamental Concepts, Editor Tabs

Implementation

TaleBlazer, ARIS, Unity

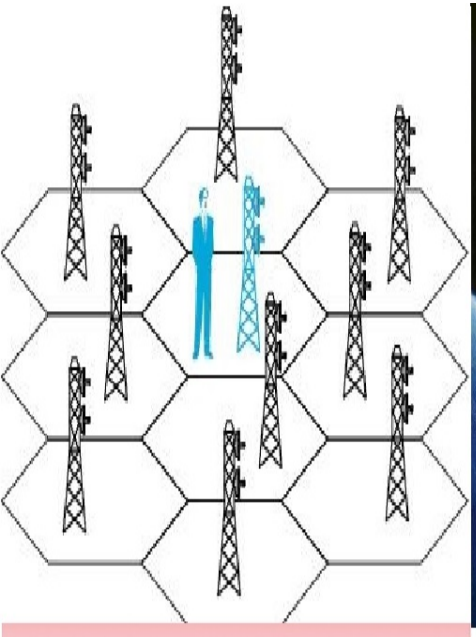
Comparison

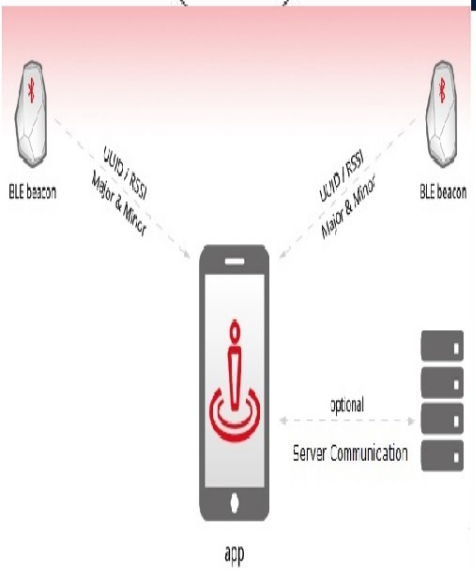
Bibliographic & Implementation Metrics

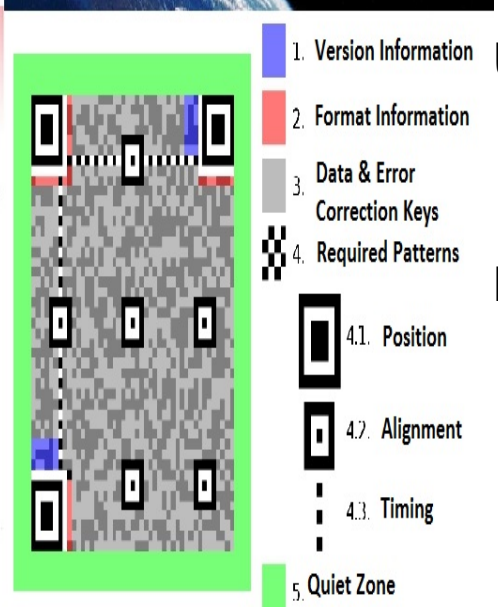
Conclusions

TaleBlazer / ARIS, Unity / Mapbox

LBG Characteristics







LBG Definition

Famous Games

Geocaching, Ingress, Pokémon Go

Characteristics

Technology (UC, Positioning, AR, Apps)

Temporality / Spatiality

Sociality (Interaction, Communication)

Informal Learning (Constructivism)

Ubiquitous Computing

Player Experience

Physical, Cognitive, Social, Emotional

Positioning Technologies

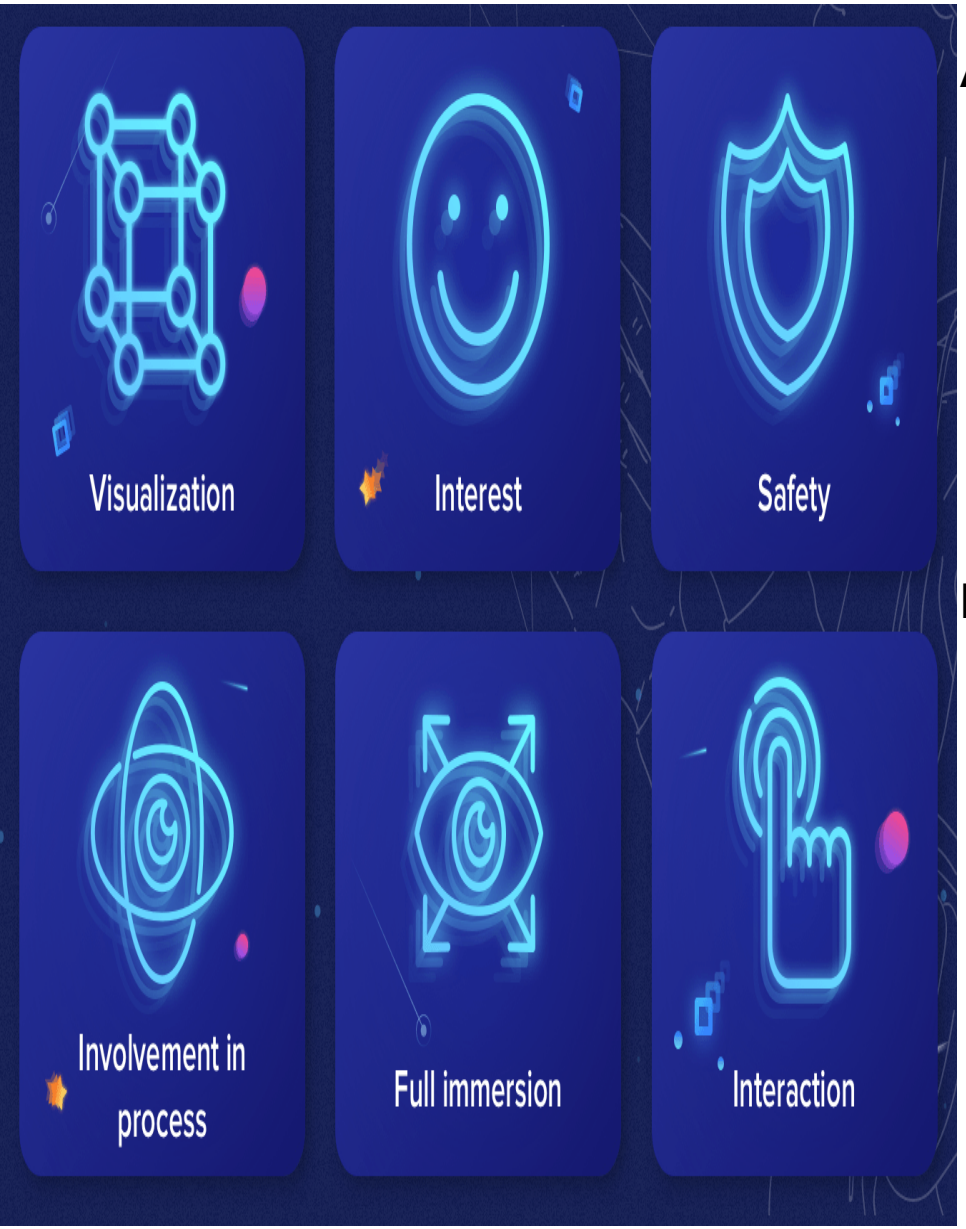
Cell Positioning (GSM, Transceiver Station, Cell)

