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MODULE NAME: CHANGEMAKERS, CREATIVITY AND VALUE CREATION

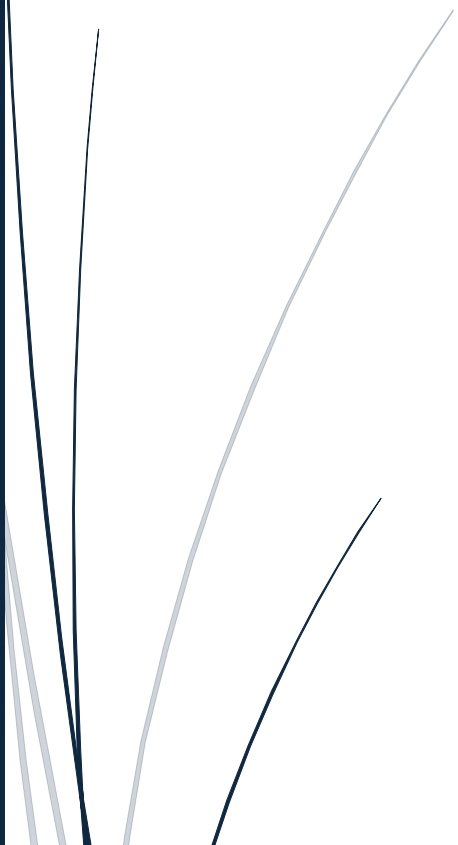
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Assignment 01: Project Proposal

Introduction

This project proposal investigates the design and development of a web-based point-of-sale platform for small retail businesses. The proposed platform will combine online and in-store order management, inventory monitoring, sales reporting and selected third-party API integrations within one system. Its purpose is to reduce disconnected processes and provide businesses with clearer information about stock and sales.

The proposal first considers how creativity, innovation and existing POS platforms influenced the selected idea. It then defines the project's aim and objectives, research philosophy and literature-search strategy. Finally, it presents the proposed data-collection and analysis methods, alongside measures addressing validity, reliability, generalisability and research ethics. A pilot questionnaire will be used to improve the research instrument before its wider distribution. The project's intended outcome is an evaluated academic prototype rather than a commercially released payment system.

Task 1 - Ideation & Mind Map

Mindmap link - <https://mm.tt/map/4058563177?t=T7e2qs8NGX>



[1], [2], [3], [4]

Task 2 - Aim & Objectives and Research area

The aim of this project is to investigate the requirements of small retail businesses and to design, develop and evaluate a web-based prototype that integrates online and in-store order management, inventory monitoring, sales reporting and point-of-sale functionality through selected third-party APIs.

Objectives

The first objective is to review existing systems and literature to identify the features, benefits and limitations of current web-based POS and inventory-management platforms.

The second objective is to gather user requirements by distributing a questionnaire to small local businesses. The questionnaire will examine current POS usage, usability problems, desired features and difficulties managing online and in-store transactions.

The third objective is to analyse the collected data to establish functional and non-functional requirements for the proposed platform, including usability, security, performance and accessibility requirements.

The fourth objective is to design the platform by producing user flows, database models, interface wireframes and an API-integration plan. A user-centred approach will ensure that design decisions reflect the needs of intended users [5].

The fifth objective is to develop a functional prototype containing product management, shared inventory, online and in-store order processing, sales reporting and at least one third-party API integration.

The sixth objective is to evaluate the prototype through functional testing and task-based usability testing with representative users. Feedback and identified defects will be used to improve the final prototype.

The final objective is to document and present the completed prototype, its evaluation results, limitations and recommendations for future development. Public commercial deployment would remain future work.

Research philosophy

Pragmatism is an appropriate research philosophy because this project is focused on solving a practical problem rather than committing exclusively to one view of knowledge. Pragmatic research selects methods according to their usefulness in answering the research question [6].

The project can combine quantitative and qualitative evidence. Closed questionnaire questions can produce numerical data about frequently used features, satisfaction and common problems. Open questions and usability feedback can provide explanations of users' experiences and requirements. The findings will then influence the design and evaluation of a working artefact.

