1.0 System Architecture Diagram
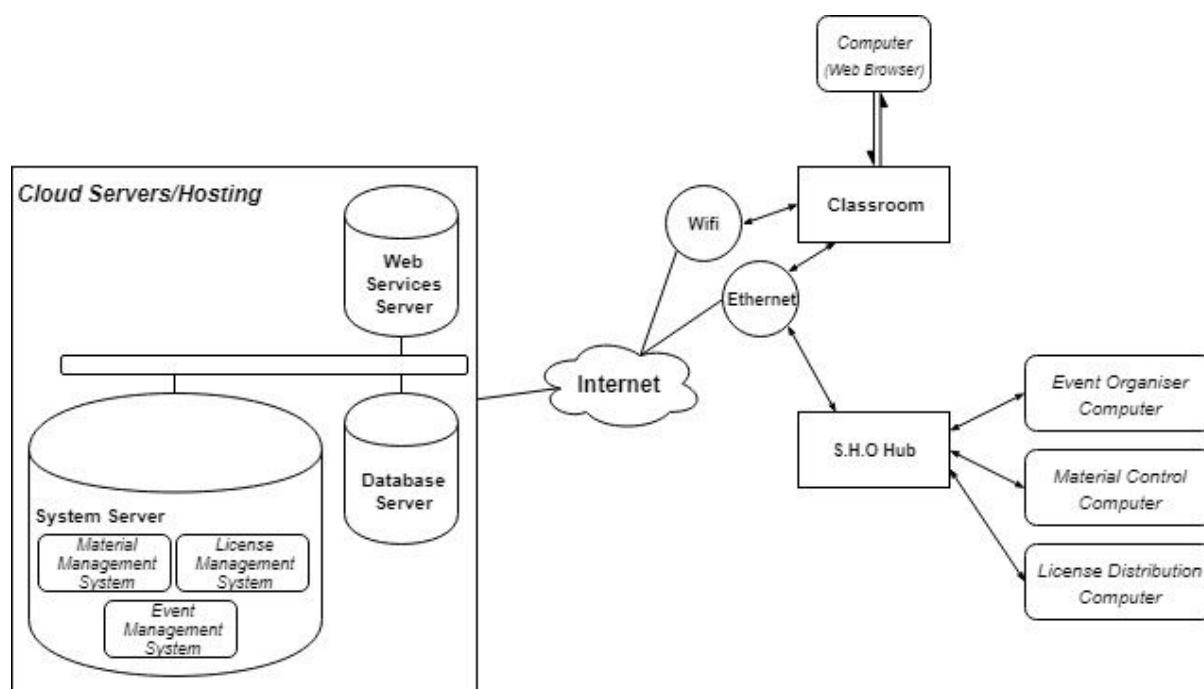

2.0 Work Breakdown Structure

1.0: E-learning Toolkit

    1.1: Infrastructure *[Budget = 100.000 GBP]*

        1.1.1: Requirements Specification Document

        1.1.2: API

        1.1.3: Communication API

        1.1.4: Cloud Server

        1.1.5: Cloud Database

        1.1.6: IDE

    1.2: License Management System *[Budget = 40.000 GBP]*

        1.2.1: Requirements Specification Document

        1.2.2: Software Documentation

        1.2.3: Test Documents

            1.2.3.1: Test Plan

            1.2.3.2: Test Results

            1.2.3.3: Test Evaluation

        1.2.4: Integration Documents

            1.2.4.1: Integration Plan

            1.2.4.2: Integration Report

1.3: Event Management System *[Budget = 70.000 GBP]*

> **1.3.1:** Requirements Specification Document
>
> **1.3.2:** Software Documentation
>
> **1.3.3:** Test Documents
>
>> **1.3.3.1:** Test Plan
>>
>> **1.3.3.2:** Test Results
>>
>> **1.3.3.3:** Test Evaluation
>
> **1.3.4:** Integration Documents
>
>> **1.3.4.1:** Integration Plan
>>
>> **1.3.4.2:** Integration Report

