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## Plan Overview

*A Data Management Plan created using DMPonline*

**Title:** Factors Influencing Usability and Perceived Satisfaction with a Continuous Monitoring and Deterioration Alerting System in a Non-ICU Setting: A Mixed-Methods Study

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**Template:** University of Manchester Generic Template

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### Project abstract:

The proposed research aims to investigate the factors that influence the usability and perceived satisfaction of a continuous monitoring and deterioration alerting system in a non-ICU setting. The study will employ a mixed-methods approach, using the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical framework. The research question is "What factors influence the usability and perceived satisfaction of a continuous monitor with a deterioration alerting system in non-ICUs from the clinician's perspective?" Data will be collected through a combination of surveys and in-depth interviews with physicians working in non-ICU settings, who have experience with the use of a continuous monitoring and deterioration alerting system. The data collected will be analyzed using both quantitative and qualitative methods, including descriptive statistics, chi-square test, Pearson's correlation coefficient and Thematic Analysis. This research seeks to fill a gap in the literature by providing insight into the factors that influence the usability and perceived satisfaction of a continuous monitoring and deterioration alerting system from the perspective of clinicians. Additionally, this study also aims to contribute to the understanding of how theoretical models such as UTAUT can be applied to the healthcare setting. This research will provide valuable information for healthcare providers and system developers to improve the design, implementation and usage of such systems, resulting in improved patient outcomes.

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**Copyright information:**

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# Factors Influencing Usability and Perceived Satisfaction with a Continuous Monitoring and Deterioration Alerting System in a Non-ICU Setting: A Mixed-Methods Study

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## Manchester Data Management Outline

1. Will this project be reviewed by any of the following bodies (please select all that apply)?

- Ethics

2. Is The University of Manchester collaborating with other institutions on this project?

- No - only institution involved

3. What data will you use in this project (please select all that apply)?

- Acquire new data

4. Where will the data be stored and backed-up during the project lifetime?

- P Drive (postgraduate researchers and students only)
- University of Manchester Research Data Storage Service (Isilon)

5. If you will be using Research Data Storage, how much storage will you require?

- 1 - 8 TB

6. Are you going to be receiving data from, or sharing data with an external third party?

- No

7. How long do you intend to keep your data for after the end of your project (in years)?

- 0-4 years

### **Guidance for questions 8 to 13**

Highly restricted information defined in the [Information security classification, ownership and secure information handling SOP](#) is information that requires enhanced security as unauthorised disclosure could cause significant harm to individuals or to the University and its ambitions in respect of its purpose, vision and values. This could be: information that is subject to export controls; valuable intellectual property; security sensitive material or research in

key industrial fields at particular risk of being targeted by foreign states. See more [examples of highly restricted information](#).

Personal information, also known as personal data, relates to identifiable living individuals. Personal data is classed as special category personal data if it includes any of the following types of information about an identifiable living individual: racial or ethnic origin; political opinions; religious or similar philosophical beliefs; trade union membership; genetic data; biometric data; health data; sexual life; sexual orientation.

Please note that in line with [data protection law](#) (the UK General Data Protection Regulation and Data Protection Act 2018), personal information should only be stored in an identifiable form for as long as is necessary for the project; it should be pseudonymised (partially de-identified) and/or anonymised (completely de-identified) as soon as practically possible. You must obtain the appropriate [ethical approval](#) in order to use identifiable personal data.

**8. What type of information will you be processing (please select all that apply)?**

- Audio and/or video recordings
- Anonymised personal data
- Personal information, including signed consent forms

**9. How do you plan to store, protect and ensure confidentiality of any highly restricted data or personal data (please select all that apply)?**

- Anonymise data
- Store data on University of Manchester approved and securely backed up servers or computers

**10. If you are storing personal information (including contact details) will you need to keep it beyond the end of the project?**

- Yes - Other

**11. Will the participants' information (personal and/or sensitive) be shared with or accessed by anyone outside of the University of Manchester?**

- No

**12. If you will be sharing personal information outside of the University of Manchester will the individual or organisation you are sharing with be outside the EEA?**

- Not applicable

**13. Are you planning to use the personal information for future purposes such as research?**

- Yes

Personal information may be kept for up to 4 years for the researcher's future studies that build on the current one.

**14. Will this project use innovative technologies to collect or process data?**

- No

**15. Who will act as the data custodian for this study, and so be responsible for the information involved?**

Jo-Fan Pan

**16. Please provide the date on which this plan was last reviewed (dd/mm/yyyy).**

2023-02-10

## **Project details**

**What is the purpose of your research project?**

The proposed research aims to investigate the factors that influence the usability and perceived satisfaction of a continuous monitoring and deterioration alerting system in a non-ICU setting. The study will employ a mixed-methods approach, using the Unified Theory of Acceptance and Use of Technology (UTAUT) as the theoretical framework.

