HANOI UNIVERSITY OF SCIENCE AND TECHNOLOGY

School of Information and Communications Technology

Feasibility Study

ShopeeFood Clone

Subject: Management of Software Development

Group 05

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Table of contents

[Table of contents 1](#_Toc86198253)

[1 EXECUTIVE SUMMARY 3](#_Toc86198254)

[2 PRELIMINARY REQUIREMENTS ANALYSIS 4](#_Toc86198255)

[2.1 Application overview 4](#_Toc86198256)

[2.1.1 Objectives 4](#_Toc86198257)

[2.1.2 Business objectives 4](#_Toc86198258)

[2.1.3 Current business process and rules 4](#_Toc86198259)

[2.1.4 User roles and responsibilities 4](#_Toc86198260)

[2.1.5 Interaction with other systems 5](#_Toc86198261)

[2.1.6 Production rollout considerations 5](#_Toc86198262)

[2.2 Functional requirements 5](#_Toc86198263)

[2.2.1 Statement of functionality 5](#_Toc86198264)

[2.2.2 Security and user capabilities 6](#_Toc86198265)

[2.2.3 Reporting 6](#_Toc86198266)

[2.2.4 Non-functional requirements 6](#_Toc86198267)

[2.2.5 Optional features 6](#_Toc86198268)

[2.2.6 Usability 7](#_Toc86198269)

[2.2.7 Scope 7](#_Toc86198270)

[3 PROCESS TO BE FOLLOWED 8](#_Toc86198271)

[4 SUGGESTED DELIVERABLES 11](#_Toc86198272)

[4.1 Periodic status report 11](#_Toc86198273)

[4.2 Periodic presentations 11](#_Toc86198274)

[4.3 Good faith requirements agreement 11](#_Toc86198275)

[4.4 Document for use and mechanics 12](#_Toc86198276)

[4.5 Demonstration and client training 12](#_Toc86198277)

[5 TECHNICAL FEASIBILITY 13](#_Toc86198278)

[6 VISIBILITY 15](#_Toc86198279)

[7 RISK ANALYSIS 16](#_Toc86198280)

[7.1 Time risks 16](#_Toc86198281)

[7.2 Resource risks 16](#_Toc86198282)

[7.3 Functionality risks 16](#_Toc86198283)

[7.4 Non-functionality risks 17](#_Toc86198284)

[7.5 Risk management and minimization 17](#_Toc86198285)

[8 BUSINESS CONSIDERATIONS 18](#_Toc86198286)

[8.1 Trade secrets and sensitive information 18](#_Toc86198287)

[8.2 Copyrights and trademark 18](#_Toc86198288)

[8.3 Patents 19](#_Toc86198289)

[9 CONCLUSION 20](#_Toc86198290)

# EXECUTIVE SUMMARY

The following proposed system is intended for public users including the reference staff of HUST Global ICT Program. The reference staff clients will be represented by Professor Nguyễn Nhất Hải, our group’s primary client. The basic goal of the development team is to implement a software that stimulates the food delivery system for buyers, store owners as well as drivers/shippers. This application will be designed to maximize sellers’ productivity and buyers experience by providing tools to assist in displaying dishes and ordering process. This software will allow store owners to manage their products and orders from the buyers. Buyers will be able to look through every store and place the food order with the help of filtering and sorting tools. Drivers/shippers can receive delivery orders from sellers and update the status of those orders. Furthermore, detail statistics will be available for both buyers, drivers, and sellers according to their roles. The overall goal of this system is to streamline and automate the process of food ordering, as well as keeping track of historical data and statistics. Successful implementation of the system will enable comprehensive and detailed data for each shop, which will no doubt help immensely in making management decisions.

# PRELIMINARY REQUIREMENTS ANALYSIS

## Application overview

### Objectives

The basic functionalities of the system will be ordering food items, confirming orders, and updating data in real time. The orders are afterwards taken by drivers and shipping fees will be calculated based on their current location.

### Business objectives

The project aims to reduce costs, optimize store owner levels, improve customer service, and store data more efficiently. It will provide the tools to make ordering food more efficient for users with an easy-to-use web interface.

Through this food ordering application, the management hopes to maximize sellers and drivers’ productivity and reduce workload. This system is also expected to greatly benefit buyers by increasing user experience in the food ordering process.

### Current business process and rules

Currently, buyers have to find the food stores online and call the owners to order food. Store owners must write down each item in the order and then make delivery requests to the drivers. This process is a waste of time for owners, buyers, and drivers and it is easy to make mistakes on the orders.

The new system will provide an easy-to-use application that meets every user needs.

### User roles and responsibilities

**Store owner role:** The ability to add and update data including store information and dishes. They can change the status of orders from buyers.

