

## INFORMATION SYSTEMS DEVELOPMENT AND TECHNOLOGY PLAN FOR TEA BARREL (PANABO BRANCH)

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### ABSTRACT

The food and beverage industry are not easy to invest in. When it comes to safeguarding the safety of people, the process of the company and all the possible outcomes are heavy load to think of. It is impossible to escape the difficulties and problems that any owner might have in a company, particularly pioneering entrepreneurs. Nonetheless, one of the best ways to find a solution is to propose viable coping mechanisms for those difficulties and problems that could make a significant contribution to the expansion and development of both its profits and the company. Most of the issues that organizations confront are related to the inventory management systems, resulting in various unfavorable conditions, including a scarcity of products. As a result, the researchers proposed a solution that consists of a system as well as the necessary platforms to solve the problems and ensure the business's fruitful and prosperous future.

**Key words:** Business, Business Process, Information System Platforms, Inventory Management System, IT infrastructure.

### 1. INTRODUCTION

#### 1.1 Background of the Company

The Tea Barrel Café Panabo opened its doors on September 24, 2020, and has since become known as one of the most delectable and affordable coffee shops in the City of Panabo, precisely located at Quezon St., just

below the famous Net Central, a computer café, and in front of Centromere, an accessories store. A lot of people come to this coffee shop due to the wide variety of premium drinks such as milk teas, frappes, espressos, and the like. The servings are made from freshly brewed tea leaves and imported ingredients from Taiwan, which provides the clients with a naturally addictive drinking experience. Aside from this, the café also offers combo rice plates and side dishes such as burgers, lasagna, French fries, and many more. Currently, the store accepts orders through dine-in, take-out, and delivery services through Food Panda. Moreover, the company was founded and run by Princess Gayle Renojo, which also has its first and second branches in the neighboring city, wherein Tagum. Region XI currently has five branches, which are in the municipalities of Nabunturan and Sto. Tomas, as well as the cities of Panabo and Tagum. The neighboring city, Tagum City. There are currently five branches across region XI which are located at Municipalities of Nabunturan and Sto. Tomas, and cities of Panabo and Tagum as mentioned.

## 1.2 Current Routines and Business Process

### 1.2.1 Current Routines

The café has its own daily routine, ensuring that Tea Barrel Café (Panabo Branch) can provide a very well-relaxing place and smooth service by cleaning the establishment before it opens for business. Secondly, performing daily record checks for sales monitoring purposes. Then, conducting a weekly inventory, which includes checking all the consumed ingredients to be restocked as well as machinery inspection.

### Event Tables of Tea Barrel Café (Panabo Branch)

Table 1. Event Table for Tea Barrel Café Store Hours

Start Time	End Time	Task	Duration
8:00AM	10:00AM	DTR log in, Preparing and checking of stocks, Cleaning Store opening, Working time	2 hours
10:00AM	11:00PM	Lunch Break for the shift.	1 hour
11:00AM	12:00PM	Cleaning, Working	
		Break time for the shift.	1 hour
12:00PM	3:00PM	Working time resumes	3 hours
3:00PM	3:30PM	Dinner time for the shift.	30 minutes
3:30PM	6:00PM	Working time resumes, DTR log-out, Store closing time.	2 hours & 30 minutes
6:00PM	6:30PM		30 minutes
6:30PM	8:00PM		1 hour & 30 minutes
Total number of durations:			12 hours

Table 1 shows the store's working hours of Tea Barrel Café (Panabo Branch). It consists of DTR logging in and out, cleaning, working, and taking breaks in between shifts throughout the twelve hours of business time.

### 1.2.2 Business Process

The Tea Barrel Café in Panabo City has its official business hours from ten in the morning to nine in the evening. The company focuses on inventory monitoring and receiving delivery products from its warehouse. Before commencing operations, the employee inspected the café's neatness and cleanliness. When a customer arrives at the café, the order will be placed as can choose whatever is sought out from the available menu, and then spots to be occupied can be selected right after. In the establishment, fair treatment is highly observed, in accordance with the golden rule of "first come, first serve.", in accordance with the golden rule of "first come, first serve."

### 1.3 Existing Technologies

The Tea Barrel Café in Panabo City is equipped with an Electronic Cash Register (ECR) System to manage the actual business transactions, specifically sales. It registers the product-to-be-sold into the computer's inventory-based yield calculations. In addition, equipment such as blenders is frequently used for making milk teas, flavored drinks, and more. It allows ingredients like fruits to be mixed into the beverages and produces a mushy drink consistency.

