Stencil of Creation Proof of Concept

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Version History

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Legal Notices

Introduction

The purpose of this document is to outline Exbos Limited's proposed approach to delivering the Proof of Concept (POC) for Sinetic's Stencil of Creation interface. The document aims to detail the technical and user interaction elements of the project along with the cost implications and delivery timescales. The overall objective is to suitably demonstrate how this approach will deliver a POC meeting the criteria of the minimum viable product (MVP) for marketing and demonstration purposes.

The proof of concept will focus on the core aspects of the project; 3D Visuals, 3D Sound, Gesture Control, Touch Control and a simple natural user interface. The POC will ultimately deliver a platform to functionally illustrate the new way of making and performing audio and visual through motion and gesture control that the Stencil of Creation Represents.

The following list represents the initial project's deliverables from a functional point perspective. These abilities will enable the delivery of all features of the POC. Whilst the clearly stated aim of the project is solely the delivery as an MVP the technical design will ensure any code produced will be transferable to a future retail product.

- Ability to place sound objects within 3D space from 2D touch and 3D gesture interfaces.
- Ability to deliver sound from positioned objects within 3D space through 5.1 surround.
- Ability to handle multiple objects, or sound sources, playing concurrently within the space.
- Ability to apply effects to each source independently and universally across the space.
- Ability to support multiple concurrent local and remote network control interactions.
- Ability to render visual output, for control purposes, to multiple network connected devices.

In summary we believe the total cost of the project will be £16,770 (Exc. VAT). This includes a £1520.00 provision for hardware which would remain the property of Sinetic AV Limited after the project has been completed.

Technical Approach

The initial request for a Proof of Concept suggested the solution employed a touch screen Apple device, namely the iPad, as the target platform. However, after careful consideration of the requirements and the limitations of this device our proposal recommends the use of more flexible PC infrastructure for the project's delivery.

Why not use the iPad as the target platform?

The iPad is both visually appealing and provides an excellent touch screen for demonstration purposes. However, as a platform, iOS is highly restrictive offering little interaction with other applications and reducing the libraries and software that can be employed. Additionally the use of the iPad has significant hardware limitations from a processing, memory, networking and sound output perspective. These would limit the fidelity of the 3D image, the number of available sound channels, the amount of post processing effects and potentially reduce the output to two channel stereo unless suitable, potentially expensive, Dolby encoding libraries and/or hardware could be attached.

So I won't be able to use the Proof of Concept from an iPad?

The approach we are proposing uses the PC hardware as the primary platform for the POC. The PC will be controlled from an attached touch screen monitor just as would be the case with an iPad. Audio will be delivered through a connected 5.1 surround sound speaker system. However, the flexibility of the PC infrastructure also allows it to act as a server to less capable connected devices. This means multiple users can collaborate or a single user control the system away from the main hardware. The result of this lets a user control the POC from an iPad, iPhone or any hardware with a web browser. This delivers the same demonstration potential as just using the iPad but also shows the possibility of collaboration with the software.

Other Benefits of the Platform

The use of PC hardware delivers several other benefits. Firstly the number of connected peripherals, such as MIDI controllers, dedicated 3D sound, dedicated 3D graphics and Leap Motion support, significantly increase the potential of the platform. Secondly the openness of the platform allows other software such as Ableton Live to interact directly with the software. Additionally the availability of libraries and well proven tools for 3D sound and visuals on the same operating system will significantly improve development time. Also this would potentially allow for the rapid inclusion of Microsoft's Kinnect Camera which is support on the suggested platform.

Code Language and Libraries

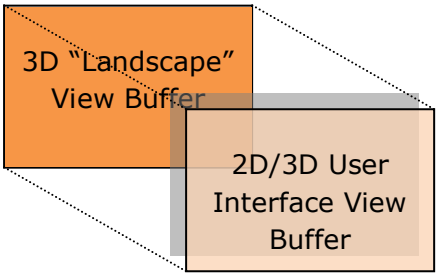
The software developed will use a mixture of C++ and C# for different aspects of the platform depending on suitability. For transferability any cross platform reusable code will be delivered in C++. The delivery of 3D Graphics and 3D Sound will be achieved through the use of Microsoft DirectX 11. The base operating system will be the touch optimised Microsoft Windows 8. If a database is required, for example for library cataloguing, Microsoft SQL Server Express 2008 will be used.

