

Information System Technology Plan for Penong's Barbecue Seafood and Grill in Panabo City, Davao Del Norte

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ABSTRACT

Penong's Barbeque Seafoods and Grill continues to be utilizing the use of manual processes of ordering and inventory tracking, which result in inefficiency, ineffectiveness of service delivery, and human errors. This research recommends the use of two major systems: a Self- Ordering Kiosk System and an Inventory Management System. The Self-Ordering Kiosk is intended to streamline customer transactions and make them faster and less stressful for front-line workers. At the same time, the Inventory Management System provides real-time tracking of inventories and supply chain decision optimization. All these systems interact to transform the restaurant's operations to its full potential, optimize customer satisfaction, and facilitate fact-based informed decision-making for growth in the future.

Keywords: Self-Ordering Kiosk System, Inventory Management System, Restaurant Automation, Real-Time Stock Tracking, IT Infrastructure, Customer Experience.

INTRODUCTION

Background of the Company

In 2009, Penongs decided to expand by creating a franchise corporation (PFC) due to its popularity and increased demand from customers. Now, it has more than 20 franchises in Visayas and Mindanao, with an estimated employees of 30, Including the Penong's franchise in National Highway, Brgy. New Pandan, Panabo City, Davao del Norte, beside Panabo Bus Terminal.

Penong's Barbecue Seafood & Grills has made a remarkable and most visited restaurant in Davao City, for it is best known for its classic Filipino dishes, grills, and seafood. The company opened its first store on December 5, 2003, along Illustre St., Davao City. Chad Robert Boniface Regis, the CEO of Penong's, has been continuously developing the skills and business he got from his grandfather. It was motivated by the dream of having a simple, Filipino-made dishes restaurant where families can bond with each other by enjoying the food and having delightful experiences. The company's first dishes were chicken bbq, chicken inasal, and grilled seafood, and now thriving have introduced a wide variety of dishes, allowing customers to eat and savor authentic Filipino dishes like butter chicken, kale, and lastly utan (vegetable soup).

Current Routines and Business Processes

Current Routines

The day-to-day activities of Penongs make it possible to easily recognize the application of the "broken time" schedule. This is visible in cleaning up during the early morning, where the push brush is applied before business hours. Next, the first shift crew comes in to handle the first wave of customers and related activities. Finally, the closing crew comes in later during the day to wrap up activities and lock up the premises. This specific shift pattern offers the rationale for the reasons for the application of some of the roles and activities at

specific times during the working day.

Table 1. Event Tables of shows the daily events and tasks performed by the employees of Penong's Barbeque Seafood and Grill in Panabo City.

Start time	End Time	Task	Duration
8:00	12:00	Push Bush	3 hours 30 min
9:30	1:30	First Shift	4 hours
10:30	10:50	Morning Talk	15-20 mins
10:30	3:30	Closer	6 hours
12:30	3:30	Push Brudh Break	3 hours
1:30	4:00	First Shift Break	4 hours 30 mins
3:30	6:00	Closer Out	2 hours 30 mins
4:00	9:00	First Shift Resume	5 hours
6:00	10:00	Closer Resume	4 hours

Business Process

Penong's Barbeque Seafood & Grill is a popular Filipino restaurant that offers high-quality services, a positive environment, and a dedication to authentic food. The manager oversees crews that must have pleasant personalities and enable them to handle the customers' complaints politely with a smile. For this business to run smoothly, it utilizes SLD (Supply and Logistics Delivery), an ordering process that shall be estimated by the managers in buying ingredients within a month to keep stocks from running out to provide quality service. The kitchen staff ensures they maintain Filipino-style dishes. In the ordering process from the customers, it is usually served by the waiter or waitress at the table, and the orders are taken manually (pen and paper). Unless the customer wants to take out the food, it is necessary to line up at the cashier. In paying the bills, the customer either pays the cashier directly or calls the crew, gets the receipt, gives the money to the crew, and lets the crew pay it to the cashier.

Existing Technologies

- Computer of the Manager
- CCTV's
- Fire Alarm Control Panel
- Biometric
- Body Clock
- Automatic Server

Problem Found

- **Manual Checking.** The company does not have an existing machine or system that can count their products, as they count and list them on paper.
- **Manual Order-taking:** Within our observation, orders are taken manually from the customers, which sometimes leads to slower services, possible chances of mistakes, and reduced efficiency.