**What policies and guidelines on data management, data sharing, and data security are relevant to your research project?**

- The University of Manchester Research Data Management Policy <http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=33802%20>
- The University of Manchester Records Management Policy <http://documents.manchester.ac.uk/display.aspx?DocID=14916>
- The University of Manchester Publications Policy <http://documents.manchester.ac.uk/display.aspx?DocID=28526>
- The University of Manchester IT policies and guidelines <http://www.itservices.manchester.ac.uk/aboutus/policy/>
- The University of Manchester Intellectual Property Policy <http://documents.manchester.ac.uk/display.aspx?DocID=24420>
- The University of Manchester Data Protection Policy <http://documents.manchester.ac.uk/display.aspx?DocID=14914>.

## **Responsibilities and Resources**

**Who will be responsible for data management?**

- Jo-Fan Pan (student) will be primarily responsible for collecting, organizing and analyzing the data.
- Dr. Dawn Dowding (Supervisor) will provide guidance and support to the student in managing the data and ensuring that data collection and analysis methods are appropriate and ethical.
- Dr. David Wong (Supervisor) will also provide oversight and support in ensuring that the data is managed in a secure and reliable manner, and that appropriate data analysis methods are used.

**What resources will you require to deliver your plan?**

The resources required to deliver the plan include:

- Qualtrics for survey administration
- Data storage for safekeeping of the collected data
- Transcription services for converting audio or video data into text
- Access to research data storage for archiving the data
- Equipped laptop for data analysis and management
- Qualitative analysis software such as Nvivo for analyzing and interpreting the data

Additionally, an estimated cost of £1,000 will be incurred for incentives for 200 participants who complete the quantitative survey, providing £5 each. Further incentives of £15 will be provided to 15-20 participants who are willing to join the in-depth interview.

## Data Collection

### What data will you collect or create?

Data that will be collected or created for this study include:

1. Oral accounts of experiences gathered through in-depth interviews with 15-20 participants, which will be recorded in .mp3 or .wav format for audio recordings. The transcripts of these interviews will be created and stored in .doc or .pdf format.
2. Online questionnaire data collected through a University approved platform such as Qualtrics, which will be stored in the platform and can be exported to .csv or .xls file format.

The total storage volume for the digital data cannot currently be estimated as it depends on the duration of the interview recordings, which is unknown. However, assuming an average interview duration of 40 minutes, the cumulative duration of interview recordings is approximately 16 hours (15-20 participants x 40 minutes per person). This can be used as a rough estimate of the amount of storage required for recordings in GB or TB. The storage requirements for transcript files are likely to be much smaller.

### How will the data be collected or created?

The data for this research project will be collected through two main methods: online quantitative surveys using Qualtrics, and 1-to-1 face-to-face interviews using Teams.

The online survey will be the first step in the research process, and participants will be asked to complete it. After completing the survey, participants will have the option to participate in a 1-to-1 interview if they are willing to do so. This will be indicated by ticking a box at the end of the survey and providing their email address. The research team will then send a consent form and an introductory message for the 1-to-1 interview to the participant.

The 1-to-1 interviews will be directed by the research team and controlled by peer review. The interview process will follow standardized methods and protocols, including a pre-determined interview schedule, and will be accompanied by annotations and documentation on the data, such as how and when it was recorded and any changes made to the original data. Recordings of participants will be processed in accordance with data protection law and will be transcribed using the University's contract provider, 'Lawson Hardwick t/a Level 1 Secretarial Services', with whom a data confidentiality agreement is in place.

Data collected from both the online surveys and the 1-to-1 interviews will be processed in accordance with data protection laws and will be stored in a clear and consistent file structure, with naming conventions and version control, in accordance with the UK Data Services Data Guidelines.

For more information on data collection and organization, see the IT Services page on Qualtrics and Teams, and the UK Data Service guidance on organizing data.

## Documentation and Metadata

### What documentation and metadata will accompany the data?

The accompanying documentation and metadata for the data will include information about the research context, the content of the data, the variables, units of measurement, and the methodology used for collection. This documentation should enable users to understand the meaning of the data, the context in which it was collected, and the methods used for quality assurance.

The metadata for the data will be highly structured and will include elements such as the provenance of the data, the spatial or temporal coverage, the descriptors, formats, ownership and access conditions, and any other relevant information. To ensure consistency and standardization, the appropriate metadata standards within the discipline will be used.