Methodology

The software will develop a core engine for sound and visual processing in 3D space. This engine will accept generic interaction through an interface and output sound/video also through a well defined interface. This generic approach will allow multiple control methods to be applied and detach the engine from controller, video rendering library and sound processing library. This delivers large benefits when the software goes multi-platform or if other libraries need to be used at any point in future.

Rendering Technique

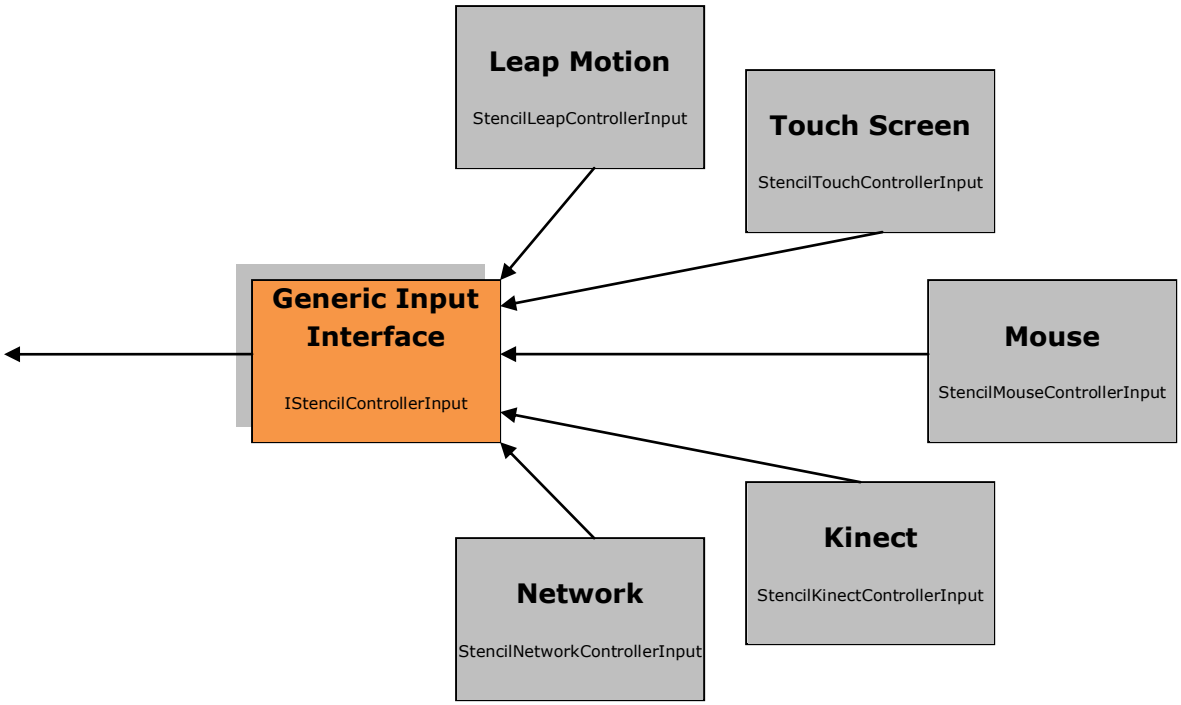
The system will render the 3D output of the current Stencil of Creation "world" to a 3D landscape buffer using Microsoft DirectX (Direct3D). The user interface will be rendered to a second buffer with the composite image representing the full user experience of the system. Each user, essentially collaborating device, on the system will have both of these buffers showing their unique view of the shared world.



This rendering method allows tight control over what is sent to each device. By splitting the UI and 3D environment we reduce the amount of processing required and keep the UI responsive even on remote devices. This also frees up resources for sound processing increasing the amount of concurrent devices and sound objects.

