

Background to project and aim of the questionnaire

Digital information management processes will greatly assist with the sustainable management of built heritage in the future. One information management tool that could be used for this is Historic Building Information Modelling (HBIM). BIM is an information management and 3D visualisation tool used extensively by the architecture, engineering and construction industry. It typically consists of a 3D model of a structure with all information about the structure (e.g. current condition, maintenance information, health and safety assessments etc) associated with objects within the model. It has the potential to assist with information management and create an enduring record for future generations of heritage stewards. This will provide tangible benefits for the heritage community including more efficient resource management and fewer instances of lost or duplicated information. However, there is currently no standard for HBIM and no consensus on what functions or features a HBIM system requires.

In a previous stage of their work, the authors of this questionnaire surveyed individuals involved in the management and maintenance of heritage to find out how they currently manage information, what problems they face and what they would need a digital information management system to do. The result of this was the identification of some proposed requirements for HBIM.

The purpose of this questionnaire is to gather insight from people involved in the management and maintenance of heritage to find out if the proposed requirements adequately meet their needs. You will be asked to indicate your agreement with some proposed requirements. The questionnaire is primarily multiple choice. There will be opportunities to suggest alterations to the requirements and additional requirements if you feel that anything is missing.

Participant Information

Please read this section carefully. It details how the data you provide will be used and stored.

If you have any further questions or wish to withdraw your information, please contact me. If you would like to provide further information you can. Summaries of the results of this research will be available on request.

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Alternatively, you can contact my project supervisors.

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1) How your information will be used

The purpose of the questionnaire is to validate the proposed system requirements for HBIM. The questions will ask you to indicate your agreement with some proposed requirements. The requirements will then be associated with modelling and data storage techniques for HBIM and existing heritage practices to develop a standard to be applied to any heritage asset. The information will be included in a thesis and may potentially be used for academic publications.

I consent for my information to be used in this way Yes
☐

2) Withdrawal

You can withdraw your information from this project anytime until **2 months after submitting this questionnaire** by contacting myself or my supervisor. All information will be removed from any work and interview recordings and transcripts will be deleted. After **2 months after you submit this questionnaire** your information will not be able to be removed from the project.

I understand that I can only withdraw my information up until **2 Months after I submit the questionnaire** Yes
☐

3) Confidentiality

Heritage management is largely dependent on individual perspectives and in-use circumstances. Therefore, it may be beneficial to include your **job title and/or organisational affiliations** in association with the data you provide. This will only be done if you consent to it. If you do not consent to your job title and/or organisational affiliation being associated with the information, the data you provide will be included using a generic title of "Participant x". Any information you provide that is subsequently used in any publications or the thesis will be anonymised.

I consent for my job title and organisation to be included with information in the thesis and any publications

Yes

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I consent for my job title to be included within the information in the thesis and any publications (my organisation will be anonymised).

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I would like any information I give to be included in any publications or the thesis in an anonymised format

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4) Data storage and sharing

During the project, questionnaire results will be stored securely and will only be shared with myself and my supervisors. **At the end of the project**, data will be made openly accessible. All data will be anonymised prior to sharing.

*I understand that information I provide will be
anonymised and made available in an Open Access
format for referencing at the end of the project.*

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Participant Name	
Participant job title	
Participant organisation	

Background questions

These questions are intended to understand your relevant experience and expertise.

Please give a brief description of your role and/or any experience you feel is relevant.	
What type/s of heritage do you work with? e.g. stately home, historic bridge, listed building, industrial structure, registered park or garden etc	

5) System requirements

This project aims to identify the comprehensive requirements for a new digital information management system for heritage structures. Some proposed requirements are given below. **Given your experience working with heritage, which requirements would a system need to fulfil for**

you to successfully carry out your work? Please indicate if the requirement is **critical** (a system that cannot achieve this requirement would not be useable in your role), **useful** (assists with/adds value to a task but work can progress without it), for a **wish-list**, or **not needed**, or **not relevant to your role**.

For the HBIM to be useful, the requirements need to reflect the actual needs of the end user. Therefore, if you feel that a requirement is not needed, please provide some additional explanation. Future versions of the requirements may be altered to reflect any feedback received.

Note- all requirements assume the system would be easy to use and update, and affordable to each organisation. This survey does not consider what information should be stored.

Requirement theme	Requirement	Please indicate if the proposed requirement is Critical, Useful, Wish-list, Not needed*, or not relevant to your role.	*If you answered 'not needed' please provide additional explanation.
Information management	HBIM system needs to contain a comprehensive and accurate record of asset information (regardless of form). <i>Note- The types of asset information will be asset specific</i>		
	HBIM system needs to allow new information to be added over time whilst retaining previous information.		
	HBIM system needs to have a search function for finding information.		
	HBIM system needs to have a structured, reportable and viewable data storage schema.		

	HBIM system needs to allow information to be viewed at different degrees of granularity.		
	HBIM system needs to allow all information to be accessed from a single source.		
	Information in the HBIM system should be associated with a digital entity with a known position in space.		
	HBIM system needs to record and report each change made to asset information.		
Collaboration	HBIM system needs to present current planning / legislative / listing restraints in a manner clearly understandable to users without expert knowledge.		
	HBIM system needs to be able to share and receive information for related assets (both internally within an organisation or externally).		
	HBIM system needs to be able to present the same information in differing ways for a defined audience.		

	HBIM data needs to be shareable with specified access controls.		
	HBIM system needs to be aligned with existing BIM practices for non-heritage assets		
	HBIM system needs to integrate with other systems without duplicating information.		
System operability	HBIM system needs to be accessible from multiple locations at the same time.		
	HBIM information needs to be accessible to users without an internet connection.		
	Users without an internet connection need to be able to record new information to be input to the HBIM system.		
Resource management	HBIM system needs to indicate whether an area is private or open to public and any restraints this poses e.g. maintenance timing or increased level of risk for public.		

	HBIM system needs to collate and prepare information required for funding applications.		
	HBIM system needs to collate and prepare information required to undertake defined activities.		
	HBIM system needs to be able to be used to digitally simulate planned activities.		
	HBIM system needs to calculate expected costs of user defined work.		
	HBIM system needs to record and report all details of each work activity undertaken and each future work activity planned.		
	HBIM system needs to assist with the creation of proactive maintenance schedules utilising both mandatory testing intervals, previous maintenance records and current asset condition.		
Visualisation	HBIM system needs to record, and visually display information associated with the location of the asset.		

	HBIM system needs to record and visually display each historic change to an asset (both large changes and small changes).		
	HBIM system needs to provide a 3D visualisation of an asset.		
	HBIM system needs to contain an accurate visual record of the current asset condition.		
Public engagement	HBIM system needs to assist with the creation, and dissemination of, audience appropriate informative materials and educational resources with the public.		
Environmental management	HBIM system needs to record and visually display environmental hazards associated with the asset.		
	HBIM system needs to monitor and report the near real-time environmental conditions of the asset. Environmental condition derived from information such as temperature, light, humidity and weather sensors etc.		
	HBIM system needs to monitor and report the near real-time performance of the asset. Performance will be evaluated against organisational specific targets.		

	HBIM system needs to allow the comparison of current energy performance with predicted outputs of alterations and upgrades.		
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Are there any extra requirements you would like to suggest?	
Any other comments?	

6) Are you happy to be contacted again if necessary?

Yes No

I am happy to be contacted again ☐ ☐

If yes, please provide contact information such as address, email address, phone number.	
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