### 1.4 Problems Found

- **Inventory.**Based on the interview of the researchers with the store supervisor, the problem that is surfacing in the company is the manual inventory process, which has been time-consuming and inconvenient for everyone. If the store stocks are not adequately monitored, it may affect the service quality due to insufficient ingredients, leading to product availability.

### 1.5. Goals and Objectives

#### 1.5.1 General Objectives

The researchers are expected to propose an information system that will help the company improve its inventory management and handling processes, which also contributes as a great coping mechanism in enhancing and expanding the company.

#### 1.5.2 Specific Objectives

The specific objectives that are aligned to the general objectives are:

- To propose a system that manages all necessary transactions and assists with stock procedures.
- With the use of the Transaction Management System, tracking of stock losses can be easier since it can monitor inventory, and missing items outside inventory can be located sensely.
- The proposed system can aid in replenishing products stocks by actively monitoring in and out quantities of ingredients.

## 1.6 Organizational Structure

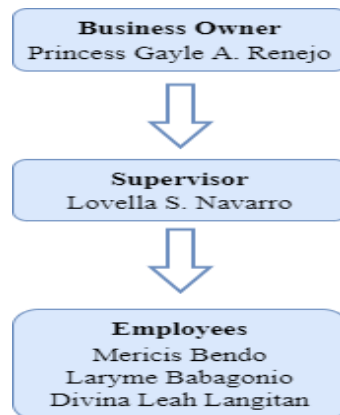


Figure 1: Tea Barrel Café (Panabo Branch)

Figure 1 shows the organizational structure of Tea Barrel Café (Panabo Branch). There are three main roles, which are the business owner, supervisor, and the employees who make the business function properly.

## 1.7 Stakeholders

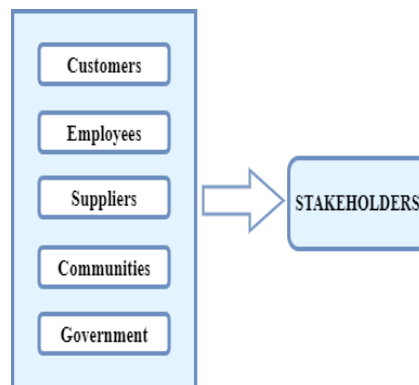


Figure 2: Stakeholders of Tea Barrel Café (Panabo Branch)

Figure 2 shows the people that affect the company: the customers, government, suppliers, landlords, and employees. To enhance and achieve business.

## 2. PROPOSED INFORMATION SYSTEMS

### 2.1 Review of the Related Study

#### 2.1.1 Related Literature

##### Sustainability Governance in the Coffee Sector

According to [1]—[5], sustainability governance methods are continuously evolving, and the coffee sector has been at the lead in implementing private and multi-stakeholder approaches to address sustainability, although recently, its innovation has also been spread in other sectors such as cocoa. Third-party certification standards have been used to address sustainability concerns in coffee, although internal standards and various supply chain interventions have emerged to form essential parts of the sustainability governance of the coffee sector [6], [7]. More current initiatives addressing sustainability strategies include direct trade, single origin, and value chain transparency, which have emerged as differentiation and sustainability strategies in the coffee sector among small roasters and are now spreading to other industries [1], [6]. Direct trade is the

commercialization of coffee from farmers to roasters without intermediaries, which can now bring benefits in higher prices for producers, increased connection to global markets, and improved agroecological production practices [8], [9].

### **Coffee Business Development Model Management**

Management is defined as the process of preparation, arranging, leadership, and control of the various sources of power within an organization to achieve its objectives effectively and efficiently. The management definition can be further described as follows:

1. Management is a process in which the overall management activities are designed into four functions and are done sustainably. It all boils down to the achievement of the objectives of the company.
2. Achievement of company goals is carried out through controlling, leadership, and organizing activities.
3. The objectives must be accomplished with effectiveness and efficiency. Effectively demonstrates the attainment of business objectives through a series of company-performed actions, whereas efficiency reflects the achievement of goals by best utilization of the source.
4. Achievement of the objectives is done by utilizing a source of executive power who owned the company [10].