Control Technique

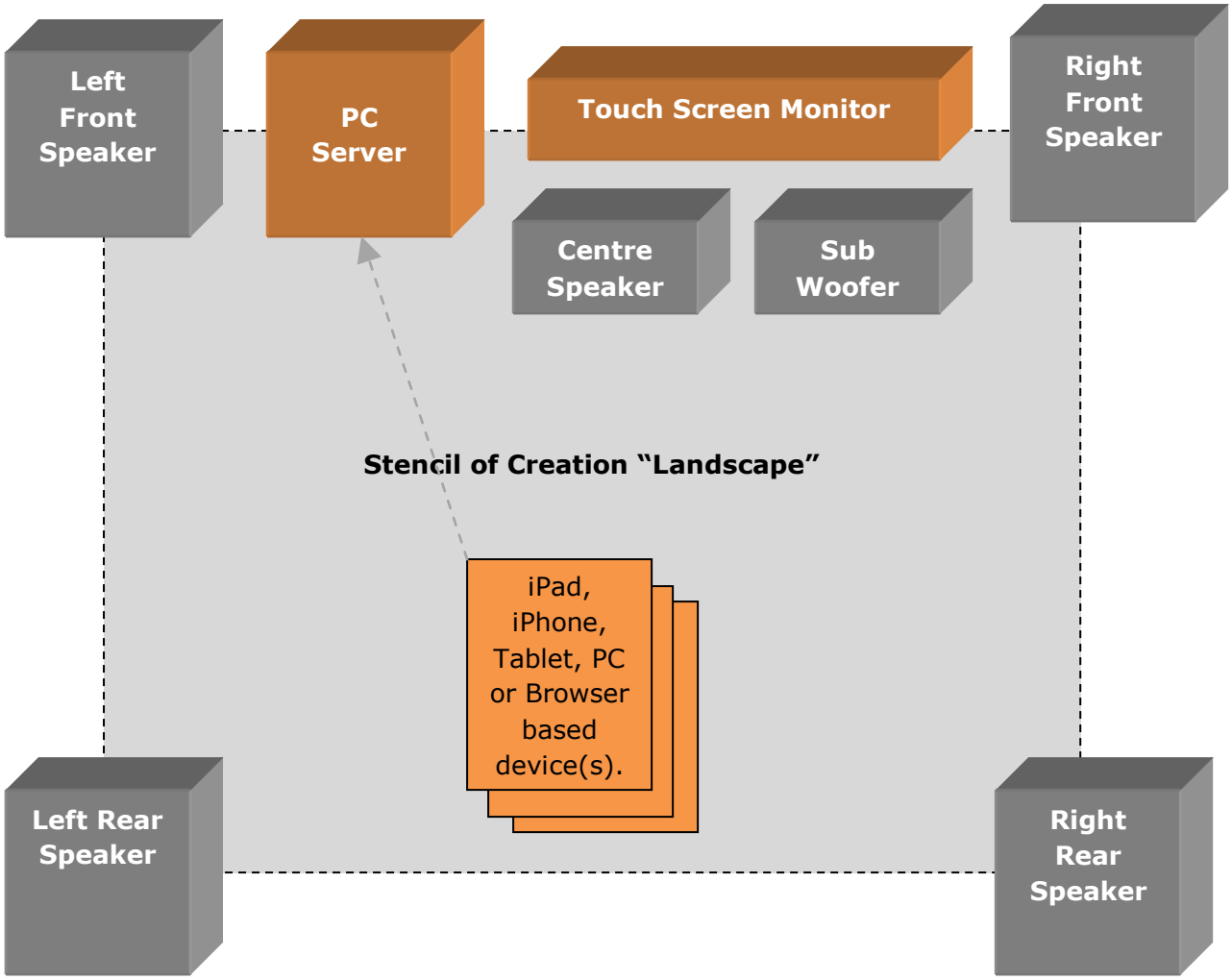
The system will use a generic approach to control through an input interface that can be implemented by any control method. This means additional control options can be created simply by supporting the interface. The base software is unaware of the end user's actual device allowing the platform to support a variety of input methods including a user across a network.



Please note that whilst many controllers could be supported in future using this approach the POC will only deliver Touch, Mouse and Network methods. Any future methods would be added to the retail version of the Stencil of Creation.

Hardware Setup

The system will use a Windows 8 PC with a touch screen monitor for the primary control and visual output. Sound will be delivered through a 5.1 channel speaker system connected to the PC. The setup for the POC will be as below with the screen representing the touch screen control device. Additional network devices such as iPads and iPhones will connect to the PC, acting as a server, to offer alternate control devices.



