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COFFEE SUPPLY CHAIN MANAGEMENT SYSTEM

TOOL AND STRATEGY TO HELP BUSINESSES MANAGE PRODUCTS AND IMPROVE WELLBEING OF USERS

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Student declaration I certify that the assignment submission is entirely my own work and I fully understand the consequences of plagiarism. I understand that making a false declaration is a form of malpractice.			
		Student's signature	Huy

Grading grid

P1	P2	P3	P4	P5	M1	M2	M3	D1	D2

❒ Summative Feedback:	❒ Resubmission Feedback:

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Signature & Date:

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This topic is a combination of theory and practice, between the scientific knowledge that I gained during 4 years of studying at Hue University of Economics and 2 years at Greenwich University Vietnam with knowledge capital. Practical formulas collected in practice. And with the help of teachers, friends, and upper-class students, I have completed the topic "**COFFEE SUPPLY CHAIN MANAGEMENT SYSTEM - Tool and strategy to help businesses manage products and improve the wellbeing of users**".

I would like to thank teacher Phan Thanh Tra, who guided me through the process of completing this topic.

With not much time as well as limited knowledge, the topic cannot avoid mistakes. I look forward to the guidance and suggestions of teachers so that we can improve and supplement our knowledge, better serve the actual work in the future.

Finally, I wish you always full of health, happiness, and success in life.

Sincerely thank!

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INTRODUCTION

In recent years, the coffee market is full of fluctuations, fake coffee is rampant, and real coffee loses its footing, consumers do not know how to distinguish.

The alarming situation of food hygiene and safety and a part of business circles use every means to profit, despite the health and lives of the people to gain profits, causing frustration for consumers. use. Fake coffee not only harms the health and economy of consumers but also causes consumers to be confused and lose confidence in Vietnamese products.

Surveys outside the market can be easily noticed, besides the big branded coffee shops, nowadays popular coffee services such as coffee stroll, coffee shop toad ... also appear quite a lot because Convenient, cheap. Coffee is prepared in large jars in an icebox to keep it cold, then mixed for guests, adding milk sugar, foaming ice. These cups of coffee are all advertised as pure coffee ingredients, how to mix, no one knows.

In order to have delicious and delicious cups of coffee with a few thousand dongs sold on the market, fake coffee production establishments mix a lot of additives and impurities such as corn, soybeans, areca grass, husks. baked coffee burns into the same coffee. These ingredients have created a fragrant, aromatic after roasting, and also have a bitter taste that consumers mistakenly believe is coffee.

More worrisome, to create odors, many manufacturing facilities also use refined coffee, mainly made from chemicals, containing many impurities, toxic heavy metals. These chemical fragrances are easily purchased at fragrance shops with a hard-to-guarantee origin. The environment for producing fake coffee is also often humid, not hygienic with old and outdated tools of hoes, shovels, roasting, and grinding tools.

The roasting of soybeans to create real coffee varieties will disintegrate the nutritional components and produce substances that are toxic to users. The raging fake coffee also partly stems from consumption habits when the way of evaluating Vietnamese delicious coffee is still mainly based on aromas and additives.

Grasping weaknesses of Vietnamese consumers who prefer to use coffee with 4 characteristics "thick, bitter, vicious, frothy" so that producers often mix impurities to meet consumers' tastes and tastes.

With the purpose of contributing a report on coffee consumption behavior analysis, providing coffee suppliers with a fuller and deeper insight into the need for clean coffee, a better understanding of customers. Therefore, the topic of the report is " **Tool and strategy to help businesses manage products and improve the wellbeing of users**"

1. The project charters

Table 1. Project charter

1. General Project Information	
Project Name:	**COFFEE SUPPLY CHAIN MANAGEMENT SYSTEM**
Executive Sponsors:	**GCD – Greenwich's Club Of Developers**
Department Sponsor:	**University of Greenwich**
Impact of the project:	**Tool and strategy to help businesses manage products and improve the wellbeing of users**

2. Project Team				
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3. Stakeholders
University of Greenwich
People using coffee in Da Nang City
Coffee Shop
Coffee Company
Team member

4. Project Scope Statement
Project Purpose / Business Justification
- Research and analyze consumer satisfaction for coffee in Da Nang city, thereby contributing some solutions for businesses to manage the supply chain. - The coffee supply chain is the sequence of activities and processes to bring raw coffee beans from coffee farms to processed coffee in markets.

Objectives

- Explain the theory of consumer behavior. Learn about the overview of the whole coffee market in Vietnam in general and Da Nang City in particular.
- Discover customers' needs and satisfaction, indicating the current situation in the coffee industry in Danang.
- Analyze the effects of product quality, price, distribution, and trade promotion on coffee usage behavior in Danang city
- From there, propose solutions to contribute to enterprises distributing pure coffee to influence coffee use behavior of consumers in Da Nang city.
- The level of consumer satisfaction with coffee
- Consumers' habit of buying and using coffee
- The impact of shoddy coffee on consumers
- Implementing smart contracts addressing the issue of storing critical data necessary at different stages of the supply chain and making it verifiable by all stakeholders in the supply chain.
- Tracking the progress of coffee beans after each stage in the blockchain.

Deliverables

- Report on the current status of coffee use in Danang in 2020
- Coffee Supply Chain Management System

Scope

- Survey locations: Da Nang City, Viet Nam
- Survey time: June 2020
- Sample size: 200 people

Project Milestones

- **Initiating**: Complete the project charter on June 1, 2020
- **Planning**: Complete the sequence of jobs, assigning tasks, appropriate resource, evaluating, assessing risk and funding on June 10, 2020
- **Executing**:
    - Research and survey: Complete on July 14, 2020
    - Design: Complete all the design of the project on July 18, 2020
    - API: Complete API on July 30, 2020
    - BlockChain: Complete smart contract on August 4, 2020
    - UX/UI: Complete UX/UI on August 9, 2020
    - Testing: Complete testing on August 11, 2020
- **Delivery and maintenance**: August 17, 2020

Major Known Risks

Risk	Risk Rating (Hi, Med, Lo)
Members quit their jobs	High
Lack of funding	High
Members have not enough experience	Medium
Survey data is incomplete	Medium
Not enough equipment/device for members	Low

Constraints

- Limited budget for the project
- Lack of technical skills

External Dependencies

- There is an agreement between the stakeholder and GCD's Team

5. Communication Strategy

- Framework: Scrum
- Communication: Slack
- Tracking: Trello
- Code controller and stored: GitHub
- A document stored: Google Drive

6. Sign-off

	Name	Signature	Date (MM/DD/YYYY)
Executive Sponsor	Tran Quang Huy	***Huy***	05/25/2020
Department Sponsor	Phan Thanh Tra	***Tra***	05/25/2020
Project Manager	Tran Quang Huy	***Huy***	05/25/2020

7. Notes

2. Literature review

2.1. Research methodologies

There are two forms of research:

- Primary Research
- Secondary Research

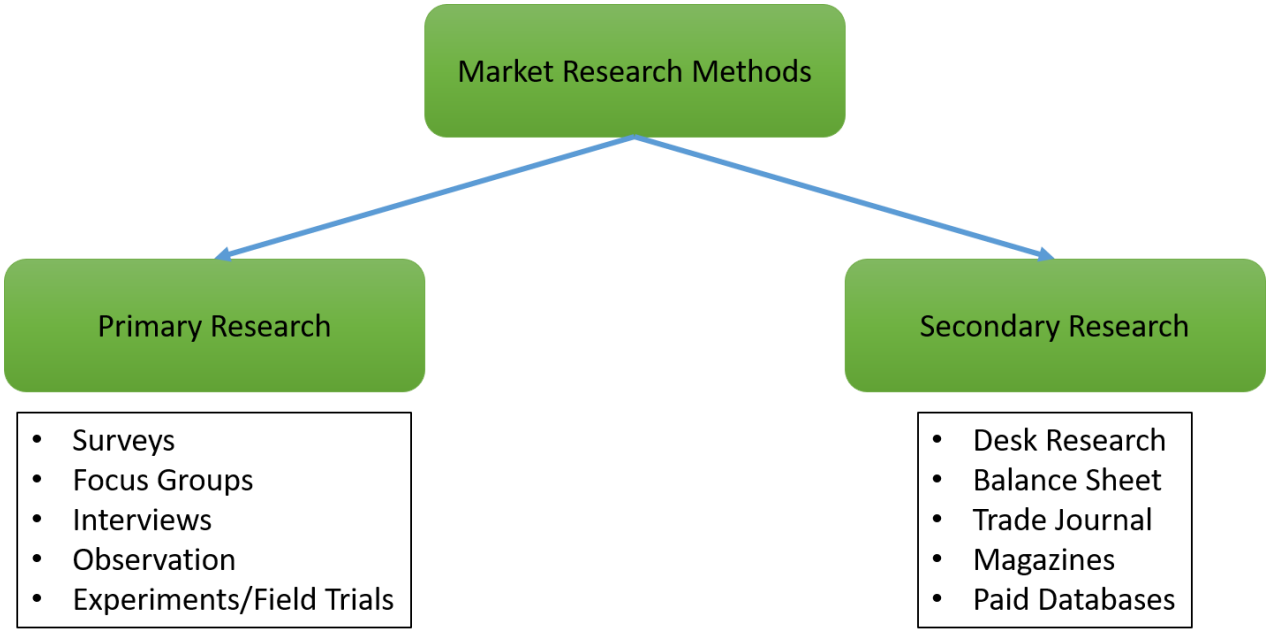


Figure 1. Research Methodologies

- **Primary research**

Primary research is defined as a methodology used by researchers to collect data directly, rather than depending on data collected from previously done research. Technically, they "own" the data. Primary research is solely carried out to address a certain problem, which requires in-depth analysis.

Businesses or organizations can conduct primary research or can employ a third party to research on their behalf. One major advantage of primary research is, this type of research is "pinpointed", research is carried around only a specific issue or problem and all the focus is directed to obtain related solutions. (questionpro, questionpro, n.d.)

For example, a brand is about to launch a new model of mobile phone and wants to research the looks and features mobile phones they are soon going to introduce. Organizations can select a qualified sample of respondents that closely resembles population and conduct primary research with them, to know their opinions. Based on this research, the brand can now think of probable solutions to make necessary changes in the looks and features of a mobile phone.

Base on (thehartford, n.d.): "Primary research is research you conduct yourself (or hire someone to do for you.) It involves going directly to a source – usually customers and prospective customers in target market – to ask questions and gather information."

In this technology-driven world, meaningful data is more valuable than gold. Organizations or businesses need highly validated data to make informed decisions. This is the very reason why many companies are proactive to gather data so that the authenticity of data is maintained and they get first-hand data without any alterations.

Figure 2. Primary research methods. (univdatos, n.d.)

There are some of the primary research methods organizations or businesses use to collect data:

- **Interviews (telephone or face-to-face):**

Conducting interviews is a qualitative research method to collect data and has been a popular method for ages. These interviews can be conducted in person (face-to-face) or over the telephone. Interviews are an open-ended method which involves dialogues or interaction between the interviewer (researcher) and interviewee (respondent).

Conducting the face-to-face interview is said to generate a better response from respondents as it is a more personal approach. However, the success of face-to-face interviews depends heavily on the researcher's ability to ask questions and his/her experience related to conducting such interviews in the past. The types of questions that are used in this type of research are mostly open-ended questions. These questions help to gain in-depth insights into the opinions and perceptions of respondents.

Personal interviews usually last up to 30 minutes or even longer depending on the subject of research. If a researcher is running short of time conducting telephonic interviews can also be helpful to collect data.

- **Surveys (online or mail):**

Once conducted with pen and paper, surveys have come a long way since then. Today, most researchers use online surveys to send it to respondents to gather information from them. Online surveys are convenient and can be sent on emails or can be filled out online. These can be accessed on handheld devices like smartphones, tablets, Ipads, and similar devices.

Once a survey is deployed, a certain amount of stipulated time is given to respondents to answer survey questions and send it back to the researcher. In order to get maximum information from respondents, surveys should have a good mix of open-ended questions and close-ended questions. The survey should not be lengthy, else respondents lose interest and tend to leave it half done.

It is a good practice to reward respondents on successfully filling out surveys for their time and efforts and valuable information. Most organizations or businesses usually giveaway gift cards from reputed brands that respondents can redeem later.

- **Observations:**

In this primary research method, there is no direct interaction between researcher and person/consumer being observed. The researcher observes the reactions of a subject and makes notes.

Trained observers or cameras are used to record reactions. Observations are noted in a predetermined situation. For example, a bakery brand wants to know how people react to its new biscuits, the observer notes the first reaction of consumers, and evaluates collective data to draw an inference.

- **Focus groups:**

This popular research technique is used to collect data from a small group of people, usually restricted to 6-10. The Focus group brings together people who are experts in subject matter, for which research is being conducted.

The Focus group has a moderator who stimulates discussions among the members to get greater insights. Organizations and businesses can make use of this method especially to identify a niche market to learn about a specific group of consumers.

Advantages of Primary Research:

- One of the most important advantages is, data collected is first hand and is accurate. In other words, there is no dilution of data. Also, this research method can be customized to suit the personal requirements and needs of organizations or businesses.
- Primary research focuses mainly on the problem in hand, which means entire attention is directed to find a probable solution to a pinpointed subject matter. Primary research allows researchers to go in-depth of a matter and study all foreseeable options.
- Data collected can be controlled. Primary research gives the means to control how data is collected and used. It's up to the discretion of businesses or organizations who are collecting data on how to best make use of data to get meaningful research insights.
- Primary research is a time-tested method, therefore, one can rely on the results that are obtained from conducting this type of research.

Disadvantages of Primary Research:

- One of the major disadvantages of primary research is, it can be quite expensive to conduct. One may be required to spend a huge sum of money depending on the setup or primary research method used. Not all businesses or organizations may be able to spend a considerable amount of money.
- This type of research can be time-consuming. Conducting interviews, sending, and receiving online surveys can be quite an exhaustive process and need investing time and patience for the process to work. Moreover, evaluating results and applying the findings to improve products or services will need additional time.
- Sometimes just using one primary research method may not be enough. In such cases, the use of more than one method is required and this might increase both times required to conduct research and the cost associated with it.

- **Secondary research**

Secondary research or desk research is a research method that involves using already existing data. Existing data is summarized and collated to increase the overall effectiveness of research.

Secondary research includes research material published in research reports and similar documents. These documents can be made available by public libraries, websites, data obtained from already filled in surveys, etc. Some government and non-government agencies also store data, that can be used for research purposes and can be retrieved from them.

Secondary research is much more cost-effective than primary research, as it makes use of already existing data, unlike primary research where data is collected first hand by organizations or businesses or they can employ a third party to collect data on their behalf. (questionpro, questionpro, n.d.)

Secondary Research Methods:

- **Data available on the internet**: One of the most popular ways of collecting secondary data is using the internet. Data is readily available on the internet and can be downloaded at the click of a button.
- **Government and non-government agencies**: Data for secondary research can also be collected from some government and non-government agencies. For example, US Government Printing Office, US Census Bureau, and Small Business Development Centers have valuable and relevant data that businesses or organizations can use.
- **Public libraries**: Public libraries are another good source to search for data for secondary research. Public libraries have copies of important research that were conducted earlier. They are a storehouse of important information and documents from which information can be extracted.

- **Educational Institutions**: The importance of collecting data from educational institutions for the secondary research is often overlooked. However, more research is conducted in colleges and universities than any other business sector.
- **Commercial information sources**: Local newspapers, journals, magazines, radio, and TV stations are a great source to obtain data for secondary research. These commercial information sources have first-hand information on economic developments, political agenda, market research, demographic segmentation, and similar subjects.

Here are the steps involved in conducting secondary research:

- **Identify the topic of research**: Before beginning secondary research, identify the topic that needs research. Once that's done, list down the research attributes and purpose.
- **Identify research sources**: Next, narrow down on the information sources that will provide the most relevant data and information applicable to research.
- **Collect existing data**: Once the data collection sources are narrowed down, check for any previous data that is available which is closely related to the topic. Data related to research can be obtained from various sources like newspapers, public libraries, government, and non-government agencies, etc.
- **Combine and compare**: Once data is collected, combine, and compare the data for any duplication and assemble data into a usable format. Make sure to collect data from authentic sources. Incorrect data can hamper research severely.
- **Analyze data**: Analyze data that is collected and identify if all questions are answered. If not, repeat the process if there is a need to dwell further into actionable insights.

Advantages of Secondary Research:

- Most information is secondary research is readily available. There are many sources from which relevant data can be collected and used, unlike primary research, where data needs to collect from scratch.
- This is a less expensive and less time-consuming process as data required is easily available and doesn't cost much if extracted from authentic sources. A minimum expenditure is associated to obtain data.
- The data that is collected through secondary research, gives organizations or businesses an idea about the effectiveness of primary research. Hence, organizations or businesses can form a hypothesis and evaluate the cost of conducting primary research.
- Secondary research is quicker to conduct because of the availability of data. Secondary research can be completed within a few weeks depending on the objective of businesses or the scale of data needed.

Disadvantages of Secondary Research:

- Although data is readily available, credibility evaluation must be performed to understand the authenticity of the information available.
- Not all secondary data resources offer the latest reports and statistics. Even when the data is accurate, it may not be updated enough to accommodate recent timelines.
- Secondary research derives its conclusion from collective primary research data. The success of research will depend, to a greater extent, on the quality of research already conducted by primary research.

- **Comparison between primary research and secondary research**

Both primary and secondary research have their advantages and disadvantages. While primary data is need-specific and quality is also up to the mark, but it is expensive and consumes more time. Secondary research, on the other hand, is cheap, and the data collection is easy, but it is also possible that the data may be outdated and does not suit requirements. So, before choosing any of these two, first examine requirements, sources, costs, etc. to choose the best research type for project.

Basis for comparison	Primary research	Secondary research
Meaning	Research conducted to gather first-hand information, for the current problem is called Primary Research.	Secondary Research is one that involves the use of information gathered originally by primary research
Based on	Raw data	Analyzed and interpreted information
Carried on by	Researcher himself	Someone else
Data	Specific to the needs of the researcher.	May or may not be specific to the needs of the researcher.
Process	Very Involved	Rapid and Easy
Cost	High	Low
Time	Primary research is an expensive process and consumes a lot of time to collect and analyze data.	Secondary research is a quick process as data is already available. Researchers should know where to explore to get the most appropriate data.

Table 2. Comparison between primary research and secondary research

Key Differences Between Primary and Secondary Research (keydifferences, n.d.):

- Research conducted to gather first-hand information, for the current problem is called Primary Research. Secondary Research is one that involves the use of information obtained originally by primary research.
- Primary Research is based on raw data, whereas secondary research is based on analyzed and interpreted information.
- The primary research, the data is collected by the researcher himself or by the person hired by him. As against this, the secondary research, the data collection is performed by someone else.
- The primary research process is very involved which deeply explores the topic. Conversely, the secondary research process is fast and easy, which aims at gaining a broad understanding of the subject.
- In the primary research, as the researcher conducts the research, the data collected is always specific to the needs of the researcher. As opposed to secondary research, wherein the data lacks particularity, i.e. it may or may not be as per the requirements of the researcher.
- Primary research is an expensive process; wherein high cost is involved in the exploration of data and facts from various sources. Unlike Secondary research, it is an economical process wherein the low cost is involved in acquiring pertinent information because the data is already collected by someone else.
- Primary research consumes a lot of time as the research is done from scratch. However, in the case of secondary research, the collection of data is already done, the research takes comparatively less time.

Picture 1. Method of primary research and secondary research. (questionpro, n.d.)

- **Qualitative Research:**

Qualitative research is defined as a market research method that focuses on obtaining data through open-ended and conversational communication.

This method is not only about “what” people think but also “why” they think so. For example, consider a convenience store looking to improve its patronage. A systematic observation concludes that the number of men visiting this store is more. One good method to determine why women were not visiting the store is to conduct an in-depth interview of potential customers in the category.

On successfully interviewing female customers, visiting the nearby stores and malls, and selecting them through random sampling, it was known that the store doesn’t have enough items for women and so fewer women were visiting the store, which was understood only by personally interacting with them and understanding why they didn’t visit the store because there were more male products than female ones.

Therefore, the qualitative research methods allow for in-depth and further probing and questioning of respondents based on their responses, where the interviewer/researcher also tries to understand their motivation and feelings. Understanding how audience takes decisions can help derive conclusions in market research.

Qualitative Research Methods:

- **One-on-One Interview**: Conducting in-depth interviews is one of the most common qualitative research methods. It is a personal interview that is carried out with one respondent at a time. This is purely a conversational method and invites opportunities to get details in depth from the respondent.
- **Focus groups**: A focus group is also one of the commonly used qualitative research methods, used in data collection. A focus group usually includes a limited number of respondents (6-10) from within target market.
- **Ethnographic research**: Ethnographic research is the most in-depth observational method that studies people in their naturally occurring environment.
- **Case study research**: The case study method has evolved over the past few years and developed into a valuable qualitative research method. As the name suggests it is used for explaining an organization or an entity.

- **Record keeping**: This method makes use of the already existing reliable documents and similar sources of information as the data source. This data can be used in the new research. This is similar to going to a library. There one can go over books and other reference material to collect relevant data that can likely be used in the research.
- **Process of observation**: Qualitative Observation is a process of research that uses subjective methodologies to gather systematic information or data. Since the focus on qualitative observation is the research process of using subjective methodologies to gather information or data. Qualitative observation is primarily used to equate quality differences.

- **Quantitative Research**

Quantitative research is defined as a systematic investigation of phenomena by gathering quantifiable data and performing statistical, mathematical, or computational techniques. Quantitative research collects information from existing and potential customers using sampling methods and sending out online surveys, online polls, questionnaires, etc., the results of which can be depicted in the form of numerical. After careful understanding of these numbers to predict the future of a product or service and make changes accordingly.

For example, the survey conducted to understand the amount of time a doctor takes to tend to a patient when the patient walks into the hospital. A patient satisfaction survey template can be administered to ask questions like how much time did a doctor takes to see a patient, how often does a patient walks into a hospital, and other such questions.

Quantitative research is mostly conducted in the social sciences using the statistical methods used above to collect quantitative data from the research study. In this research method, researchers and statisticians deploy mathematical frameworks and theories that pertain to the quantity under question.

Quantitative research templates are objective, elaborate, and many times, even investigational. The results achieved from this research method are logical, statistical, and unbiased. Data collection happened using a structured method and conducted on larger samples that represent the entire population.