### **Entrepreneurship**

Entrepreneurship is defined as the ability to create business activities. Kem Ampuan requires the creativity and innovation that constantly finds something different from what existed before. An entrepreneur must be creative and innovative in finding ideas [11]. Additionally, in Entrepreneurship: Tips and process Towards Success, entrepreneurship is defined as applying creativity and innovation in solving and looking for opportunities for the problem people face every day [12].

### **Business Planning**

According to [13], a business plan is a framework that describes every aspect of a business from the beginning to the end. It includes various events that must be anticipated if undesirable events occur so that a business plan is created concerning conditions that are deemed realistic or feasible.

### **Strategic Planning**

A business strategic planning proposal is a method a firm uses to make decisions regarding its future performance [14]. The planning strategy is the process of self-assessment, objective determination, strategy preparation, and porter monitoring. According to [15], emphasize that the most crucial aspect of a company's interpretation strategy is the different actions of its competitors business opportunities.

### **Marketing Planning**

According to [15], assert that the marketing notion is a philosophy "Organization objectives are contingent on the firm's capacity to meet reviews. Reviews those requirements and desires more thoroughly than the competition." The marketing mix consists of marketing instruments (product, price, paice, and promotion) that a corporation employs to fulfill its marketing objectives.

### **Operation Planning**

Management of operations is defined as a set of actions that transform numerous inputs into outputs in the production of products and services, according to [16]. Ten crucial operational planning decisions necessitate the analytical prowess of the organization, notably [15].

### **Planning a Source of Power Human**

It is necessary to anticipate the demand for labor and the availability of workers with specific qualifications in the market power of work to properly plan a power source [16]. The activity of human resource planning is to prepare the required quantity of workers following the job analysis that has been carried out, according to [11].

### **Financial Planning**

One measure of a company's overall performance is its financial performance. As a result, financial planning is an essential aspect of business planning. Calculating financial ratios against a company's budget is integral to making an attractive investment offer. Given that you are an investor, you can use these metrics to gauge if the company's health is deteriorating or if it has any potential for growth [17]. An investment strategy needs to be evaluated based on a set of criteria, including:

1. Present Net Value (NPV)
  - a. Used to calculate the time value of money of all cash flows. Cash flow can be in the form of expenses or income. Criteria for acceptance are achieved when the NPV is equal to zero or is positive, which means that the present value (PV) of the flow of cash entry is equal to or greater than the cash flow out.
2. Profitability Index (PI)
  - a. PI is the ratio between PV of cash inflows and PV of cash outflows. Criteria acceptance achieved PI equal to or more substantial than the mean PV flow of cash incoming similar to or larger than PV flow of cash out.
3. Payback Period
  - a. The payback period is a period that shows how long it takes for the invested capital to return. The more short-time required for the return of the investment cost, the more profitable the investment [15].

#### **2.1.2 Related System**

Transaction processing (TPS) are the basic business systems that serve the operational level of the organization. A transactions processing system is a computerized system that performs and records the daily routine transactions necessary for the conduct of the business. According to [18], the lowest level of the organizational hierarchy, we find the transaction processing systems that support the day-to-day activities of the business. Management Information Systems are a kind of a computer information systems that could collect and process information from different sources to institute decision-making at level of management. Management information systems provide information in the form of pre-specified reports and displays to support business decision-making. The next level in the organizational hierarchy is occupied by low-level managers and supervisors. This level contains computer systems that are intended to assist operational management in monitoring and controlling the transaction processing activities that occur at the clerical level. According to [19], management information systems (MIS) use the data collected by the TPS to provide supervisors with the necessary control reports. Knowledge management systems are knowledge-based information systems that support the creation, organization, and dissemination of business knowledge to employees and managers throughout a company. Knowledge management is the deployment of a comprehensive system that enhances the growth of an organization's knowledge. Strategic information systems apply information technology to a firm's products, services, or business processes to help it gain a strategic advantage over its competitors. These systems are an important special type of organizational information system used to secure or sustain competitive advantage in the market place.

## 2.2 Proposed Information Systems

### 2.2.1 Functionality

Transaction Management System offers:

- Every cost of the item, the range of supplies and the quantity of the products will be generated into a report.
- Stocked is monitored and documented in every transaction.
- Recorded numbers of sold-out beverages and remains as well as income of every week.
- Generates receipts for ordered products.
- Good communication with suppliers and clients.