Goal and Objectives General Objective

The researchers aim to:

The researchers are expected to implement Self-Ordering Kiosk Machine and Inventory Management System to increase order accuracy, streamline operations, improve financial management, and tracks stock levels.

Specific Objectives

The specific objective of this study is to enhance the business process and routines of the store. The researcher aims to

- To generate accurate purchase and delivery reports that assist in forecasting demand and scheduling timely restocking from suppliers.
- To enhance accuracy and improvise the menu through order trends (Self-Order Kiosk) helps minimize challenges by reducing reliance on order- takers during peak hours.
- To evaluate the integration of the inventory management system with sales data to forecast demand and streamline supply chain operations.
- To centralize inventory data across multiple branches for better monitoring and unified control of stock movement.

Organizational Structure

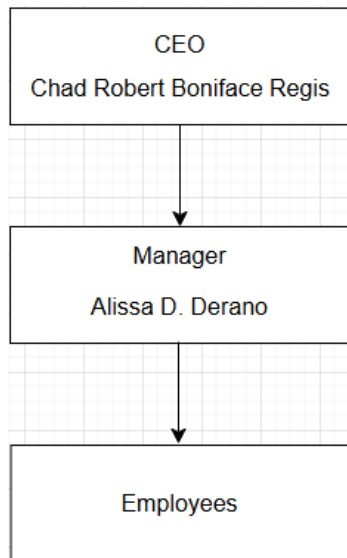


Figure 1: Organizational Structure of Penong's Barbeque Seafood & Grill in Panabo City.

Figure 1 shows the organizational structure of Penong's Barbeque Seafood & Grill. The CEO of the company is the one who cooperates with the operations managers across different branches. The manager arrives early to open the store and conduct an inspection. At the same time, the employees work efficiently to serve food and drinks to the customers.

Stakeholders

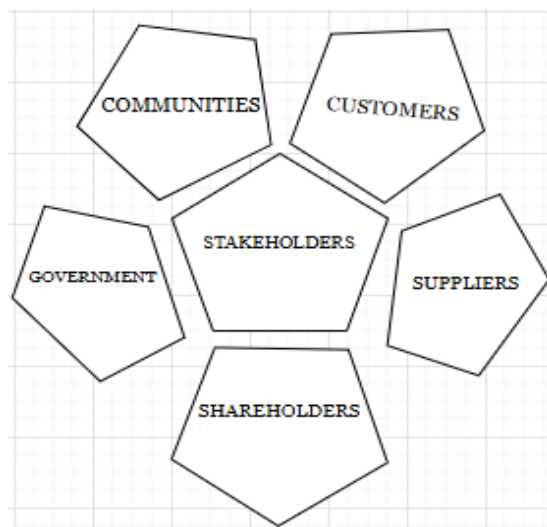


Figure 2: Stakeholders of Penong's Barbeque Seafood & Grills Stakeholders.

Figure 2 shows the people that affect the company's business performance: the communities, customers, government, shareholders, and suppliers.

Proposed Information Systems

The researcher's proposed The Researchers propose both a Self-Ordering Kiosk System and a Management System that will seek to streamline existing manual business procedures and produce necessary real-time data for performance assessment. The Self-Ordering Kiosk System eliminates order taking, making the customer experience better and improving efficiency. At the same time, the Inventory Management System streamlines the tracking of stock, delivering critical data to determine business performance at any given time.

Name of Information System

Self-ordering Kiosk Systems are unmanned payment systems that allow customers to order food directly or participate in service processes rather than experience face-to-face service with employees. Since kiosks in a restaurant not only build an innovative technology infrastructure but also provide new value for customers, they are expected to become a universal and routinized service for customers [1].

Inventory Management System is a critical function within any organization that deals with physical goods, whether in manufacturing, retail, or distribution. The goal of inventory management is to ensure that the right quantity of products is available at the right time, minimizing both excess inventory and stockouts. Reducing expenses, improving customer satisfaction, and preserving operational efficiency all depend on effective inventory management [2].