Quantitative Research Methods:

- **Primary Quantitative Research Methods:**

Techniques and Types of Studies:

Survey Research is the most fundamental tool for all quantitative research methodologies and studies. Surveys used to ask questions to a sample of respondents, using various types such as online polls, online surveys, paper questionnaires, web-intercept surveys, etc. Every small and big organization intends to understand what their customers think about products and services, how well are new features faring in the market and other such details.

By conducting survey research, an organization can ask multiple survey questions, collect data from a pool of customers, and analyze this collected data to produce numerical results. It is the first step towards collecting data for any research.

There are two types of surveys, either of which can be chosen based on the time in-hand and the kind of data required:

- **Cross-sectional surveys**: Cross-sectional surveys are observational surveys conducted in situations where the researcher intends to collect data from a sample of the target population at a given point in time. Researchers can evaluate various variables at a particular time. Data gathered using this type of survey is from people who depict similarity in all variables except the variables which are considered for research. Throughout the survey, this one variable will stay constant.
- **Longitudinal surveys**: Longitudinal surveys are also observational surveys but, unlike cross-sectional surveys, longitudinal surveys are conducted across various time durations to observe a change in respondent behavior and thought-processes. This time can be days, months, years, or even decades. For instance, a researcher planning to analyze the change in buying habits of teenagers over 5 years will conduct longitudinal surveys.

Correlation research is conducted to establish a relationship between two closely-knit entities and how one impacts the other and what are the changes that are eventually observed. This research method is carried out to give value to naturally occurring relationships, and a minimum of two different groups are required to conduct this quantitative research method successfully. Without assuming various aspects, a relationship between two groups or entities must be established.

Causal-Comparative Research: This research method mainly depends on the factor of comparison. Also called the quasi-experimental research, this quantitative research method is used by researchers to conclude the cause-effect equation between two or more variables, where one variable is dependent

on the other independent variable. The independent variable is established but not manipulated, and its impact on the dependent variable is observed. These variables or groups must be formed as they exist in the natural set up. As the dependent and independent variables will always exist in a group, it is advised that the conclusions are carefully established by keeping all the factors in mind.

Experimental Research: Also known as true experimentation, this research method is reliant on a theory. Experimental research, as the name suggests, is usually based on one or more theories. This theory has not been proven in the past and is merely a supposition. In experimental research, an analysis is done around proving or disproving the statement. This research method is used in natural sciences.

Data Collection Methodologies:

The second major step in primary quantitative research is data collection. Data collection can be divided into sampling methods and data collection with the use of surveys and polls.

- **Step 1: Sampling Methods**

There are two main sampling methods for quantitative research: **Probability** and **Non-probability sampling**.

Probability sampling: A theory of probability is used to filter individuals from a population and create samples in probability sampling. Participants of a sample are chosen random selection processes. Each member of the target audience has an equal opportunity to be selected in the sample.

Non-probability sampling: Non-probability sampling is where the researcher's knowledge and experience are used to create samples. Because of the involvement of the researcher, not all the members of a target population have an equal probability of being selected to be a part of a sample.

- **Step 2: Using Surveys & Polls**

Once the sample is determined, then either surveys or polls can be distributed to collect the data for quantitative research.

Using Surveys for Primary Quantitative Research: A Survey is defined as a research method used for collecting data from a pre-defined group of respondents to gain information and insights on various topics of interest. The ease of survey distribution and the wide number of people can be reached depending on the research time and research objective make it one of the most important aspects of conducting quantitative research.

Use of Different Question Types: To conduct quantitative research, close-ended questions have to be used in a survey. They can be a mix of multiple question types including multiple-choice questions like semantic differential scale questions, rating scale questions, etc.

Using Polls for Primary Quantitative Research: Polls are a method to collect feedback with the use of close-ended questions from a sample. The most commonly used types of polls are election polls and exit polls. Both of these are used to collect data from a large sample size but using basic question types like a multiple-choice question.

Data Analysis Techniques:

The third aspect of primary quantitative research is data analysis. After the collection of raw data, there has to be an analysis of this data to derive statistical inferences from this research. It is important to relate the results to the objective of research and establish the statistical relevance of results.

It is important to consider aspects of research that were not considered for the data collection process and report the difference between what was planned vs. what was executed.

It is then required to select a precise statistical analysis method such as SWOT, Conjoint, Cross-tabulation, etc. to analyze the quantitative data.

- **SWOT Analysis**: SWOT Analysis stands for the acronym of Strengths, Weakness, Opportunities, and Threat analysis. Organizations use this statistical analysis technique to evaluate their performance internally and externally to develop effective strategies for improvement.
- **Conjoint Analysis**: Conjoint Analysis is a market analysis method to learn how individuals make complicated purchasing decisions. Trade-offs are involved in the daily activities of an individual, and these reflect their ability to decide from a complex list of product/service options.
- **Cross-tabulation**: Cross-tabulation is one of the preliminary statistical market analysis methods which establishes relationships, patterns, and trends within the various parameters of the research study.
- **TURF Analysis**: TURF Analysis, an acronym for Totally Unduplicated Reach and Frequency Analysis, is executed in situations where the reach of a favorable communication source is to be analyzed along with the frequency of this communication. It is used for understanding the potential of a target market.

- **Secondary Quantitative Research Methods:**

Secondary quantitative research or desk research is a research method that involves using already existing data or secondary data. Existing data is summarized and collated to increase the overall effectiveness of research.

This research method involves the collection of quantitative data from existing data sources like the internet, government resources, libraries, research reports, etc. Secondary quantitative research helps to validate the data that is collected from primary quantitative research as well as aid in strengthening or proving or disproving previously collected data.

Following are five popularly used secondary quantitative research methods:

- **Data available on the internet**: With the high penetration of internet and mobile devices, it has become increasingly easy to conduct quantitative research using the internet. Information about most research topics is available online, and this aids in boosting the validity of primary quantitative data as well as proving the relevance of previously collected data.
- **Government and non-government sources**: Secondary quantitative research can also be conducted with the help of government and non-government sources that deal with market research reports. This data is highly reliable and in-depth and hence, can be used to increase the validity of quantitative research.
- **Public libraries**: Now a sparingly used method of conducting quantitative research, it is still a reliable source of information though. Public libraries have copies of important research that were conducted earlier. They are a storehouse of valuable information and documents from which information can be extracted.
- **Educational institutions**: Educational institutions conduct in-depth research on multiple topics, and hence, the reports that they publish are an important source of validation in quantitative research.
- **Commercial information sources**: Local newspapers, journals, magazines, radio, and TV stations are a great source to obtain data for secondary quantitative research. These commercial information sources have in-depth, first-hand information on economic developments, political agenda, market research, demographic segmentation, and similar subjects.

- **Comparison between quantitative Research and Qualitative Research**:

Attributes	Qualitative Research Methods	Quantitative Research Methods
Analytical objectives	This research method focuses on describing individual experiences and beliefs.	The quantitative research method focuses on describing the characteristics of a population.
Types of questions asked	Open-ended questions	Closed-ended questions
Data Collection Instrument	Use semi-structured methods such as in-depth interviews, focus groups, and participant observation	Use highly structured methods such as structured observation using questionnaires and surveys
Form of data produced	Descriptive data	Numerical data
Degree of flexibility	Participant responses affect how and which questions researchers ask next	Participant responses do not influence or determine how and which questions researchers ask next

Table 3. Comparison between quantitative Research and Qualitative Research

Objective and flow of research:

- **Quantitative research** is used in data-oriented research where the objective of the research is to derive "measurable empirical evidence" based on fixed and pre-determined questions. The flow of research, is, therefore, decided before the research is conducted.
- **Qualitative research** is used where the objective is the research is to keep probing the respondents based on previous answers under the complete discretion of the interviewer. The flow of research is not determined and the researcher/interviewer has the liberty to frame and ask new questions.

Respondent sample size:

- **Quantitative research** such that enough verifiable information is gathered to conclude without opinion bias. In large scale quantitative research, sample size can be in thousands.
- **Qualitative research** inherently uses less sample size because a large sample size makes it difficult for the research to probe respondents. For instance, a typical political focus group study evaluating election candidates involves no more than 5-10 panelists.

Information gathering:

- **Quantitative research** uses information-gathering methods that can be quantified and processed for statistical analysis techniques. Simply put – quantitative research is heavily dependent on “numbers”, data, and stats.
- **Qualitative research** uses conversational methods to gather relevant information on a given subject.

Post-research response analysis:

- **Quantitative research** uses a variety of statistical analysis methods to derive quantifiable research conclusions. These are based on mathematical processes applied to the gathered data.
- **Qualitative research** depends on the interviewer to derive research conclusions based on qualitative conversations held with the respondents. This conclusion is effectively subjective. This is why quantitative research recordings are often reviewed by senior researchers before the final research conclusion is drawn.

- **Scientific method:**

The scientific method is an empirical method of acquiring knowledge that has characterized the development of science since at least the 17th century. It involves careful observation, applying rigorous skepticism about what is observed, given that cognitive assumptions can distort how one interprets the observation. It involves formulating hypotheses, via induction, based on such observations; experimental and measurement-based testing of deductions drawn from the hypotheses; and refinement (or elimination) of the hypotheses based on the experimental findings. These are principles of the scientific method, as distinguished from a definitive series of steps applicable to all scientific enterprises. (wikipedia, n.d.)

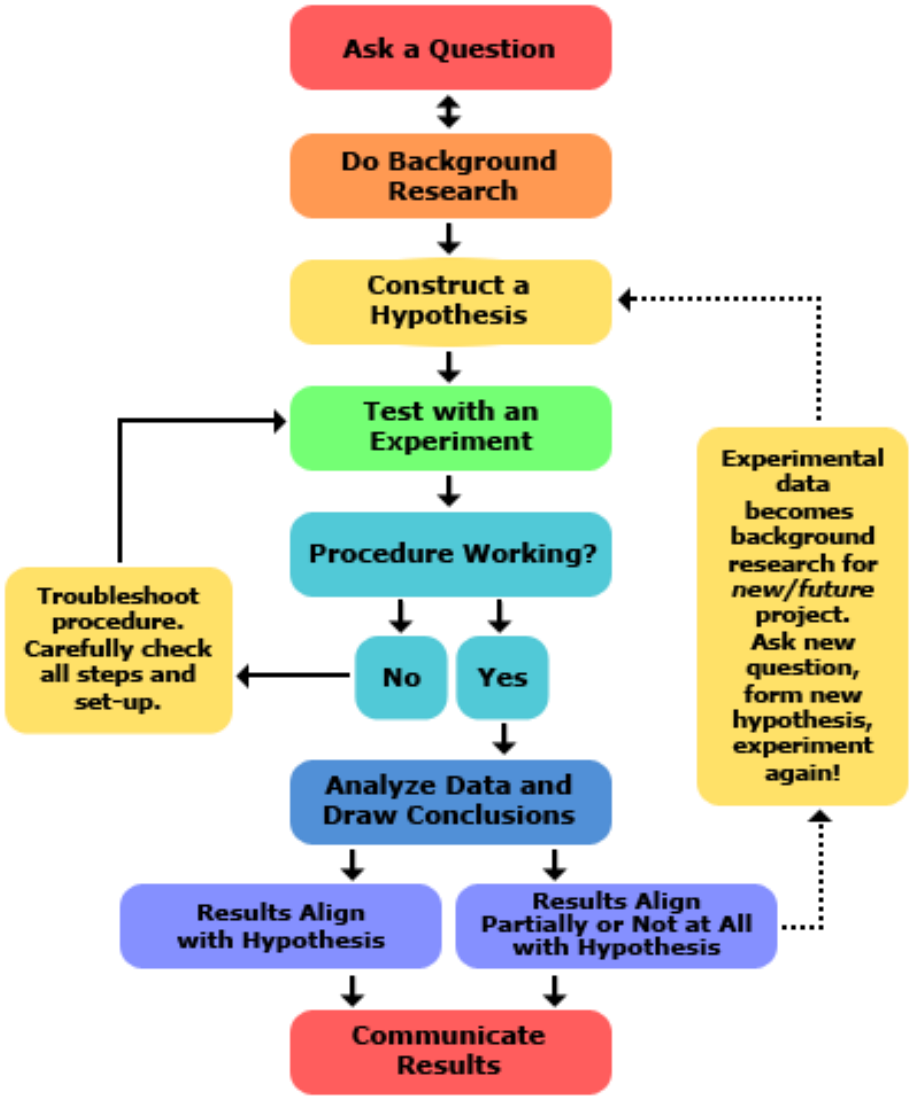


Figure 3. Scientific method. (sciencebuddies, n.d.)

Steps of the Scientific Method:

- **Ask a Question**: The scientific method starts when you ask a question about something that you observe: How, What, When, Who, Which, Why, or Where? For a science fair project, some teachers require that the question be something you can measure, preferably with a number.
- **Research**: Conduct background research. Write down sources so you can cite references. In the modern era, a lot of research may be conducted online. Scroll to the bottom of articles to check the references. Even if you can't access the full text of a published article, you can usually view the abstract to see the summary of other experiments. Interview experts on a topic. The more you know about a subject, the easier it will be to conduct investigation.
- **Hypothesis**: Propose a hypothesis. This is a sort of educated guess about what you expect. It is a statement used to predict the outcome of an experiment. Usually, a hypothesis is written in terms of cause and effect. Alternatively, it may describe the relationship between the two phenomena. One type of hypothesis is the null hypothesis or the no-difference hypothesis. This is an easy type of hypothesis to test because it assumes changing a variable will not affect the outcome. In reality, you probably expect a change but rejecting a hypothesis may be more useful than accepting one.
- **Experiment**: Design and experiment to test hypothesis. An experiment has an independent and dependent variable. You change or control the independent variable and record the effect it has on the dependent variable. It's important to change only one variable for an experiment rather than try to combine the effects of variables in an experiment. For example, if you want to test the effects of light intensity and fertilizer concentration on the growth rate of a plant, you're looking at two separate experiments.
- **Data/Analysis**: Record observations and analyze the meaning of the data. Often, you'll prepare a table or graph of the data. Don't throw out data points you think are bad or that don't support predictions. Some of the most incredible discoveries in science were made because the data looked wrong! Once you have the data, you may need to perform mathematical analysis to support or refute hypothesis.
- **Conclusion**: Conclude whether to accept or reject hypothesis. There is no right or wrong outcome for an experiment, so either result is fine. Accepting a hypothesis does not necessarily mean it's correct! Sometimes repeating an experiment may give a different result. In other cases, a hypothesis may predict an outcome, yet you might draw an incorrect conclusion. Communicate
- **Results**: The results may be compiled into a lab report or formally submitted as a paper. Whether you accept or reject the hypothesis, you likely learned something about the subject and may wish to revise the original hypothesis or form a new one for a future experiment.

- **Steps of the research process:**

Scientific research involves a systematic process that focuses on being objective and gathering a multitude of information for analysis so that the researcher can conclude. This process is used in all research and evaluation projects, regardless of the research method (scientific method of inquiry, evaluation research, or action research). The process focuses on testing hunches or ideas in a park and recreation setting through a systematic process. In this process, the study is documented in such a way that another individual can conduct the same study again. This is referred to as replicating the study. Any research done without documenting the study so that others can review the process and results is not an investigation using the scientific research process. The scientific research process is a multiple-step process where the steps are interlinked with the other steps in the process. If changes are made in one step of the process, the researcher must review all the other steps to ensure that the changes are reflected throughout the process. Parks and recreation professionals are often involved in conducting research or evaluation projects within the agency. These professionals need to understand the eight steps of the research process as they apply to conduct a study. These steps of the research process and provides an example of each step for a sample research study (humankinetics, n.d.):

- **Step 1: Identify the Problem**

The first step in the process is to identify a problem or develop a research question. The research problem may be something the agency identifies as a problem, some knowledge or information that is needed by the agency, or the desire to identify a recreation trend nationally.

- **Step 2: Review the Literature**

This is the problem has been identified, the researcher must learn more about the topic under investigation. To do this, the researcher must review the literature related to the research problem. This step provides foundational knowledge about the problem area. The review of literature also educates the researcher about what studies have been conducted in the past, how these studies were conducted, and the conclusions in the problem area. The information discovered during this step helps the programmer fully understand the magnitude of the problem, recognize the future consequences of obesity, and identify a strategy to combat obesity.

- **Step 3: Clarify the Problem**

Many times the initial problem identified in the first step of the process is too large or broad in scope. In step 3 of the process, the researcher clarifies the problem and narrows the scope of the study. This can only be done after the literature has been reviewed. The knowledge gained through the review of literature guides the researcher in clarifying and narrowing the research project. In the example, the programmer has identified childhood obesity as the problem and the purpose of the study. This topic is very broad and could be studied based on genetics, family environment, diet, exercise, self-confidence, leisure activities, or health issues. All of these areas cannot be investigated in a single study; therefore, the problem and purpose of the study must be more clearly defined. This purpose is more narrowly focused and researchable than the original problem.

- **Step 4: Clearly Define Terms and Concepts**

Terms and concepts are words or phrases used in the purpose statement of the study or the description of the study. These items need to be specifically defined as they apply to the study. Terms or concepts often have different definitions depending on who is reading the study. To minimize confusion about what the terms and phrases mean, the researcher must specifically define them for the study. By defining the terms or concepts more narrowly, the scope of the study is more manageable for the programmer, making it easier to collect the necessary data for the study. This also makes the concepts more understandable to the reader.

- **Step 5: Define the Population**

Research projects can focus on a specific group of people, facilities, park development, employee evaluations, programs, financial status, marketing efforts, or the integration of technology into the operations.

For example: If a researcher wants to examine a specific group of people in the community, the study could examine a specific age group, males or females, people living in a specific geographic area, or a specific ethnic group. Thousands of options are available to the researcher to specifically identify the group to study. The research problem and the purpose of the study assist the researcher in identifying the group to involve in the study.

In research terms, the group to involve in the study is always called the population. Defining the population assists the researcher in several ways.

- First, it narrows the scope of the study from a very large population to one that is manageable.
- Second, the population identifies the group that the researcher's efforts will be focused on within the study.

This helps ensure that the researcher stays on the right path during the study. Finally, by defining the population, the researcher identifies the group that the results will apply to after the study. This narrower population makes the study more manageable in terms of time and resources.

- **Step 6: Develop the Instrumentation Plan**

The plan for the study is referred to as the instrumentation plan. The instrumentation plan serves as the road map for the entire study, specifying who will participate in the study; how, when, and where data will be collected; and the content of the program. This plan is composed of numerous decisions and considerations that are addressed in chapter 8 of this text. The researcher develops the plan for the walking program, indicating what data will be collected, when and how the data will be collected, who will collect the data, and how the data will be analyzed. The instrumentation plan specifies all the steps that must be completed for the study. This ensures that the programmer has carefully thought through all these decisions and that she provides a step-by-step plan to be followed in the study.

- **Step 7: Collect Data**

Once the instrumentation plan is completed, the actual study begins with the collection of data. The collection of data is a critical step in providing the information needed to answer the research question. Every study includes the collection of some type of data—whether it is from the literature or from subjects—to answer the research question. Data can be collected in the form of words on a survey, with a questionnaire, through observations, or from the literature.

The researcher collects these data in the first session and the last session of the program. These two sets of data are necessary to determine the effect of the walking program on weight, body fat, and cholesterol level. Once the data are collected on the variables, the researcher is ready to move to the final step of the process, which is the data analysis.

- **Step 8: Analyze the Data**

All the time, effort, and resources dedicated to steps 1 through 7 of the research process culminate in this final step. The researcher finally has data to analyze so that the research question can be answered. In the instrumentation plan, the researcher specified how the data will be analyzed. The researcher now analyzes the data according to the plan. The results of this analysis are then reviewed and summarized in a manner directly related to the research questions. In the obesity study, the researcher compares the measurements of weight, percentage of body fat, and cholesterol that was taken at the first meeting of the subjects to the measurements of the same variables at the final program session. These two sets of data will be analyzed to determine if there was a difference between the first measurement and the second measurement for each individual in the program. Then, the data will be analyzed to determine if the differences are statistically significant. If the differences are statistically significant, the study validates the theory that was the focus of the study.

- **Populations and Samples in Research:**

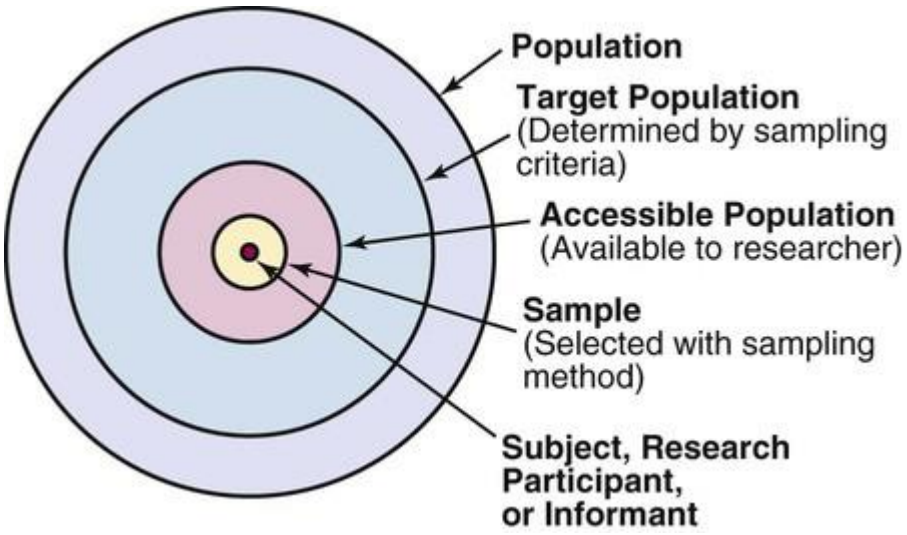


Figure 4. Population and Sample in research. (elitemv, n.d.)

The Population:

The Population can be explained as a comprehensive group of individuals, institutions, objects, and so forth with have common characteristics that are the interest of a researcher. The common characteristics of the groups distinguish them from other individuals, institutions, objects, and so forth.

A research population is generally a large collection of individuals or objects that is the main focus of a scientific query. It is for the benefit of the population that researches are done. However, due to the large sizes of populations, researchers often cannot test every individual in the population because it is too expensive and time-consuming. This is the reason why researchers rely on sampling techniques.

A research population is also known as a well-defined collection of individuals or objects known to have similar characteristics. All individuals or objects within a certain population usually have a common, binding characteristic or trait.