**Buyer role:** The ability to register to the system and create orders. They can give feedback for the dishes they bought.

**Driver role:** The ability to update the status of delivery orders.

### Interaction with other systems

The system will be built using modern web technologies.

### Production rollout considerations

The central data repository design and development, the design layouts, and generation of reports are expected to be carried out in a phased manner over three months before the system is tested and put into production. Users are expected to use this system with no difficulty.

## Functional requirements

### Statement of functionality

The software system will have different access levels so that different types of users may log in and out.

The buyers can look for the products they want with the search bar. They can also use filter to group the products by category or location as well as sort them by price or sales.

The information of the food stores such as contact details, sale statistic, and reviews, will be available for all buyers.

Buyers will be able to manage their basic information, the detail history of their orders, and their favourite stores. As for ordering dishes, they can observe the status of their placed orders, apply voucher to orders, write product review or make a group order.

A store owner will be able to manage the dishes in his/her own store and control the orders from customers as they can change the order status.

The drivers can receive and accept delivery orders from store owners. When finishing the delivery, they will have to update the status of the order.

### Security and user capabilities

The software system will support three types of users. To access the system, all users will need to login with a password. They will be granted permission to use the application with the corresponding interface based on their roles.

### Reporting

The reports generated will help in statistical analysis of the reference data that is collected and stored in the central data repository. Daily, weekly, monthly, quarterly, and yearly reports will be created using the functionalities of the system and sorted data.

### Non-functional requirements

The system will be implemented as a web-based application. Users will be able to access the application from all modern web browsers.

The criteria for the success of the system would be measured by the flexibility and sustainability of the system. The functionality and ability of the system to meet all requirements (simultaneous access from different browsers, effectiveness of the design of the central data repository, automatic backups, various levels of user access, etc.) would be critical for success as well. Ease of use and efficiency would be adequate measures of performance.

### Optional features

The payment related features such as banking payment can be developed and integrated into the application.

### Usability

Usability issues such as speed of operation for the user interface, collection and storage of important quantitative data, efficiency of the workflow processes, and concurrency of collected data will be important considerations.

### Scope

The scope of our system includes creating and managing food orders, updating user and store detail information, and giving product feedbacks.

The ordering process will become easier for buyers with the help of filtering tools.

# PROCESS TO BE FOLLOWED

For this project, the team has decided to follow Agile Scrum approach. Scrum framework implements the scientific method of empiricism. Scrum replaces a programmed algorithmic approach with a heuristic one, with respect for people and self-organization to deal with unpredictability and solving complex problems. It provides a means for teams to establish a hypothesis of thinking how something works, try it out, reflect on the experience, and make the appropriate adjustments. Scrum framework consists of Sprint, Refinement and Backlog.

* **Sprint:** A sprint is a short period of time for the scrum team to complete a set of work. Our team has decided that each sprint will last for two weeks. At the beginning of a sprint, we have Sprint Planning, which decides the number of stories or tasks that must be done in that sprint as well as work assignment to each member. At the end of a sprint, a Review session will be held to evaluate and demonstrate the finished work in that sprint as well as giving story points.
* **Refinement:** It has a shorter period than sprint, which we have decided to have once a week. At the refinement meeting, the team will review the tasks has been done, tasks that in progress and tasks will be implemented in the next sprint. The overall purpose of refinement is to break down the sprint so that the amount of work will be reviewed frequently, and the team will meet the sprint’s goals.
* **Backlog:** A product backlog is a prioritized list of work for the development team that is derived from the roadmap and its requirements. The most important items are shown at the top of the product backlog, so the team knows what to deliver first.

Below is the proposed outline of the iteration stages and milestones including what the team expects to have completed at each stage.

**I. Milestone 1 (October 27, 2021)**

The team will prepare a formal document that will study the feasibility of the project. The client will categorize these requirements into required, desired and optional features. After the document is approved by the client, the team will prepare for the system design.

**II. Milestone 2 (November 3, 2021)**

The team will prepare a Software Requirement Specification document and decide a suitable design for the system. Screen mockup will be drawn as well as sample data will be generated for the the database. After the client’s evaluation of the software architecture and design, modification will be made if it is necessary.

**III. Milestone 3 (November 17, 2021)**

Basic functions for Authenticate and Product services are implemented as well as the application interface for those services.

**IV. Milestone 4 (December 1, 2021)**

The features of Payment and Billing service as well as Order service will be developed at this stage.

**V. Milestone 5 (December 8, 2021)**

A formal document will be prepared that include both system design and code behind it. Details about the application design will cover internal functionality so that developers can maintain and modify the application in the future.

The team may hold a short presentation as progress evaluation for client. As part of this progress report, the team will update the work done and task schedules to ensure that the system will be completed by the end of the final iteration.

