

# Information Systems Development Plan for Dojo Upholstery

John Cristopher D. Eliguen<sup>1</sup>, Efraim B. Maniwang<sup>2</sup>, Marianne N. Dojo<sup>3</sup>, Ricah Bea L. Leron<sup>4</sup>, Glendell R. Jadraque<sup>5</sup>

<sup>1,2,3,4</sup>Student, Bachelor of Science in Information Technology, Davao del Norte State College

<sup>5</sup>Faculty, Davao del Norte State College

<sup>1</sup>eliguen.johnchristopher@dnc.edu.ph, <sup>2</sup>maniwang.efraim@dnc.edu.ph, <sup>3</sup>dojo.marianne@dnc.edu.ph, <sup>4</sup>leron.ricabea@dnc.edu.ph, <sup>5</sup>glendell.jadraque@dnc.edu.ph

## ABSTRACT

The purpose of this research is to explain the Information Systems Development Plan for Dojo Upholstery. This paper will discuss the company's background, and through interviews with the owner and employees, the researchers used the data gathered to propose an Information System. A Transaction Processing System (TPS) is an information system that collects, stores, retrieves, and modifies the data transactions of an enterprise. It is commonly embedded in many businesses as it improves business processes and routines. Today, numerous enterprises sell products and services through Web enterprise applications that play a big part. Web applications are application software on a web server that clients can visit. Commonly used to access web applications are web browsers where the customer's data entered is stored in the business database, which can be accessed anytime, providing ease to both customer and the company.

**Keywords:** business problems, business processes, IT infrastructure, Transaction Processing System, web applications.

## 1. INTRODUCTION

### 1.1 Background of the Company

Dojo Upholstery is a small business that was founded in 1989. Before settling in Tagum City, he worked as the right hand of a small business in Manila that provided upholstery service. Mr. Dojo started his own upholstery business since he has expertise and knowledge in the field. Presently has five stores operating. Its manufacturers still necessitate human labor, but with the assistance of a machine (sewing machine, hydraulic press machine, and air tucker).

They accept cash on delivery (COD) or cash on pick up (COP) as the payment method of their business. Dojo upholstery is consumer-friendly since the pricing is reasonable and the product is of high quality.

## 1.2 Current routines and business processes

### 1.2.1 Current Routines

The regular business procedures include opening early in the morning, cleaning, and organizing products. In addition, they do inventory every month to see where they lack supplies.

Start Time	End Time	Task	Duration
7:30 AM	8:00 AM	Making all items in order inside the store and cleaning the facility	30 Minutes
8:00 AM	11:30 AM	Working Time	4 Hours and 30 minutes
11:30 AM	12:00 PM	Lunch Break	30 Minutes
12:00 PM	3:30 PM	Resume of Work	1 Hour and 30 Minutes
3:30 AM	4:00 PM	Closing Time	30 Minutes

Table I. Event Table of Dojo Upholstery

Table 1 shows the Event Table of Dojo Upholstery. They usually operate 8 hours and 30 minutes a day with 30 min of lunch break.

### 1.2.2 Business Process

The shop is open from 8:00 am to 4:00 pm. Customers may pick the product detail and color they wish to purchase physically or online since they operate and accommodate clients through Facebook messenger and calls. Then, they may decide whether they want to pay cash on delivery or cash on pick up.

### 1.3 Problems Found

- **Inventory.** According to the researcher who interviewed the owner and another employee, they have experienced customers who are not accountable for fulfilling their duties and misunderstanding customers over their purchase.
- **Lack of IT Infrastructure.** The researcher observed during the interview; the store doesn't invest in Information Technology.
- **Transaction Process.** According to the researchers' interview, their transaction between customers and owner is poor for it is traditional.

1.4 Goals and Objectives

1.4.1

General Objectives

The researchers aim to:

The researchers expected to propose an IT infrastructure that executes and includes all of the purchases and deals of items and services, together with any everyday business transactions or activities required to function as a company. It also assists in preparing sales order entries, shipping, sales management, or other routine transactions to maintain operations.

1.4.2 Specific Objectives

In line with the general objective, the specific point of this study is;

- To improve the transaction process through the assistance of the IT framework, TPS, and CRM.
- To have a high level of reliability and accuracy in their user/customer information while minimizing the potential for human error.
- To provide customers product customization to improve customer satisfaction.

1.5 Organizational Structure

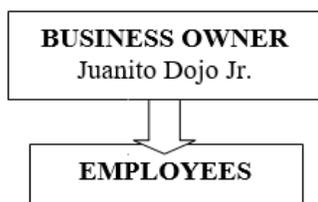


Figure 1: Organizational Structure of Dojo Upholstery

Figure 1 shows Dojo upholstery organizational hierarchy. The owner also serves as the general manager of the business, and the employees execute the operations.

1.6 Stakeholders

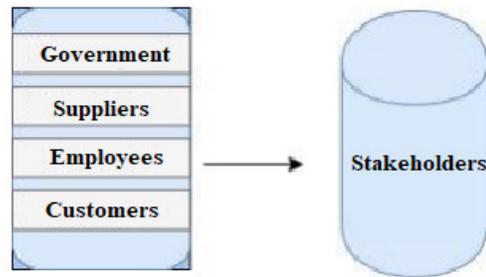


Figure 2: Stakeholders of Dojo Upholstery

Figure 2 shows that the government, suppliers, employees, customers are considered as stakeholders of the Dojo Upholstery.