Two Types of Population in Research:

- **Target Population:** The target population refers to the ENTIRE group of individuals or objects to which researchers are interested in generalizing the conclusions. The target population usually has varying characteristics and it is also known as the theoretical population.
- **Accessible Population:** The accessible population is the population in research to which the researchers can apply their conclusions. This population is a subset of the target population and is also known as the study population. It is from the accessible population that researchers draw their samples.

The sample:

The sample can be defined as the small portion of a population selected for a particular study. The sample should represent the characteristics of the intended group.

A sample is simply a subset of the population. The concept of sample arises from the inability of the researchers to test all the individuals in a given population. The sample must be representative of the population from which it was drawn and it must have good size to warrant statistical analysis.

The process of selection or the drawing of the accurate representation of a unit, group, or sample from a population of interest is called sampling. Sampling can be done through various sampling techniques following the nature of the sample as well as the subject matter of the study. It is the Sampling procedure, which will decide the accurate representation of the sample selected for the study as well as the relevance of generalization made from the research.

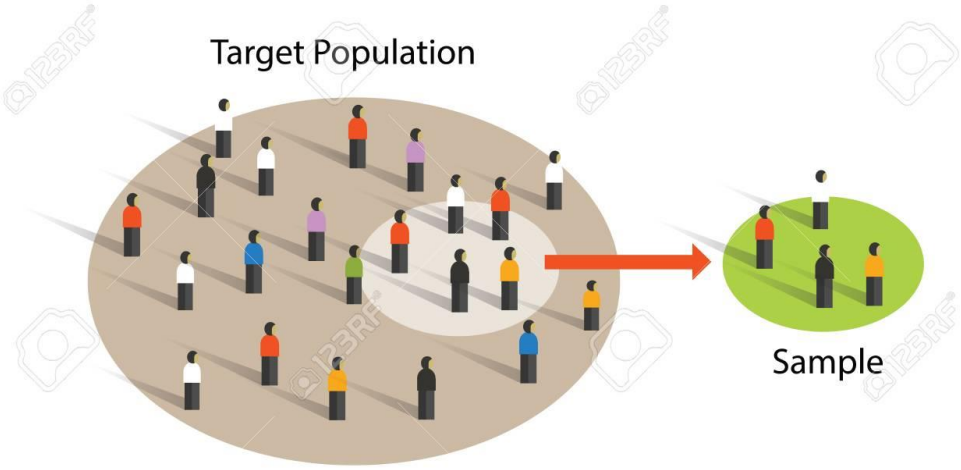


Figure 5. Sample in research

There are the most common sampling techniques:

- **Probability sampling**: Samples chosen based on the theory of probability.
- **Non-Probability Sampling**: Samples chosen based on the researcher's subjective judgment.

Sample Size:

Sample size determination is the act of choosing the number of observations or replicates to include in a statistical sample. The sample size is an important feature of any empirical study in which the goal is to make inferences about a population from a sample. (wikipedia, n.d.)

Example: With a list of the 2000 subjects in the sampling frame, go to the starting point, and select every 40th name on the list until the sample size is reached. Probably will have to return to the beginning of the list to complete the selection of the sample.

The difference between sample and population:

The main difference between a population and the sample has to do with how observations are assigned to the data set:

- **A population** includes all of the elements from a set of data.
- **A sample** consists of one or more observations drawn from the population.

Population	Sample
The measurable characteristic of the population like the mean or standard deviation is known as the parameter.	The measurable characteristic of the sample is called a statistic.
Population data is a whole and complete set.	The sample is a subset of the population that is derived using sampling.
A survey done of an entire population is accurate and more precise with no margin of error except human inaccuracy in responses. However, this may not be possible always.	A survey done using a sample of the population bears accurate results, only after further factoring the margin of error and confidence interval.
The parameter of the population is a numerical or measurable element that defines the system of the set.	The statistic is the descriptive component of the sample found by using sample mean or sample proportion.

Table 4. The difference between sample and population

2.2. Research methods in the coffee supply chain management system

- **Preliminary research:**

Interview (n = 10): an individual interview with a hand-to-hand discussion framework to discuss the factors affecting the behavior of coffee consumers in Da Nang City. Interview results will be used for developing questionnaires and research models.

Quantitative research (n = 20): After building the questionnaire, conduct a direct survey (n = 20) to check the validity of the questionnaire. From there, adjust the questionnaire appropriately.

- **Official research** (With Official survey n = 150)**:**

Quantitative research was conducted to collect quantitative information on factors affecting the behavior of young coffee consumers in Danang. The results will be a database to test the research model and hypotheses, testing consumers in Da Nang city are satisfied with the coffee that consumers are using or not.

Collect research data using questionnaires and interviewing techniques for consumers aged 18-30 in Danang city. **Sample size n = 200**, selected by the method of random sampling, no duplicates in areas of Danang city

Preliminary assessment of the reliability and value of the scale by Cronbach's alpha reliability coefficient and **EFA** (Exploratory Factor Analysis) analysis using **SPSS 18** processing software, thereby eliminating the observed variables are not achieve reliability, convergence, and differentiation; at the same time, restructure the remaining observation variables into the elements (into

measurement)), which sets the basis for the adjustment of the research model and the research hypotheses, the next analytical content.

Multivariate regression analysis aims to test the research model, the research hypotheses, and measure the intensity of the impact of the factors.

T-Tests Testing; ANOVA; KRUSKAL - WALLIS, Chi-square aims to test whether there is a difference in the behavior of pure coffee consumers aged 18-30 in Da Nang city (based on demographic characteristics of people). consumption such as gender, occupation, income, region).

2.3. Secondary research

Well-being:

Well-being is the experience of health, happiness, and prosperity. It includes having good mental health, high life satisfaction, a sense of meaning or purpose, and the ability to manage stress. More generally, well-being is just feeling well.

Well-being is something sought by just about everyone because it includes so many positive things such as feeling happy, healthy, socially connected, and purposeful.

5 Types of Well-Being:

- **Emotional Well-Being**: The ability to practice stress-management techniques, be resilient, and generate the emotions that lead to good feelings.

There are some of the skills that research suggests contribute to emotional well-being:

  - Happiness Skills
  - Mindfulness Skills
  - Positive Thinking Skills
  - Resilience Skills
- **Physical Well-Being**: The ability to improve the functioning of body through healthy eating and good exercise habits.

There are some of the things that can help to boost physical well-being:

  - Eating for Health
  - Detoxing Body
  - Correcting Nutritional Deficiencies
  - Removing Plastic From Home
- **Social Well-Being**: The ability to communicate, develop meaningful relationships with others, and maintain a support network that helps you overcome loneliness.

There are some of the skills that research suggests contribute to better social well-being:

  - Practicing Gratitude
  - Building Meaningful Social Connections
  - Managing Relationship with Technology

- **Workplace Well-Being**: The ability to pursue interests, values, and purpose in order to gain meaning, happiness, and enrichment professionally.

There are some of the key skills you need for workplace well-being:

  - Maintaining Work-Life Balance
  - Finding Purpose
- **Societal Well-Being**: The ability to actively participate in a thriving community, culture, and environment.

There are some of the skills you can build for greater societal well-being:

  - Living Values
  - Creating a Plastic-Free Home
  - Making Positive Impacts in Other People's Lives
  - Kindness

Well-being useful for public health:

- Well-being integrates mental health (mind) and physical health (body) resulting in more holistic approaches to disease prevention and health promotion
- Well-being is a valid population outcome measure beyond morbidity, mortality, and economic status that tells us how people perceive their life is going from their perspective.
- Well-being is an outcome that is meaningful to the public.
- Advances in psychology, neuroscience, and measurement theory suggest that well-being can be measured with some degree of accuracy
- Results from cross-sectional, longitudinal, and experimental studies find that well-being is associated with:
  - Self-perceived health.
  - Longevity.
  - Healthy behaviors.
  - Mental and physical illness.
  - Social connectedness.
  - Productivity.
  - Factors in the physical and social environment.
- Well-being can provide a common metric that can help policymakers shape and compare the effects of different policies.
- Measuring, tracking, and promoting well-being can be useful for multiple stakeholders involved in disease prevention and health promotion.

Wellbeing research:

- Data from the NHANES I (1971–1975), found that employed women had a higher sense of well-being and used fewer professional services to cope with personal and mental health problems than their nonemployed counterparts
- Data from the 2001 NHIS and Quality of Well-Being scale, a preference-based scale which scores well-being between 0-1, found that males or females between the ages of 20–39 had significantly better well-being (scores ≥ 0.82) compared with males or females 40 years of age or older (scores >0.79)
- Data from the 2005 Behavioral Risk Factor Surveillance System found that 5.6% of US adults (about 12 million) reported that they were dissatisfied/very dissatisfied with their lives.48
- Data from the 2005 BRFSS found that about 8.6% of adults reported that they rarely/never received social and emotional support; ranging in value from 4.2% in Minnesota to 12.4% in the US Virgin Islands
- Based on the 2008 Porter Novelli HealthStyles data.
    - 11% of adults felt cheerful all of the time in the past 30 days.
    - 15% of adults felt calm and peaceful all of the time in the past 30 days.
    - 13% of adults felt full of life all of the time in the past 30 days.
    - 9.8% of adults strongly agree that their life is close to their ideal.
    - 19% of adults strongly agree that they are satisfied with their life.
    - 21% of adults strongly agree that their life has a clear sense of purpose.
    - 30% of adults strongly agree that on most days they feel a sense of accomplishment from what they do.

Digital Well-being:

Digital wellbeing is a term used by health professionals, researchers, and device manufacturers to describe the concept that when humans interact with technology, the experience should support mental and/or physical health measurably. The goal of improving digital wellbeing is to design technology in such a way that it promotes healthy to use and proactively assists the user to maintain a healthy lifestyle.

As a response to a call for apps and technology that respect a person's time, some companies developed features that are less disruptive or added the ability to turn off distracting notifications. Besides, companies created new apps that track digital wellbeing keep records of things like the amount of screen time spent on different apps. They help the user to lower undesired types of screen time, or to be more deliberate about how technology is used. (techtarget, n.d.)

Digital wellbeing considerations:

- Limiting screen time to a certain number of minutes or hours over a day or week.
- Reducing eye strain infrequent device users. Products such as dark panels that cover screens or special lenses that go over glasses to reduce glare have been developed to aid with eye strain. Recommendations also exist for how large information on the screen should be, what settings and resolution should be implemented, how often eyes need to be rested, and what the optimal distance is between eyes and the screen.
- Being aware of unforeseen mental health impacts. One example of an adverse feature to mental health is the endless scroll addition to social media platforms like Facebook and Instagram. This has been attributed to internet addiction which has been correlated with high levels of anxiety, ADHD, depression, poor time management, and impulsiveness.
- Increasing emphasis on physical activity and nutrition. Many technological devices have been developed to help devices users bring up fitness levels, track heart rate, report daily step count, and monitor diet.
- Supporting healthy sleep patterns, especially for users that bring devices with them to bed. Users can set their devices to turn off certain features at bedtime or change the screen contrast or switch to grayscale to reduce eye strain. For example, the iPhone includes a built-in feature that reminds users to go to sleep at a certain time.

Responsible for digital wellbeing

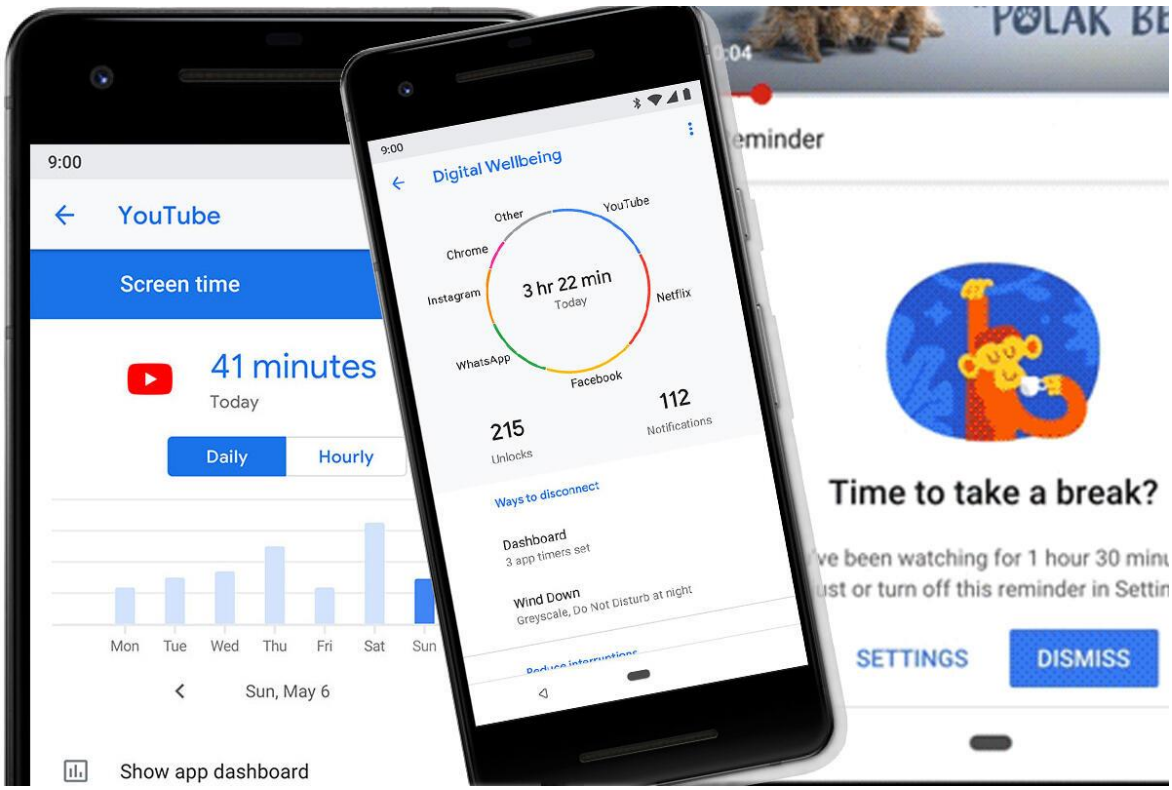
- **For individuals**: Although digital wellbeing tools emphasize individual responsibility, many participants felt like this should be a last resort. It may be particularly important, however, to keep the locus of control at the individual level when individual differences are significant: when a technology that increases the wellbeing of one person decreases that of another.
- **For designers & others in the industry**: A responsibility to inform oneself about the potential benefits and harms that might result from the product or service they are designing, and to inform potential end-users. They should avoid the worst cases, design for a range of use cases, and consider the experience of marginalized and vulnerable populations. The group also discussed challenges with normalizing ethics reviews of new products, services, and features and with building organizational capacity for digital wellbeing. In a previous post here on the UX Collective, Zsolt Szilvai also presented designers with a template for a Digital Wellbeing Workshop.
- **For organizations**: Organizations that impose technology on others (e.g., schools and workplaces) should consider effects on wellbeing and develop policies that support a range of individual needs. Schools have a responsibility to teach, and for such teaching to represent the nuances of digital wellbeing rather than, for example, pursuing unrealistic "abstinence-only" types of programs.
- **For regulators and policymakers**: We cannot rely on individuals or companies to always make the best choices, and regulation will be needed to prohibit the worst cases, particularly when they may seem individually or economically appealing. At the same time, some policy misfires suggest a need for regulators and policymakers to be better informed when drawing up policy. (uxdesign)

Digital wellbeing app:

- **Android's Digital Wellbeing**:

For Android users, Google has created the Digital Wellbeing app to help track and manage technology use. At the moment this app is not available on all Android phones but is expanding to more phones bit by bit. Features of the Digital Wellbeing app include:

- Reports on how frequently you use different apps, how many notifications users receive, and how often users check phone.
- Daily app timers to set limits for how much user use apps.
- Wind Down mode for setting a schedule to fade screen to Grayscale and turn on Do Not Disturb.
- Focus mode to hide notifications from specific distracting apps.



Picture 2. Android's Digital Wellbeing

- **iOS Screen Time:**

For iOS users, there is an app called Screen Time which provides reports on how much time users spend on apps, websites, and more, as well as setting daily limits on app usage by category.

Picture 3. IOS Screen Time

- **Digital Wellbeing research:**
    - **Children and Digital Wellbeing in Australia: Online regulation, conduct, and competence** (Nansen, 2011):

This article contributes to the study of children and the internet by reporting on findings from an ethnographic study of children's online use, experience, and regulation in Melbourne, Australia. As part of a social inclusion study of technology use, we worked with children and their families in the contexts of every day and home internet use. This article begins by identifying age-related gaps in the literature on children's online risks and then moves on to a discussion of the research findings relating to children's online mediation, conduct, and competence. By developing a concept of digital wellbeing the article argues that rather than focus only on risk protection measures, it is important to equip children with the knowledge and skills to be active, ethical, and critical participants online.

    - **The Race Towards Digital Wellbeing: Issues and Opportunities** (Roffarello, 2019):

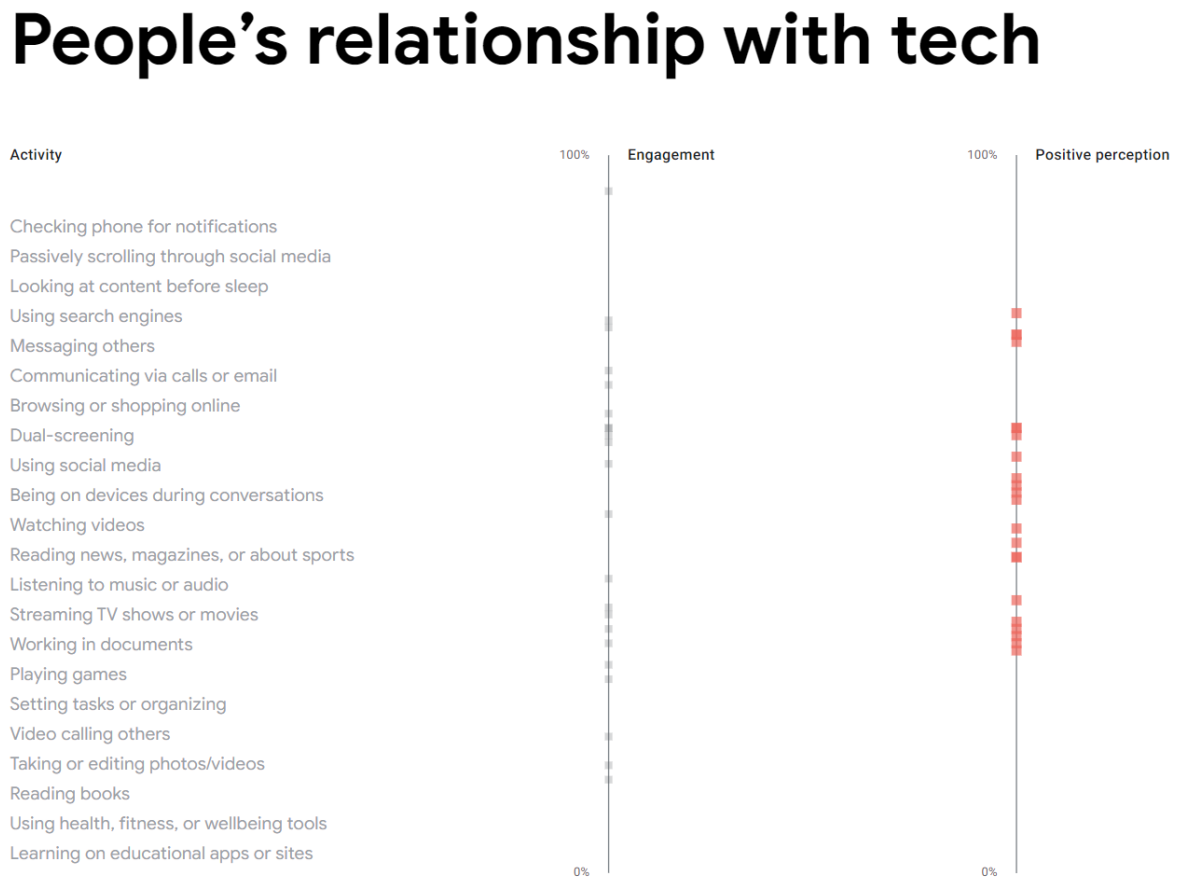
As smartphone use increases dramatically, so do studies about technology overuse. Many different mobile apps for breaking "smartphone addiction" and achieving "digital wellbeing" are available. However, it is still not clear whether and how such solutions work. Which functionality do they have? Are they effective and appreciated? Do they have a relevant impact on users' behavior? To answer these questions, we reviewed the features of 42 digital wellbeing apps, we performed a thematic analysis on 1,128 user reviews of such apps, and we conducted a 3-week-long in-the-wild study of Socialize, an app that includes the most common digital wellbeing features, with 38 participants. We discovered that digital wellbeing apps are appreciated and useful for some specific situations. However, they do not promote the formation of new habits and they are perceived as not restrictive enough, thus not effectively helping users to change their behavior with smartphones.

- **Digital wellbeing is about more than just screentime** (thinkwithgoogle, n.d.):

New research on digital wellbeing reveals how people perceive their relationship with technology and provides the first draft of recommendations that go beyond restricting screentime.

As screens, devices, and apps become more and more a part of our daily lives, we start to evaluate our relationship with technology. Is it helping us do more of what matters most to us? Or is it getting in the way of that?

To learn more about people's perceptions of their digital wellbeing, we surveyed over 9,000 people across six countries. Here we look at the complicated relationship people have with technology, reveal activities that make up its personality, and consider what that means for brands.



Picture 4. People's relationship with tech in google research

- **Theoretical foundations of research:**
  - **The concept of consumer behavior**: consumer behavior are reactions that individuals express in the decision-making process for purchasing goods and services. Research consumer behavior to identify individual characteristics, needs, interests, buying habits, identifying specific customers who want to buy, why to buy, how to buy, how to buy, where to buy, when to buy, how to buy to build an appropriate marketing strategy, promote consumers to buy products and services.
  - **Factors affecting consumer behavior:**
    - **Cultural elements**:

Culture is a system of values, beliefs, traditions and standards, behaviors that are formed, developed, and inherited over many generations. Culture is absorbed right in the family, school, working environment, friends, and society ...

Culture is the basic cause, leading to human behavior in general and consumer behavior in particular. The way to eat, wear, communicate, perceive the value of goods, express yourself through consumption is dominated by culture.