The specific recommended hardware requirements are outline in the costing sections of this document. The hardware setup is designed to showcase the ease of control through touch screens and highlight the dimensional sound processing. Please note that even in this setup the sound is essentially only a 2D representation of the Stencil of Creation Landscape. In future versions it may however be possible to combine two or more 5.1 surround sound speaker setups to deliver a further level of depth. However, this is outside of the scope of this proof of concept.

User Interface Design

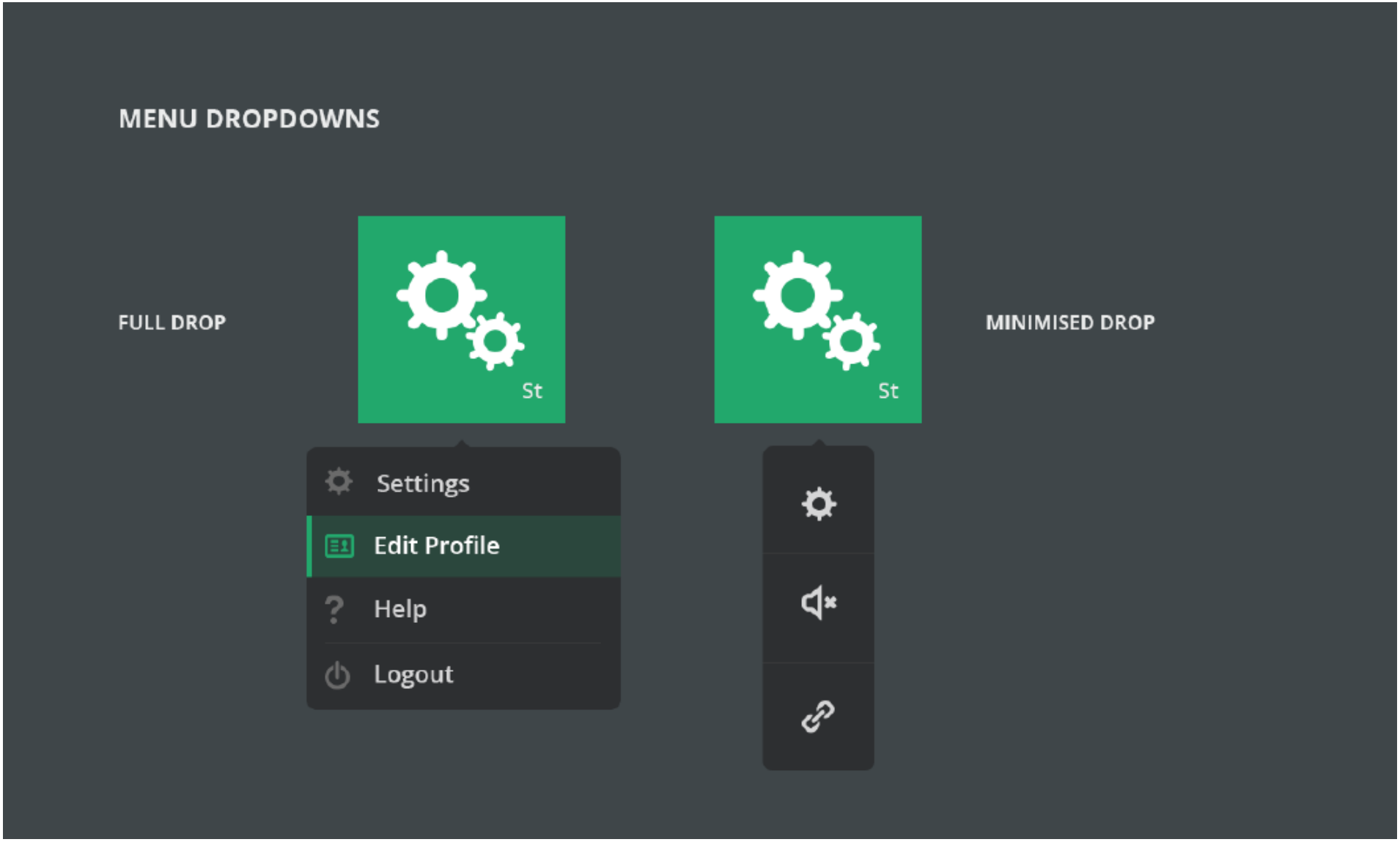
The following pages contain some initial thought designs based on the meetings held between Exbos Limited, Aaron Lee Smiles and James Foster. This is not the full design which will be done during the development process with meetings to better establish the requirements.

