

Redefining the Use of Augmented Reality

Requirements Specification

Version 1.0
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0.0 Version History

VERSION 1.0

Version 1.0 is the original version of the Requirements Specification document. This version of the document was created following the 7/08/15 meeting with Luminary, where high-level requirements were discussed. Version 1.0 is an initial draft document, which will be approved by Ahmed and Roopak.

This version of the Requirements Specification does not include the '4.0 Use Cases' section and the '5.0 User Stories' section. These section will be added in version 1.1, after the '3.0 User Requirements' section has been deemed accurate and complete.

1.0 Single Statement of Need

Luminary Promotions require Unity plugins for their Augmented Reality platform to provide them the ability to integrate GPS marker functionality and deploy data to the device at runtime.

2.0 Actors & User Descriptions

2.1 Platform User

The Platform User will access the Unity plugins through the Platform Application. The Platform User must be able to download/stream AR content and view the content through the application.

2.2 System Administrator

The system administrator will modify the GPS markers and AR content. They will add, remove and modify GPS markers, 2D sprites and 3D models. The administrator requires an interface to make the changes. The changes will be actioned by the Unity plugins in the Platform Application.

2.3 Information Server

The Information Server will host all of the asset bundles. Asset bundles will be added to the Information Server by the System Administrator. The Platform Application will load the asset bundles via the Unity plugin.

2.4 Platform Application

The Platform Application will implement the Unity plugins. The Platform Application will call the Unity plugins' methods to perform operations such as: load new markers, load AR content, update GPS markers and remove GPS markers.

2.5 Luminary's Clientele

Luminary's Clientele will request for AR content and GPS markers to be added to, modified and removed from the Information Server. The System Administrator will perform these changes on the client's behalf.

3.0 User Requirements

3.1 GPS Service Plugin

FUNCTIONAL REQUIREMENTS

Requirement Title:	Retrieve current location	Number:	1
Description	The plugin must be able to retrieve the user's current location.		
Rationale	It is required to locate the user's position in order to display relevant, local content.		
Success Criteria	The GPS coordinates of a user's device can be determined.		
Priority	5: High — this is a basic requirement.		

Requirement Title:	Display current location	Number:	2
Description	Users should be able to see their current location printed on screen in real-time.		
Rationale	Nearby GPS nodes will be shown around the user's current location. It is therefore necessary to display the user's location on screen in real-time.		
Success Criteria	The GPS coordinates of a user's device can be printed onto the screen.		
Priority	5: High — this is a basic requirement.		

Requirement Title:	Add a new GPS node	Number:	3
Description	The plugin must be able to add new GPS nodes at runtime.		
Rationale	New GPS nodes will be added between application updates, so it is necessary to be able to add nodes at system runtime.		
Success Criteria	GPS nodes can be added at runtime, without the need for a full app update.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Remove an existing GPS node	Number:	4
Description	The plugin must be able to remove existing GPS nodes at runtime.		
Rationale	Existing GPS nodes will be removed between application updates, so it is necessary to be able to remove nodes at system runtime.		
Success Criteria	GPS nodes can be removed at runtime, without the need for a full app update.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Modify an existing GPS node	Number:	5
Description	The plugin must be able to modify existing GPS nodes at runtime.		
Rationale	Existing GPS nodes may change between application updates, so it is necessary to be able to modify nodes at system runtime.		
Success Criteria	GPS nodes can be modified at runtime, without the need for a full app update.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Return the nearby GPS nodes	Number:	6
Description	The plugin must be able to return a set of all the nodes near a user's current location, within a distance determined by the System Administrator.		
Rationale	Nearby GPS nodes will be shown around the user's current location. It is therefore necessary that the plugin can return a set of nodes that are within a given distance of the user's location.		
Success Criteria	The GPS nodes within a given distance of the user's location can be returned by the plugin.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Display markers within an Augmented Reality 3D view	Number:	7
Description	The user will be able to open an Augmented Reality view, where markers can be overlaid onto their camera's view. Markers can be added to this view at given GPS coordinates.		
Rationale	It is needed to show the users markers within an Augmented Reality 3D view.		
Success Criteria	Markers can be viewed in 3D space in relation to the user's location, using an Augmented Reality overlay.		
Priority	4: Important — this is an important feature of the plugin, but will depend on higher priority requirements to be met beforehand.		

NON-FUNCTIONAL REQUIREMENTS

Requirement Title:	Code must be easily readable	Number:	8
Description	All code must follow pre-determined standards in order to be understood by Luminary's development team and other group members.		
Rationale	Code standards ensure efficiency of development.		
Success Criteria	All code will follow pre-determined standards and be understandable by others.		
Priority	4: Important — this is an important requirement, but it does not directly determine the successfulness for the plugin.		

Requirement Title:	The plugin needs to be developed in Unity	Number:	9
Description	The plugin must be developed to work with the Unity development platform.		
Rationale	Luminary use Unity as their primary development platform as it deploys to both Android and iOS. The plugin must be compatible with Unity.		
Success Criteria	The plugin will be fully compatible with Unity.		
Priority	5: High — this is a basic requirement.		

Requirement Title:	Code must be segmented into many relevant classes	Number:	10
Description	The code must be broken into many smaller relevant classes, i.e., there should be no 'god' classes.		
Rationale	The reusability of the code is determined by its modularity. Breaking the code into many specialised classes ensures that it can be reused in many applications.		
Success Criteria	No god classes will exist. All code will be broken up into smaller classes that have a specific functionality, allowing for reuse.		
Priority	4: Important — this is an important requirement, but it does not directly determine the successfulness for the plugin.		