- **Social class**:

Reference groups are groups that directly or indirectly influence an individual's attitudes and perceptions when forming attitudes and opinions. Typical reference groups: Primary group: Including family, friends, neighbors, colleagues ..., Secondary group: association or legal organizations: religious organizations, industry associations trades, unions, unions, clubs: swimming, ornamental plants, consumer associations ...; Admirers and boycott groups: These are the groups that often create a "trend" and "trend" effect

- **Individual element**:

For each age group, at each stage of life, purchasing power, tastes, and consumption characteristics of different types of products/services are different; In other words, buying behavior, consumption characteristics at different ages are different. Enterprises can use this age criterion to identify target markets and develop marketing programs according to age groups and stages of the family life cycle.

Based on the personality, habits, interests, and conditions that each consumer will choose for himself a career, however, in the course of work, affected by the specific characteristics of the work and the working environment and will adversely affect consumers 'characteristics and characteristics affecting consumers' consumption behaviors; On the other hand, occupation also affects the income level of consumers, which affects the purchasing power of consumers.

Economic conditions determine the purchasing power of consumers, the purchasing power of consumers depends on their financial capacity, and commodity prices.

The financial capacity of consumers depends on the macroeconomic situation, personal income, savings, borrowing capacity, opinion of spending, age at which stage of the life cycle.

- **Psychological factors**:

Motivation is the need that has become imperative for people to act to satisfy it. Motivation is the force that forces people to act to satisfy a physical or mental need or desire or both.

Awareness is a process through which individuals select, organize, and interpret information that comes to create a meaningful picture of the world around them.

- **The process of making consumer buying decisions:**

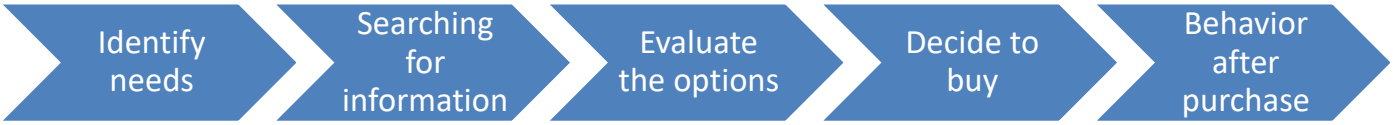


Figure 6. Model of buying decision. (Koter)

Stage 1: Identify needs / Awareness of the problem:

Starting when consumers feel the difference between the actual situation and the desired situation, forming demand.

The reason for the formation of this demand is that consumers are subject to stimuli from within or from outside.

Businesses need to pay attention to find out: the circumstances that make demand arise, which are what needs, what makes demand appear, that demand is towards which goods / services to satisfy; on the other hand, businesses also need to find appropriate marketing stimuli that can evoke, pique demand, drive demand into motivation (desire).

Phase 2: Searching for information:

As soon as demand has emerged, permanent consumer response is to seek out more information to satisfy demand. The purpose of seeking more information is: to better understand the products/brands, the supply activities of businesses related to the options of customers, and reduce risks in shopping and consumption.

How different information is sought for each person's needs is different: it may be just paying more attention to information related to the needs, or referencing and seeking information differently. Quickly in various ways and sources.

Sources of information: Depending on the nature of goods and services, customers can choose one or several sources of information before deciding to buy or not purchase: from individuals; trade information; General information, practical experience.

Phase 3: Evaluation of options:

After searching for all the information about the products / services of businesses that are able to satisfy their needs, consumers will form a set of brands, each brand has its Typical typical characteristics. Customers evaluate the options to choose the plan that the consumer considers the most appropriate, best suited to them. This is considered the process of organizing the "values" of evaluation criteria for products and services of customers

Phase 4: Decision to buy:

After evaluating the options, the customer has formed a ranking list of options, forming the intention to buy. However, from the point of purchase to the decision to buy customers is also influenced by a number of other effects that can change customer intentions: the attitude of those who are able to influence the decisions of customers. customers with products and services that customers intend to buy, the impact of objective impacts (unexpected factors): suddenly customers have an accident, lose a wallet (no money to buy)

Phase 5: Evaluation after buying:

Post-purchasing behavior is a collection of emotions, attitudes, attitudes, and actions of consumers when they consume a company's products.

Post-purchase evaluation is directly related to customer satisfaction after using the product/service of the business: satisfied or dissatisfied.

After buying and using the product/service, the customer will be satisfied or dissatisfied with the product depending on the degree of difference between the expectation of the customer before buying the product compared to the actual quality of the product. goods/services when using.

Satisfied: Their ability to reuse, buy back their products is high and they will become the most useful communication channel of the business;

Dissatisfied: The likelihood of them returning to the business/service of the business is low and more dangerous than they will tell other subjects.

- **The model of consumer behavior research:**
  - **Theory of Reasoned Action – TRA:**

Reasonable Action Theory - TRA (Fishbein, M. & Ajzen 1975) demonstrates the combination of components of attitude in a structure designed to better predict and analyze consumer behavior in society is based on these two basic concepts:

- Consumer attitudes towards the behavior
- Subjective standards of consumers

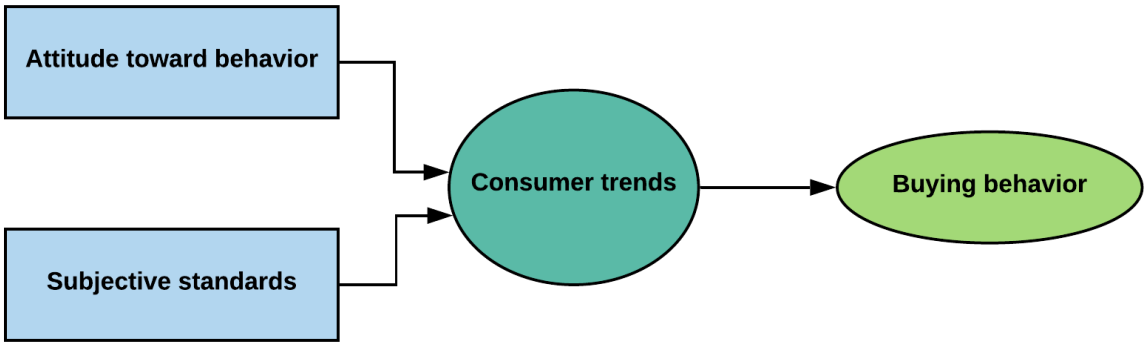


Figure 7. Reasonable theory of action TRA

- **Model of signal theory:**

Erdem and **Swait** (1998) examine how market information imperfections and asymmetry affect consumer attitudes and behavior, leading to appropriate cognitive and aspects of signals to consumer behavior, as well as to emphasize the role of credibility and clarity in explaining the perceived quality and perceived risks.

- **Model of consumption trends:**

Based on the **model of Zeithaml** (1998) assume price and brand are two important factors of perceived quality and have a positive impact on consumption trends. Dodds, Monroe, and Grewal in 1991 established a model for testing direct and indirect relationships between exogenous signs (price, brand, store name) on evaluating a buyer's product for personalities. factors related to awareness and impact on consumer trends. Research shows the important role of value that consumers perceive. This value can promote or hinder the consumption of a brand because this value is a result of the quality received and the cost of the consumer.

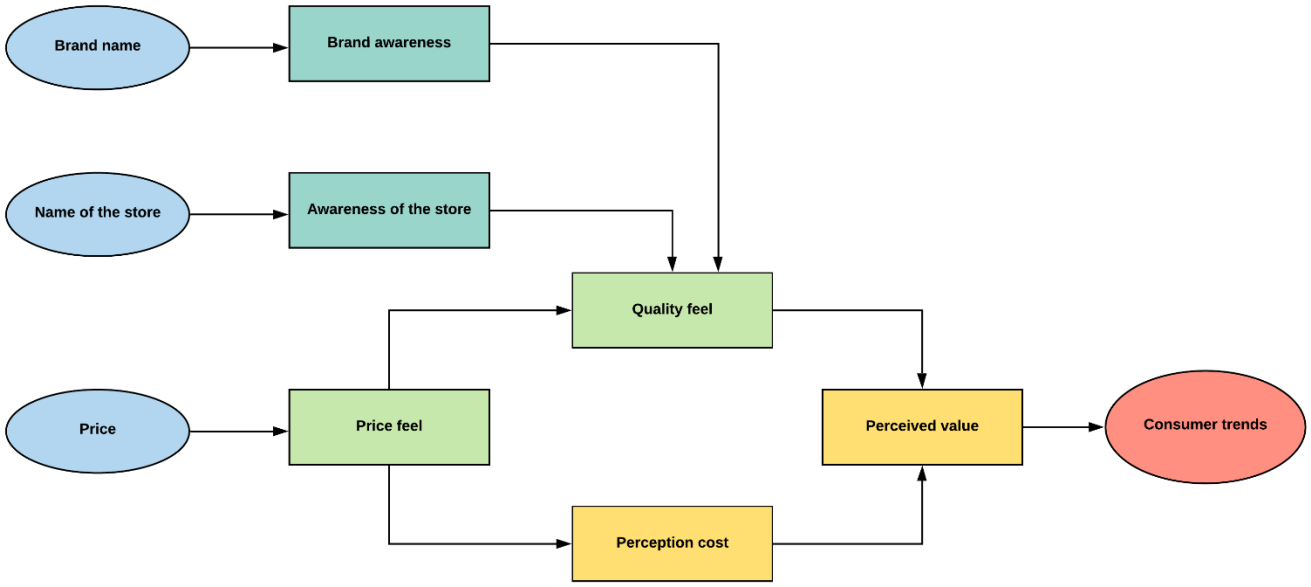


Figure 8. Consumer trend model

- **Previous research on consumer behavior:**
  - **Analysis of factors affecting safe vegetable consumption behavior in Can Tho city:**

Research paper of 2 authors **Nguyen Van Thuan** and **Vo Thanh Danh** in 2011 showed that 5 factors affecting safe consumption behavior in Can Tho city are: distributor's prestige, quality of vegetables and variety of vegetables, convenience shopping, reasonable prices, good service attitude.

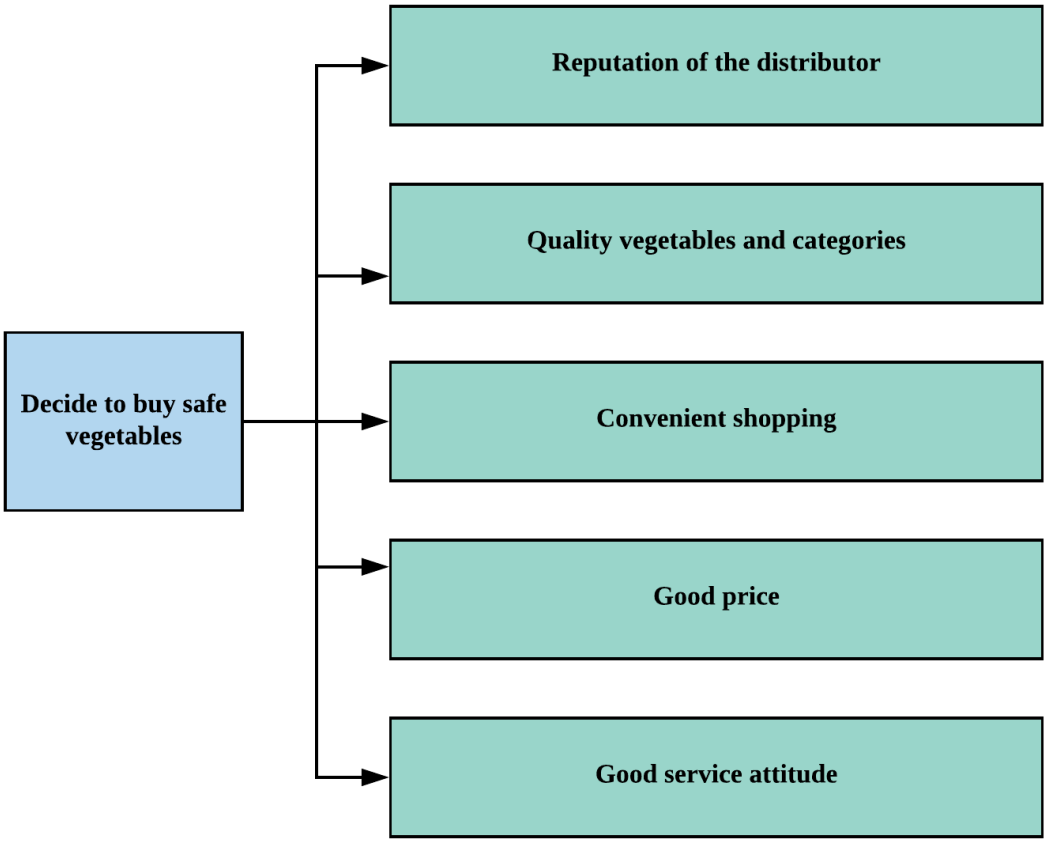


Figure 9. Model of factors influencing safe vegetable consumption behavior in Can Tho city. (more.edu, n.d.)

- **Research "Consumption of formula milk for children under 6 years old in Can Tho City"**:

According to 2 authors, **Le Thi Thu Trang** and **Tran Nguyen Toan Trung**, 2014 - Factors influencing the decision to choose formula milk for babies under 6 months old in Can Tho city include packaging and brand, promotion, uses, price, and quality, impact groups, convenience.

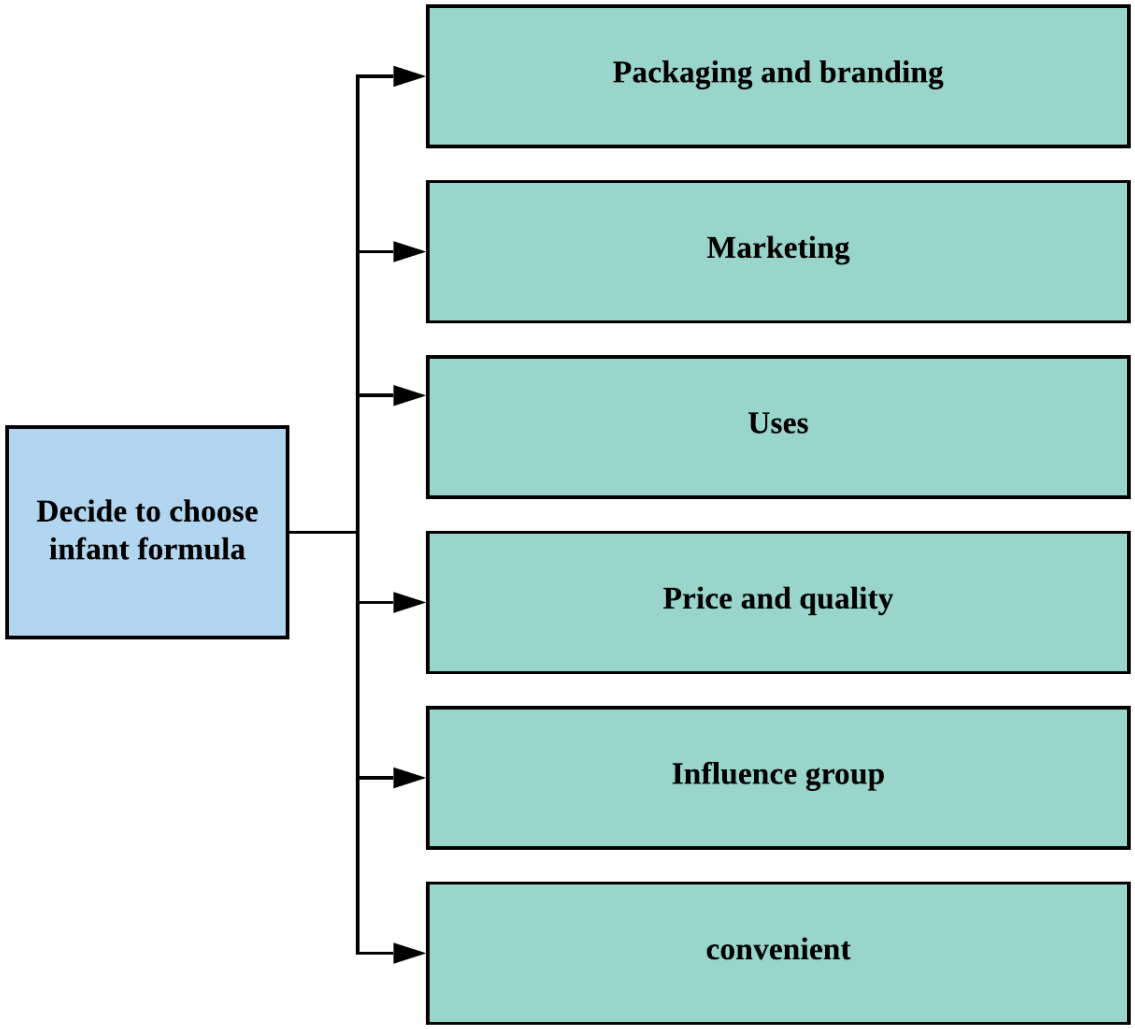


Figure 10. Behavior of using formula milk for children under 6 years old in Can Tho city. (more.edu, n.d.)

- **Research "Factors affecting the demand for pure coffee on Ho Chi Minh City market":**

According to author **Tran Quang Hoang Oanh** pointed out 4 factors affecting the demand for pure coffee in the city market. Ho Chi Minh City includes Brand factors and products, the sense of health protection, personal factors, and factors affecting society.

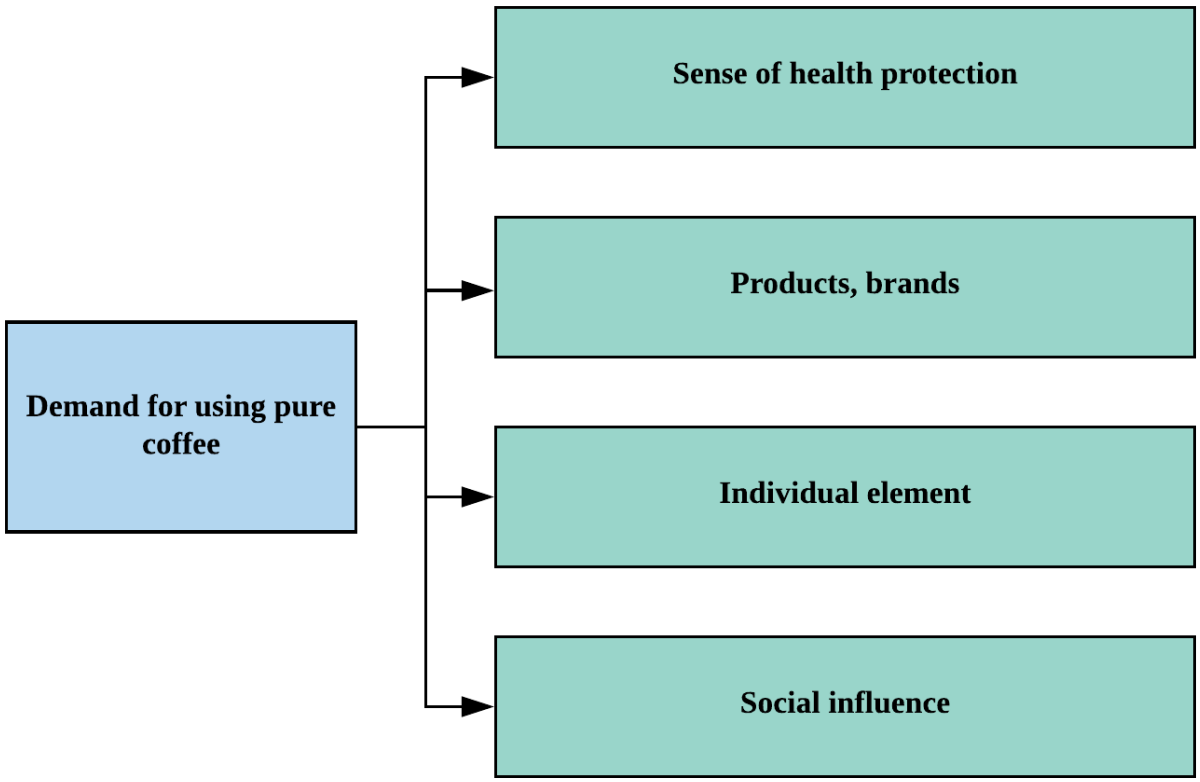


Figure 11. Model of factors influencing the demand for pure coffee in Ho Chi Minh City. (luanvan.net, n.d.)

2.4. Conclusion and propose an initial hypothesis

The above studies show the ability to consume pure coffee in some cities in Vietnam and the behavior of consumers towards the type of coffee product. But not yet more clear about the impact of dirty coffee, poor quality affecting consumers' health and solutions can help businesses improve the wellbeing of consumers. Especially, digital wellbeing for consumers of clean coffee products in Da Nang city.