Global Positioning System (Satel, Stations, Receiver)

Bluetooth Beacons (BLE, UUID, Major, Minor)

Quick Response Codes (Barcode, Data Storage)

LBG Characteristics



Augmented Reality

- Technology Components
  - Device, Application, Marker, Content
- Disadvantages
  - Weather, Privacy Breach, Physical Security
- Learning Benefits
  - Immersion, Interaction, Visualisation

Informal Learning

- Narration
- LBG Categorisation
  - Lydic (Action Games, Treasure Hunts, RPGs)
  - Hybrid (Mobile Fiction, Museum Games)
  - Pedagogic (Language Learning, Active Sim)
- Learning Theories
  - Behaviorism, Cognitivism, Constructivism, Social, Contextual

LBG Characteristics

Game Elements

Map, Area, Quest, Track, NPC, Bump, Item, Unlock, Dialogue, Progress

Game Design

Concept, Mechanics

Design Document, Design Pattern

Development Tools

Available Tools (TaleBlazer, ARIS, Unity, AirFresh...)

System Architecture (Editor, Server, Application)

Game Development (Standardised / Non Games)

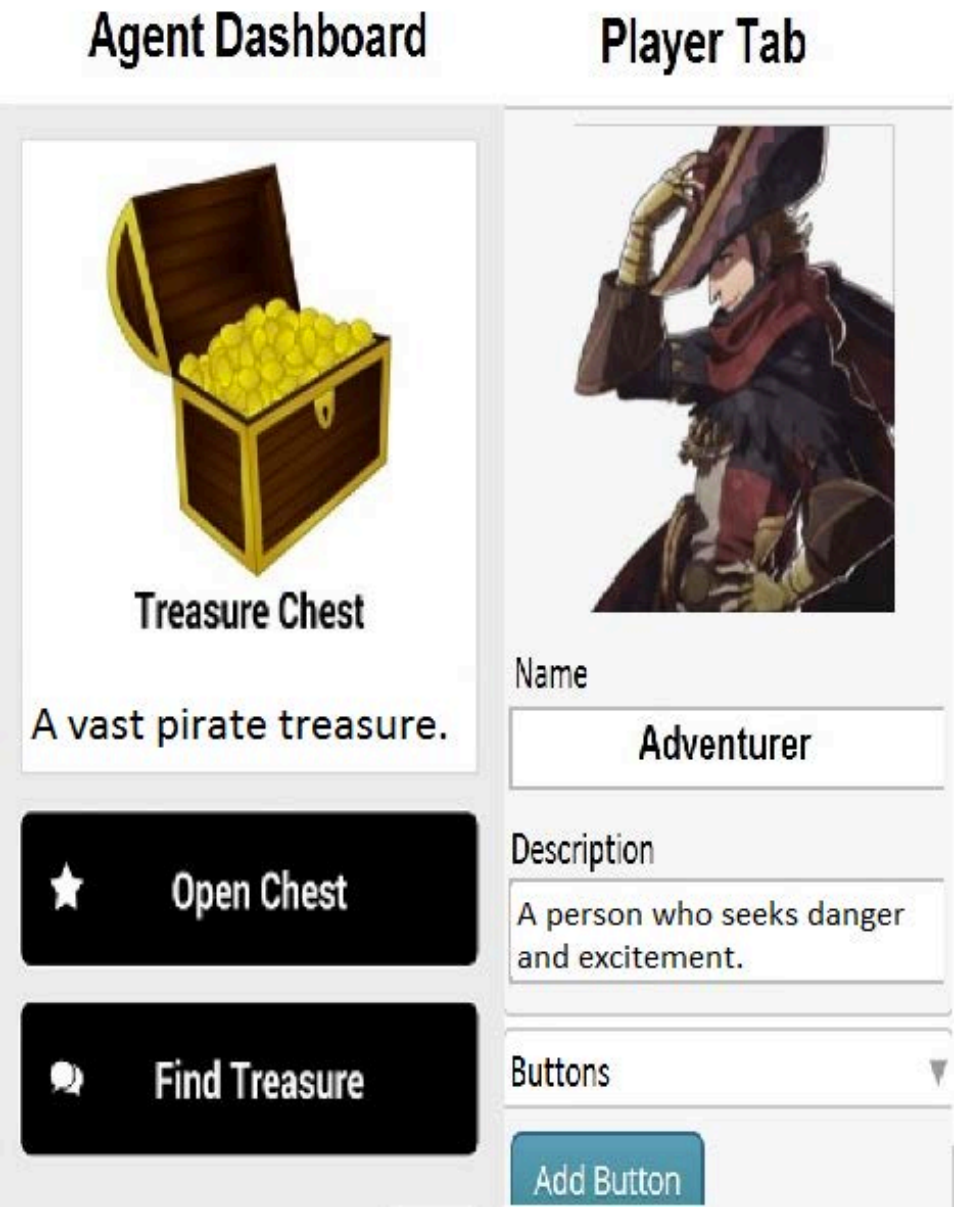
Development Process (Map Authoring, Coding)

Game Publication (Developer Licence)

Developer Functionality (Fast & Effective Process)

Player Captivation (Engaging & Meaningful Games)

TaleBlazer



Introduction

Scheller Teacher Education Program, MIT

System Architecture (Mobile App, Web Editor, Game Server, Multiplayer Server, Analytics Server)

Famous Games (Red Butte Garden Game Suite, ImparApp, AR_Zombie Apocalypse)