Requirement Title:	The plugin must be designed to be reusable	Number:	11
Description	The plugin must allow options that can be set at runtime. It should be designed to be usable across any possible application.		
Rationale	The plugin must not be designed for one specific application as it may need to be used across varying uses.		
Success Criteria	The plugin will be generalised. It will allow for settings to be changed by the System Administrator without having to rewire any part of the plugin itself.		
Priority	4: Important — this is an important requirement, but it does not directly determine the successfulness for the plugin.		

Requirement Title:	The plugin must allow for poor GPS reception	Number:	12
Description	The plugin must be able to provide useable GPS information, regardless of the reception quality.		
Rationale	The user's GPS coordinates are essential to the plugin. If the exact coordinates cannot be determined, it is important that the best-guess coordinates are given.		
Success Criteria	The plugin will be able to provide a justified set of coordinates at all times, regardless of reception quality.		
Priority	3: Moderate — this is an important aspect of the plugin, but it does not determine its overall functionality.		

Requirement Title:	Markers must display correctly	Number:	13
Description	The markers shown in the 3D Augmented Reality view must not 'jitter' or move about as the user is interacting with the application. Technologies such as the device's on-board sensors and specialised algorithms should be used to provide a smooth user experience.		
Rationale	From a user's perspective, the quality of the application may be determined by the smoothness of the experience.		
Success Criteria	Markers will be displayed in a fixed location. The phone can be moved about in space and the markers will stay true to their set positions.		
Priority	3: Moderate — this is an important aspect of the plugin, but it does not determine its overall functionality.		

3.2 Asset Bundling Plugin

FUNCTIONAL REQUIREMENTS

Requirement Title:	Connection to server	Number:	1
Description	The plugin must be able to connect to and communicate with Luminary's server.		
Rationale	Content will be retrieved from Luminary's server. The plugin must therefore be able to establish a connection with the server.		
Success Criteria	The plugin will be able to establish and maintain a connection to Luminary's server.		
Priority	5: High — this is a basic requirement.		

Requirement Title:	Streaming of content	Number:	2
Description	The plugin must allow for the live streaming of content from Luminary's server.		
Rationale	Some content, such as video and marker information may not be stored on the Platform Application. It will instead be live-streamed from Luminary's server.		
Success Criteria	The plugin will be able to stream content from Luminary's server.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Download updates	Number:	3
Description	The plugin must be able to download update packets from Luminary's server.		
Rationale	GPS nodes, markers and other content may be added or modified by the System Administrator. The plugin needs to be able to download update packets from Luminary's server.		
Success Criteria	The plugin can download update packets from Luminary's server.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Action updates	Number:	4
Description	Update packets will be downloaded periodically. The update packets will contain information about what changes need to be made. The plugin will perform the required changes.		
Rationale	The plugin must be able to perform the specified changes to implement the downloaded update packet.		
Success Criteria	The plugin can implement update packets.		
Priority	5: High — this is an essential feature of the plugin.		

Requirement Title:	Automatic selection of streamed content quality	Number:	5
Description	The plugin must make an automatic selection of the quality at which content should be streamed (when quality options are available).		
Rationale	Lower quality version of content may be more suitable in cases of a slow connection to Luminary's server.		
Success Criteria	The plugin will automatically select the most ideal content quality to stream.		
Priority	3: Important — this is a non-essential feature that improves the user's experience.		

Requirement Title:	Update options	Number:	6
Description	The plugin will allow for multiple options for performing updates. It will have reusable update methods that allow for periodic updates at a given interval, and one-off update calls.		
Rationale	An update may need to be triggered at a different time/frequency in certain applications of the plugin.		
Success Criteria	Options for updates will be available within the plugin.		
Priority	4: Important — this is an important feature, but it is not critical.		

Requirement Title:	Successful data transmission must be guaranteed	Number:	7
Description	The plugin must ensure that data is successfully transmitted from the server.		
Rationale	Partial data is unusable by the plugin and Platform Application.		
Success Criteria	The plugin will use transmission protocols that ensure successful delivery of data.		
Priority	5: High — this is an essential feature of the plugin.		

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Priority	4: Important — this is an important requirement, but it does not directly determine the successfulness for the plugin.		

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Success Criteria	The plugin will be generalised. It will allow for settings to be changed by the System Administrator without having to rewire any part of the plugin itself.		
Priority	4: Important — this is an important requirement, but it does not directly determine the successfulness for the plugin.		

Requirement Title:	Reliability of connection	Number:	12
Description	The plugin must be able to maintain a reliable connection to Luminary's server.		
Rationale	Content may be downloaded/streamed from Luminary's server by the Platform Application. The connection to the server must be reliable to ensure successful transmission of information.		
Success Criteria	The plugin will be able to maintain a connection to the server for the duration of the use of the Platform Application.		
Priority	4: Important — this is an important requirement, but it does not directly determine the successfulness for the plugin.		

Requirement Title:	Speed of transmission	Number:	13
Description	Data from Luminary's server must be able to be transmitted at an acceptable speed, without long load times or intrusive buffering.		
Rationale	Update packets must not take a long time to load and streamed content must be usable without buffering/loading.		
Success Criteria	Data can always be transmitted through the plugin at an acceptable speed, where the user experience is not tarnished by load times or buffering.		
Priority	3: Moderate — this is an important aspect of the plugin from a user's perspective, but it does not determine its overall functionality.		