The project also follows principles of design science research, in which knowledge is generated through creating and evaluating an artefact intended to address an identified problem [7]. In this project, the artefact is the POS prototype. Its value will be judged by how effectively it satisfies the requirements identified through research, rather than by whether it is technically functional alone.

Search tools, databases and strategies

Existing POS platforms, inventory-management techniques and API technologies represent the project's known knowns. However, the exact problems experienced by small retailers and the features they require are known unknowns. Research will therefore be used to develop a clearer understanding of these areas and may also reveal previously unidentified issues.

The UWTSD Library Search and Google Scholar will be used as general discovery tools. Specialist databases will include IEEE Xplore for software architecture, API integration and cybersecurity; the ACM Digital Library for human-computer interaction and usability; ScienceDirect for information systems and retail technology; and Scopus for identifying multidisciplinary research and tracking citations. Official documentation from Square, Shopify and Lightspeed may also provide current technical information, although its commercial purpose will be considered.

The research topic will be divided into keywords, including *point-of-sale*, *small business*, *inventory management*, *online ordering*, *API integration*, *usability* and *cybersecurity*. Boolean operators, quotation marks and alternative terms will refine searches. Example searches include:

- "point-of-sale system" AND "small business"
- ("POS" OR "retail platform") AND "inventory management"
- "web-based POS" AND (usability OR accessibility)
- "third-party API" AND (payments OR security)

Sources will be assessed using the CRAAP criteria: Currency, Relevance, Authority, Accuracy and Purpose [8]. Peer-reviewed research and recognised technical standards will

be prioritised. Commercial documentation may provide current product and API details but claims from POS vendors will be compared with independent evidence because those sources are intended to promote their products.

Task 3 – Research Strategies

Validity, reliability, generalisability and ethical considerations

Validity concerns whether the research measures what it intends to measure.

Questionnaire questions will therefore correspond directly to the project objectives, focusing on current POS usage, inventory problems, desired features and usability requirements. Neutral wording will reduce leading questions. Content validity will be strengthened by piloting the questionnaire and asking representative users to confirm that the questions are relevant and understandable. Questionnaire findings will also be compared with interview and usability-testing evidence through triangulation [9].

Reliability concerns whether consistent results would be produced if the research were repeated. Every participant will receive the same questions, definitions and instructions. Closed questions will use consistent five-point response scales. Prototype evaluations will use identical tasks and success criteria wherever possible. Maintaining a record of questionnaires, testing procedures and analysis decisions will improve reproducibility.

Purposive sampling will recruit participants with experience of operating or managing a small retail business. Including different business types and sales channels will provide a wider range of perspectives. However, a small local sample will not represent every small business. The participant characteristics and study limitations will therefore be reported, and findings will not be generalised beyond the available evidence [6].

Participants will receive an information sheet and provide informed consent. Participation will be voluntary, with the right to withdraw before anonymised analysis. Names, customer information, passwords, payment information and commercially sensitive sales data will not be collected. Responses will be anonymised and stored securely for only the required period. University ethical approval will be obtained where necessary [10].

Data collection and pilot method

A mixed-method strategy will collect quantitative and qualitative evidence. An online questionnaire will use multiple-choice, Likert-scale and open questions to examine current systems, common problems and desired functionality. Semi-structured interviews with selected participants may provide more detailed explanations of important questionnaire findings.

Once the prototype is available, representative users will perform standardised tasks such as adding a product, processing a sale, updating inventory and viewing a report. Completion rate, task time and errors will be recorded. Participants will then complete the System Usability Scale and provide comments about their experience [11].

The questionnaire will first be piloted with two or three people who have relevant retail or business experience. They will evaluate its clarity, relevance, response options, completion time and handling of potentially sensitive information. Their feedback will be used to revise the questionnaire before wider distribution. The pilot instrument and evidence of feedback will be included in Appendix A.

Quantitative and qualitative analysis

Quantitative questionnaire data will be summarised using frequencies, percentages and charts. Means or medians will summarise Likert-scale answers, while ranges and standard deviations may show variation. Prototype results will include task-completion rates, completion times, error counts and usability scores. Cross-tabulation may compare responses by business type if the sample is sufficiently large.

Open questionnaire responses and interview comments will be examined using thematic analysis. Responses will be coded, similar codes grouped into categories, and broader themes developed, such as *inventory difficulties*, *integration requirements* and *usability barriers*. Themes will be reviewed against the original responses and supported by anonymised quotations [10].