Fundamental Concepts

Agents

Item, Character, Tapping, Proximity, Clue Code

Traits & Actions

Variables-Buttons (Text / Video / Builtin / Script)

Regions

Physical-Digital, Open-Close

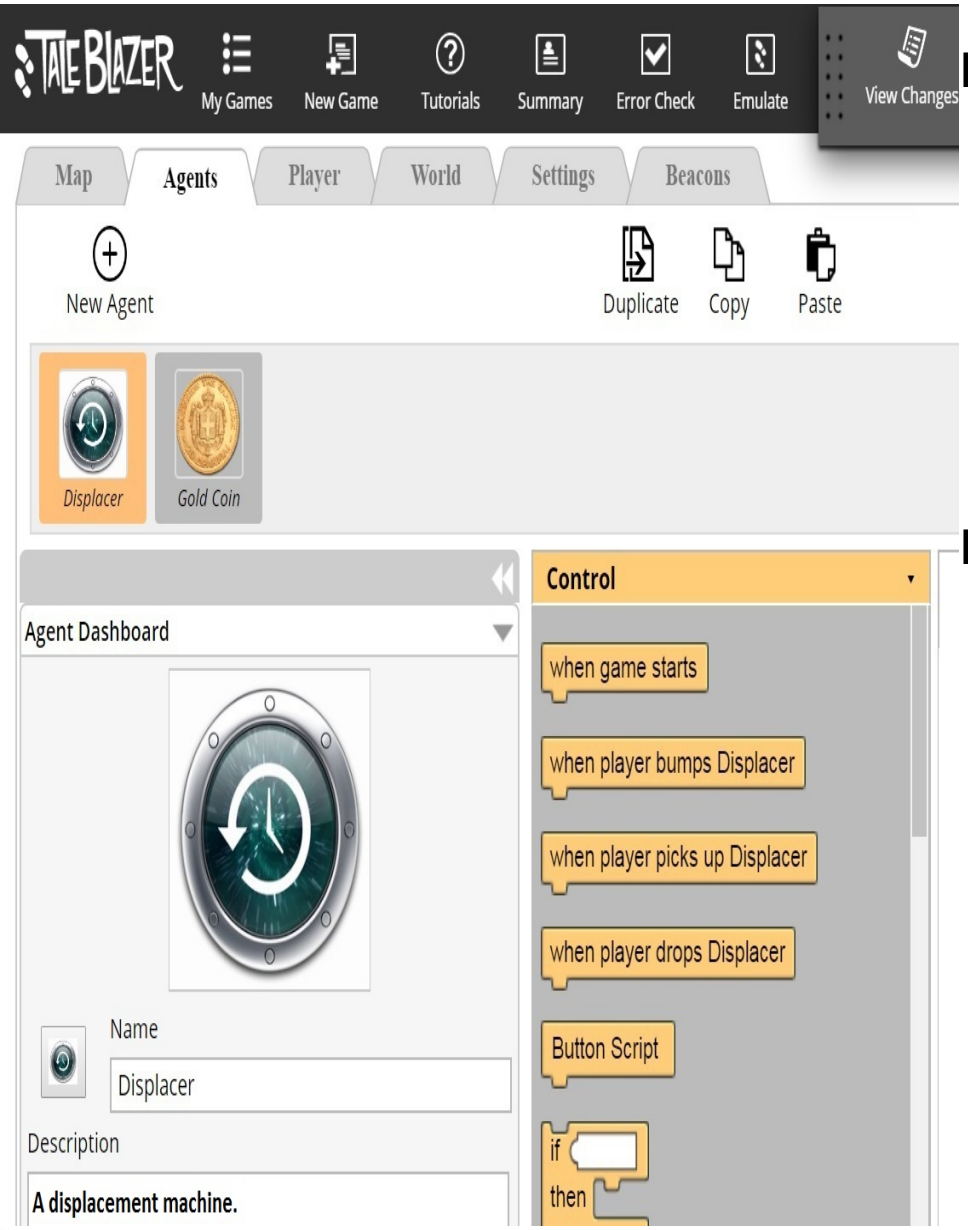
Roles

Player Classes

Scenarios

Difficulty, Duration, Start Location

TaleBlazer



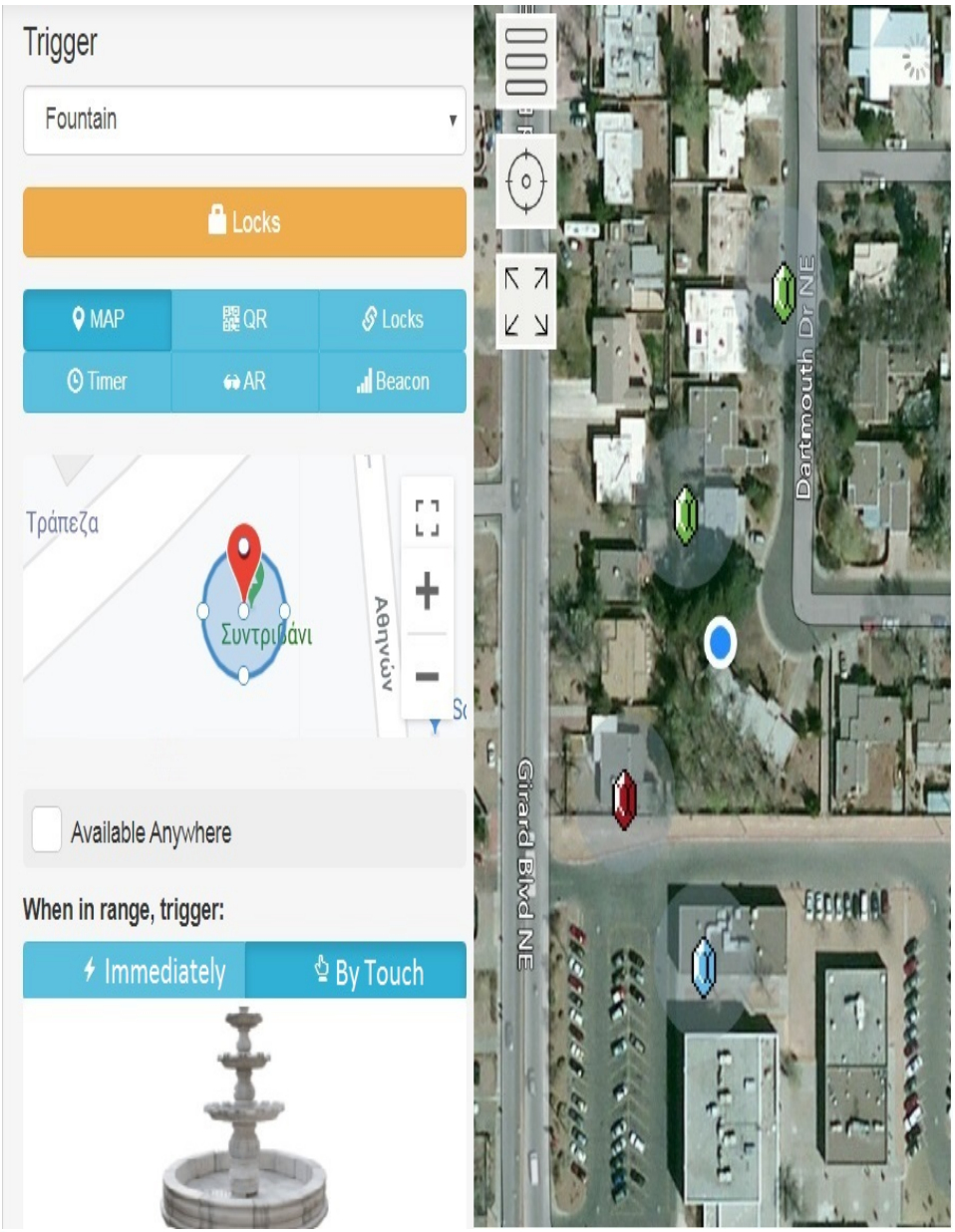
Editor Tabs

- Map (Regions, Coordinates, Custom Maps, Indoor)
- Agents (Dashboard, Settings, Buttons, Traits)
- Player (Role, Dashboard, Buttons, Traits)
- World (Dashboard, Buttons, Traits)
- Settings (Tabs, Introduction, Scenarios, Bump Setup)
- Beacons (Dashboard, UUID, Major, Minor, Bump)

Blocks Based Scripting Language

- 8 Block Groups (Agents / Player / World Tabs)
  - Control (Orange, Conditions, Repetition)
  - Operators (Green, Mathematical Operations)
  - Game (Yellow, Agent / Player / Scenario Choice)