1.4: Material Management System *[Budget = 60.000 GBP]*

> **1.4.1:** Requirements Specification Document
>
> **1.4.2:** Software Documentation
>
> **1.4.3:** Test Documents
>
>> **1.4.3.1:** Test Plan
>>
>> **1.4.3.2:** Test Results
>>
>> **1.4.3.3:** Test Evaluation
>
> **1.4.4:** Integration Documents
>
>> **1.4.4.1:** Integration Plan
>>
>> **1.4.4.2:** Integration Report

1.5: Course/Class/Module Management System *[Budget = 40.000 GBP]*

> **1.5.1:** Requirements Specification Document
>
> **1.5.2:** Software Documentation
>
> **1.5.3:** Test Documents
>
>> **1.5.3.1:** Test Plan
>>
>> **1.5.3.2:** Test Results
>>
>> **1.5.3.3:** Test Evaluation
>
> **1.5.4:** Integration Documents
>
>> **1.5.4.1:** Integration Plan
>>
>> **1.5.4.2:** Integration Report

1.6: System Interface *[Budget = 30.000 GBP]*

> **1.6.1:** Requirements Specification Document
>
> **1.6.2:** Software Documentation
>
> **1.6.3:** Integration Documents
>
>> **1.6.3.1:** Integration Plan
>>
>> **1.6.3.2:** Integration Report
>
> **1.6.4:** Test Documents
>
>> **1.6.4.1:** Test Plan
>>
>> **1.6.4.2:** Test Results
>>
>> **1.6.4.3:** Test Evaluation

1.7: Full System Integration *[Budget = 40.000 GBP]*

> **1.7.1:** Integration Plan
>
> **1.7.2:** Integration Report

1.8: Documentation *[Budget = 20.000 GBP]*

> **1.8.1:** Software Documentation
>
> **1.8.2:** Installation Guide

1.8.3: Platform Manuals
1.8.4: Staff Training Manuals

3.0 Project Uncertainties

3.1 Financial

3.1.1 Unfavourable

Unforeseen reduction in the budget allocated for the project occurs which would potentially cause deliverables to be unable to be completed/delivered.

3.1.2 Favourable

Estimates of deliverable costs are higher than they actually are, meaning resources have been saved and can potentially be used elsewhere or kept as profit depending on how other components are handling resources.

3.2 Technical

3.2.1 Unfavourable

The technological components of the project being used are not fully suited for what needs to be delivered. Limitations include lack of scalability from the components and lacking an established interface to interact/work with the components.

3.2.2 Favourable

Development of new components or the improvement of existing components that would facilitate increased power of the system with little to no additional cost in return. May include improvement of web-based components to improve web interfaces of hardware improvements to increase speed/efficiency of processes.

3.3 Business Environment

3.3.1 Unfavourable

The possibility of a legislation being passed that handles the treatment and aid of homeless in Scotland/United Kingdom. The result could be newly imposed limitations or requirements when working/dealing in this area which the project/system doesn't currently take into account, requiring new work to accommodate the required changes.

3.3.2 Favourable

On the otherside of the unfavorable, should there be an appeal to aid the homeless perhaps from a politician or similar. The result would be more support provided to S.H.O and

similar businesses in order to achieve the desired result, in this case, the project S.H.O have requested. Politcal presence that brings positive attention to aiding the homeless and in turn, support towards projects aimed at doing so, like this one.

3.4 Social

3.4.1 Unfavourable

Communication from the stakeholders is at a low level and communication received from stakeholders is of little value to the project. An example would be taking a length of time to respond to concerns and then the response not providing any useful information to handle the concern brought up.

3.4.2 Favourable

The nature of the project and the desired goal could prompt additional stakeholders who hold the same or similar goal to buy-in to the project. Doing so would contribute to the resources/capital/budget available for the project. Potential stakeholders could be 'Shelter Scotland' or similar charities/companies who have the same or similar goal.