RELATED LITERATURE

Self-checkout kiosks have become an important part of the modern food service environment. These changes opened new opportunities for customers to learn new ways of interacting with businesses. These kiosks allowed customers to order on their own, pay online via QR codes, and pack their items independently and quickly without the need for human interaction. This type of service became popular as it helped users and businesses, especially during the pre-pandemic era, because they could order peacefully without needing human interaction. Self-checkout kiosks gained popularity in multiple retail shops and food service environments. Using the self-checkout kiosks, individuals were now free to order on their own, and they could even pay without interacting with workers, offering a more efficient experience for consumers. Approximately 73% of customers, a particularly meaningful majority, clearly preferred using self-service technologies such as self-checkout systems over customary methods in retail settings. These statistics highlighted a trend that was growing toward the use of self-service technologies across multiple demographics. Several factors drove this trend, including convenience, speed, and personalization [3]. Kiosks have been a common feature in certain segments of the hospitality industry (e.g. airline self-service check-in kiosks and airport information kiosks). Restaurants and hotel businesses have also adopted this technology to efficiently and effectively serve their patrons or guests. Restaurants use self-service kiosks (SSKs) for customers to place, customize, and pay for their food and drink orders while hotels utilize this technology device to provide hotel and area information and self-check-in/out services [4]. Meanwhile, In restaurant operations, inventory management helps restaurants be free from stockouts, overstocking, and unnecessary wastage since they all lead to reduced profits and sometimes loss of customer base. Besides, the products are always in stock, which is critical since food quality and safety are important working principles that help achieve customer confidence and loyalty [5]. Moreover, it is also important to have such an intelligent inventory management system for restaurants that is capable of carefully monitoring the quality and concern for safety in determining the expiration date to help prevent food-borne sickness. Also, it reduces food waste by maximizing storage, which lowers operational expenses and environmental damage[6]. The less raw materials available, the greater the possibility of a stockout. As a result, the greater the loss of profit opportunities. Therefore, the inventory needs to be regulated in such a way that the risk of loss that can be experienced by the company can be minimized. One way to control inventory to minimize the costs incurred is to set the optimal number of orders and carry continuous control with the production department by considering waiting times [7]. In a real-time inventory management system for stocks, there has been demand from companies, stores, laboratories, and restaurants. Aside from reducing the amount of heavy work for employees and the required money for just manually using tracking and counting stock products, this also serves for safety, for any possible risks like theft that could lead to loss of income for an owner [8].By focusing on the enhancement of various sizes and business industries, the

system shall provide an accessible and user-friendly solution by utilizing HTML, CSS, and Javascript that smoothly run inventory control[9]. Thus, the world must take advantage of the effectiveness and efficiency of the inventory management system in formal record keeping, for as a company grows, challenges also arise, and different items and products are necessary to be maintained by most of the managers in any business firm[10].

System Functionality

Self-Ordering Kiosk System

- Intuitive Touchscreen Interface
- Customizable Menus
- Secure Payment Options
- Real-Time Menu Updates
- Multilingual Support Inventory Management System
- Real-Time Inventory Tracking
- Quality Management
- Automated Data Entry
- Optimized Stock Levels
- Preventing Stockouts and Overstocking