  - Looks (Levander, UI Related Functionality)
  - Movement (Blue, Regions & Distance)
  - Traits (Pink, Name, Description, Traits)
  - Time (Gray, Time Counters)
  - Bluetooth (Light Blue, BLE Support)

ARIS



Introduction

Center for Educational Research, Wisconsin

System Architecture (Mob App, Web Editor, Server)

Application Types (Tours, Scavenger Hunts, Interactive Stories, Situated Documentaries, Data Collection Activities, Geolocation Games)

Famous Games (Mentira, Dow Day, Digital Graffiti Gallery, Rupee Collector, Explorez)

Fundamental Concepts

Objects (Characters, Plaques, Items)

Traits: Name, Description, Icon

Triggers (Sensor+Action)

Location, QR Code, Lock, Timer, Beacon, AR

Locks (Condition Functionality, AND / OR Structure)

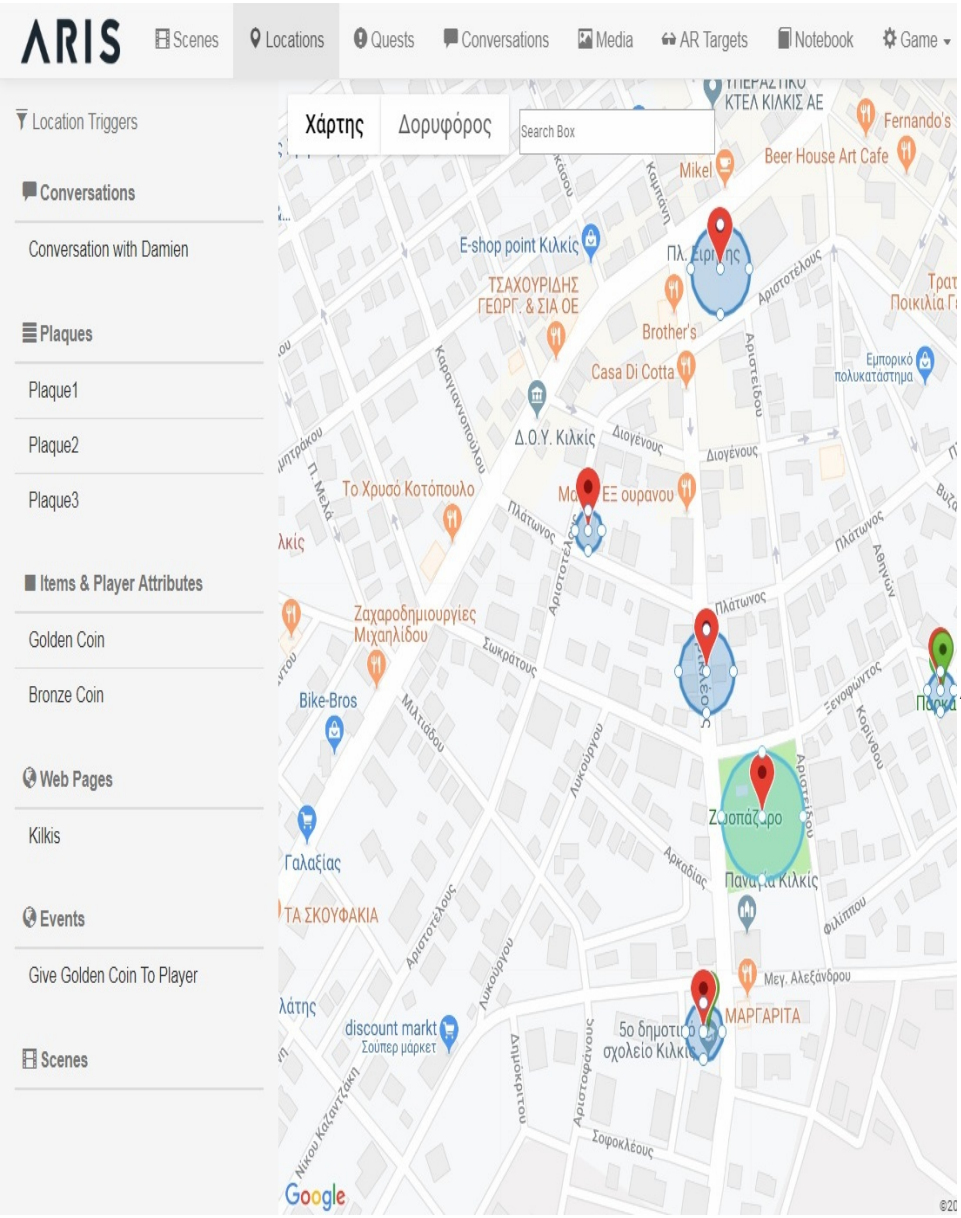
Triggers, Quests, Conversations, UI Tabs

