

# **WIMBORNE MODEL TOWN**

## **DEVELOPMENT**

### **WINTER 2016/17 REQUIREMENTS**

**Issue 3.0**

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# 1 INTRODUCTION

This document details the requirements for a number of enhancements to the Wimborne Model Town. Some of the functions required have existed in the past, but have now fallen into disrepair. Others will be new features for the town.

## 2 DETAILED REQUIREMENTS

### 2.1 Functional

The Table below details the functionality required of each element of the system, its priority and type.

TABLE 1: FUNCTIONAL REQUIREMENTS

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
1.1	<b>Minster Bells</b>	1	Essential
1.1.1	The system shall provide a simulation of the real town's Minster bells to play within the model.	1	Essential
1.1.1.1	The system shall play the chimes, eg the hours, the quarters (including the Quarter Jack bells), the half hours and the three-quarters.	1	Essential
1.1.1.2	The system shall activate the Quarter Jack at the quarter hours, without actually striking the bells.	2	Desirable
1.1.1.3	The playing of the chimes shall commence approximately 2 minutes after the real Minster bells.	1	Essential
1.1.1.4	The system shall play change rings.	2	Desirable
1.1.1.5	The playing of change rings shall be optional and capable of being triggered by the WMT staff.	1	Essential
1.1.1.6	The timing of the chimes and the change rings shall be programmable.	1	Essential
1.1.2	The system shall optionally play music, to simulate a service or daily background hymns.	2	Desirable
1.1.2.1	It shall be possible to select 'playlists' of music that are to be played or no playlist at all.	1	Essential

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
1.1.3	The system shall be designed so that a sequence of change rings and wedding music may optionally be selected to simulate a wedding being performed in the Minster.	2	Desirable
1.1.3.1	It shall be possible to select the wedding simulation to be performed on demand or at programmable times during the day, eg 11 am and 2 pm.	1	Essential
1.1.4	The wedding simulation and the music playing shall be mutually exclusive.	1	Essential
1.1.5	The system shall be designed so that the chimes and music only play when the Model Town is open to the public..	1	Essential
1.1.5.1	The default playing period for the chimes and wedding march shall be between 10 am and 5 pm each day.	1	Essential
1.1.5.2	It shall be possible to extend the playing period for the chimes and wedding march to allow for occasional evening events.	1	Desirable
1.1.6	The system shall not be mechanical, but instead use some programmable device to control the timing and play the sounds.	1	Essential
1.1.7	At startup, or when the Model Town opens for the day, the music player shall be enabled.	1	Essential
1.1.7.1	The system shall store the current playlist, so that it may be invoked when the music is restarted.	1	Essential
1.1.7.2	When a wedding simulation has been selected, the system shall revert to playing music when the sequence is complete.	1	Essential
1.2	<b>Audio Guide</b>	2	Essential
1.2.1	The system shall provide an audio guide.	2	Essential
1.2.2	The scripts for the audio guides will be provided by the Model Town staff and volunteers.	2	Essential
1.2.3	The system shall include an IEEE 802.11 Wireless Access Point and Web Server to meet the Operational requirements in Section 2.2 below.	2	Essential
1.2.4	The system shall automatically route the User's browser to the	2	Desirable

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
	Home Page, so they may select the guide easily.		
1.3	<b>Children's Quiz</b>	3	Essential
1.3.1	The system shall provide a quiz facility for children.	3	Essential
1.3.2	The questions and answers will be provided by the Model Town staff and volunteers.	3	Essential
1.3.3	The system shall include an IEEE 802.11 Wireless Access Point and Web Server to meet the Operational requirements in Section 2.2 below.	3	Essential
1.3.4	The system shall automatically route the User's browser to the Home Page, so they may select the quiz easily.	3	Desirable

Note 1: Item 1.1 is currently installed in the Minster model, but has not worked for many years.

Note 2: Items 1.2 and 1.3 are new for the Model Town and have previously only existed in paper form.

## 2.2 Operational

The Table below details the operational capabilities required of the system, it's priority and type.