### 2.2.2 System Architecture

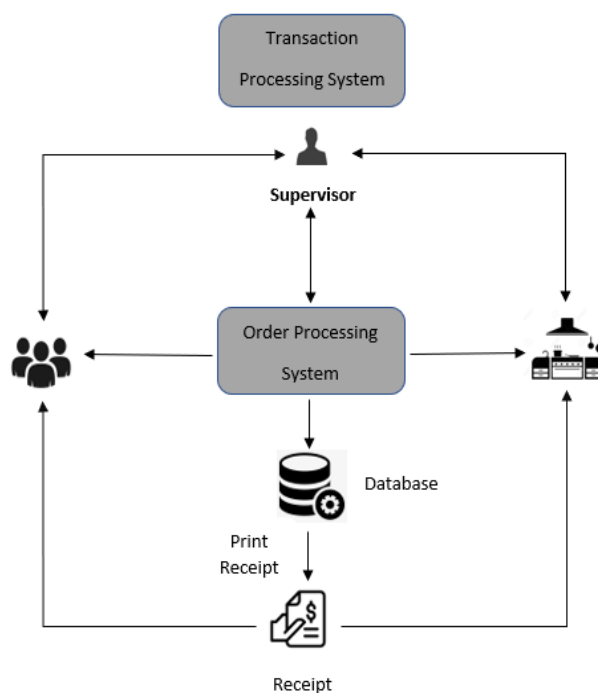


Figure 3: System Architecture for Tea Barrel Café (Panabo Branch)

Figure 3 shows the system architecture and the transaction management system of the customer receipts in tea barrel café.

### 2.2.3 Economic Feasibility

Table 2. Cost structure of Tea Barrel café

Cost Description	Cost
Operational Cost	Php 70,000
Maintenance Cost	Php 50,000
Development Cost	Php 100,000
Manpower Cost	Php 30,000
<b>Total</b>	<b>Php 250,000</b>

Table 2 shows the cost structure of the economic feasibility of Tea Barrelcafé.

### 3. PROPOSED IT INFRASTRUCTURE

#### 3.1 Proposed Computer Hardware

The computer hardware proposed by the researchers will aid the company in implementing the proposed information system.

##### Desktop Computer

A desktop computer is a device that is for tabletop usage, which is also known as a personal computer. It is designed to be kept in one place and for a single person to use only.

##### Tablet

A tablet is a handheld computing device that works like a desktop computer but can also be a laptop in the preference of the user. It is larger than a phone but is smaller than a laptop.

Table 3. Proposed Computer Hardware for Tea Barrel Café (Panabo Branch)

Computer Hardware	Specifications	Qty	Unit Cost
Desktop Computer	i7 CPU 2.9GHz to 4.2GHz, 8GB RAM, 240GB Hard Drive.  Keyboard, mouse, mouse pad, camera, Uninterruptible Power Supply (UPS), 22-inch display screen	1	Php 20,800
Tablet	Helio G90T at least 2GHz chipset, Mali-G76 GPU, 4GB RAM, 64GB storage.  Waterproof, 11-inch display, touchscreen 10-point multitouch, 10.17in x 0.29in x 6.41in, 500g. WLAN, Bluetooth, WWAN 4G LTE support, USB-C 2.0 with data transfer, OTG and power delivery 3.0, nano-SIM, and microSD support.	1	Php 13, 895
<b>Overall Computer/Tablet Hardware Costs:</b>			<b>Php 34, 695</b>

Table 3 shows to proposed Computer Hardware, specifications, unit cost and quantity for Tea Barrel Café.

#### 3.2 Proposed Operating System Platforms

The researchers will use an operating system and a platform that are compatible with the proposed system, which are Windows 10 and Apache NetBeans in its most recent versions.

##### Microsoft Windows 8.1

Windows 8.1 A1-32, 64-kernel hybrid platforms, have enhanced data management capabilities. It can accomplish more staff personnel duties and can manage flexibility of work within the department.

##### Cloudbeds

Cloudbeds are cloud-based platforms that collaborate with websites to connect the property business to hundreds of channels through real-time two-way integration.



Table 4. Proposed Operating System Platforms for Tea Barrel Café (Panabo Branch)

Computer Hardware	Specifications	Qty	Unit Cost
Microsoft Windows 10	AI-32, AI-64 kernel type hybrid [22]	1	₱ 3,616
Cloud-based Platforms	Cloud-based, SaaS, and Web platform[23]	1	₱ 3,500
<b>Overall Computer Hardware Costs:</b>			<b>₱ 7, 116</b>

Table 4 shows the specifications and cost of the proposed operating system platforms.