Events (Execute Action)

Action: Give, Take, Set, Run JS

Factories (Random Item Spawn)

ARIS



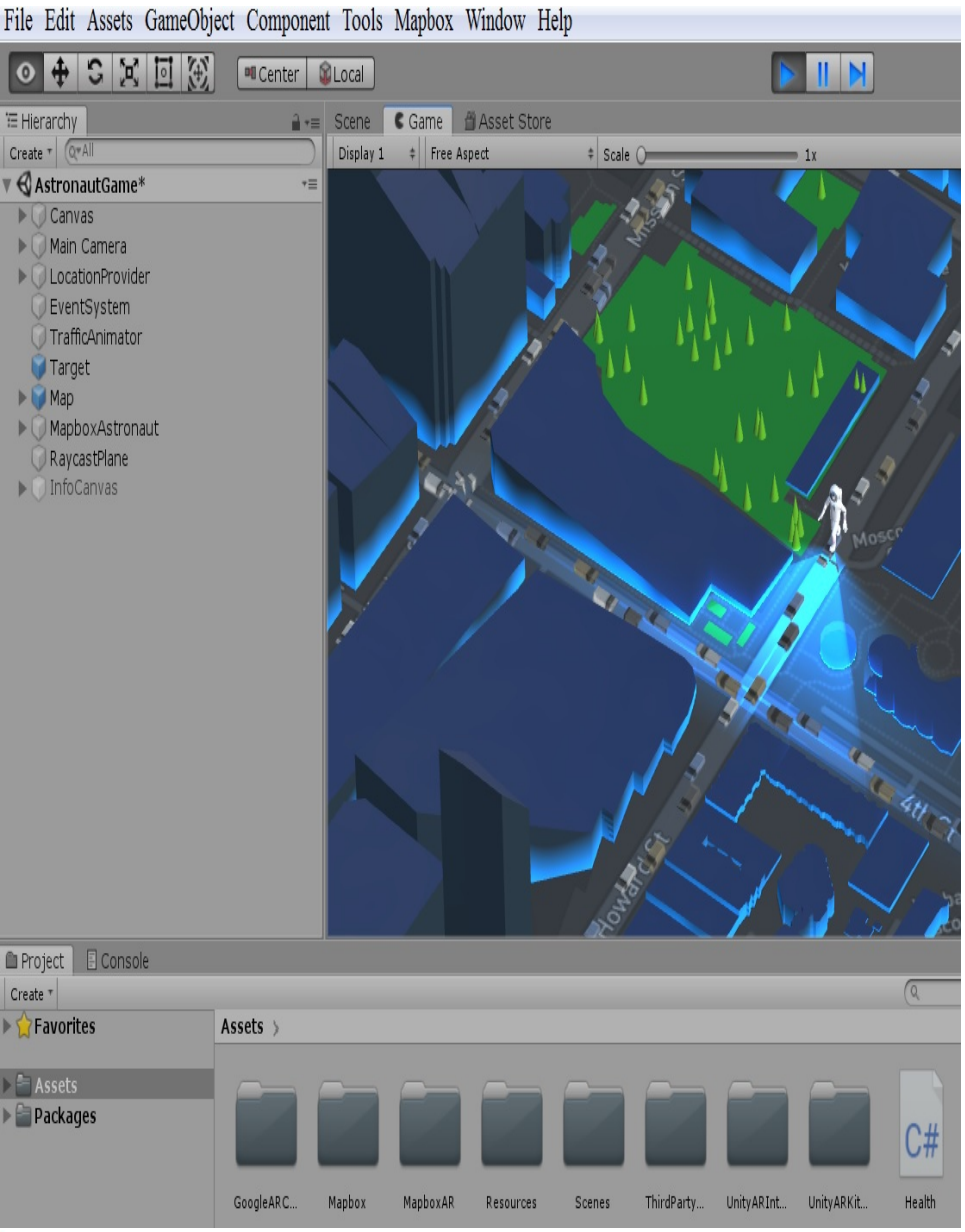
Editor Tabs

- Scenes (Objects, Conversations, Events, Factories)
- Locations (Location Triggers, Coordinates, Range)
- Quests (Missions)
- Conversations (Characters, Lines, Choices)
- Media (Icons, Images / Sounds / Videos, Referenced)
- AR Targets (vuforia.com, Trigger Image, AR Overlay)
- Notebook (Data Collection, Tag+Media)
- Game (Settings, UI Tabs, Groups, Tags, Sharing)

ARISjs

- JavaScript Code Embedded in Text Frames
- Immediate Execution/Delayed Execution
- 4 Function Categories
  - Legacy (Deprecated)
  - Main (Backbone)
  - Cache (Synchronisation Risk)
  - Callback (Synchronisation Certain)

Unity/Mapbox



Introduction

Unity Technologies/Mapbox (Digital Maps Provider)

System Architecture (Mob App, Local Editor)

Mapbox SDK (Map-based App Dev,
- Maping / Geocoding / Directions,
- Vector / Cloudless / Elevation / Custom Maps)

Famous Games (Pokémon Go, Ingress, Zombie Go)

Editor (Personal Edition Licence)
- Header (Toolbar & Menu Items)
- Left Sidebar (Hierarchy)
- Main Window (Scene, Game, Asset Store)
- Right Sidebar (Inspector, Services)
- Footer (Assets / Packages / Favorite, Console)