3.5 External/Natural Environment

3.5.1 Unfavourable

A natural disaster of some form or another (earthquake, storm, etc) causes damage to server/database networks meaning communication to and from those components is heavily stunted until the problem is solved by the team or the provider of said components.

3.5.2 Favourable

Should weather remain consistent with little occurrence of adverse weather conditions, this will aid in the productivity and progress of the project. Adverse weather may prompt members of the project to be unable to reach workspaces or similar. This being the case, a long span of consistent weather without any adverse conditions, work will progress more smoothly.

4.0 Uncertainties Impact/Estimates/Response

E_o = Estimated Occurrence (0.0 being 'Will not Occur' and 1.0 being 'Garunteed to Occur')
E_i = Estimated Impact (0.0 being 'No impact on project' and 10.0 being 'Project may fail or at least heavily delayed')
$E_o * E_i$ = Estimated Risk (0.0 being 'No Risk' and 10.0 being 'End of the world')

ID	E_o	E_i	$E_o * E_i$	Response Strategies
3.1.1	*0.1*	*7.0*	*0.8*	Speak to stakeholders to determine and narrow down priority development of deliverables in order to deliver all or

				as many components the stakeholders deems a top priority.
3.2.1	*0.2*	*6.0*	*1.2*	Firstly, establish what the limitations are and whether there are potential workarounds. This is not so true for scalability limitations but can apply to components lacking interfaces. Either way, determine to what degree the current components fulfill the requirements and determine what needs to be replaced/upgraded, what can be but isn't immediately a problem, and what can be worked around using current components.
3.3.1	*0.2*	*5.0*	*1.0*	Firstly, determine how specifically the legislation affects the project/system. The impact could be big or small depending on this. Regardless, determine the effect and consult the stakeholders about the impact. Following that, work with stakeholders to come up with a new set of requirements or change the previous set in order to accommodate the changes brought on by the legislation.
3.4.1	*0.3*	*5.0*	*1.5*	Priority should be to establish an active communication channel whether it be physical meetings, online chat channels, email, etc. Though assuming something of this level is already being used, effort should be put into making stakeholders provide more input, more often. Speaking directly to the stakeholders and explaining that the lack of communication being received will likely hinder the quality of deliverables and similar. Basically, speak to the stakeholders and explain communication needs to be improved.
3.5.1	*0.1*	*10*	*1.0*	Find and obtain new components to replace (ideally temporarily) the existing ones for the duration of downtime. Ideally, downtime of the components would not be for an extended period of time but obtaining a backup will allow the system to continue operation while the main component is under maintenance/fixing.