- **Research hypotheses:**
  - Trademarks and products that influence the use of pure coffee by consumers
  - Price has an impact on consumer behavior of pure coffee
  - Individual factors that influence the use of pure coffee
  - The density of pure coffee distribution has an impact on coffee use behavior
  - Investing in marketing has an impact on coffee use behavior
  - Health awareness has an impact on coffee use behavior
  - There are differences in customers' assessments of the factors that influence the use of pure coffee according to individual characteristics of consumers.
- From a theoretical basis and research models on the factors affecting behavior, purchasing decisions, and customer perceptions about products/services. Some factors affecting customer satisfaction for coffee in coffee shops include:
  - Branding factor and product (H1)
  - Perceptible price factor (H2)
  - Individual factor (H3)
  - Distribution density (H4)
  - Marketing factor (H5)
  - Health when use Product (H6)

3. Primary research

3.1. Research process

The study implements the research according to the procedure shown in the figure:

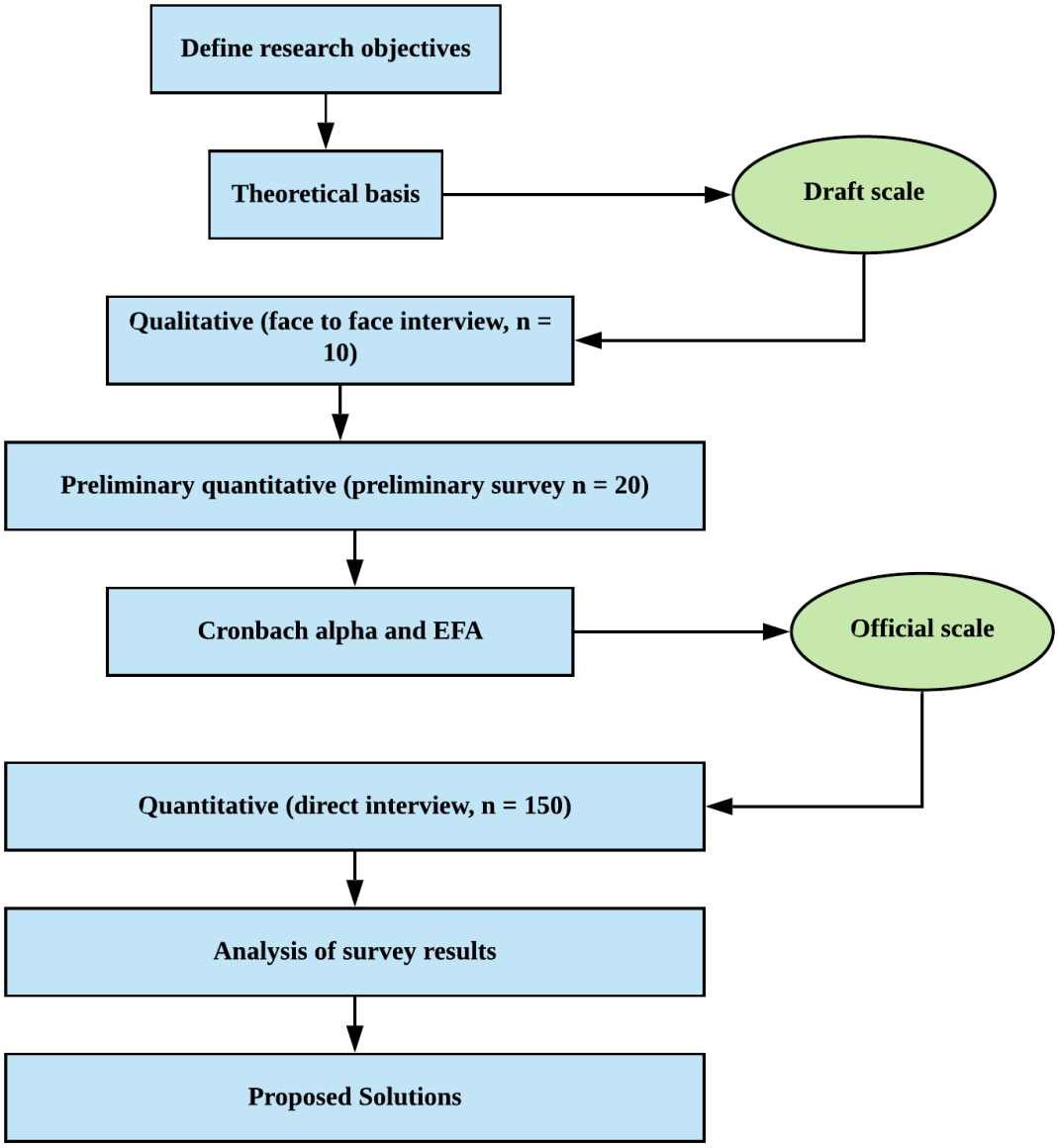


Figure 12. Research process

The introduction and understanding of research objectives will help the project not be vague so that there are directional guidelines to accomplish the goal. When there are clear goals, the following steps will be guided: Research subjects, the scope of research, and appropriate research methods for the topic.

The research model can be applied to many different studies not only on computing research but also on social, human, and economic research topics. But the scope of the process also clearly identifies the methods from which to study the computing research that the research is doing.

With the research topic "**Tool and strategy to help businesses manage products and improve the wellbeing of users**", the above research process includes "**Studying the factors affecting the consumption behavior of pure coffee by young people in Da Nang City** "from which to make research insights. Based on the data, the study can produce better solutions and recommendations.

Through a preliminary evaluation of the reliability and value of the scale by **Cronbach's alpha** reliability coefficient and analysis of **EFA** (Exploratory Factor Analysis) by SPSS processing software, the study can eliminate variables. observation does not reach reliability, convergent values, and discrimination; at the same time, restructure the remaining observation variables into appropriate factors, laying the basis for the adjustment of the research model and the research hypotheses, the next analytical content.

Cronbach's alpha	Internal consistency
$\alpha \geq 0.9$	Excellent (High-Stakes testing)
$0.7 \leq \alpha < 0.9$	Good (Low-Stakes testing)
$0.6 \leq \alpha < 0.7$	Acceptable
$0.5 \leq \alpha < 0.6$	Poor
$\alpha < 0.5$	Unacceptable

Figure 13. Cronbach's Alpha result. (surveyvitals, n.d.)

3.2. Research model

From a theoretical basis and research models on the factors affecting behavior, purchasing decisions, and customer perceptions about products/services. Some factors affecting customer satisfaction for coffee in coffee shops include:

- Branding factor and product (H1)
- Perceptible price factor (H2)
- Individual factor (H3)
- Distribution density (H4)
- Marketing factor (H5)
- Health when use Product (H6)

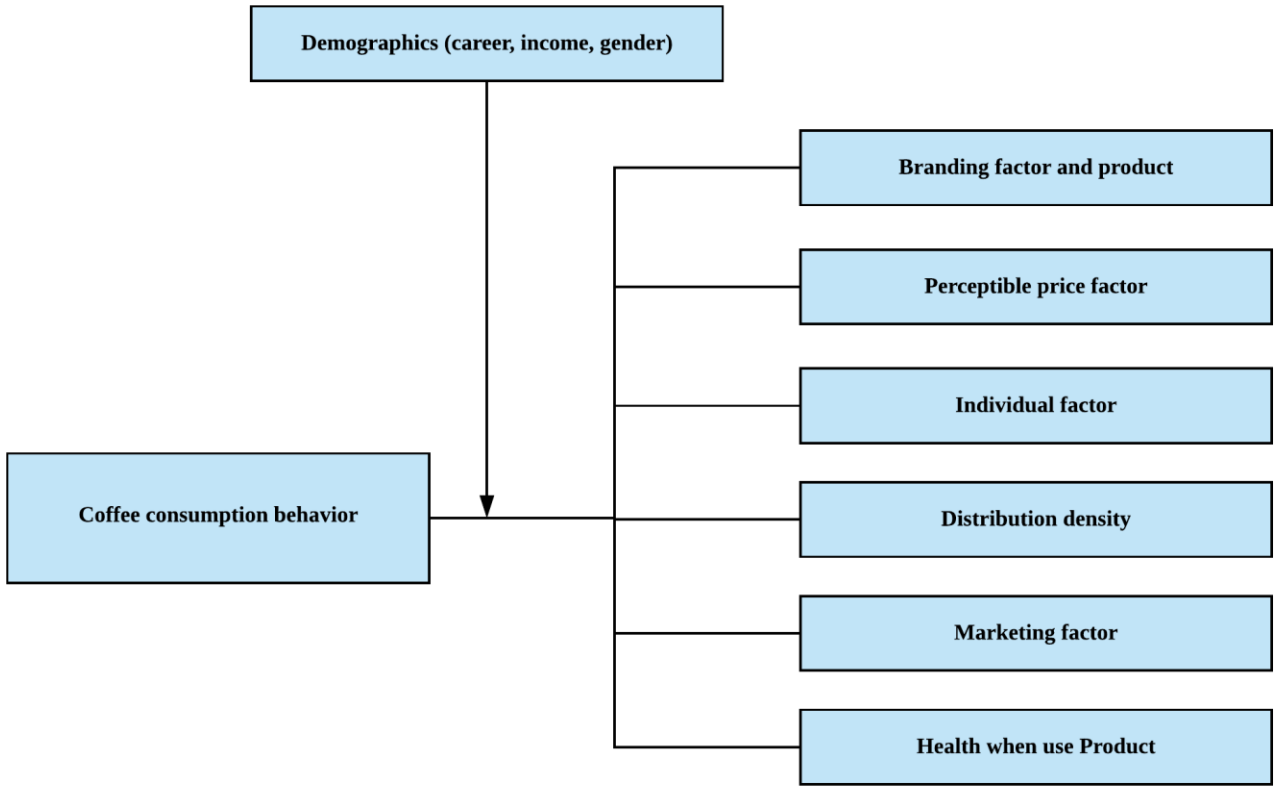


Figure 14. Research model

3.3. Building a scale

- **Identify the scales**:

From the research model of factors affecting the wellbeing of coffee customers in Da Nang City:

- The brand and product shown by coffee have a clear origin, is a product of an enterprise with a reputation and diversity in brand, products with full quality assurance certification, beautiful packaging, Eye-catching, and natural fragrance.
- The price of the product is perceived by the high price of pure coffee, price consistent with quality, and standard production process.
- The personal factor is expressed by being a coffee lover, loving the natural beauty of pure coffee, and liking the pure natural taste of the coffee.
- The distribution density of pure coffee is reflected in the fact that the products are sold in many places, easily found when needed, sold directly at local roasted coffee shops.
- The sense of health when using pure coffee is expressed through the coffee must ensure food hygiene and safety, pure natural, ensure the taste, and no mixing of other harmful impurities. Besides, the use of pure coffee also brings many health benefits, helps clarity and alertness, stimulates creative thinking in study and work.

Research hypotheses:

- **H1**: Brand and product that influence the use of pure coffee by young people
- **H2**: Prices have an impact on consumer behavior of coffee
- **H3**: Individual factors that influence coffee use behavior
- **H4**: Coffee distribution density has an impact on coffee consumption behavior of consumers
- **H5**: Health awareness has an impact on consumers' coffee use behavior

- **Identify observed variables:**

The draft scale was developed based on the model of the main factors affecting the coffee consumption behavior of consumers in Da Nang city. As a result, a draft scale for the main factors affecting the use of pure coffee was developed in the form of a five-level Likert scale of 1-5 (1 - disagree and 5 - agree)

The research proposes 06 scales affecting onions because the use of coffee products affects the wellbeing of consumers in Da Nang City, each scale has certain observed variables presented in the following table:

TH	**Branding factor and product**
TH1	The type of coffee has a clear origin
TH2	Coffee of reputable businesses
TH3	Coffee has full quality assurance certification
TH4	Types of coffee with reasonable prices
TH5	Types of coffee with natural flavor and aroma
GC	**Perceptible price factor**
GC1	The price of coffee is high
GC2	The price of coffee is high because of the standard and quality production process
GC3	I will still buy pure coffee even though the price is higher than regular coffee
CN	**Individual factor**
CN1	Expressed who is knowledgeable about coffee when using coffee
CN2	Coffee lover
PP	**Distribution density**
PP1	I choose to buy pure coffee because it is sold in many places
PP2	I feel like using pure coffee at the local roasted coffee shop
CT	**Marketing factor**
CT1	Pure coffee is having more ads that make me more confident
CT2	There are many promotions
CT3	There are good articles in newspapers and social networks
SK	**Health when use Product**
SK1	Use pure coffee that contains lots of antioxidants and is good for my cardiovascular system
SK2	Using pure coffee helps me stimulate creativity
SK3	Using pure coffee makes me feel relaxed and lucid
SK4	Pure coffee ensures food safety and hygiene
SK5	Use pure coffee because it brings many health benefits
HV	**Consumer behavior**
HV1	I will use (or continue to use) coffee more often if I know it's pure coffee
HV2	I will use (or continue to use) pure coffee even though the price is higher than regular coffee
HV3	I will use (or continue to use) pure coffee for its health benefits
HV4	I would recommend to friends/relatives/colleagues to use pure coffee

Table 5. The scale affects onions because of the use of coffee products

The scales are built and developed from a theoretical basis and research models. Before the creation of a formal scale for research objectives, in-depth interviews were conducted to understand the content of concepts and the meaning of words. The observed variables in the questionnaire using the 5-point Likert scale with option 1 means "**strongly disagree**", 2 means "**disagree**", 3 means "**no opinion**". ", 4 means" **agree** ", 5 means" **very agree** ". Use this scale in research because the issues are multifaceted.

3.4. Determine the number of survey samples

There are many methods of sample selection such as applying the methods of existing surveys, consulting experts, people with experience in the field of market research, or applying the existing sample calculation formulas. In the study, Factors affecting wellbeing and coffee consumption behavior of consumers in Da Nang city, the researchers decided to use the following formula to calculate the number of available samples as follows:

Y = 5n + 20

Y: Minimum number of samples to survey

n: Number of observed variables

After the process of surveying the coffee business in Da Nang city, the study proposed 07 scales affecting the use of pure coffee. Each scale has some specific observation variables and will be presented in the following table:

No.	Scale	Number of observed variables
1	Branding factor and product	5
2	Perceptible price factor	3
3	Individual factor	2
4	Distribution density	2
5	Marketing factor	3
6	Health when use Product	5
7	Consumer behavior	4
Total		24

Table 6. The scale of research

- The total number of observed variables in the proposed group is 24, thus, applying the above formula we have Y = 24 x 5 + 20 = 140
- Therefore, the minimum number of research samples to study is **140 samples**

3.5. Research methods

- **Qualitative research:**

Begin the qualitative research process, conduct research on searching and filtering primary data by the following methods:

  - **Direct observation**: observing coffee use behavior of consumers at coffee shops in Danang city.
  - **Personal interview**: Online personal interviews and direct personal interviews. Conduct online interviews through online communication to collect data.

- **Quantitative research**:

The survey by a questionnaire including an online survey and a direct survey.

Subjects surveyed: young customers aged 18 to 30 using coffee in takeaway cafes, on-site roaster cafes and popular in Danang city like Milano, Cong Cafe, Long Cafe, Hancoffee Original, The Coffee House and student of university of Greenwich Viet Nam (Da Nang Campus).

3.6. Scope and object of the research

- **Research scope**:

Danang city is a major commercial center of the country with a large population and diverse demographics. Moreover, the city of Danang is also a major consumer of coffee. Therefore, the survey in the city of Da Nang will ensure the representative of the sample

Duration of research: From June 1, 2020, to June 14, 2020

- **Research subjects**:

Consumer behavior of customers aged 18 - 30 years old in Da Nang City.

3.7. Cost

Phase	Process	Members	Work hours	Cost per hour	Total
Initiating					
	Develop Project Charter	5 members	24 hours	$5	$600
Planning					
	Develop Project Management Plan	4 members	16 hours	$5	$480
	Plan Scope	3 members	16 hours	$5	$240
	Create WBS	1 member	12 hours	$5	$70
	Plan Schedule	2 members	72 hours	$5	$720
	Plan Cost	3 members	20 hours	$5	$300
	Plan Quality management	3 members	18 hours	$5	$270
	Plan Resource	3 members	10 hours	$5	$150
	Plan Communication	1 member	10 hours	$5	$50
	Plan Risk	3 members	24 hours	$5	$360
Executing					
Collection data	Survey	2 members	60 hours	$4	$480
	Processing data	2 members	20 hours	$4	$160
	Data analysis	3 members	40 hours	$5	$600
Back-end	Smart contract	2 members	528 hours	$6	$6336
	NodeJs	2 members	80 hours	$5	$800
	Abi	3 members	340 hours	$6	$6,120
	Machine Learning	2 members	360 hours	$5	$3,600
	API	2 members	80 hours	$5	$800
Front-end	UX/UI	2 members	40 hours	$5	$400
	Testing	3 members	18 hours	$4	$216
Delivery & Maintenance					
Delivery	System Document	4 members	100 hours	$3	$1,200
Maintenance	Checking status	1 member	40 hours	$4	$120
	Checking performance	1 member	40 hours	$4	$120
	Checking quality	2 members	60 hours	$5	$600
Total					$25,192

Table 7. Project cost estimation each phase

3.8. The new contributions of the research

The research proposes a theoretical model and a scale of key factors affecting the behavior and wellbeing of pure coffee consumers in Da Nang City as well as providing some objective test results to brighten. show the hypotheses from the model. Thereby, the research paper will be the basis for the wellbeing research of consumers of this product.

The results of the study suggest key factors affecting the behavior and wellbeing of pure coffee consumption in Da Nang City, which can help consumers have a better perception of clean coffee and habits of using pure coffee in particular and food in general, to ensure both economic and safety factors.

The research results support coffee-producing enterprises to identify market needs as well as customer tastes, important factors affecting the decision-making process for the consumption of pure coffee products. of current consumers. Besides, the thesis proposes some strategic solutions specific to the industry in the production chain. Since then, businesses have the basis to formulate and develop market strategies that are suitable for potential customers.

4. Analyze the result of the primary research

During the research period, a total of 70 survey questionnaires were distributed in various forms to broadcast to respondents in Da Nang city at major universities such as Greenwich University and University. learn foreign languages, ... and some other areas of the city such as cafes, coffee distribution points ... Survey results obtained 55 survey tables. Besides, the study used to design questionnaires on the Internet, via Facebook, sent via email, the sample obtained from the online survey was 115 tables. At the end of the survey, after checking and removing the questionnaires that failed due to lack of information, the participants incorrectly read the questions, resulting in incorrect answers. Besides, the research subjects of the project are only young people aged 18 to 30 years using pure coffee in the city of Da Nang. Therefore, some people who have not used pure coffee, aged under 18 or over 30 and living in other areas of Da Nang city will be excluded from the scope of analysis. The number of appropriate live questionnaires and online surveys included in the statistical analysis is 156, accounting for nearly 92%.

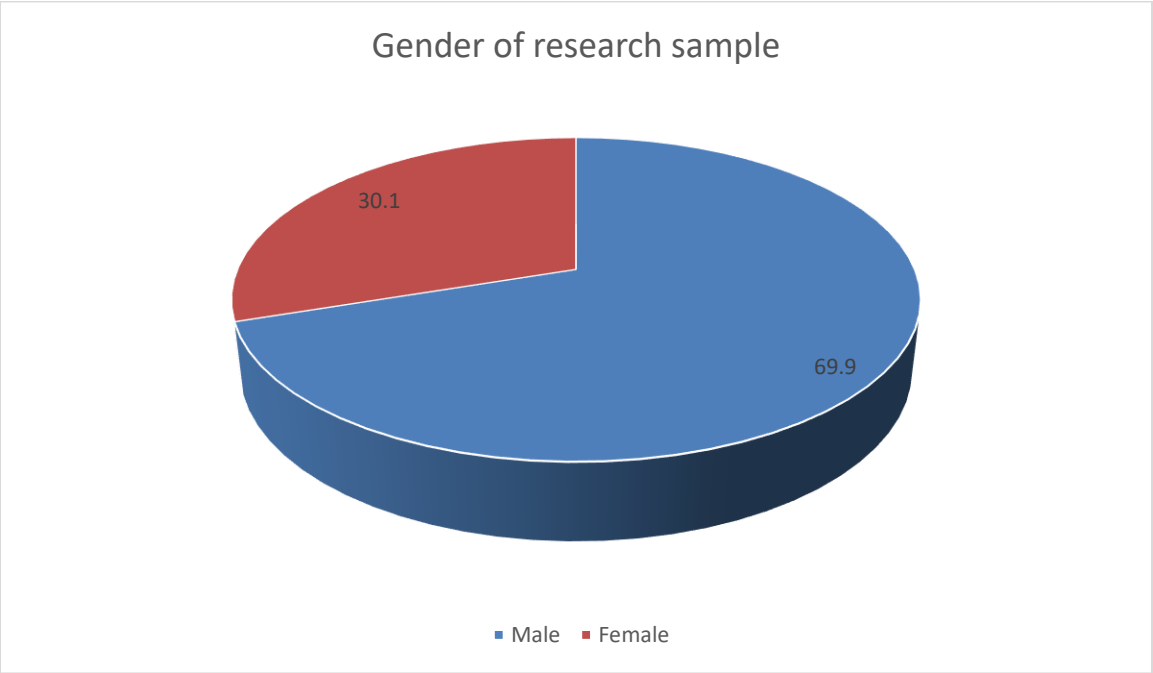
4.1. Information on research samples

The structure of the sample is divided and statistical according to criteria such as gender, occupation, age, and personal income.

The personal characteristics of the customer		Frequency	Rate (%)
Gender	Male	109	69.9
	Female	47	30.1
	Total	**156**	**100**
Age	From 18 to 22 years old	98	62.8
	From 22 to 25 years old	38	24.4
	From 25 to 30 years old	20	12.8
	Total	**156**	**100**
Career	Student	97	62.2
	Officer	42	26.9
	Worker	4	2.6
	Business	4	2.6
	Other	9	5.7
	Total	**156**	**100**
Income	Less than 1.5 million	28	17.9
	From 1.5 million to 3.0 million	36	23.0
	From 3.0 million to 5.0 million	60	38.5
	Over 5.0 million	32	20.6
	Total	**156**	**100**

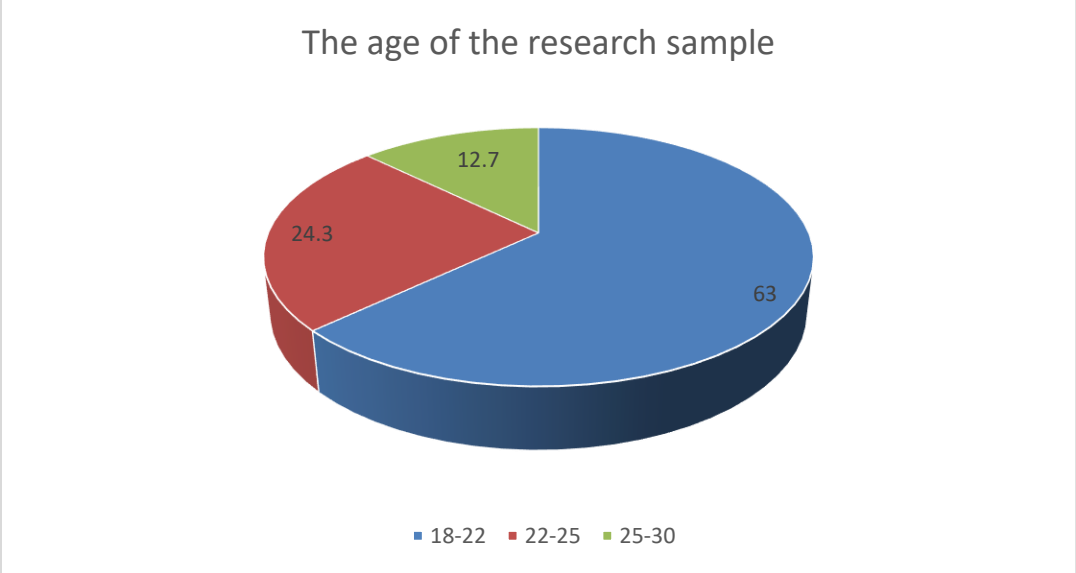
Table 8. Information about the research sample of individual characteristics of the customer

Among 156 eligible survey participants included in the primary data set, the results of the gender survey: according to the survey results, the number of male customers accounted for 69.9%; The number of female customers is 30.1%.