Fundamental Concepts

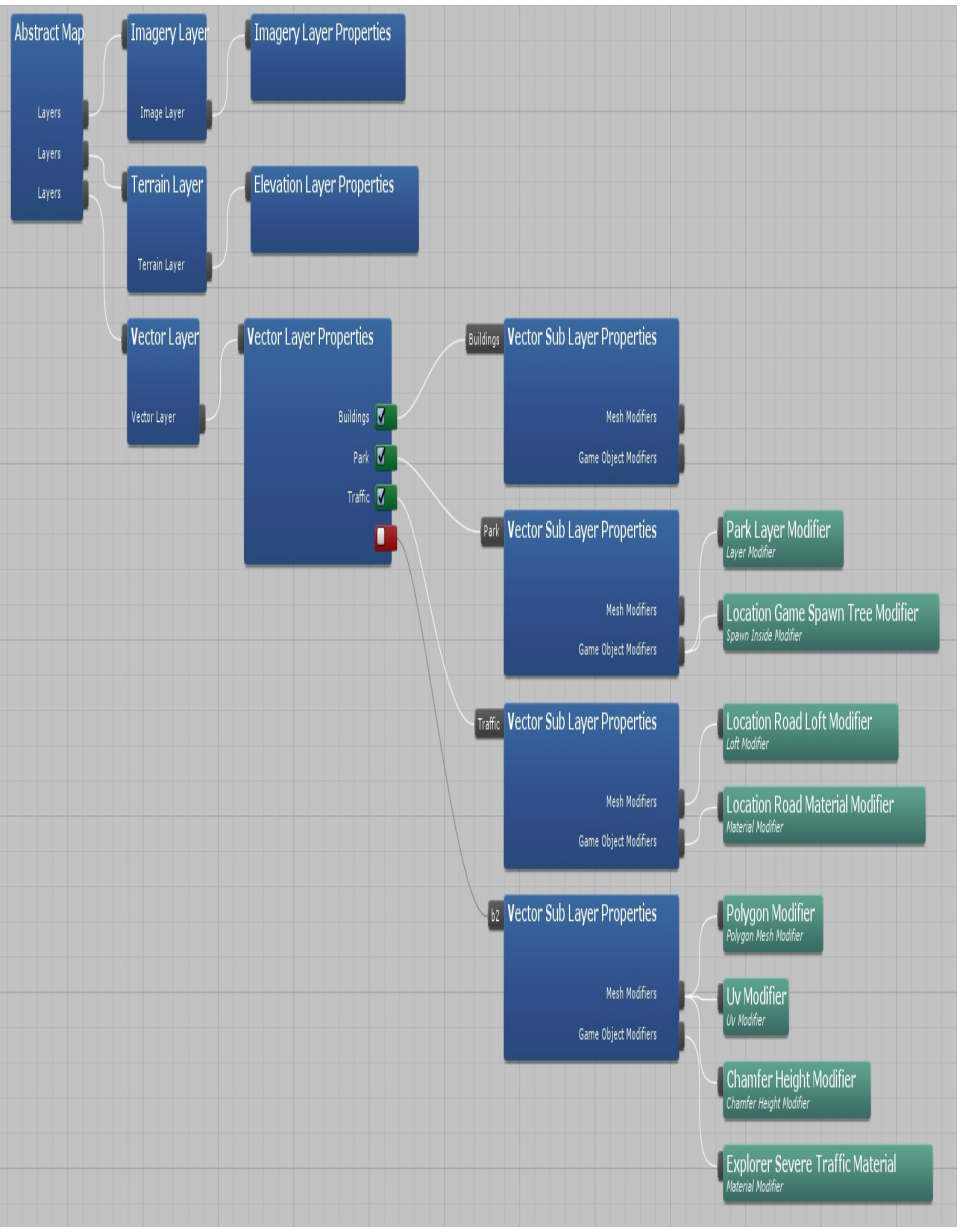
Assets (Multimedia Content)

GameObjects (Game Elements)

Components (Functionality)

Prefabs (Reusable Assets)

Unity/Mapbox



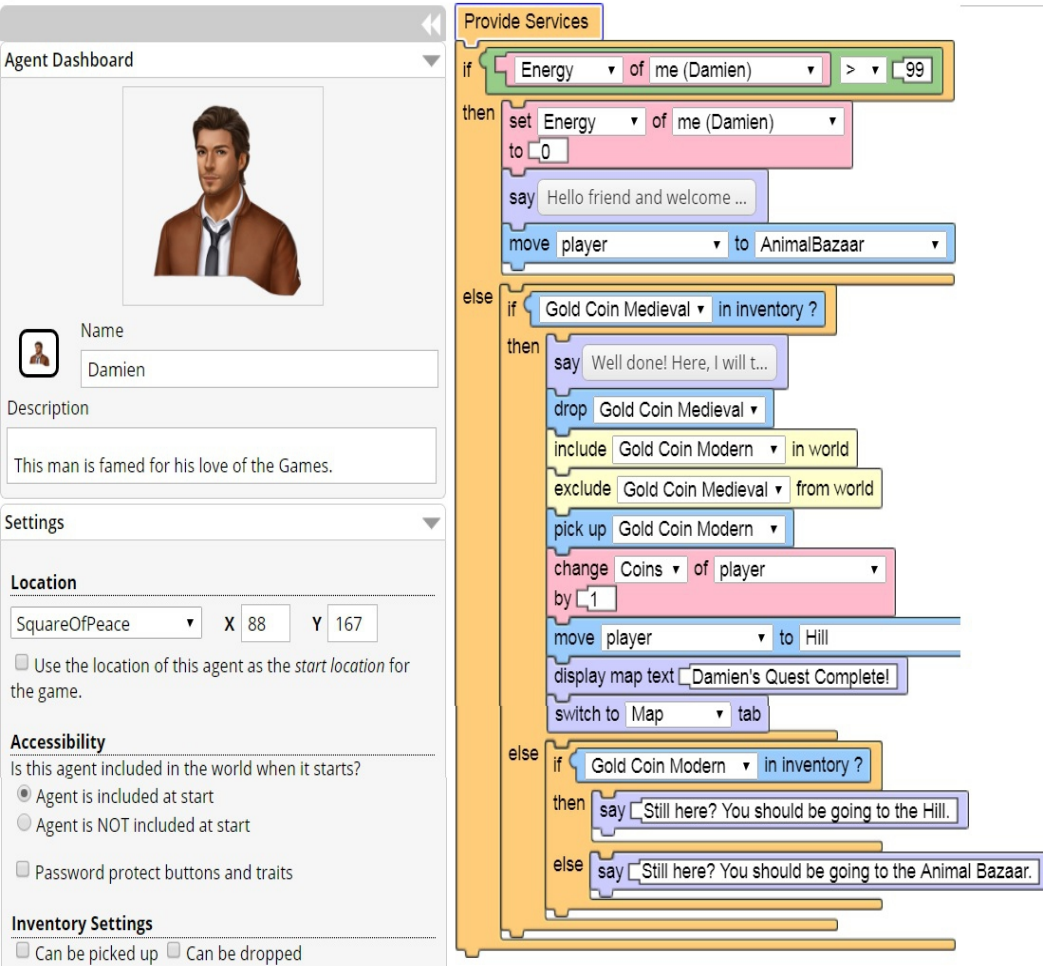
Editor Tabs

- Mapbox Assets
  - Modifiers (Mesh Visualisation Enhancement)
  - AtlasInfo (Texture Atlases on Buildings)
  - ScriptablePalette (Color Pallet Containers)
  - MapVisualizer (Tile-based Map Builder)
- Atlas Template Generator (Texture Atlases)
- Setup (Parameters)
- Map Editor (Map Tree Representation)