### 3.3 Proposed Enterprise Software Applications

The enterprise software applications assess the environment of the business' process. It is an excellent resource for the corporation for enhanced transaction processes and product documentation.

### 3.4 Proposed Data Management

The Enterprise Software Application and Data Management that the researchers propose is the same because only a few users will handle the data information to fill in the lack of process in relation customer preferences and basic information.

#### Microsoft 365

Microsoft 365 is the latest version of Microsoft Office series. Just like the older versions, it is a single installer of a package of applications that are necessary for studies, business and others.

Table 5. Proposed Enterprise Software Application and Data Management for Tea Barrel Café (Panabo Branch)

Data Management	Specifications	Qty	Unit Cost
Microsoft 365	Applications [22]: - Word - Excel - PowerPoint - OneDrive (at least 1TB) - Outlook  It can be used on desktops, laptops, tablets, and mobile phones. It is compatible with OS like Windows, macOS, and Android [22].	1	Php 4, 699 / year
<b>Overall Data Management Costs:</b>			<b>Php 4, 699</b>

Table 5 shows the specification and cost of the proposed application to be used as enterprise software application and for data management.

### 3.5 Proposed Network and Telecommunications

The researchers suggest implementing an internet with a landline connection for the company to utilize for the implementation of the management system.

#### 3.5.1 PLDT HOME Fibr and DSL

The provided proposal both PLDT HOME and DSL can offer a robust and reliable internet connection for the customers' transactions on the internet platforms. The DSL plans use copper wire technology with speed as high 15 Mbps. At the same time, our fibr plans use fiber optic technology and have a speed as high as 100 Mbps to 1 Gbps.

Table 6. Proposed Network and Telecommunications

Network and Telecom-munications	Specifications	Unit Cost	Qty	Total Cost
PLDT HOME	₱6,500 for the 15mbps plan [25]	₱6,500	12	₱78,000
<b>Overall Network and Telecommunication Cost (Monthly)</b>		₱78,000(Yearly)		

Table 6 presents the offers within the GFiber Unli Plan 2,099 and its cost upon enforcement.

### 3.6 Proposed Internet Platforms

The researchers propose platforms that will enable businesses to increase the profitability and sales by increasing the number of people that can reach via online media.

#### Data Management Platforms (DMP)

DMPs can collect and organize information and identify bespoke audiences for digital advertising.

#### Social Media Platform

Being present in an era of technology, social media platforms are used for electronic communication, which is not limited to messages and calls but also, to an extent, the ability to share multimedia files. Furthermore, social media platforms serve as a dome-like audience for viewing what is happening on stage, whether in a close race or at the end of the benches.

Table 7. Proposed Internet Platforms for Tea Barrel Café (Panabo Branch)

Internet Platforms	Specifications	Unit Cost	Qty
Data Management Platforms	Online advertising, ability to know trends and taste preferences of consumers.	Free	2
Social Media Platforms	Ables the company to promote its products to groups of target customers online thru Facebook and Instagram.	Free	2
<b>Total Proposed Internet Platforms Costs:</b>			<b>Php 0</b>

Table 7 shows the proposed internet platforms for Tea Barrel Café (Panabo Branch) and its corresponding costs.

### 3.7 Proposed IT Manpower

IT manpower will handle the software and hardware tools for the given problems inside the business. The problems are the expenses of the customer; lack of promotion process and advertisement; IT manpower will help provide its duty and knowledge to fix the given problems to the satisfaction of the customer; ecotourism.

Table 8. Proposed IT Manpower for Tea Barrel Café (Panabo Branch)

IT Manpower	Qty	Salary
IT Staff	1	₱17, 971
<b>Overall IT ManpowerCosts:</b>		<b>₱17, 971</b>

Table 8 presents the proposed IT manpower and its proposed salary for the tea barrel café.

## 4. CONCLUSION AND RECOMMENDATION

### 4.1 Conclusions

The Tea Barrel Café (Panabo Branch) is one of the leading businesses in the city. However, there are situations that threaten the business's consistency in thriving. The company uses a manual process of the ingredients and product inventory. Moreover, there are tendencies that clients will be disappointed due to unexpected unavailability of the chosen menu, which has caused involuntary image degradation. The proposed Transaction Management System is designed to aid in managing and monitoring stock availability to avoid insufficient production. With this goal in mind, it is a leverage for the company to maintain consistency not just in-service quality but also in the right production for good business profits.