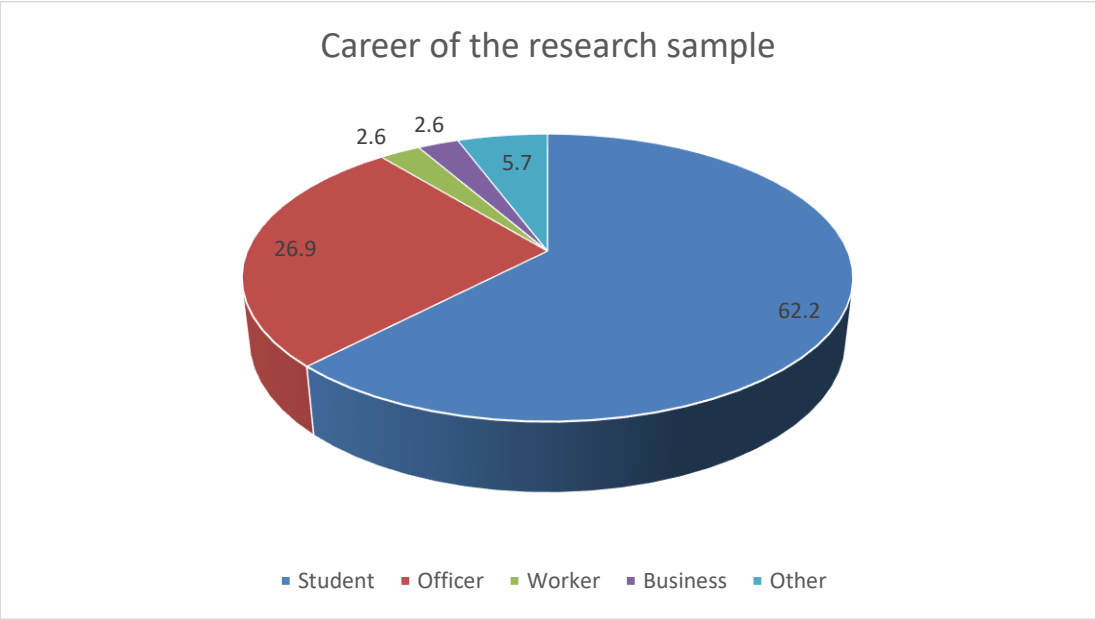
Picture 5. Gender of the research sample

Survey results on age: the number of customers in the age group from 18 to 22 accounted for 62.8%, from 22 to under 25 accounted for 26.9%, from 25 to under 30 accounted for 12.8%



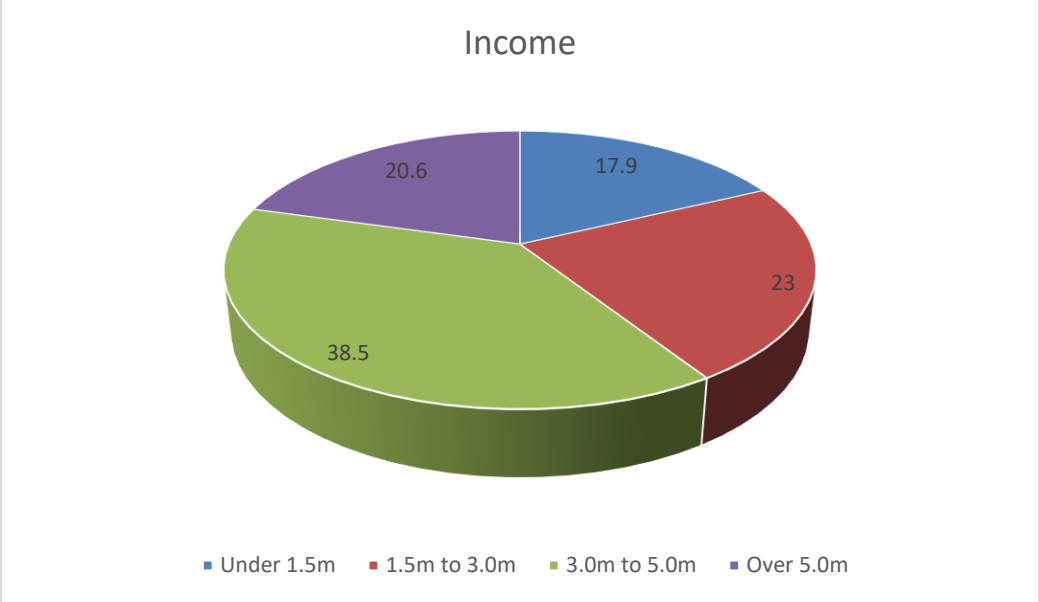
Picture 6. The age of the research sample

By occupation, the number of customers interviewed is more concentrated in the student career group (62.2%), the rest is distributed to the three groups of office workers (26.9%); workers (2.6%); business (2.6%) and other sectors (5.7%).



Picture 7. The career of the research sample

By income, the number of customers in the group with a monthly income of fewer than 1.5 million accounts for 17.9%; from 1.5 to under 3 million, accounting for 23.0%; from 3 million - under 5 million, the highest rate is 38.5%; customer group with an income of over 5 million is 20.6%.



Picture 8. The income of the research sample

		Income			
		Under 1.5m	**From 1.5m to 3.0m**	**From 3.0m to 5.0m**	**Over 5m**
Frequency of coffee use in 1 week	**Less than 3 times**	12.6%	33.7%	32.6%	21.1%
	From 3 to 5 times	4.7%	20.6%	45.9%	28.8%
	From 6 to 8 times	6.4%	17.0%	31.9%	44.7%
	Over 8 times	0.0%	10.0%	10.0%	80.0%

Table 9. Table of coffee consumption levels in 1 week and income of research sample

The level of pure coffee usage is less than 3 times, mainly the group of customers with income from 1.5 to less than 3 million (33.7%). The level of coffee usage from 3 to 5 times a week is mainly for the group of customers with income from 3 to less than 5 million (45.9%) and using from 6 to 8 times and over 8 times mainly in the customer group. goods with an income of over 5 million.

Based on the results of a survey on the behavior of customers using pure coffee in Da Nang city, the research shows that the sample structure by gender, age group, occupation, and income is consistent with the reality. International. Thus, the size and structure of satisfactory samples were determined in the sample design of the study sample, and at the same time suitable for groups of customers using pure coffee in fact in the market of Da Nang city at present.

4.2. Evaluate the scales

- **Test the reliability of the scale (Cronbach's Alpha index):**

The Cronbach's Alpha coefficient is a statistical test coefficient of confidence level and correlation among observed variables in the scale. The verification of the reliability of the scale plays a very important role in the accuracy and suitability of the research results. It indicates coherence and consistency in the responses to ensure respondents understand the same concept. Moreover, in this research, we used and refer to many scales of previous studies as well as developed some new scales. Therefore, testing the reliability of the scale is very necessary.

Observed variables	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
Brand, product scale (TH): Alpha = 0.787				
TH1	13.58	11.072	0.638	0.724
TH2	13.67	11.132	0.727	0.711
TH3	13.55	11.090	0.784	0.703
TH4	13.05	11.919	0.574	0.752
TH5	16.75	17.667	0.251	0.826
Price scale (GC): Alpha = 0.712				
GC1	7.27	2.042	0.622	0.498
GC2	7.37	2.602	0.531	0.624
GC3	7.30	2.645	0.451	0.715
Personal factor scale (CN): Alpha = 0.741				
CN1	10.93	6.356	0.674	0.595
CN2	10.21	6.969	0.580	0.654
Distribution density scale (PP): Alpha = 0.72				
P1	7.89	2.037	0.668	0.484
P2	7.85	2.457	0.474	0.726
Marketing factor scale (CT): Alpha = 0.859				
CT1	9.63	7.655	0.680	0.831
CT2	9.70	7.688	0.765	0.796
CT3	9.48	7.696	0.763	0.796

Health Awareness Scale (SK): Alpha = 0.835				
SK1	14.27	11.713	0.605	0.812
SK2	14.34	10.859	0.786	0.756
SK3	14.42	12.077	0.685	0.788
SK4	13.76	12.617	0.601	0.811
SK5	13.98	13.302	0.511	0.833
The Coffee Use Behavior scale (HV): Alpha = 0.78				
HV1	17.85	7.380	0.529	0.748
HV2	18.11	8.110	0.394	0.779
HV3	17.84	7.882	0.439	0.769
HV4	17.79	6.932	0.659	0.714

Table 10. Scale rating factor (Cronbach's Alpha)

Cronbach's alpha assessment results are shown that the scales have Alpha coefficient satisfactory> 0.6. However, the TH5 variable of the branding factor, pure coffee (TH) correlates with a total variable of 0.251 unsatisfactory (> 0.3), and if this type of variable, the alpha coefficient increases from 0.787 to 0.826. The results run again after the TH5 variable of the Brand Factor scale, pure coffee (TH) is as follows:

Brand, product scale (TH): Alpha = 0.787				
TH1	13.58	11.072	0.638	0.787
TH2	13.67	11.132	0.727	0.760
TH3	13.55	11.090	0.784	0.745
TH4	13.13	13.784	0.574	0.846

Table 11. The reliability of the brand and product scale

4.3. Regression analysis

Dependent variable Behavior is affected by 6 independent variables, so to estimate the model studying the influence of factors on coffee use behavior in Da Nang, the research uses the regression equation. rules of multiplication, the equation have the form:

$$HV = \beta o + \beta 1TH + \beta 2GC + \beta 3CN + \beta 4PP + \beta 5CT + \beta 6SK$$

- **HV**: Behavior of using pure coffee
- **TH**: Brand, pure coffee products
- **GC**: Price of pure coffee
- **PP**: Coffee distribution factor
- **CT**: Marketing factor
- **SK**: Health factor

- **Testing correlation coefficient:**

In order to perform the correlation coefficient test, the research conducted to calculate the average value for the adjusted scales:

Satisfactory evaluation scales are included in Pearson correlation analysis (because variables are measured using interval scales) and regression analysis to test hypotheses. Correlation analysis is performed between dependent variables and independent variables to confirm a linear relationship between dependent variables and independent variables, then the use of linear regression analysis is appropriate. Correlation analysis also helps to detect the close correlations between the independent variables, because such correlations will cause multi-collinear phenomena, greatly affecting the regression results.

The results of the correlation test between independent variables and between independent variables and dependent variables by **Spearman's method**. Below is a matrix of correlation coefficients between research concepts.

		HVx	THx	GCx	CNx	PPx	CTx	SKx
HVx	Pearson Correlation	1	.403	.521	.717	.523	.680	.726
	Sig. (2tailed)	-	.000	.000	.000	.000	.000	.000
	N	156	156	156	156	156	156	156
THx	Pearson Correlation	.403	1	.119	.271	.200	.210	.294
	Sig. (2tailed)	.000	-	.033	.000	.000	.000	.000
	N	156	156	156	156	156	156	156
GCx	Pearson Correlation	.521	.119	1	.280	.341	.383	.329
	Sig. (2tailed)	.000	.033	-	.000	.000	.000	.000
	N	156	156	156	156	156	156	156
CNx	Pearson Correlation	.717	.271	.280	1	.377	.579	.522
	Sig. (2tailed)	.000	.000	.000	-	.000	.000	.000
	N	156	156	156	156	156	156	156
PPx	Pearson Correlation	.523	.200	.341	.377	1	.205	.317
	Sig. (2tailed)	.000	.000	.000	.000	-	.000	.000
	N	156	156	156	156	156	156	156
CTx	Pearson Correlation	.680	.210	.383	.579	.205	1	.579
	Sig. (2tailed)	.000	.000	.000	.000	.000	-	.000
	N	156	156	156	156	156	156	156
SKx	Pearson Correlation	.726	.294	.329	.522	.317	.579	1
	Sig. (2tailed)	.000	.000	.000	.000	.000	.000	-
	N	156	156	156	156	156	156	156

Table 12. Matrix correlation coefficients between research concepts

The key factors influencing the use of pure coffee by young people in Da Nang are closely related. In which the correlation between the dependent variables ranges from 0.403 to 0.726; The correlation between the independent variables ranges from 0.119 to 0.579.

This proves that the independent variables are more likely to explain the dependent variable. At the same time, the set variables reach the discriminant value.

- **Building the regression model**:

The regression model is performed by using regression command in the **SPSS** software and the **Enter method** to put variables into the regression equation at the same time.

To assess the suitability of a linear model. We use the coefficient R, R2 (With 0 <R2 <= 1. adjusted R2, and standard errors. The regression equation is estimated based on data collected through the results of the investigation of 156 sample elements.

R	R Square	Adjusted R Square	Std. An error of the Estimate
0.889	0.808	0.805	0.2356571090

Table 13. Summary regression model

The results of the regression model summary are shown R2 value = 0.808> adjusted R2 = 0.805. Demonstrate the regression model is built with independent variables: brand, price, promotion, individual, distribution, The health explained 80.8% of the variation of the dependent variable is the use of pure coffee by young people in Da Nang city.

Testing the suitability of the model

Hypothesis Ho: Set of independent variables not related to dependent variables

		Sum of Squares	df	Mean Square	F	Sig.
1	**Regression**	73.813	6	12.302	221.523	.000
	Residual	17.493	149	.056		
	Total	91.306	155			

Table 14. The results of testing the conformity of the regression model

ANOVA analysis results show that the test value F (= 221,523) is statistically significant (Sig. = 0.000 <0.05).

The Ho hypothesis was rejected. Conclusion The regression model including 6 variables included in the regression model is consistent with the research data and can be extrapolated to the overall **Brand of Product** (TH), **Price** (GC), **individual factor** (CN), **Distribution factor** (PP), **marketing** (CT), **The health factor** (SK) included in the regression model is consistent with the research data and can be extrapolated to the population as a whole.

Statistical parameters of the regression model

		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	Constant	0.568	0.095	-	5.995	0.000	-	-
	Brand	0.086	0.017	0.136	5.185	0.000	0.888	1.126
	Price	0.134	0.020	0.183	6.552	0.000	0.776	1.289
	Individual	0.175	0.021	0.282	8.550	0.000	0.559	1.789
	Distribution	0.142	0.021	0.190	6.732	0.000	0.768	1.303
	Marketing	0.121	0.020	0.206	6.045	0.000	0.522	1.917
	Health	0.187	0.020	0.298	9.175	0.000	0.575	1.739

Table 15. Statistical parameters of the model

Analysis results show. of 6 factors influencing the pure coffee usage behavior of young people in Da Nang City. The most influential factor is the "Health Factor" (Health) with Beta = 0.298. The "Personal Factor" (Individual) with Beta = 0.282. “Marketing" has Beta = 0.206. "Distribution factor" with Beta = 0.190. "The price" (GC) has a beta = 0.183. "Brand” has Beta = 0.136. Thus, the regression model showing the main factors affecting the use of pure coffee by consumers in Da Nang city is determined as follows:

HV= 0.568+ 0.136TH + 0.183 GC + 0.282CN + 0.190PP + 0.206 CT + 0.298SK

Among the 6 factors included in the model, there is a positive correlation with the consumption behavior of pure coffee. Inside. The "health factor" is the most influential. Specifically: When consumers rate the factor "health factor" by 1 more unit, the consumer behavior score will increase by 0.298 units (corresponding to the non-standardized correlation coefficient of 0.298). When consumers rate the factor "personal factor" by 1 unit, the consumer behavior score will increase by 0.282 units (corresponding to the non-standardized correlation coefficient of 0.282). When consumers rate the "marketing" by 1 unit, the consumer behavior score will increase by 0.206 units (corresponding to the non-standardized correlation coefficient of 0.206). When consumers rate the "distribution" factor by 1 more unit, the consumer behavior score will increase by 0.190 units (corresponding to the non-standardized correlation coefficient of 0.190). When consumers rate the factor "perceived price" by 1 unit, the consumer behavior score will increase by 0.183 units (corresponding to the non-standardized correlation coefficient of 0.183). When consumers evaluate the factor "brand, product” increases by 1

unit, the consumer behavior score will increase by 0.136 units (corresponding to the non-standardized correlation coefficient of 0.136.

The coefficients β bear the (+) sign, which proves that the TH, GC, CT, CN, PP, SK variables have a positive impact on the consumption of pure coffee, proving that the assumptions about the model are correct.

Thus, with this result, the hypotheses proposed and adjusted and based on the regression equation can make new hypotheses for the model as follows:

- **H1**: Brand perception. The product of pure coffee positively affects the behavior of pure coffee by young people
- **H2**: The price of pure coffee affects positively the use of pure coffee by the young.
- **H3**: Personal factors that positively influence the use of pure coffee by the young
- **H4**: Distribution factors influence positively the behavior of pure coffee usage among young people
- **H5**: Promotion program that positively affects the use of pure coffee by young people
- **H6**: Health factors positively affect the behavior of pure coffee use of young people

Testing violation of regression model assumptions:

Acceptance values of the independent variables (Tolerance) are greater than> 0.5 (at least 0.522); The magnification variance (VIF) is less than 2 (the largest is 1,917). Therefore, for assertion does not occur multi-collinear phenomenon.

4.4. Testing the difference of customers' assessment of wellbeing factors affecting coffee consumers in Da Nang City

- **Test the difference of impact factors according to customers' gender:**

The tool used is the **Independent - Sample T-Test**; The method of implementation is to test whether there is a difference in the mean of the two populations - the independent sample is the male and female client groups.

		Levene's Test for Equality of Variances		t-test for Equality of Means		
		F	Sig.	T	Df	Sig. (2-tailed)
THx	Equal variances assumed	.114	.736	.367	320	.714
	Equal variances not assumed			.375	191.938	.708
GCx	Equal variances assumed	2.113	.147	.723	320	.470
	Equal variances not assumed			.682	160.875	.496
CNx	Equal variances assumed	.003	.959	.077	320	.939
	Equal variances not assumed			.078	184.452	.938
PPx	Equal variances assumed	.865	.353	-.375	320	.708
	Equal variances not assumed			-.382	190.244	.703
CTx	Equal variances assumed	2.114	.147	.654	320	.513
	Equal variances not assumed			.686	203.826	.493
SKx	Equal variances assumed	1.999	.158	.650	320	.516
	Equal variances not assumed			.679	201.939	.498

Table 16. Test the difference of impact factors according to customers' gender

The results show that, **Sig of Levene test** = 0.203> 0.05 and **Sig of t-test in Equal variances assumed** = 0.261> 0.05: for convenience: Sig of test Levene = 0.370> 0.05 and Sig of t-test in Equal variances assumed = 0.401> 0.05; For promotion programs: Sig of Levene test = 0.039 <0.05 and Sig of t-test in Equal variances not assumed = 0.297> 0.05; for prices: Sig of Levene test = 0.724> 0.05 and Sig of t-test in Equal variances assumed = 0.572> 0.05; for brand factor: Sig of Levene test = 0.061> 0.05 and Sig of t-test in Equal variances assumed = 0.563> 0.05; for Sig quality factor of Levene test = 0.451> 0.05 and Sig of t-test in Equal variances assumed = 0.000 <0.05. This also allows us to conclude that **there is no difference between male and female customers** in assessing the impact of product quality, convenience, promotion, price, and brand; and there is the only difference between male and female customers in assessing the impact of quality on the pure coffee consumption behavior of young people in Da Nang City. Specifically, the male customer group places more importance on the impact of the quality factor of the product than the female customer group.

- **Testing by age:**

The instrument used in the analysis of variance (**ANOVA**); The method of testing is to test whether there is a difference in the average of the four population groups - the independent sample is classified according to the age group of the survey group: from 18 to 22 years old, 22 to 25 years old. and 25 to 30 years old.

With Lenovo's Sig on brand, price, personal, distribution, marketing, health factors, respectively: 0.332, 1.754, 0.616, 0.776, 0.448, 3.769> 0.05, we can say the Difference of assessment The importance of branding factors on price, individuality, distribution, promotion, the health of 3 different age groups can be used to use ANOVA analysis results.

	Levene Statistic	df1	df2	Sig.
Brand	.332	2	319	.718
Price	1.754	2	319	.175
Individual	.616	2	319	.541
Distribution	.776	2	319	.461
Marketing	.448	2	319	.639
Health	3.769	2	319	.024

Table 17. Testing by age

ANOVA analysis results show. for **individual values** Sig = 0.177> 0.05; for **health value** Sig = 0.218> 0.05. The value of **distribution factor** sig = 0.60> 0.05 proves that there is no difference between age groups of customers in assessing the impact of individual factors and distribution factors. Health factors to coffee consumption behavior. On the other hand, for **product brands** Sig = 0.001 <0.05; for the **price value** Sig = 0.034 <0.05. For **marketing value** sig = 0.018, there is a difference between customer groups by age in assessing the impact of brand and price factors. promotion to coffee consumption behavior.

		N	Mean	Std. Deviation	Std. Error
THx	18-22 years old	98	3.218719	.8177755	.0573966
	22-25 years old	38	3.561538	.8552710	.0968404
	25-30 years old	20	3.590244	.8074048	.1260954
	Total	156	3.349068	.8406434	.0468472
GCx	18-22 years old	98	3.5961	.70277	.04932
	22-25 years old	38	3.6752	.79677	.09022
	25-30 years old	20	3.9187	.67404	.10527
	Total	156	3.6563	.72861	.04060
CTx	18-22 years old	98	3.0333	.87657	.06152
	22-25 years old	38	3.3718	.90430	.10239
	25-30 years old	20	3.1890	.99966	.15612
	Total	**156**	**3.1351**	**.90816**	**.05061**

Table 18. Descriptives for age

Follow the **Descriptives table** below for brand importance. Products and prices are appreciated in the age group from 25 to 30 years old (With an average value of 3,590244 respectively with brand elements. 3,9187 with price factor). The importance of marketing is highly appreciated in the age group from 22 to under 25 years old (with the highest average value is 3.3718).

- **Testing by career:**

Same as the customer's age. Results of variance analysis (**ANOVA**) for five client groups by occupation are student groups. officer. worker. Other business and career. With Sig of Leneve of the **product brand**, **price**, **individual**, **distribution**, **marketing, health factors** are 0.111, 0.537, 0.119, 0.645, 0.582, 0.887> 0.05 can say the variance of the evaluation of the importance of weak brand products, price, individual, distribution, marketing and the health factors of five occupational groups were not so different, so it was possible to use ANOVA analysis results.