C# Scripting

- Microsoft Visual Studio
- Benefits: Input Handling, Event Prioritisation, Special Effects, Behavior Control, Artificial Intelligence
- Scripts as GameObject Components
- Unity MonoBehaviour Class (Start / Update)
- Unity Specific Code (25 Namespaces)
- Mapbox-SDK-CS (17 Namespaces)

Implementation



TaleBlazer (Citizenship)

Game Type:

Pedagogic Game, Interactive Story, RPG

Educational Purpose:

Historical & Cultural Knowledge

Mission Objective: Pass the Tests

Ultimate Goal: Become Citizen

Game Scenario:

Mayor, Damien, Kilkis, Citizenship, Examination, Tests, Relics

Elements Used:

Regions, Agents, Roles, Scenarios, Introduction, Media, Traits, Buttons, Scripting

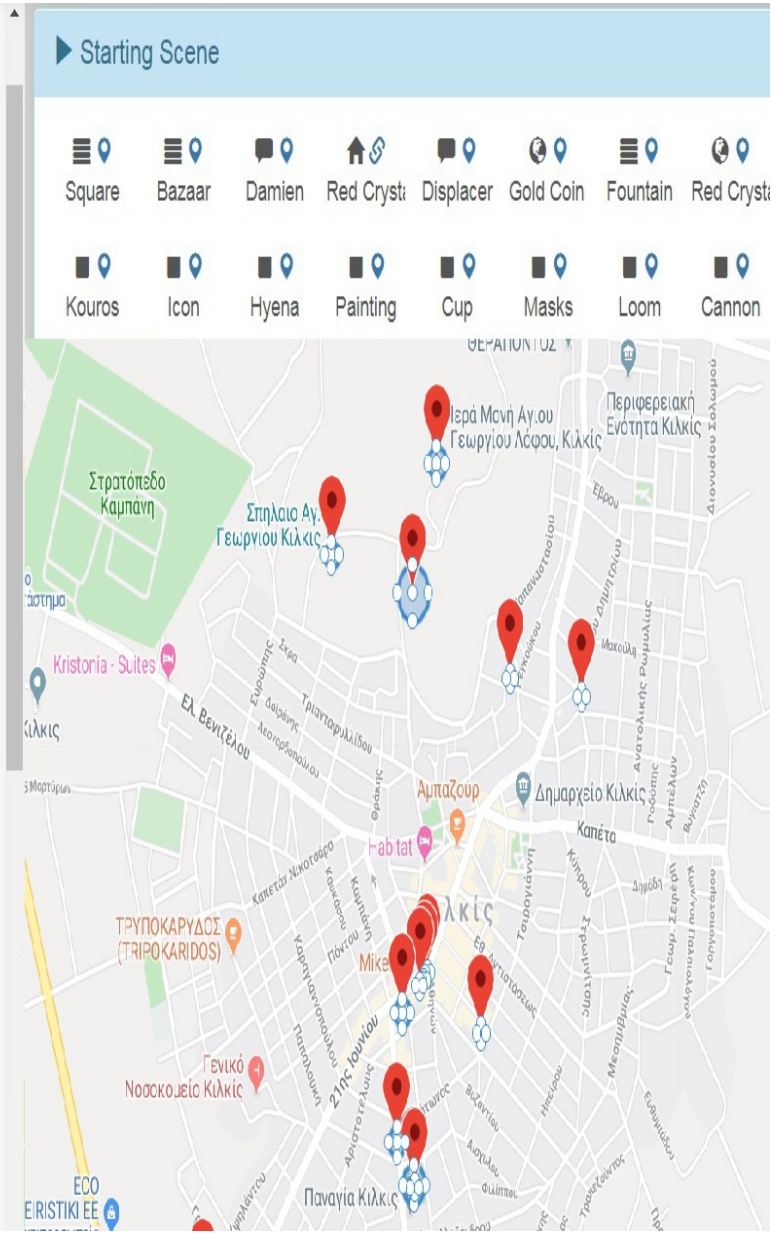
Development Process:

Original Idea, Tool / Game Case Study, Educational / Game Content Design Media Selection, Agent Placement, Trait / Button Definition

Prerequisites:

Game Dev/Programming Experience, Understanding of LBG Principles

Implementation



ARIS (Gathering)

Game Type:
Hybrid, Scavenging, Narration, Fiction, Unlock

Educational Purpose:
Tour Guide

Mission Objective: Treasure Collection

Ultimate Goal: Return Home

Game Scenario:
Displacer, Damien, Kilkis, Relics, Red Crystals

Elements Used:
Scene, Factory, Events, Objects, Characters, Plaques, Items, Quests, Conversations, Media, Locks, Triggers.

Development Process:
Original Idea, Tool / Game Case Study, Game Content Design-Scenes, Objects, Quests Locations / Media Selection, Object Placement, Game Mechanics Design-Events/Triggers/Locks

Prerequisites:
Game Dev / JavaScript Experience, Understanding of LBG Principles

Implementation

Unity/Mapbox (Pocket Droids Go)

Game Type:
Ludic / Action Game, Scavenger Hunt

Educational Purpose:
None

Mission Objective: Android Collection

Ultimate Goal: Reduce Android Population

Game Scenario:
Future, Android, Government, Capturing, Orb

Elements Used:
Mapbox SDK, Custom Maps, Points of Interest, LocationProvider GameObject, Vector Tile Meshes, Satellite Terrain, MapVisualizer Assets.