**VI. Milestone 6 (December 22, 2021)**

The Shipping features will be implemented, and other/optional functions will be further developed. Our team will improve the UI of the system to meet the requirements of the client.

**VII. Milestone 7 (January 5, 2022)**

The team plans to reserve one to two weeks before the final presentation so that the client and members can test the product in its intended environment with real users and data. All functional requirements will have been met at this point. Any changes hereafter will only cover small details such as aspects of user interface.

The document for the final version of the product will be completed by the team members. This will include information on all required features as well as optional features that will have been fully implemented.

**VIII. Milestone 8 (January 19, 2022)**

The final presentation and document of the system will be given to the client. The team will also provide a demonstration of the system and training so that the client can understand how the user interface is intended to be used.

# SUGGESTED DELIVERABLES

To satisfy the client’s need for a digital and easy-to-use food ordering system, the following set of work-products will be delivered to the client.

## Periodic status report

Throughout the software development process, periodic reports will be written and presented to the client to maintain process visibility and enhance the team’s responsiveness to the client’s needs. The team understands that the client will wish to comment and respond to the development progress. In turn, the team will strive to continually adjust and target processes and progress to the client’s needs. Periodic status reports will detail the feasibility of the project, its exact requirements, its design, and ultimately, its final form and implementation. These will be documents that are presented to the client and any other individuals the client identifies.

## Periodic presentations

Accompanying requirements, design, and final reports will be periodic presentations where the team will demonstrate different aspects of the software system in development. The team’s iterative approach to software design means that different presentations may concentrate on specific areas of the client’s need. These presentations are designed to give the client maximum understanding of how their needs are being addressed in the actual product. Feedback will be critical to these presentations, so that the team may use the client’s comments to understand completely how the system meets the client’s needs.

## Good faith requirements agreement

After the project requirements have been discussed and reviewed with the client, a requirements agreement will be presented to the client to clarify exactly what the project intends to accomplish. The agreement will explicitly spell out which features and objectives the team intends to deliver.

## Document for use and mechanics

The client will be provided documentation both explaining how to use our system and describing its underlying mechanics. The client has expressed interest in gaining familiarity with the system, and the documentation will be useful for reference needs.

## Demonstration and client training

In addition to documentation, the team may need to provide demonstrations of the system (in various stages of completion) throughout the semester (in coordination with our periodic presentations) and by allocating time after the final system is finished to train the clients in the use of our system.

# TECHNICAL FEASIBILITY

The ShopeeFood Clone is a web-based application build with microservices model. The main technologies and tools the team using are:

* Front-end: ReactJS, HTML, CSS, JS
* Back-end: Java (Spring framework)
* Database: MongoDB, MariaDB
* Deployment: Docker, Docker Compose
* Version control: Github
* CI/CD: Github Actions
* Management: Trello, Github Projects

Each of the technology is freely available and the technical skills required are manageable for our team members.

**Requirement:**

**(1) Multiple roles of access to the system**

Users include store owners, buyers, and drivers. Therefore, different levels of users need to be identified by the system by authentication methods.

**(2) Product sorting by different fields (category, sale, etc.)**

The filtering tools will need to include different fields of information since it will be used to organize the data in different ways depending on user’s purpose.

**(3) Large amount of data storing and accessing**

Since there is a lot of information that must be dealt with, the system needs to ensure the ability to store and query data as quickly as possible.

**(4) Microservices architecture**

The microservices architecture improves the scalability of the application and provides better fault isolation and more resilient application. It also offers more flexibility to use the programming languages and technologies that best fit the needs of the project and the skillsets of the team.

**(5) Security**

Security needs to be maintained to ensure the integrity of the data with strictly permission. Password-protection and a login system (based on access-level or user role) are sufficient.

Additionally, it should be noted that the final system delivered to the client may be different from the technically feasible one described herein. The purpose of this study was to determine if the project itself was feasible at all. Future concentration on the requirements of the system will be made and an optimal architecture will be adopted.

# VISIBILITY

The team will take efforts to maximize the visibility of the system and the development process. This will ensure that the project is being developed in line with client specifications. Any deviations from those specifications can also be caught early and corrected through client feedback. Various visibility methods the team intends to use are described below.

**Communication**

In person meetings and emails would be the primary form of open communication to keep the team members and clients updated with the progress of the project. Regular meetings will be held with the client to discuss progress and for the purposes of two-way feedback. The team will also meet as a whole at least once a week to assure all members are caught up and understand their roles and jobs.

**Intermediate Deliverables and Presentations**

*Live demonstrations*: The client will be given demonstrations of the progress through presentations at the client site and at the monthly presentations corresponding to each major phase in the project.