The inspiration for the design has been taken from UI interfaces used by windows, iOs 7 and google just to name a few. The flat feel of the UI and icons are very on trend at the moment and for the foreseeable future. It gives the design ease of use and clarity when using the software in question letting the actual job of the software to take forefront. Small design elements will be included to again represent the periodic table and reinforce the theme Aaron has been thinking of.

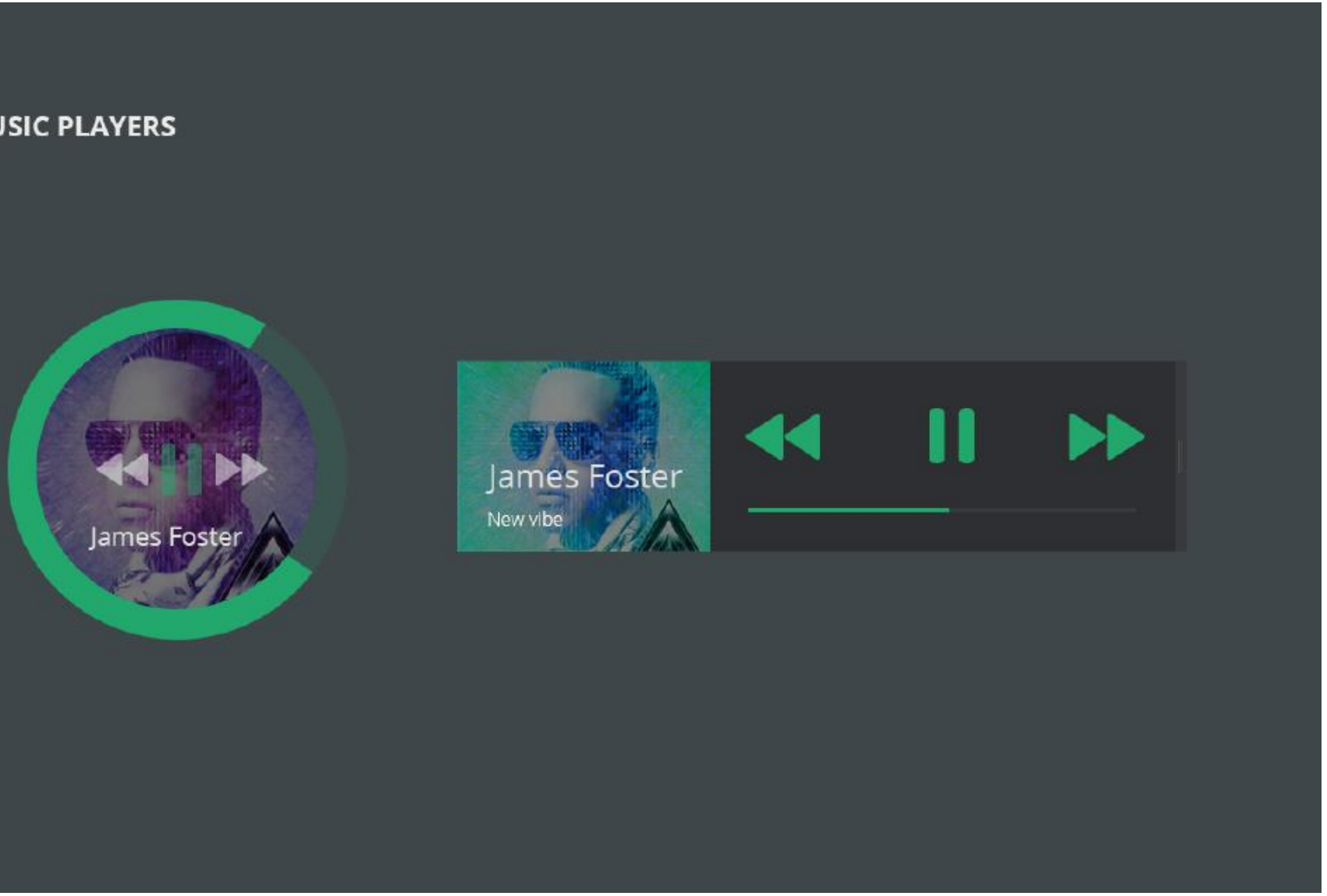
MENU ITEMS

Settings | Environment | 3D Object | Equaliser | Colour

ICONS WILL BE SIMPLE ICONS SET ON EASY TO TOUCH SHAPES GIVING MAXIMUM VISABILITY AT ANY SIZE AND IN ANY ENVIRONMENT. INSPIRATION IS TAKEN FROM THE PERIODIC TABLE WITH HINTS OF ACTION IN BOTTOM RIGHT CORNER.