5.0 Network Diagram and Critical Path
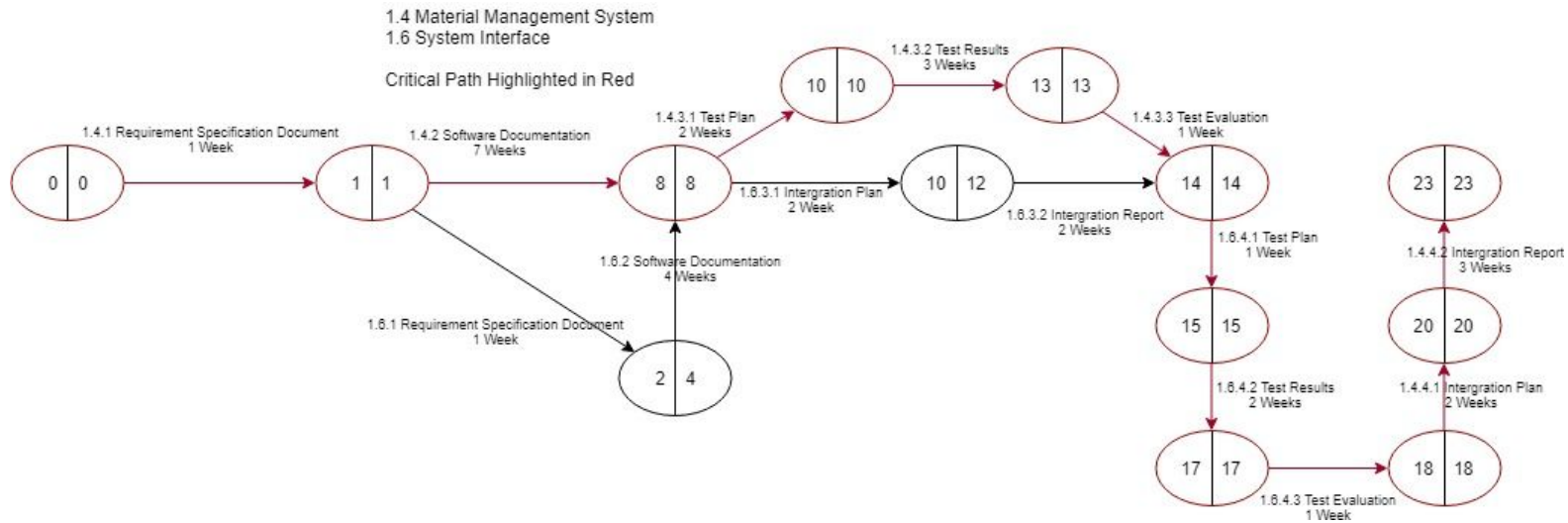
6.0 Size, Effort, and Cost Estimation

6.1 Functional Breakdown

Simple Functional Breakdown of Event Management System	
A	Log into the System.
B	The user can change their password.
C	The user can search/list all currently scheduled events.
D	The user can Schedule a new event on the calendar.
E	The user can change the location for a scheduled event.
F	The user can change the time of the scheduled event.
G	The user can change the attendee limit of the scheduled event.
H	Select an event to confirm attendance.
I	The user can search/list all events they are listed to attend.
J	Conflicts between events checked and the user notified of issues.
K	The user can cancel a currently scheduled event.
L	Canceled events stored for a period of time in the event of accidental canceling

6.2 Size/Function/Sum of Functions

Function	Inputs	Entities	Output

A	2	1	1
B	3	1	1
C	2	1	5
D	4	2	4
E	2	2	4
F	2	2	4
G	2	2	4
H	1	2	2
I	2	2	5
J	6	1	7
K	1	3	2
L	4	2	1
	31	**21**	**40**

6.3 System Size (Function Point Count)

W1 = 0.58
W2 = 1.66
W3 = 0.26

$$FPC = (31 * 0.58) + (1.66 * 21) + (0.26 * 40) = 63.24$$

6.4 System Complexity

Complexity Factor	Rating	Complexity Factor	Rating
Data Communication	*3*	Documentation	*4*
Performance Objectives	*3*	Distributed Functions	*0*
Transaction Rate	*2*	On-Line Data Entry	*3*
End User Efficiency	*4*	Complex Processing	*3*
On-Line Update	*1*	Design for Reusability	*3*
Installation Ease	*5*	Operational Ease	*4*
Multiple Sites	*4*	Facilitate Change	*4*
Interface to Systems	*5*	Security/Privacy	*5*

User Training	2	Third Party Use	1
		Total	**56**

6.5 Adjusted FP Count

$AF = 0.65 * 0.005 * 56(TCF) = 0.93$

$Adjusted\ FPC = 0.93 * 63.24 = 58.81$

6.6 Effort Determination

FPC = 63.24
Productivity = 0.742 for 3GL or 1.183 for 4GL

$Effort = 58.81/0.742 = 79.3\ man-days\ for\ 3GL$

$Effort = 58.81/1.183 = 49.7\ man-days\ for\ 4GL$

6.7 Elapsed Time

$Delivery\ Rate = 0.45 * (58.81)^{1/2} = 3.45$

$Elapsed\ Time = 58.81 / 3.45 = 17.05\ Weeks$