In addition to the metadata, a basic README file will be maintained that provides a more detailed description of the data, including the dates of interviews, the interview schedules or topic guides, any changes made to the original data, and any abbreviations used. This file will allow users to read more information about the data alongside the dataset, ensuring that they can (re)use the data correctly for their respective projects and purposes.

## Ethics and Legal Compliance

### **How will you manage any ethical issues?**

In this study, I will be conducting a mixed-method research on the factors that influence the usability and perceived satisfaction of a continuous monitoring and deterioration alerting system in a non-ICU setting. To manage ethical concerns, I will take the following measures:

1. Obtaining formal consent agreements: Before participating in the study, the participants will be fully informed about the purpose of the research and will sign a written consent letter. The participant information sheet will clearly state that participation is voluntary and that they can stop the interview or survey at any time if they feel emotionally uncomfortable.
2. Anonymisation of data: To protect the participants' privacy and confidentiality, I will assign study IDs and store the pseudonymisation key separately and securely from the participant data after I complete the data collection. The UK Data Service Anonymisation resource and the UK Anonymisation Network Framework will be followed for guidance on anonymisation.
3. Secure data storage and transfer: All sensitive data will be stored securely using a password-protected device and transferred from Onedrive Business to the RDS (Research Data Storage of the University of Manchester) immediately after the participants share their recordings or survey data with me.
4. Review of transcriptions/summaries: Participants will be given opportunities to review the transcriptions/summaries of their interviews and survey data before I begin my analysis.
5. Referral to ethics committees: If necessary, I will refer to departmental or institutional ethics committees to manage any ethical issues that may arise.

I will follow the UK Data Service Anonymisation resource and the UK Anonymisation Network Framework for guidance on anonymization. If participants have any complaints, they can contact my supervisory team or the Research Ethics Manager of the University.

### **How will you manage copyright and Intellectual Property Rights (IPR) issues?**

I acknowledge that the copyright and Intellectual Property Rights (IPR) of the data collected through my research will be owned by the University of Manchester, as per its policy on ownership of research outputs as outlined in the University of Manchester Intellectual Property Policy (<http://documents.manchester.ac.uk/display.aspx?DocID=24420>). The data collected will be licensed for reuse under a Creative Commons Attribution 4.0 International License, which will allow others to freely use and re-distribute the data with proper attribution to the University of Manchester and the participants.

In case of any third-party data used in my research, I will ensure that I have obtained the necessary permissions and followed any restrictions on data sharing specified by the owner of the data. If any such restrictions exist, I will make sure to clearly mention it in my research report

## **Storage and backup**

### **How will the data be stored and backed up?**

The data will be backed up regularly, at least once a week, to ensure the data is secure and protected against data loss. The backup data will be stored in multiple locations, including the managed storage and automatic backup services provided by IT Services, such as the Research Data Storage of the University of Manchester, to ensure the data is securely stored and compliant with the funders' retention requirements of 5+ years. To further protect the data, encryption will be used when storing the data on laptops or external storage devices.

### **How will you manage access and security?**

The data collected through the semi-structured interviews will be kept confidential and is expected to include limited sensitive information such as demographic background, education level, work experience, and gender. The recordings of the interviews will be encrypted and immediately deleted from the University-approved recording device or platform, Microsoft Teams, once they have been transferred to secure storage, such as the University's Research Data Storage service. The data will be anonymized and kept for a maximum of four years following the completion of my PhD studies. I will be the sole individual with access to this private data, which will be stored securely in the University's Research Data Storage service."

## **Selection and Preservation**

### **Which data should be retained, shared, and/or preserved?**

In this research, the anonymized data that could have lasting value and is deemed appropriate for sharing, such as to validate research findings, conduct new studies, or for teaching purposes will be preserved beyond the duration of the project. This data will be stored in a publicly accessible data repository. On the other hand, the raw data including any confidential or personal information will be disposed of in accordance with the Information Governance Office guidance on disposal of confidential material. The data retention and disposal will be in accordance with the Records Retention Schedule of The University of Manchester.

### **What is the long-term preservation plan for the dataset?**

The long-term preservation plan for the dataset is to store it in the Research Data Storage (RDS) service, providing a member of the research team remains at the University and has continued access to the service.

## **Data Sharing**

### **How will you share the data?**

Findings based on the data will be shared with readers/researchers in the same field. The methodology used, any analysis materials and other relevant data may also be shared through the University's institutional data repository, Figshare, or through a discipline-specific data repository found through Re3data.org. Raw data will not be shared.

### **Are any restrictions on data sharing required?**

Not applicable.