System Architecture

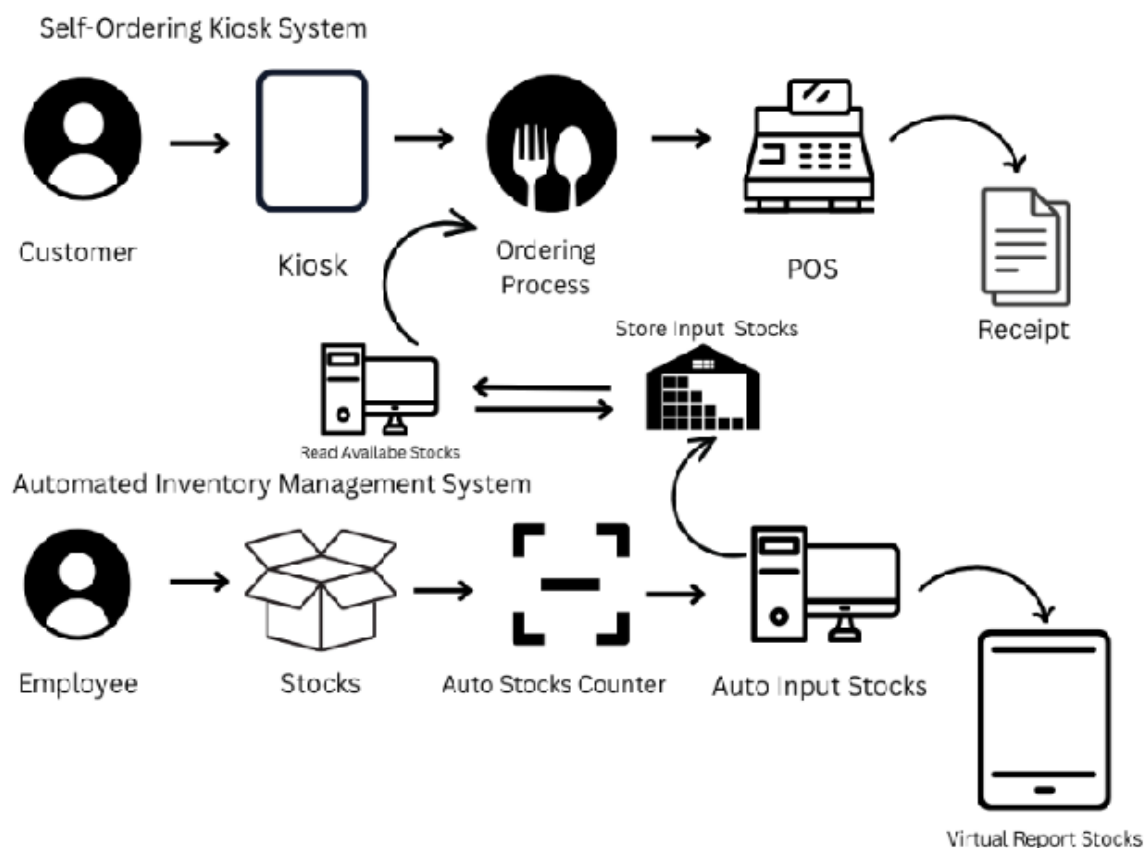


Figure 3. System Architecture of of Penong's Barbeque Seafood & Grill in Panabo City.

Self-Ordering Kiosk System: The table shows that the customer enters data through the kiosk. The data is routed through the system in order to build an order and complete the transaction through the POS. The result is a customer receipt and a posting within the POS system.

Automated Inventory Management System: Employee activity and scanned data are entered here in this scenario. The system calculates the data to maintain current stock records. Outputs comprise updated stock records and reports that can be utilized for making purchasing decisions.

Cost Structure

Table 2. Cost Structure

Cost Description	Cost
Operational Cost	₱ 50,000.00
Maintenance Cost	₱ 21,500.00
Total Cost:	₱ 75,000.00

Table 2 shows the overall cost of the restaurant if they apply the proposed system.

Proposed It Infrastructure and Peopleware

The researchers proposed this computer hardware for the store, which helps save and secure documents. In addition, these types of equipment can aid in the improvement of restaurant transactions, sales, inventory recording, tracking, and storing essential records.

Proposed Computer Hardware

The hardware infrastructure is integrated with fast-growing technologies to make business operations function smoothly. A business is considered operationally robust with adequate hardware.

Table 3. Computer Hardware

Computer Hardware	Specification	Unit Cost	Quantity	Total Cost
Self- Ordering Kiosk Machine	Diagonal Size 23. Panel Type ADS Resolution 1,920 x 1,080	₱42,676.84	1	₱ 85, 353.68
	Pixel Pitch (HxV, mm) 0.2745 x 0.2745 mm			
	Brightness (Typical) 250 cd/m ² (Typ, w/o glass)			
	Contrast Ratio 1000:1 (without glass)			
CPU Computer	Core i5-10400 DDR4 8GB Ram 2666 MHz	₱ 17, 676.84	1	₱ 34, 320
	Windows 11 IoT Enterprise 64- bit			
	Asus H410m 10th Gen Motherboard LGA 1200			
	Lenovo L24i-4A 23.8" Monitor			
Connectiv ity	And Mouse Set Desktop Computer Keyboard, Style: With Mouse	₱ 9,291	1	₱ 9291
	Tp-link Switch 16 Ports TL- SG1016DE			
	CAT5e UTP LAN Cable 100 Meters CAT5 Ad-Link 100M CAT6 UTP Cable Pure Copper Blue			
Overall Cost: ₱ PHP 128,964.68				

Proposed Operating System Platforms

The researcher will use an operating system that is compatible with the proposed system, which is Windows 11 in the latest version.