Conclusion

This proposal has established a structured plan for investigating and developing an integrated web-based POS platform. The project applies creativity and incremental innovation by adapting existing technologies to the identified requirements of small retail businesses. A pragmatic philosophy and design science approach will support the combination of user research with the creation and evaluation of a functional artefact.

Questionnaires, possible follow-up interviews and task-based usability testing will provide quantitative and qualitative evidence. Piloting, standardised procedures, triangulation and transparent documentation will strengthen the quality of the research. Ethical measures will include informed consent, voluntary participation, anonymisation and secure data handling. Although the small purposive sample will limit generalisability, the findings should provide an evidence-based foundation for the prototype and identify opportunities for future development and commercial investigation.

References

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Appendices

Appendix A – Pilot Questionnaire and Feedback

A1. Participant information

Project title:

Web-Based POS and Inventory Management Platform for Small Businesses

Purpose:

This questionnaire supports a university project investigating the requirements of small retail businesses. It explores current POS and inventory-management practices, common problems and features that businesses may value in a new web-based platform.

Participation:

Participation is voluntary. The questionnaire should take approximately 5–10 minutes. Participants may stop at any time before submitting their responses without providing a reason.

The questionnaire does not request names, customer records, passwords, payment information or commercially sensitive sales information. Responses will be anonymised and used only for this academic project. Because responses are anonymous, they cannot be withdrawn after submission because it will not be possible to identify an individual response.

Research data will be securely stored and deleted according to university requirements. Questions about the research can be sent to 2423608@student.uwtsd.ac.uk.

Consent:

Please confirm each statement:

- ☐ I have read and understood the participant information.

- ☐ I understand that participation is voluntary.
- ☐ I understand how my anonymised responses will be used.
- ☐ I confirm that I am aged 18 or over.
- ☐ I voluntarily agree to participate.

Participants who do not provide consent should not continue.

A2. Pilot questionnaire

1. What is your role within the business?
 - Owner
 - Manager
 - Employee
 - Other: _____
2. What type of products or services does the business provide?
3. Approximately how many employees does the business have?
 - 1
 - 2–5
 - 6–10
 - 11–49
 - 50 or more
 - Prefer not to say
4. Which sales channels does the business use?
 - Physical premises
 - Business website
 - Online marketplace
 - Social media
 - Other: _____
5. Which POS or inventory-management system is currently used?

- System name: _____
- No dedicated system
- Unsure

6. How satisfied are you with the current system?

1 – Very dissatisfied

2 – Dissatisfied

3 – Neither satisfied nor dissatisfied

4 – Satisfied

5 – Very satisfied

N/A – No current system

7. Which problems does the business experience? Select all that apply.

- Duplicate data entry
- Inaccurate inventory information
- Difficult or confusing interface
- Limited sales reporting
- Poor integration with other services
- High subscription or transaction costs
- Difficulty connecting online and in-store sales
- No significant problems
- Other: _____

8. Rate the importance of each proposed feature from 1 to 5, where 1 means “not important” and 5 means “extremely important.”

- Shared online and in-store inventory
- Online order management
- Low-stock notifications
- Sales reports and dashboards
- Employee accounts and permissions
- Third-party API integrations

- Browser-based checkout
- Product and price management

9. Which external services should the platform support?

Examples may include payment providers, accounting software or ecommerce platforms such as eBay.

10. What security or privacy concerns would you have about using a web-based POS platform?

11. What single improvement to the current system would provide the greatest value?

12. Would you consider participating in future prototype testing?

- Yes
- No
- Unsure

Contact information for prototype testing will be collected through a separate form to preserve questionnaire anonymity.

A3. Pilot feedback form

Participant code: P__

Date completed: __

Completion time: __ minutes

1. Were the participant information and instructions clear?
2. Were any questions confusing or ambiguous? If yes, identify them.
3. Did any question appear leading or biased?
4. Were any relevant response options missing?
5. Were any questions irrelevant or unnecessarily sensitive?
6. Was the questionnaire an appropriate length?
7. Did the rating scales make sense?
8. What changes would improve the questionnaire?