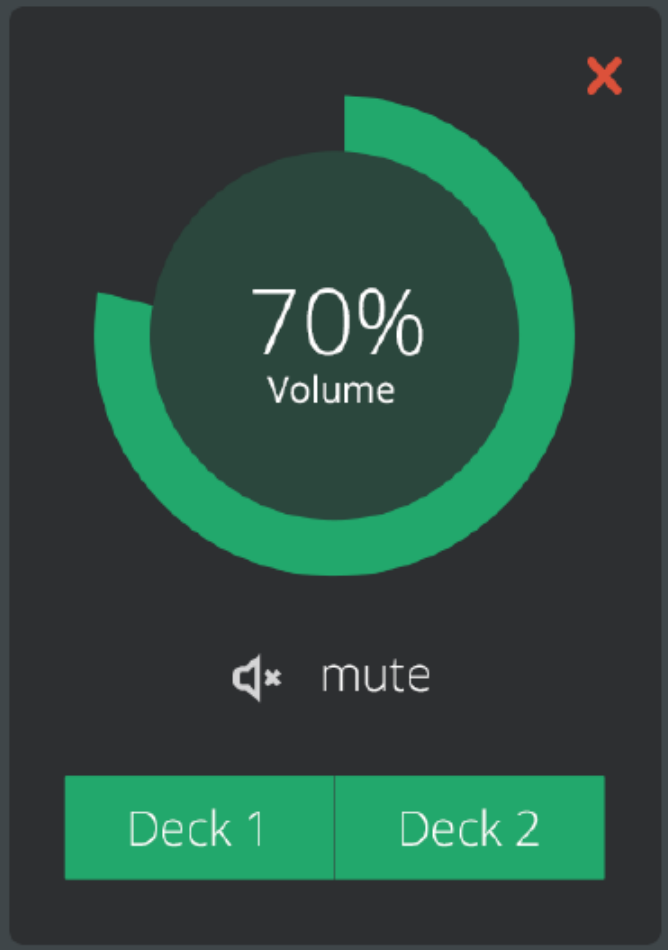

MENU DROPDOWNS
FULL DROP
St
Settings
Edit Profile
Help
Logout
St
MINIMISED DROP

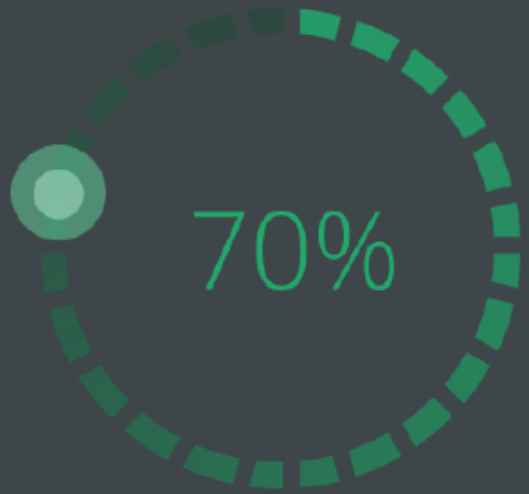
MUSIC PLAYERS