Windows 11 Pro, Microsoft's latest operating system (OS), claims to offer enhanced security features designed to tackle such threats. Carried file types cover various scripts, text documents, Word and Excel files, and PNG and JPEG images. The researcher will use an operating system that is compatible with the proposed system, which is Windows 11 in its latest version.

Table 4. Operating System Operation for Penong's Barbeque Seafoods and Grill in Panabo City.

OS Platform	Specification	Unit Cost	Quantity	Total Cost
Microsoft Windows 11	RAM- 4 Hard Disk Storage Device	₱1,445.00	1	₱ 1,455.00
	Graphic card- compatible			
	WWDM 2.0			
	Drive			
	Display- High			
	Quality at least			
	(720)			
Overall Cost: ₱ 1,455.00				

Proposed Enterprise Software Applications

The researcher proposed the point of sale using for a real-time inventory management system to reduce time consumption in maximizing stocks. An all-in-one cloud POS platform that helps companies speed up their online tracking operations

Table 5. Enterprise Software Applications for Penong's Barbeque Seafoods and Grill in Panabo City.

Enterprise Software	Specification	Unit Cost	Quantity	Total Cost
Point of Sales	Microsoft Windows Microsoft SQL Server and Oracle Database Supports TCP/IP networking protocol for communication with other applications.	₱ Free	1	₱ 0
Overall Cost: ₱ 0				

Proposed Network & Telecommunications

A Local Area Network (LAN) is a preferred network type for restaurants due to its fast speeds, secure data sharing, and ability to connect various devices within the restaurant's limited area. LANs also allow for easy management and control, which is crucial for managing data and resources like printers and applications.

Table 6. Data Management

Proposed Data Management	Specification	Unit Cost	Quantity	Total Cost
Simphony Microsoft Windows	Microsoft SQL Server Free 1 Php 0 and Oracle Database	₱ Free	1	₱0
Overall Cost: ₱ 0				

Table 7. Network & Telecommunications for Penong's Barbeque Seafoods and Grill in Panabo City.

Proposed Network & Telecommunications	Specification	Unit Cost	Quantity	Total Cost
LAN TP-Link TD-W8961N	300Mbps Wi-Fi NADSL2+ modem router production. 2 Antennas, 4x fast Ethernet LAN ports, and 1x RJ11 port roductnation 300Mbps at 2.4 GHz, ADSL 24/3.3 Mbps speed production Annex A, IPTV production	₱ 1,489.00	1	₱ 1,489.00
Overall Cost: ₱ 1,489.00				

Proposed Data Management

It provides the structure for information to be easily shared with others and organizes the firm's data.

Proposed Network & Telecommunications

Proposed Internet Platforms

To support the proposed systems and enable online connectivity for both internal operations and customer-facing services, the researchers recommend the following internet platforms.

Table 8: Proposed Internet Platform for Penong's Barbeque Seafoods and Grill in Panabo City.

Table 8. Internet Platform

Proposed Internet Platforms	Specification	Unit Cost	Quantity	Total Cost
E-Commerce Add-on	Enables online food ordering, digital menu access, and advance booking of seats or takeouts.	₱ Free	1	₱0
Overall Cost: ₱ 0				

Proposed IT Manpower

To ensure smooth deployment, monitoring, and maintenance of the proposed information systems, the following IT manpower roles are suggested.

Table 9. IT Manpower for Penong's Barbeque Seafoods and Grill in Panabo City.

Proposed IT Manpower	Specification	Proposed Salary
System Administrator	Responsible for managing the System configurations, backups, and server maintenance	₱ 20,000.00/month
Overall Cost: ₱ 20,000.00/month		

Prototype



Figure 4: Prototype for Penong's Barbeque Seafoods and Grill in Panabo City.

Self-Ordering Kiosk Interface

The first module simulates a touch-based ordering system designed to streamline the ordering process for customers.

CONCLUSION AND RECOMMENDATION

Conclusions

This research indicates that Penong's Barbeque Seafoods and Grill must upgrade its existing manual

operations. Taking orders and inventory manually creates hold-ups and errors. By implementing a Self-Ordering Kiosk System and an Inventory Management System, the restaurant will be able to process customers more quickly, monitor stock better, and operate smoother in general. The systems are simple to operate, efficient, and will assist the business in expanding and enhancing the service.

Recommendations

The research has demonstrated that enhancing the business process and increasing productivity involves procuring IT infrastructure and Information systems. Below are the researcher's recommendations for Penong's Barbeque Seafoods and Grill.