**TABLE 2: OPERATIONAL REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
2.1	The system shall be designed so that the Town staff can start the new functions at the beginning of each day. if required, by turning on the power.	1	Essential
2.2	The system shall be designed so that the Town staff can stop the new functions at the end of each day, if required, by turning off the power.	1	Essential
2.4	Item 1.2 shall be capable of being accessed using a Smartphone, tablet computer or other portable computing device.	2	Essential
2.4.1	Audio content shall be prepared to provide the guidance material.	2	Essential
2.4.2	Users shall be provided with a menu, so that they may choose the audio content that they wish to listen to.	2	Essential
2.5	Item 1.3 shall be capable of being accessed using a Smartphone, tablet computer or other portable computing device.	3	Essential
2.5.1	A framework shall be prepared to contain the questions.	3	Essential
2.5.2	Questions shall be selectable by the use of a list which may be worked through sequentially by the users.	3	Essential
2.5.3	A selection of answers shall be offered for each question with a scoring system based on the answer being right or wrong.	3	Essential
2.5.4	The scoring system shall preferably discriminate between questions that are completely right, completely wrong or nearly right.	3	Desirable
2.5.5	At the end of the quiz, the user shall be provided with a final score out of the total maximum score.	3	Essential

## 2.3 Environmental

The Table below details the environmental requirements of the system, their priority and type.

**TABLE 3: ENVIRONMENTAL REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
3.1	All components of the system that are installed in the Minster model shall be protected from the ingress of moisture.	1	Essential
3.2	All components of the system that are installed in the Minster model shall be adequately cooled.	1	Essential
3.3	All components of the system that constitute the webserver shall be adequately cooled.	1	Essential

## 2.4 Reliability

The Table below details the reliability required of the system, it's priority and type.

**TABLE 4: RELIABILITY REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
4.1	The system shall be designed to be fail-safe in the event of a power supply failure.	1	Essential
4.2	Components shall be de-rated where possible, especially circuits carrying powers in excess of 1 W.	1	Essential

## 2.5 Maintainability

The Table below details the maintainability required of the system, it's priority and type.

**TABLE 5: MAINTAINABILITY REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
5.1	The system shall be designed to be maintainable by suitably qualified Town staff, using only the documentation provided by the developers.	1	Essential
5.1.1	A tool shall be provided to allow Town staff, with minimal training and support documentation, to add new content to Items 1.2 and 1.3	2	Desirable
5.1.2	Provision shall be made for the WMT staff to modify the music included in each Playlist in Item 1.1.2.	3	Desirable
5.2	Spares shall be provided for any components that are liable to end-of-life or frequent failure.	1	Essential
5.3	Backups of any software developed shall be made available for future maintainers.	1	Essential

## 2.6 Safety

The Table below details the safety requirements of the system, it's priority and type.

**TABLE 6: SAFETY REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
6.1	The system shall be designed such that no mains or high voltage supplies are used within the functional parts of the system.	1	Essential
6.2	Power supplies derived from mains shall be fully enclosed in a protective case.	1	Essential



## 2.7 Documentation

The Table below details the documentation requirements of the system, it's priority and type.

**TABLE 7: DOCUMENTATION REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
7.1	A comprehensive design specification shall be produced.	1	Essential
7.2	The design specification shall include full descriptions of all functionality, parts lists and circuit diagrams.	1	Essential
7.3	All software shall be fully documented with comments.	1	Essential
7.4	An Installation Specification shall be provided that details how to deploy the software and hardware.	1	Essential
7.5	A User Manual shall be provided that details how to use and maintain the software and hardware.	1	Essential

## 2.8 Miscellaneous

The Table below details the miscellaneous requirements of the system, it's priority and type.

**TABLE 8: MISCELLANEOUS REQUIREMENTS**

<i>No</i>	<i>Requirement</i>	<i>Priority</i>	<i>Type</i>
8.1	Where possible and without compromising the other requirements in this document, elements of the current design shall be re-used, such as the mechanism for operating the Quarterjack bells on the front of the model Minster.	2	Goal
8.2.	No budgetary requirements have been set, but the system costs shall remain within the overall budget for the Wimborne Model Town.	2	Goal

### **3 ASSUMPTIONS**

The following assumptions are made.

- Developers will have the pre-requisite knowledge to design and implement the hardware and software required to realise this project and subsequently enhance it.
- Maintainers will have the pre-requisite knowledge, supported by the supplied documentation, to maintain the system.
- Operators will have the pre-requisite knowledge, supported by the supplied documentation, to start and stop the system each day as required.