	Levene Statistic	df1	df2	Sig.
Brand	1.893	4	317	.111
Price	.782	4	317	.537
Individual	1.848	4	317	.119
Distribution	.625	4	317	.645
Marketing	.715	4	317	.582
Health	.286	4	317	.887

Table 19. Testing by career

For brand elements. The product is highly appreciated by other professional groups and office workers. For promotional elements are appreciated by other professional groups and office workers. For health, factors are highly appreciated by the office workers' occupational group.

		N	Mean	Std. Deviation	Std. Error
THx	Student	97	3.262687	.8259847	.0582605
	Officer	42	3.487356	.8932310	.0957644
	Worker	4	3.450000	.6907553	.2442189
	Business	4	2.800000	.6676184	.2360387
	Other	9	3.844444	.5554248	.1309149
	Total	**156**	**3.349068**	**.8406434**	**.0468472**
CTx	Student	97	3.0784	.91639	.06464
	Officer	42	3.2874	.88391	.09476
	Worker	4	3.0625	.93303	.32987
	Business	4	2.3125	.63738	.22535
	Other	9	3.4306	.80351	.18939
	Total	**156**	**3.1351**	**.90816**	**.05061**
SKx	Student	97	3.502488	.8424036	.0594186
	Officer	42	3.694253	.8478915	.0909035
	Worker	4	3.500000	.7329003	.2591194
	Business	4	2.675000	.9003967	.3183383
	Other	9	3.588889	.8330588	.1963538
	Total	**156**	**3.538509**	**.8526712**	**.0475175**

Table 20. Descriptives for career

According to the Descriptives table above. For brand elements. The product is highly appreciated by other professional groups and office workers. For promotional elements are appreciated by other professional groups and office workers. For health, factors are highly appreciated by the office workers' occupational group.

- **Testing by income:**

The result of variance analysis (**ANOVA**) for four groups of customers is less than 1.5 million. 1.5 to 3 million. 3 to 5 million and over 5 million. With Sig of Leneve of product brand elements. price feel. personal element. distribution. promotion program. Health factors are 0.276, 0.107, 0.336, 0.321, 0.158 and 0.634> 0.05 can say the variance of the evaluation of the importance of product brand factors. price feel. personal element. distribution. promotion program. The health factors of the four income quintiles were not different so they could use the ANOVA analysis results

	Levene Statistic	df1	df2	Sig.
Brand	1.297	3	318	.276
Price	2.049	3	318	.107
Individual	1.132	3	318	.336
Distribution	1.170	3	318	.321
Marketing	1.745	3	318	.158
Health	.558	3	318	.643

Table 21. Testing by income

ANOVA analysis results show. For **brand value** Sig = 0.362> 0.05 for the **price factor** Sig value = 0.149> 0.05 for **individual factors** Sig value = 0.828> 0.05. with the sig value factor = 0.394> 0.05 and the **health factor** sig = 0.410> 0.05, it shows that there is no difference between income groups in assessing brand impact, price, personal, promotion, health to coffee consumption behavior. On the other hand, for the value **distribution** Sig = 0.004 <0.05, there is a difference between customer groups by occupation in assessing the impact of the distribution of pure coffee consumption behavior.

The importance of the **distribution factor** is appreciated in two-income groups: over 5 million. 1.5 to 3 million.

4.5. Solutions and recommendations

- **Solutions for each impact factor:**
    - **Product:**

When consumed, consumers are quite interested in product quality, so pure coffee should take quality as the core. The quality of pure coffee is assessed based on brand, flavor, color, rich taste, consistency. Especially for the young, the generations receive knowledge and easily accept new things. They are coffee savvy and concerned about the quality of the product when used. Recently, the trend of using pure or pure coffee has become more popular, because the demand for people is gradually towards clean food without toxic chemicals that affect health.

On the market today, there are products with pure coffee labels but not tested and not through a closed production process, making consumers less confused, and also a danger to Company reputation, manufacturer of pure coffee. Therefore, it is necessary to build knowledge and beliefs about pure coffee, facilities, producers, and distribution points of pure coffee, so they have a clear name and brand.

So pure coffee must truly win customers' trust by making the coffee supply chain transparent. It is very difficult for Vietnam to obtain such certifications because most of the coffee comes from small family farming that is not guaranteed. Want a good cup of coffee, it must first be clean coffee. In order to have a quality coffee, the raw materials must meet the standards, so businesses and the state should take measures to synchronize the quality of coffee, encourage and support science and technology as well as technology. Coffee growers can improve the quality of the coffee. Besides, it is necessary to raise consumers' awareness about knowledge of pure coffee.

- **Price:**

According to the research, the price has an influence on the consumption behavior of pure coffee of consumers though not much. Consumers often accept high prices to be able to use quality products. However, on the market, many products carry pure coffee, but only roasted soybeans at cheap prices, only about 50 thousand VND per kg. The price of robusta coffee is about 40 thousand VND / kg, an average of 1.3 kg of raw coffee produces 1 kg of the finished product. In addition to production costs and other costs, where to get the price is only 50 to 60 thousand kilograms of coffee powder sold everywhere in the market today. Not to mention that manufacturers also "give" the "accessories" accompanying such as umbrellas, cups, signs ... Because they want cheap, consumers or cafes are willing to buy even though they do not know Is the coffee clean or not, adversely affecting health? Because of the need to use coffee with a strong aroma, smooth and frothy foam, there are still opportunities for dirty coffee production enterprises.

Currently, pure coffee is used quite popular because to have a cup of pure coffee, consumers only need to spend about 12,000 to 15,000 thousand heaps to have a cup of roasted coffee on the spot. With reasonable and cheap price should suit consumers.

- **Distribution:**

The original roasted coffee shops, in the beginning, were loved by the price and quality and could easily find a roasted coffee shop on site, pure coffee when needed. The coffee car carrying in the morning also thrives with wide coverage.

However, there are still many sidewalk cafes or even large luxury cafes that still use dirty coffee that may be for-profit or because of Vietnamese coffee's preference and habit of using coffee. Therefore, there are still many market segments left open so enterprises producing pure coffee should focus and penetrate the market.

- **Marketing:**

Provides transparency in information, processes, production technologies for the press, business reports, answers consumer questions, and creates a beautiful brand image.

Funding the agricultural program, introducing business and production models for people to get acquainted, and introducing the advantages to the increasingly scaling model and talking with agricultural engineers.

Combining a popular reality show, building games related to the process of pure coffee production for viewers to witness and better understand this process. Organize seminars, distinguish free whole coffee, and invite prestigious experts to attend.

- **Health:**

When consumers use coffee, they not only want to be more alert but also desire many other health benefits. Especially when choosing pure coffee, consumers expect and want more about the health factors that coffee brings. However, many people still do not know all the benefits that coffee brings. Therefore, it is necessary to promote information dissemination for people to understand that pure coffee is not harmful to health. The International Coffee Organization has collaborated with many reputable research institutes and universities and clarified the relationship between health and coffee. carcinogens for rodents but their content is insignificant. The scientific research results show many benefits of coffee for human health, especially anti-aging effects.

Besides, there should be programs to improve consumers' understanding of pure coffee, can distinguish between pure and dirty coffee and impurities and change the habit of using. cups of coffee must be black, viscid, frothy from roasted soybeans

- **For Enterprises:**

Enterprises need to develop and apply a coffee supply chain management system. The coffee supply chain is the sequence of activities and processes to bring raw coffee beans from coffee farms to processed coffee in markets.

- **Problems in Existing System:**

Currently, Coffee trade mostly relies on fax machines and emails to send and receive contracts across the globe, resulting in slower and error-prone paperwork.

Blockchain can solve this by providing immutable and verifiable data sources.

- **What the system is providing:**

The system has implemented a smart contract addressing the issue of storing critical data necessary at different stages of the supply chain and making it verifiable by all stakeholders in the supply chain.

- **Application Workflow Diagram:**

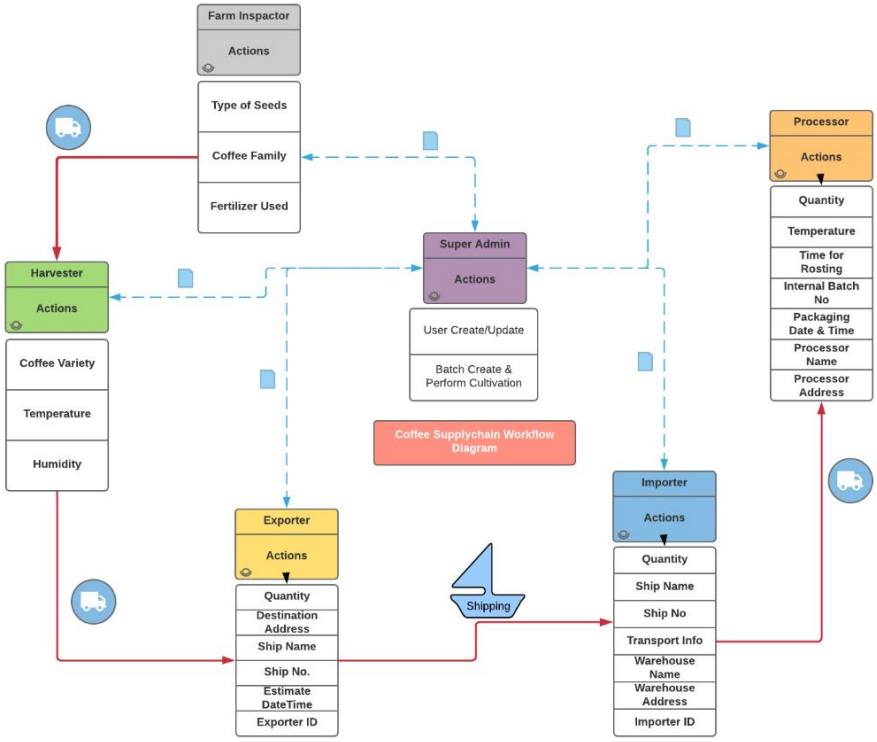
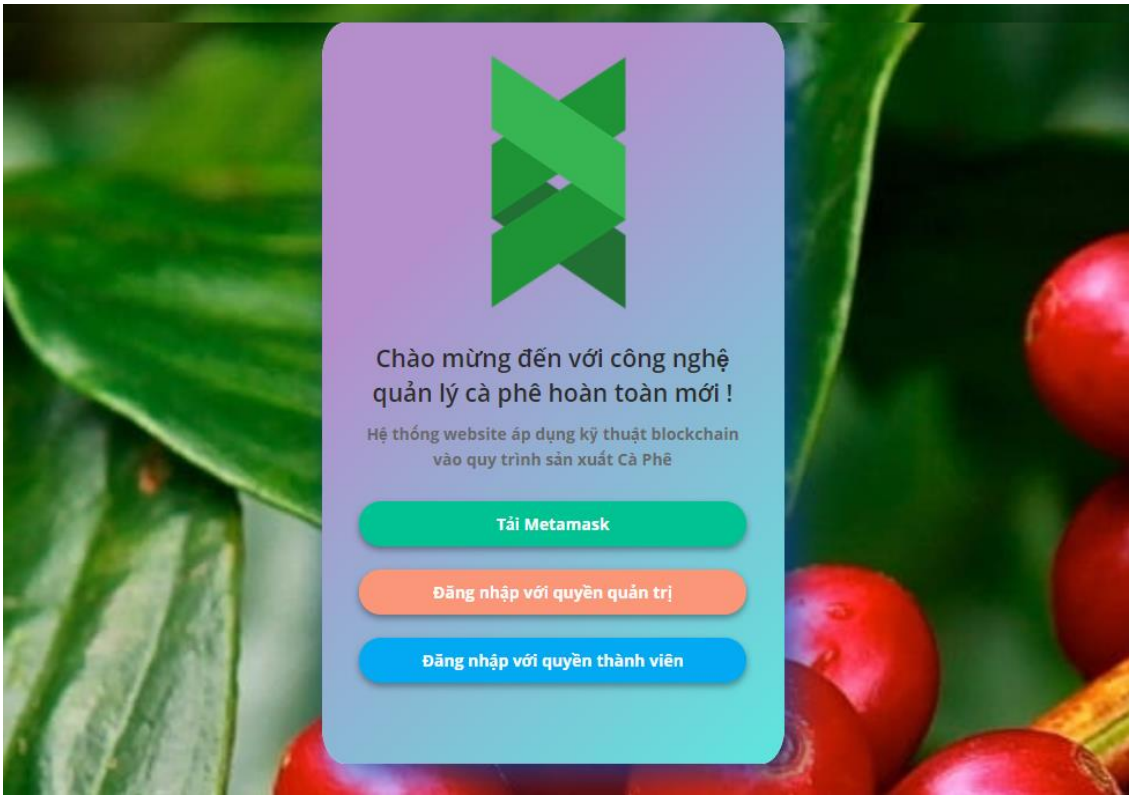


Figure 15. Coffee supply chain management system workflow diagram

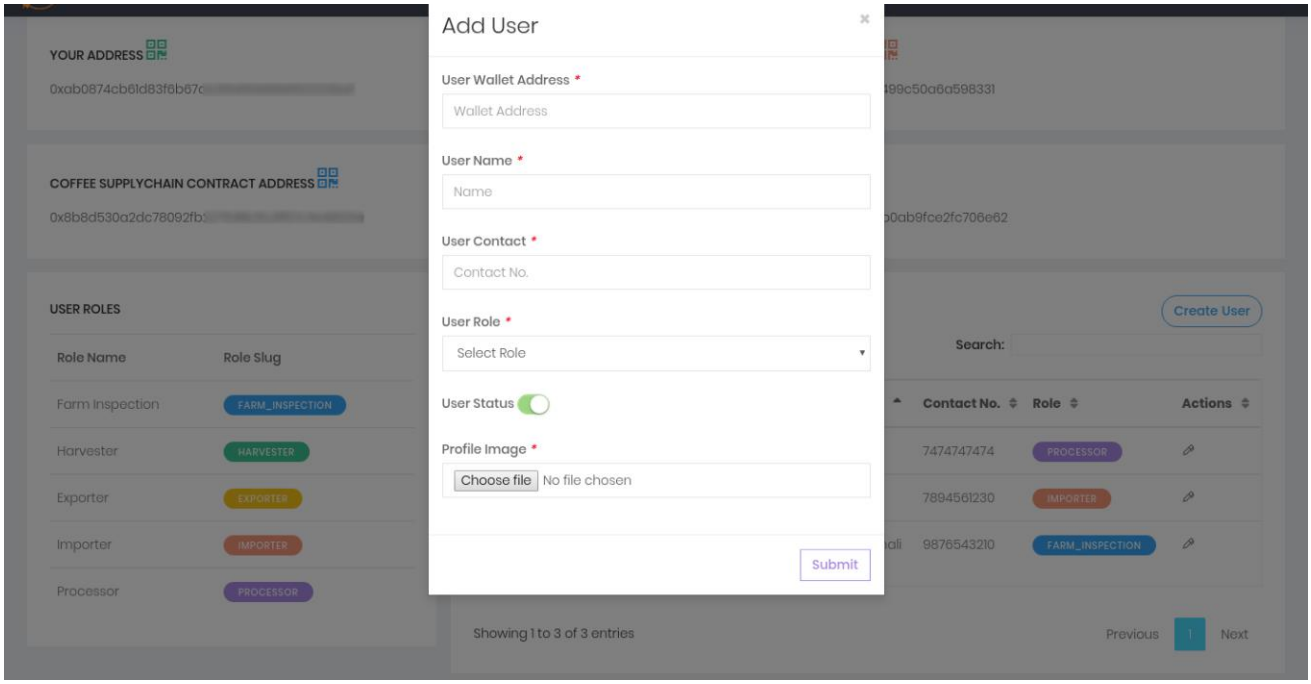
- **In this application we have Six stages:**
  - **Admin**: Admin creates a new batch which is the initial stage of the coffee batch.
  - **Farm-Inspector**: Farm-inspectors are responsible for inspecting coffee farms and updating information like coffee family, type of seed, and fertilizers used for growing coffee.
  - **Harvester**: Harvesters conducting plucking, hulling, polishing, grading, and sporting activities, further updating the information of crop variety, the temperature used and humidity maintained during the process.
  - **Exporter**: Exporters are the organization who exports coffee beans throughout the world. Exporter adds quantity, a destination address, ship name, ship number, estimated date, and time and exporter id.
  - **Importer**: Importers imports the coffee from coffee suppliers and updates quantity, ship name, ship number, transporters information, warehouse name, warehouse address, and the importer's address.
  - **Processor**: Processors are the organizations who process raw coffee beans by roasting them on particular temperature and humidity and make it ready for packaging and to sell into markets. The processor adds the information like quantity, temperature, roasting duration, internal batch number, packaging date-time, processor name, and processor address.

- **Included Components:**
  - Solidity (Ethereum)
  - Metamask (Ethereum wallet)
  - Rinkeby test network
  - Infura
  - Truffle
  - IPFS
  - Web3JS
  - Apache and PHP
- **Prerequisites:**
  - Nodejs v9.10 or above
  - Truffle v4.1.8 (core: 4.1.8)
  - Solidity v0.4.23
  - Metamask
- **Development Screen's:**
  - Login Page:



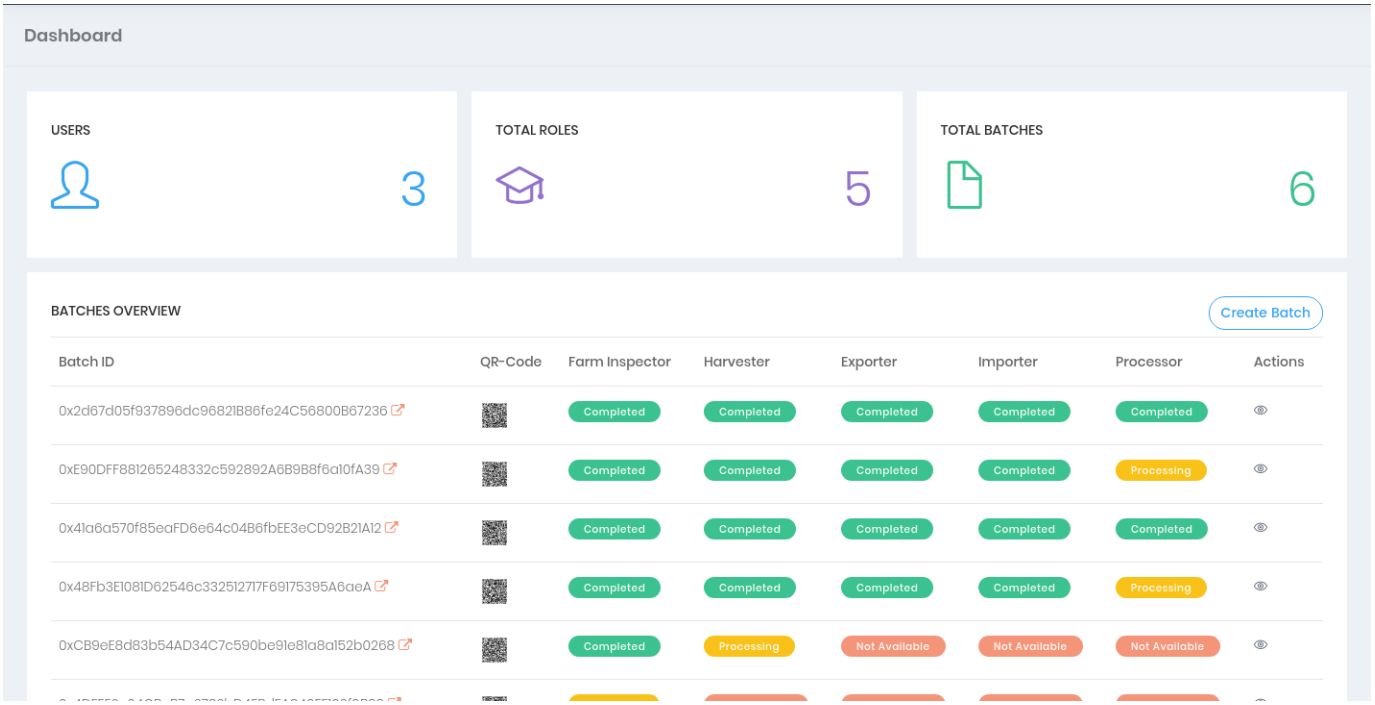
Picture 9. Login page

- Admin Dashboard:



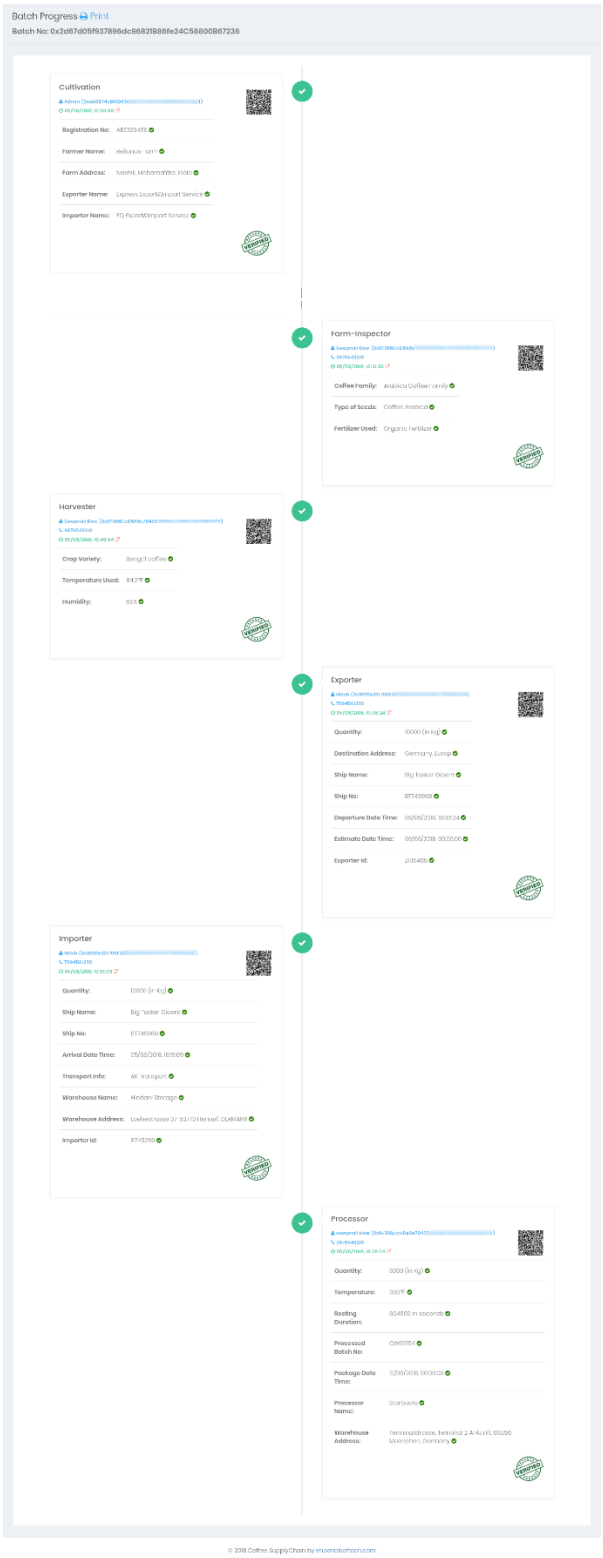
Picture 10. Admin Dashboard

- Batch Overview:



Picture 11. Batch Overview

- Batch Details:



Picture 12. Batch Details

In this way, the system can track the progress of coffee beans after each stage in the blockchain.