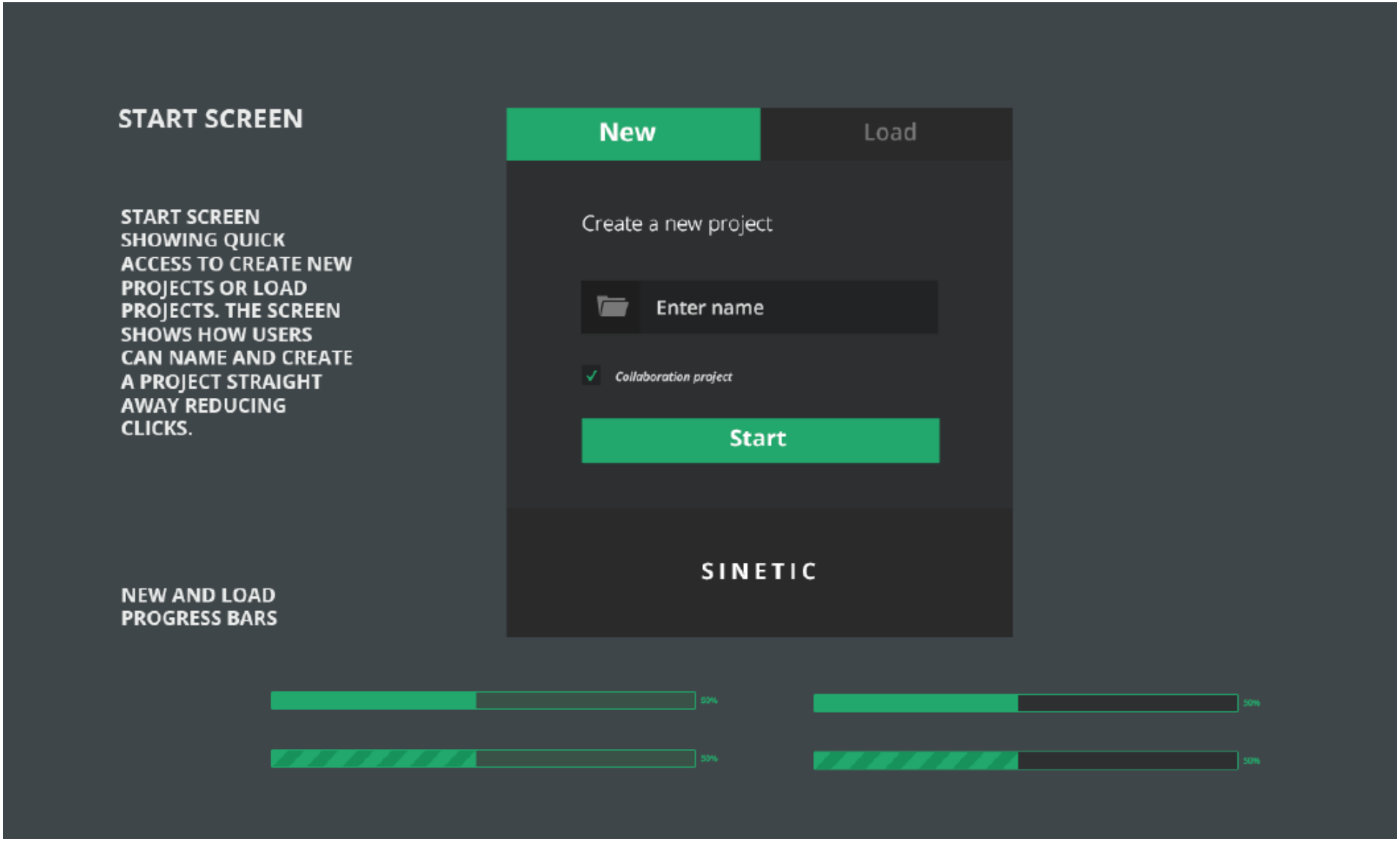


VOLUME CONTROL

VOLUME COULD BE POSSIBLY IN TWO VERSIONS. ONE VERSION FOR MAIN CONTROL AND ANOTHER FOR QUICK VIEW THAT COULD OVERLAY ON MAIN SCREEN POSSIBLY.