The researchers suggest that Penong's should:

- Use the **Self-Ordering Kiosk System** to make ordering faster and reduce errors.
- Start the **Inventory Management System** to monitor stock in real-time and avoid running out of supplies.
- Hire basic **IT support staff** to manage the system and help employees use it properly.
- Set up a reliable **internet connection** to keep systems working and updated.
- Train employees and test the systems before fully using them in daily operations.

With these steps, Penong's can improve its services and become more efficient and modern.

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APPENDIX



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STUDENT

CONTACT

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EDUCATION

ELEMENTARY

A.L Navarro Central Elementary
School

- Grade 1-6

HIGH SCHOOL

A.L Navarro National High School

- Grade 7-10

Gabriel Taborin College of Davao
Foundation Inc

- Grade 11-12

COLLEGE

- DNSC 1st year

SKILLS

- Good Communication Skills
- Music
- Drawing
- Adaptability

PROFILE

Dedicated and driven undergraduate student at Davao Del Norte State College presently working toward a Bachelor of Science in Information Systems. eager to apply academic knowledge to practical projects that address real-world issues. Proficient at organizing and solving problems, with a passion for coding and software development, well-known for having strong communication skills, searching for future career growth prospects.

WORK EXPERIENCE

ENCODER

2024 - PRESENT

JANITOR

2021

On the Job Training

Encoder & City Hall Assistant

2023



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EDUCATION

ELEMENTARY
SAN FRANCISCO ELEMENTARY SCHOOL
• KINDER - GRADE 6

HIGH SCHOOL
PANABO CITY NATIONHAL HIGH SCHOOL
• GRADE 7 - GRADE 10
DAVAO DOCTORS COLLEGE, INC.
• GRADE 11 - GRADE 12

COLLEGE
DAVAL DEL NORTE STATE COLLEGE
• 1ST YEAR

SKILLS

- Vocal Performance
- Adaptability

PROFILE

Motivated and diligent undergraduate student currently pursuing a Bachelor of Science in Information Systems at Davao Del Norte State College. Eager to apply academic knowledge to real-world challenges through hands-on projects. Strong organizational and problem-solving skills, with a interest in software development and coding. Known for being effective communicator. Seeking opportunities to grow professionally in the future.

WORK EXPERIENCE

ENCODER

2024 - PRESENT

FIREFIGHTER MEMBER

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EDUCATION

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HIGH SCHOOL

PANABO CITY NATIONAL HIGH SCHOOL

- Grade 7-10
- Grade 11-12 (SHS)

COLLEGE

Davao Del Norte State College

- 1st Year (Current)

SKILLS

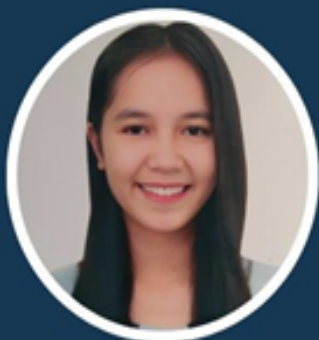
- Teamwork
- Time Management
- Effective Communication

PROFILE

As a committed undergraduate student pursuing a Bachelor of Science in Information Systems at Davao del Norte State College, I am deeply passionate about the intersection of technology and any businesses. I actively seek opportunities to expand my knowledge, develop practical skills, and stay updated with emerging trends in the digital world, and discover new things about technology and other businesses matter.

WORK EXPERIENCE

ENCODER	2024-PRESENT
SURVEYER	2024
HOUSEMAID	2021
CASHIER	2020



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EDUCATION

ELEMENTARY
SAN ROQUE ELEMENTARY
SCHOOL
• Grade 1-6

HIGH SCHOOL
NEW CORELLA DAVAO DEL
NORTE
• Grade 7-10
• SHS/HUMSS

COLLEGE

Davao Del Norte State College
• 1st Year(Current)

SKILLS

- Good Communication Skills
- Adaptability
- Active listening
- Teamwork

DANA QUEEN B. SEMINI

STUDENT

PROFILE

A dedicated and highly motivated student currently pursuing a Bachelor of Science in Information Systems at Davao Del Norte State College. I am passionate about learning new things, especially in the fields of technology and the business industry. Eager to enhance my capabilities and contribute improvement to these evolving industries.

WORK EXPERIENCE

Literatue Evangelist

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MEDICAL MISSION

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