*Presentations*: Slideshows of design layouts of screens, reports and demos of working functions, and the system will be shown to the client to keep them updated with the team’s progress.

*Reports*: The clients will also be presented with copies of the documentation, which record details at each phase in the software development process. These progress reports will also enable them to be well awared of the details of the project from their perspectives.

# RISK ANALYSIS

As with any project, this undertaking is not entirely risk-free. Three major risk categories have been identified: time, resource, and functionality.

## Time risks

As course requirements specify that the project must be completed within one academic semester, any extensions are not possible. This introduces the risk that the system may not be completed with the full functionality the client wants within the given timeframe of a semester. In this case, there is also a second risk of delayed implementation of the system if the client chooses to wait until the system is fully functional.

## Resource risks

Resource risks involve technologies and data the team has available for their use. Due to costs and other external constraints, the team may not be able to obtain the needed or best resources to complete parts of the system. For example, the data of food shops will be crawl online and may not be available for storing. In addition, there are inherent risks in the resources, such as the software and hardware the team decides to use. Currently, to keep costs at a minimum, the team is considering open-source software, which is available without charge. Risks that stem from resources include hardware failures, system crashes, bugs in the code, etc., which may cause accidental data loss. Since the system is web-based, slight variations in display of the user interface may also occur due to different internet browsers.

## Functionality risks

Functionality risks have to do with how the system works. Issues that fall under this category include developing a user interface that is not user-friendly or not well-liked by the client or producing functions that have limited sustainability. The biggest risk comes from developing a system that does not do what the client wants it to do.

Out of the three risk categories, functionality risks are the easiest to reduce since functionality constraints are more flexible than time or resource constraints. However, minimizing functionality risk is usually accomplished by omitting specific parts and/or functions of the system, as decreasing functionality naturally decreases its associated risks. The team would like to avoid doing this as much as possible. The clients must be aware that it is possibile that this must be done to deliver the system by the due date at the end of the semester.

## Non-functionality risks

Similar to incomplete requirements, non-functional requirements have not been brought up in the initial meeting with the Client. These include requirements on the number of users that the system expects to support concurrently, and the response time of the database lookup.

## Risk management and minimization

Having outlined the basic risks associated with this project above, the team is prepared to take precautionary actions to minimize these risks. The principal plan is to develop and practice good management strategies. The team intends to divide the project into a series of iterative phases that have concrete milestones as discussed in previous sections. These milestones will provide project visibility and allow the client to see the team’s progress at each stage. Multiple mockups will allow the client to evaluate usability, increase familiarity with the system, and shorten the learning curve. Frequent communication and feedback from the client are also essential for client satisfaction with the user interface and functionality. The team will also constantly review their progress and modify goals if necessary to deliver a satisfactory system on time to the client.

# BUSINESS CONSIDERATIONS

## Trade secrets and sensitive information

As far as the team could gather from discussions with clients, there are no trade secrets or sensitive information that will be dealt with in the implementation of our system. The information is not of a sensitive nature that will have to be heavily guarded through several security measures. Even considering this situation, the system will be designed with password protected pages to prevent malicious users from accessing and corrupting this valuable data.

## Copyrights and trademark

The team consists of the following members: Lưu Đức Thành, Đỗ Tiến Thành, Nguyễn Đức Thái, Lê Đức Long, Lại Tiến Đức, Nguyễn Thanh Tùng, Trịnh Long, Ngô Quang Minh, hereafter referred to as “the team.” The team will give a limited license to Hanoi University of Science and Technology, SoICT department, and Professor Nguyễn Nhất Hải, hereafter referred to as “the client”. This limited license will allow the client to use and modify the software system for an unlimited period of time. The team will not be responsible for any modifications after the software system is delivered but will help with any questions or concerns of the client as time and circumstances permit. The team reserves the right to be able to demo the software system to prospective employers and showcase the software system as a work created by each team member.

Since the team does not plan to trademark any names in relation to the software system, trademark is not foreseen as being an issue.

## Patents

No part of the system is foreseen to be eligible for any patent applications. However, if upon a later date, a part of the system is found to be patentable, the team reserves the rights to the uncontested patent and any derivative works based therein, while the client will automatically gain non-exclusive rights to use the system and will have full rights to the use and modification of the system regardless of any patent rights held by the team.

# CONCLUSION

From the results of the feasibility study, the team finds that the ShopeeFood Clone project is feasible in terms of technicality, skill of team members, and time. Given the time constraint of one semester, the team believes the scope of the project is manageable and that the client’s requirements can be satisfactorily fulfilled upon system completion. The team members also possess the adequate skills to implement the system and are familiar with hardware and software that may be used in this project. The conclusion of the feasibility report is to go ahead with this software development project.