START SCREEN
START SCREEN SHOWING QUICK ACCESS TO CREATE NEW PROJECTS OR LOAD PROJECTS. THE SCREEN SHOWS HOW USERS CAN NAME AND CREATE A PROJECT STRAIGHT AWAY REDUCING CLICKS.
NEW AND LOAD PROGRESS BARS
New
Load
Create a new project
Enter name
Collaboration project
Start
SINETIC

Delivery Timescales

The project includes approximately 7 weeks of work to deliver the prototype. We would anticipate this work to be spread over a three month period to allow time for research, meetings and other commitments. We would aim to have something in place two months after receiving the go ahead with the final month spent performing changes based on feedback and any required bug fixes. During this final month we would anticipate several releases to demonstrate the system.

The graphic and user interface design will be done in parallel to the development work. This should allow good early sight of the projects UI. This will also mean there will be no surprises once the software is actually delivered.

Project Pricing

The table below shows the estimated cost of the project including technical design, user interface and actual development. The price includes one week technical design, six weeks of development and the production of the user interface experience designs. The table does not include hardware costs which are highlighted separately on the next page.

Proof of Concept Development Costs	
Technical Design The creation of the initial development project, technical architecture and design documentation.	£2750.00 (5 days @ £550.00)
User Interface and Experience Design The production of the user interface experience design, associated graphics and models for use within the POC.	£2000.00
Development The physical implementation of the proof of concept onto the target hardware.	£10,500 (30 days @ £350.00)
Total	£15,250

All figures quoted are excluding VAT. The prices are guaranteed for three months from the issue of this document. The prices do not include any travel or accommodation costs which, if required would have to be charged separately. It is intended that meetings will be required but travel and face to face meetings will be kept to a minimum to reduce costs. A table of our standard day rates is included at the end of this document should any additional work be required.

Indicative Hardware Costs

The table below shows the estimated costs based on the recommended hardware for the prototype. These costs have been kept separate from the main pricing as, whilst the hardware will be used for development, the ownership will remain with Sinetic AV LTD for use in demonstrations. The prices are estimates for budget purposes.

Proof of Concept Hardware Costs	
Intel Core i7-3820 3.6GHz	£195.00
Intel Socket 2011 Motherboard	£210.00
8GB DDR3 Ram	£65.00
120GB Primary SSD (OS and caching)	£70.00
1TB Secondary HDD 7200rpm (Library storage)	£60.00
850W Power Supply	£70.00
Basic Black Case Unit	£40.00
NVIDIA GeForce GTX 650 1GB	£65.00
Creative SoundBlaster 3DCore	£50.00
Dell 21.5” Touch Screen Monitor S2240T 1080p	£260.00
5.1 Surround Speaker System	£100.00
Cables and Peripherals	£50.00
Microsoft Windows 8 Professional OEM	£110.00
Build and Setup	£175.00
Total	£1520.00

The hardware and setup suggested for the prototype represents a mid to high end PC by today’s standards. These requirements are much higher for the POC than would be likely for the end product. This is because of the level of optimisation that would be put into an end product versus a POC.

Appendix

Clear Price Promise

At Exbos Limited we take pride in delivering our projects on time and on budget. However, we also appreciate that new requirements and/or additional work can arise at anytime. In Proof of Concept projects of this kind, where there is an understandable risk of 'activity creep', we set out our base rates to illustrate the cost of out of scope development.

Resource Day Rates

The following list of prices represents the day rate of each resource assigned to any given project. This cost is based on the resource working out of the Exbos Offices and not onsite. A single day can be considered a standard "9 to 5" office day with a 7 hour working period.

Role	Price (Exc. VAT)
Analyst	£350.00
Developer	£350.00
Tester	£350.00
Project Manager	£450.00
Technical Architect	£550.00

Resource Onsite Day Rates

The following list of prices represents the day rate of each resource assigned to any given project. This cost is based on the resource working at a customer designated site. A single day can be considered a standard "9 to 5" office day with a 7 hour working period. Note: Where the time or distance required for travelling to the site is judged unreasonable for daily commuting; hotel accommodation may be required. The day rate does not include any hotel accommodation or travel costs which will be charged as additional amounts.

Role	Price (Exc. VAT)
Analyst	£450.00
Developer	£450.00
Tester	£450.00
Project Manager	£550.00
Technical Architect	£650.00