### 4.2 Recommendations

System integration might be troubling as change is not that amazing most of the time, but with the help of the proposed information system, it will be of the company's advantage to take service and image branding to a higher level compared to those food and beverage stores which are in tight competition with them. As for the future researchers of the company, the system only focuses on the management of basic transactions, specifically in sales and inventory processes, extending the system for another gateway for the company to grow is highly encouraged.


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## APPENDINCES

### Letter of Approval

**DAVAO DEL NORTE STATE COLLEGE**  
Institute of Computing

May 4, 2022

**LOVELLA S. NAVARRO**  
Supervisor  
Tea Barrel Panabo  
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Ma'am/Sir:

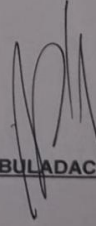
Warmest greetings! We are the first-year students of Davao del Norte State College (DNSC), currently pursuing Bachelor of Science in Information Systems this 2<sup>nd</sup> Semester of School Year 2021-2022. As part of our course subject requirement for **IS121 – Fundamentals of Information Systems**, we are asking your humble office to grant us permission on implementing an **Information Systems Development and Technology Plan** for your company.

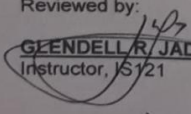
This is to know the current situation, especially the problems with the current traditional procedures, and propose an Information System that will ease the flow of your business. Part of our development will have an interview session, environmental scanning, business process analysis, on-site visit (can be virtual), and more.

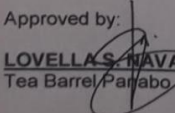
Your kindness and open participation will be very much appreciated. Thank you for taking the time in reading this letter of approval. This will really help us develop our skills in accordance with the standards of your company and our college. We wish nothing but success to your organization!

Sincerely yours,

Bravo, Joan A.  
Bucio, Reyna M.  
Embodo, Cris Dave A.  
Icalina, Jobert R.  
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**Photo Documentation**











### Curriculum Vitae

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<b>BIRTHDAY:</b>	Apr. 06, 2003
<b>BIRTHPLACE:</b>	Apokon, Tagum
<b>AGE:</b>	19
<b>NATIONALITY:</b>	Filipino
<b>RELIGION:</b>	Roman Catholic
<b>CIVIL STATUS:</b>	Single
<b>FATHER NAME:</b>	Reynaldo N. Bucio
<b>MOTHER NAME:</b>	Delia M. Bucio

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#### EDUCATIONAL BACKGROUND:

##### TERITARY:

BACHELOR OF SCIENCE IN INFORMATION SYSTEM

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##### SECONDARY:

PANABO CITY NATIONAL HIGH SCHOOL (JHS)

Gredu, Panabo City, Davao Del Norte

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##### ELEMENTARY:

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#### PERSONAL INFORMATION:

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<b>NATIONALITY:</b>	Filipino
<b>RELIGION:</b>	Roman Catholic
<b>CIVIL STATUS:</b>	Single
<b>FATHER NAME:</b>	Silveste Ulla Jr.
<b>MOTHER NAME:</b>	Arnita Bravo

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#### EDUCATIONAL BACKGROUND:

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##### TERITARY:

DAVAO DEL NORTE STATE COLLEGE  
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<b>AGE:</b>	19
<b>NATIONALITY:</b>	Filipino
<b>RELIGION:</b>	Foursquare
<b>CIVIL STATUS:</b>	Single
<b>FATHER NAME:</b>	Paterno G. Embodo
<b>MOTHER NAME:</b>	Mary E. Embodo

**EDUCATIONAL BACKGROUND:**

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**TERITARY:**

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<b>RELIGION:</b>	Roman Catholic
<b>CIVIL STATUS:</b>	Single
<b>FATHER NAME:</b>	Roberto L. Icalina
<b>MOTHER NAME:</b>	Rachel R. Icalina

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**EDUCATIONAL BACKGROUND:**

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<b>RELIGION:</b>	Roman Catholic
<b>CIVIL STATUS:</b>	Single
<b>FATHER NAME:</b>	Johnny S. Langamon
<b>MOTHER NAME:</b>	Analín L. Langamon

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**EDUCATIONAL BACKGROUND:**

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