Development Process:
Programming of Game Classes
Scene Editing
Prefabs: XP, Points Of Interest
Multimedia: Sound & Music

Prerequisites:
Game Dev / C# / Unity Experience, Understanding of LBG Principles

Comparison

Developer Functionality	TaleBlazer	ARIS	Unity
Non-linear Authoring	Yes (*if-then* Block)	Yes (Locks/Triggers/ Events)	Yes (Script Components)
Visual Authoring	Yes (Editor GUI)	Yes (Editor GUI)	Yes (Editor GUI/ Scene Editor)
In-situ Authoring	No	No	No
Re-use & Re-editing	Yes (Remix/Copy)	Yes (Import/Duplicate)	Yes (Open Project)
Content Adding & Management	Partial (Can not delete/ rename multimedia)	Yes (*Multimedia* Tab)	Yes (Asset Import)
Editor Customisation	Partial (Foldable Menus)	No	Yes (Change Layout)
Simulation Mode	No (Discontinued)	No	Yes (Game Tab)
Game Analytics	Partial (Official Partners)	No	No
Map Authoring	Yes (*Map* Tab)	Yes (*Locations* Tab)	No
Visual Programming	Yes (Block Scripting Language)	Partial (Locks/Events)	Partial (*Mapbox/Map Editor* Tab)
Programming Interface	No	Yes (JavaScript)	Yes (C#)

Bibliography Metrics

Game Element Equivalence

TaleBlazer (Friendly UI)

ARIS (**Better LBG Principle Support**)

Unity (Coding)

Developer Functionality

No In-Situ Authoring/Analytics

TaleBlazer (**Visual Prog**, -Prog. Interface)

ARIS (**Events / Locks**, ARISjs / JavaScript)

Unity (**Simulation Mode**, Editor Customisation, C# Scripting, **-Map Authoring**)

Player Captivation

No Communication

TaleBlazer (**Balanced**)

ARIS (Multiple **Positioning** Technologies, Multiple **Players**, Collaboration, **-Multiple O.S**, -Connectionless Play)

Unity (-Outdoor-Indoor Playability, -Reflection)

Comparison

Additional Functionality	TaleBlazer	ARIS	Unity
Game Start Event	*Settings/Introduction* +Block Scripting (When Game Starts)	Starting Scene	InitializeOnLoad Attribute+Class with static constructor
Game End Event	Block Scripting	Quest+End Scene	C# Scripting+End Scene
Scheduled & Random Events	Block Scripting	Timer Trigger	C# Scripting
Tap to Bump	*Settings/Bump Settings/Allow Tap To Bump* Tab	*Game/Settings/Offsite Mode* Tab	C# Scripting (Input.getTouch)
On Screen Navigation	Map Tab	Map Tab	Map Prefab
User Input	Buttons, Clue Code Tab, Trait & Action Passwords	Conversation Choices, QR Scanner, Decoder Codes	C# Scripting (Input Class)
Data Collection	-	Notebook	-
Multimedia Sharing Between Games	Stored in MyFiles & MyIcons	-	Asset Packages
User Application Customisation	User Tabs Only	User Tabs Only	No Standardisation
Automated Version Control	Game Revision History	-	Collab
Shared Editing	-	*Game/Sharing* Tab	*Collab/Invite*
Game Export	Summary	*Game/Settings/Export* Tab	*File/Save Project*
Help Button	Tutorials	-	Help
Error Checking	Error Check	-	Console Window

Impementation Metrics

Additional Functionality

TaleBlazer (-Shared Editing)

ARIS (**Data Collection**, -Multimedia Sharing, - Version Control, -Help, - Error Checking)

Unity (-Programming Dependent)

Positioning Techniques

TaleBlazer (-No QRC, -Limited AR Capabilites)

ARIS (**Best Results**)

Unity (Strong AR Capabilites, -No QRC, -No BB)

Overview & Feedback

TaleBlazer (**Free**, Friendly UI, -Extensibility Toolkits, -Active Community, -Forum)

ARIS (Open Source, Active Community, **Forum**, Video Tutorials, -Minor Editor Bugs)

Unity (Professionality, Creativity, Extensibility, **Dimensionality**, Support, -Close Source, -Local Editor, - Demos, -**Tutorials**, -Documentation & Manuals, -**Learning Curve**, -Unfriendly UI)

Conclusion

Overview & Feedback	TaleBlazer	ARIS	Unity
Open Source	Y (No Source Code)	Y (Source Code)	-
Costs/Price	Completely Free	Free until 100 players monthly	Free until $100k gross limit
Extensibility Toolkits	-	SIFTR, Vuforia	Mapbox, Vuforia, ARKit, ARCore etc
Game Dimensions	2D	2D	2D/3D
Development Platforms	Chrome/Firefox	Chrome/Firefox	Windows/Mac
Server-Client Architecture	Yes	Yes	-
Editor Usage	Cloud	Cloud	Local
Official Support	Support Person	Support Forum	Support Forum/Person
Active Community	Minimal	Maximal	Moderate
Documentation & Manuals	Maximal	Maximal	Moderate
Video Tutorials	Moderate	Maximal	Minimal
Game Demos	Maximal	Maximal	Minimal
Friendly Developer UI	Moderate	Maximal	Minimal
Friendly Player UI	Maximal	Moderate	Moderate (Developer Dependent)
Playing System Requirements	Moderate	Moderate	Maximal
Development System Requirements	Minimal	Minimal	Maximal
Learning Curve	Moderate	Moderate	Maximal
General Advantages	+Great Educational Potential +Plenty Training Material +User Friendly GUI +Extra Developer Functionality	+Great Educational Potential +Plenty Training Material +User Friendly GUI +Truly Open Source	+Great Creative & Extensibility Potential +Great Official Support +Professional Tool +Advanced AR Capabilities
General Disadvantages	-Reduced AR Features -No Multiplayer Games -Limited Multimedia Management Capacities	-iOS Only -Internet Connection Required -Minor Editor Bugs	-Overwhelming Editor GUI -Scarce Training Material -Local Editor Installation -Programming Necessitated

LBG Development Adequacy

TaleBlazer / ARIS

- **Role**-based / **Story**-based Games
- Use / Publishing Facility
- Active Learning
- **Web**-based Editor / Game Server / Client Application
- Coding **Optional** / Map Based Authoring
- Re-usable Games (Demos)
- Training Content (Manuals / Documentation / Tutorial)

Unity / Mapbox

- **Action**-based Games
- Immersion
- Professionality
- **Local**-based Editor / Client Application
- Coding **Obligatory**
- Big Learning Curve-Time Consuming

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Λήξη