The stages which are yet not updated in blockchain are denoted using cross sign and the stages which are completed are denoted by the right tick sign.

Users can also find out the name, address, and contact information of a user who updated the particular stage in the coffee supply chain.

- Source Code: https://github.com/SuperMido/greechain
- Live demo: https://greechain.herokuapp.com/

4.6. The limitations of the research

Due to time constraints, this study only focused on young consumers aged 18 to 30, geographically only surveying consumers in the area of Da Nang city. Therefore, the research results are somehow not representative of all Vietnamese consumers. Therefore, a larger-scale study is needed to assess the overall wellbeing of consumers for coffee products.

A study using a random sampling method. However, the sample size is not large and the criteria for scaling according to demographic factors on gender, age, occupation, uneven income, and many limitations. This makes the study unable to obtain the most accurate research results.

In the next research, building and standardizing scales suitable for Vietnamese consumers is an important requirement.

From the limitations of this study, expanding the scope to other provinces and cities or the whole country will be the direction that can be continued to implement more broad solutions.

5. Project plan

5.1. Project milestone

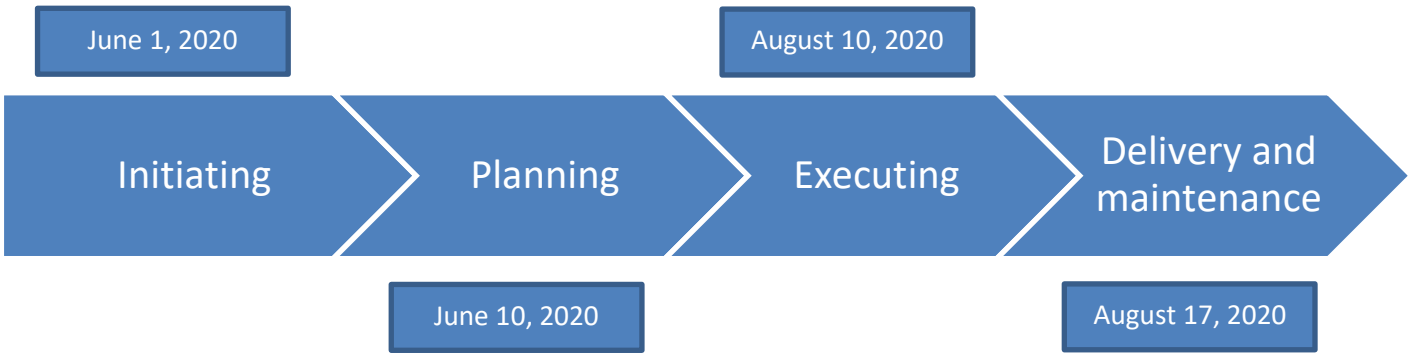


Figure 16. Project milestone

5.2. Project communication

Communication	Frequency	Goal	Owner	Audience
Email				
Project status report	Weekly	Review project status and discuss potential issues or delays	Project manager	Project team + Project sponsor
Meetings				
Team stand-up	Daily	Discuss what each team member did yesterday, what they will do today and any blockers	Project manager	Project team
Project review	At milestone	Present project deliverables, gather feedback and discuss next step	Project manager	Project team + project sponsor
Post-mortem meetings	At the end of the project	Assess what worked and what did not work and discuss actionable takeaways	Project manager	Project team
Team Gantt				
Task progress updates	Daily	Share daily progress made on project tasks	Project manager	Project team
GitHub				
Update source code	Daily	Commit source code on GitHub for each function.	Project manager	Project team
Pull source code	Daily	Keep track and pull source code from GitHub that team had done yesterday	Project manager	Project team
Skype				
Communication channel	Daily	Talk and exchange information about the project	Project manager	Project team

Table 22. Project Communication

5.3. Project work breakdown structure (WBS)

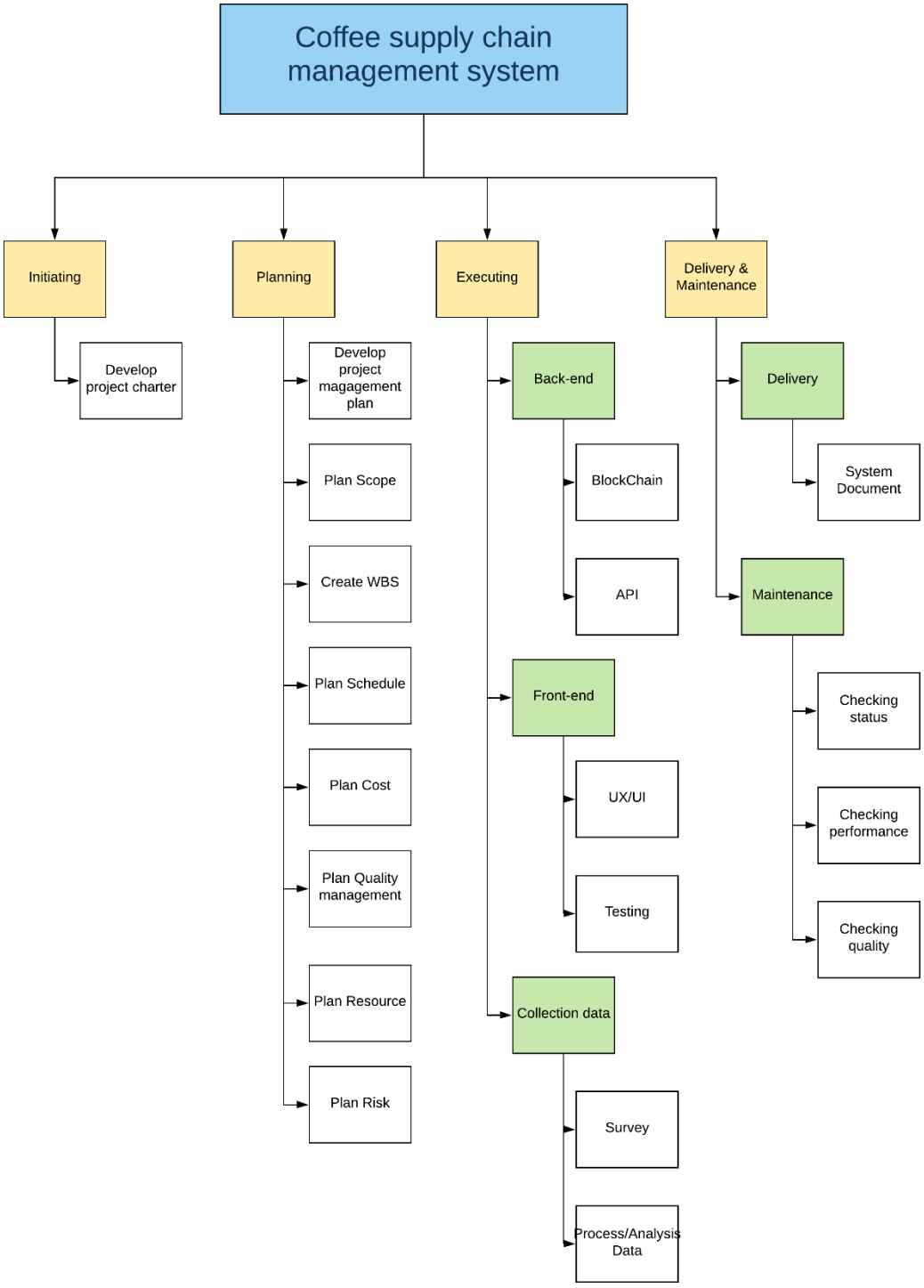


Figure 17. Project work breakdown structure (WBS)

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Appendix

Appendix 1. Survey form

The survey of factors affecting wellbeing of coffee consumers in Danang (from 18 to 30 years old)

I am a science research student, currently a second-year student of the faculty of Information Technology, University of Greenwich. This is a survey to help us with quantitative results, supporting the completion of the study with the subject "A survey of factors significant wellbeing of coffee consumers in Danang (from 18 to 30 years old)". The information in this survey is for research purposes only, not for any other purpose. The results of this survey are of great value to our research paper, and we hope you will take the time to complete this survey.

Sincere thanks!

Your name: ……...……

Phone number: ……

Gender: ☐ Male ☐ Female

1. Have you ever used Pure Coffee before?

   ☐Never

   ☐Used to

If you have never used Pure Coffee, please stop surveying here. If you have ever used Pure Coffee, please continue with question 2!

2. Where do you live and work?

   ☐In Danang City

   ☐Not living and working in Da Nang City

If you are living outside the city area. Da Nang, please stop surveying here. If you are living in the city area. Da Nang, please continue the survey with question 3!

3. Your age?

   ❒Under 18

   ❒FROM 18 TO UNDER 22 years old

   ❒FROM 22 TO UNDER 25 years old

   ❒FROM 25 TO UNDER 30 years old

   ❒OVER 30 years old

If you are under the age of 18 or over 30, please stop surveying here. If you are in the other age group, please start the survey below!

4. What is your income?

   ❒UNDER 1.5 million VND

   ❒FROM VND 1.5 million TO BELOW 3.0 million VND

   ❒FROM 3.0 million VND TO BELOW 5.0 million VND

   ❒OVER 5.0 million VND

5. Your occupation?

   ❒The student

   ❒Student

   ❒Officer

   ❒Worker

   ❒Other: ……

6. Pure coffee is a kind of coffee?

   ☐Has a light fragrance, not too rich

   ☐Coffee water is light brown, not black

   ☐Coffee water has very little viscosity

   ☐The taste of coffee is mildly bitter and has a slight acidity

   ☐Other: ……

7. How often do you drink coffee a week?

   ☐UNDER 3 times

   ☐FROM 3 TO 5 times

   ☐FROM 6 TO 8 times

   ☐OVER 8 times

8. Please rank from 1 => 6 your level of interest in the following factors when using Pure Coffee (Lowest - 1, ..., highest - 6)

	1	**2**	**3**	**4**	**5**	**6**
Personal (love coffee, want to use, ..)						
Promotion factors (advertising programs, attractive promotions, ..)						
Distribution density (wide, easy to find when needed, ..)						
Brand, product (pure product, guaranteed flavor, ..)						
Product price (expensive/affordable, affordable ...)						
Health factors (health benefits, harms when using coffee, ..)						

9. Where do you usually drink coffee?

   ❒The selling points of coffee on the sidewalk

   ❒Luxury cafes

   ❒Take-away coffee

   ❒Make your drink at home

   ❒Other: ……

10. When do you usually drink coffee during the day?

    ❒Morning

    ❒Noon

    ❒Night

    ❒At work

    ❒Anytime (feel free to go)

11. Who do you usually drink coffee with?

    ❒Friends, colleagues

    ❒Alone

    ❒Lover

    ❒Family, relatives

    ❒Other: ……

RATE YOUR CONSENT / LEARNING RATE FROM 1 TO 5, THE FOLLOWING FACTORS ABOUT THE USE OF RAW COFFEE

(1) Strongly disagree; (2) Disagree; (3) No comments; (4) Agree; (5) Strongly agree

		1	2	3	4	5
Product brands	Pure coffee has a clear origin					
	Pure coffee of a reputable business					
	Pure coffee is fully certified to ensure quality					
	Pure coffee with reasonable prices					
	Pure coffee with nice packaging					
	Pure coffee has a natural flavor and aroma					
Price	The price of high pure coffee					
	The price of pure coffee is high because of the standard and quality production process					
	I will still buy pure coffee even though the price is higher than regular coffee					
Individual	Demonstrate who is knowledgeable about coffee when using pure coffee					
	Coffee lover					
	Like the natural taste of pure coffee					
	I feel like the pure beauty of coffee					
Density distribution	I choose to buy pure coffee because it is sold in many places					
	I chose to buy pure coffee because it is easy to find when needed					
	I feel like using pure coffee at the local roasted coffee shop					
Promotion	Pure coffee is having more ads that make me more confident					
	There are attractive ads					
	There are many promotions					
	There are good articles in electronic newspapers and social networks					
Health awareness	Use pure coffee that contains lots of antioxidants and is good for my cardiovascular system					

	Using pure coffee helps me stimulate creativity					
	Using pure coffee makes me feel relaxed and lucid					
	Pure coffee ensures food safety and hygiene					
	Use pure coffee because it brings many health benefits					
The behavior of pure coffee consumption	I will use (or continue to use) coffee more often if I know it's pure coffee					
	I will use (or continue to use) pure coffee if it's easy to find when needed					
	I will use (or continue to use) pure coffee if there are attractive promotions					
	I will use (or continue to use) pure coffee even though the price is higher than regular coffee					
	I will use (or continue to use) pure coffee for its health benefits					
	I would recommend to friends/relatives/colleagues to use pure coffee					

Thank you for helping us with the above question, your comments will be a valuable document for us to carry out our research.

SINCERELY THANK!

Appendix 2. Testing the coefficient of CRONBACH'S ALPHA

Reliability Statistics

Cronbach's Alpha	N of Items
.787	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
TH1	17.22	14.305	.651	.724
TH2	17.31	14.556	.711	.711
TH3	17.19	14.588	.753	.703
TH4	16.69	15.572	.548	.752
TH5	16.77	17.673	.377	.788
TH6	16.75	17.667	.251	.826

Reliability Statistics

Cronbach's Alpha	N of Items
.712	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
G1	7.27	2.042	.622	.498
G2	7.37	2.602	.531	.624
G3	7.30	2.645	.451	.715

Reliability Statistics

Cronbach's Alpha	N of Items
.741	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CN1	10.93	6.356	.674	.595
CN2	10.33	7.749	.498	.701
CN3	10.21	6.969	.580	.654
CN4	10.68	7.675	.399	.759

Reliability Statistics

Cronbach's Alpha	N of Items
.726	3

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
PP1	7.89	2.037	.668	.484
PP2	7.85	2.457	.474	.726
PP3	7.88	2.453	.512	.681

Reliability Statistics

Cronbach's Alpha	N of Items
.859	4

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CT1	9.63	7.655	.680	.831
CT2	9.70	7.688	.765	.796
CT3	9.48	7.696	.763	.796
CT4	8.82	8.050	.618	.856

Reliability Statistics

Cronbach's Alpha	N of Items
.835	5

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
SK1	14.27	11.713	.605	.812
SK2	14.34	10.859	.786	.756
SK3	14.42	12.077	.685	.788
SK4	13.76	12.617	.601	.811
SK5	13.98	13.302	.511	.833

Reliability Statistics

Cronbach's Alpha	N of Items
.781	6

Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
HV1	17.83	6.971	.560	.741
HV2	17.85	7.380	.529	.748
HV3	18.11	8.110	.394	.779
HV4	17.84	7.882	.439	.769
HV5	17.79	6.932	.659	.714
HV6	17.43	7.262	.597	.731

Appendix 3. Project proposal

Student Name: Tran Quang Huy **Student Number**: GCD18457

Tutor: Phanh Thanh Tra **Date**: 26/6/2020

Unit 13: Computing research project

Propose title: COFFEE SUPPLY CHAIN MANAGEMENT SYSTEM - Tool and strategy to help businesses manage products and improve wellbeing of users

Section One: Title, objective, responsibilities
Research question: What are the issues affecting wellbeing of coffee consumers aged 18 to 30 in Danang City? **Objectives** - Explain the theory of consumer behavior. Learn about the overview of the whole coffee market in Vietnam in general and Da Nang City in particular. - Discover customers' needs and satisfaction, indicating the current situation in the coffee industry in Danang. - Analyze the effects of product quality, price, distribution, and trade promotion on coffee usage behavior in Danang city - From there, propose solutions to contribute to enterprises distributing pure coffee to influence coffee use behavior of consumers in Da Nang city. - The level of consumer satisfaction with coffee - Consumers' habit of buying and using coffee - The impact of shoddy coffee on consumers - Implementing smart contracts addressing the issue of storing critical data necessary at different stages of the supply chain and making it verifiable by all stakeholders in the supply chain. Tracking the progress of coffee beans after each stage in the blockchain.
Section Two: Reasons for choosing this research project
Vietnam is the 2nd largest country in the world in exporting coffee, in which it ranks first in exporting Robusta coffee. However, Vietnam mainly exports raw materials (95%), only 5% for domestic consumer products. So, is the domestic market enough coffee to consume? And a recent disturbing fact is that the situation of dirty coffee rampant in the market has lost the confidence of domestic consumers. Dirty coffee is a type of soybean coffee, burnt popcorn mixed with dozens of additives, chemical flavors to form a coffee powder. The toxic substances when roasted popcorn, soybeans not only do not help

alert and focus but more seriously cause adverse effects on consumers' health. Increasing living standards, consumers are more concerned about health issues and quality of food hygiene and safety, especially for young people. According to statistics, each year Vietnam has about 250-500 cases of food poisoning, the main cause of poisoning is due to food contaminated with microorganisms (33-49%), food contaminated with chemicals (11-27%) and some other causes, more serious are the number of cancer patients in Vietnam ranked among the highest in the world. This shows that food hygiene and safety are at an alarming level and the demand for clean food and drinks is becoming urgent and necessary.

Section Three: Literature sources searched

The initial sources which could help me to answer those questions:

1. https://www.questionpro.com/
2. Research paper of 2 authors Nguyen Van Thuan and Vo Thanh Danh in 2011
3. Research paper of 2 authors Le Thi Thu Trang and Tran Nguyen Toan Trung, 2014

   - Factors affecting the decision to choose formula for babies under 6 months old in Can Tho city

Section Four: Activities and timescales

- Milestone one: Initiating - Complete the project charter on June 1, 2020
- Milestone two: Planning - Complete the sequence of jobs, assigning tasks, appropriate resource, evaluating, assessing risk and funding on June 10, 2020
- Milestone three: Executing:
    - Research and survey: Complete on July 14, 2020
    - Design: Complete all the design of the project on July 18, 2020
    - API: Complete API on July 30, 2020
    - BlockChain: Complete smart contract on August 4, 2020
    - UX/UI: Complete UX/UI on August 9, 2020
    - Testing: Complete testing on August 11, 2020
- Milestone four: Delivery and maintenance - August 17, 2020

Section Five: Research approach and methodologies

- Research process: sequential
- Research classes: quantitative and qualitative
- Research methods: case study, survey, interview

Comments and agreement from tutor
[This part not for student] Comments (optional): I confirm that the project is not work which has been or will be submitted for another qualification and is appropriate. Agreed: ..... (Name) ..... (Date) .....
Comments and agreement from project proposal checker (if applicable)
[This part not for student] Comments (optional): Agreed: ..... (Name) ..... (Date) .....

Appendix 4. Ethics form

Section One: Basic details

Project title: COFFEE SUPPLY CHAIN MANAGEMENT SYSTEM - Tool and strategy to help businesses manage products and improve wellbeing of users

Student name: Tran Quang Huy

Student number: GCD18457

Major: Computing.

School: University of Greenwich (Viet Nam) - Da Nang campus

Intended research start date: 01-06-2020

Intended research end date: 26-06-2020

Section Two: Project summary

Please select all research methods that you plan to use as part of your project:

• Interviews ☒

• Questionnaires ☒

• Observations ☒

• Use of personal records ☒

• Data analysis ☒

• Action research ☒

• Focus groups ☒

• Other (please specify):

Section Three: Participants

Please answer the following questions, giving full details where necessary.

Will your research involve human participants?

Yes: ☒ No: ☐

Who are the participants?

Young people aged 18-30

How will participants be recruited (identified and approached)?

Survey online on Social networks and direct survey

Describe the processes you will use to inform participants about what you are doing:

How will you obtain consent from participants? Will this be written? How will it be made clear to participants that they may withdraw consent to participate at any time?

Studies involving questionnaires:

Will participants be given the option of omitting questions they do not wish to answer?

Yes: ☒ No: ☐

Studies involving observation:

Confirm whether participants will be asked for their informed consent to be observed.

Yes: ☒ No: ☐

Will you debrief participants at the end of their participation?

Yes: ☒ No: ☐

Will participants be given information about the findings of your study?

Yes: ☐ No: ☒

Section Four: Data storage and security

Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998):

Yes: ☒ No: ☐

Who will have access to the data and personal information?

Project team

During the research:

Where will the data be stored? My personal computer, Google Drive. Will mobile devices (such as USB storage and laptops) be used?

Yes: ☒ No: ☐

If yes, please provide further details: They will be used to store research materials including images, e-books, papers.

After the research:

Where will the data be stored?

On Google Drive, My personal computer, my removable hard drive

How long will the data and records be kept for and in what format?

Five years

Will data be kept for use by other researchers?

Yes: ☒ No: ☐

Section Five: Ethical issues

Are there any particular features of your proposed work which may raise ethical concerns? If so, please outline how you will deal with these:

It is important that you demonstrate your awareness of potential risks that may arise as a result of your research. Please consider/address all issues that may apply. Ethical concerns may include:

Data storage and security, both during and after the research (including transfer, sharing, encryption, protection).

Section Six: Declaration

I **have read, understood and will abide by the university's Research Ethics Policy:**

Yes: ☒ No: ☐

I have discussed the ethical issues relating to my research with my Unit Tutor:

Yes: ☒ No: ☐

I confirm that to the best of my knowledge:

The above information is correct and that this is a full description of the ethics issues that may arise in the course of my research.

Name: Tran Quang Huy

Date: June 26, 2020