2. PROPOSED INFORMATION SYSTEM

The researchers plan a Web Transaction Processing System and IT Infrastructure to provide faster and efficient transaction processes, stimulating the business's growth.

2.1 Review of Related Study

2.1.1 Related Literature

Transaction processing systems provide an execution environment that guarantees the integrity, accessibility, and security of information[1]. These also guarantee quick response time and high transaction throughput. The adding, modifying, removing, or searching up of a record in an information record or database by entering the information at a terminal or workstation is referred to as the transaction process.[2]. Most exchange handling frameworks moreover incorporate a strategy of guaranteeing that all the data entered as a transaction is at the same time saved[3].

One place where transaction processing has made a splash is on the Web. The appearance of online innovation has made the worldwide dissemination of products and data fast and frequently straightforward[4]. Different illustrations of transaction processing are mechanized teller machines, credit card authorizations, online charge installments, self-checkout stations at basics supply stores, the exchanging of stocks over the Web, and different other shapes of electronic commerce[5]. To have an effective information system (IS), it needs to be adantable and accommodate a specific

variation[6].

Commonly, it accompanies customer relationship management. A CRM system helps businesses keep customers' contact details up to date, track every interaction they have with your business, and manage their accounts. Thus, it helps the company improve customer relationships, and in turn, customer lifetime value. It also refers to all strategies, techniques, tools, and technologies used by the business for developing, retaining, and acquiring customers[7].

Today, many enterprises use many strategies to reduce costs and attract customers; one is web-based self-service (WBSS). If done correctly, along with product customization, it will improve the customer experience[8]. Furthermore, research shows that a business-to-customer (B2C) type of e-commerce boosts the business transactions in high-level customers' internet accessibility[9].

Investing in e-commerce will provide an excellent connection to customers for Dojo Upholstery. In this way, it will improve all the processes and revenue.

**2.1.2 Related System**

The Internet has made many advances to transform businesses into a form we know of today, in a website framework designed using web services, web resources, and web APIs. With all the sophisticated tools, customers can access a web application that can be used as a mainstream process and target a larger market. It automates all user's activities and records real-time reports about sales data without human involvement. It also comprises personalization of the products displayed in the website's interfaces and shows consumers the product variation changes[10].

A related system called "Development Model of Web Design Element for Clothing E-commerce Based on the Concept of Mass Customization." Designed with a customization interface that makes websites easier for consumers to design clothing types. For example, by selecting available apparel types, such as blouses, dresses, and pants, clothing parts by altering some available parts, such as buttons, sleeves, collars, pockets, embellishments, and clothing details, choose fabrics, sizes, and colors

In addition, it allows customers to compare designs using the interface to decide after that and submit orders so that customers ensure that the results meet their needs and are usable [11].

**2.2 Transactional web application**

Transactional web application as a business-to-consumer web application collects, records, processes, validates, modifies, stores, and retrieves data from every business transaction. It also helps to improve the business routine and expand the business' reach with the help of TPS; it will help the company to have efficient processes. Accompanied by a CRM system that helps keep customer's contact details up to date, track every interaction they have with your website, and manage their accounts. It supports and improves customer relationships, and in turn, customer lifetime value.

**2.2.1 Functionality**

- It will automatically record the price, number of items, amount of the purchased product.
- Provide printed receipts and product personalization for the customers.
- Provide a new seamless business process.
- Record the number of items sold and left and income (daily, monthly, and annually).
- Able to send updates to customers to keep track of their product.
- Record every data and transaction into the database.

**2.2.2 System Architecture**

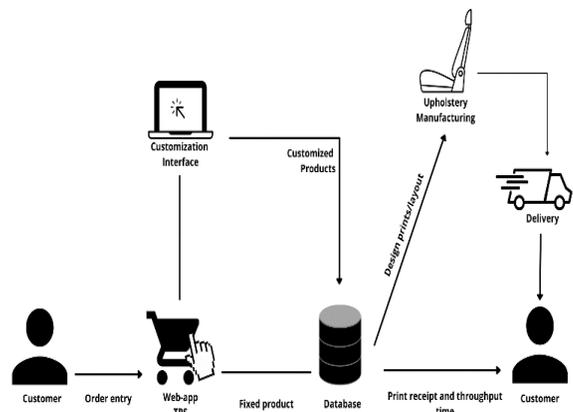


Figure 3: System Architecture of Dojo Upholstery

Figure 3 shows the proposed system architecture. The system can receive orders online and provides customers' a choice to customize their products. Then, the order details

is saved in the database which the staffs can use in printing receipts, contracts and the blueprints which is needed in the manufacturing. Lastly, the systems notify the customers when the delivery is ready.

**2.2.3 Economic Feasibility**

Description	Cost
Development Cost	Php 48, 391
Operational Cost	Php2,000
Maintenance Cost	Php 6,000
<b>Total Cost</b>	<b>Php 56, 991</b>

Table II. Economic Feasibility of Dojo Upholstery

Table 2 shows the overall cost of implementing the proposed Information System. The proposed system is inexpensive and the development of this system does not require large costs. To operate day-to-day internet is required which doesn't cost much. Maintenance costs are only occasional, this only includes replacements when hardware failure occurs or security patch is needed.

**3. PROPOSED IT INFRASTRUCTURE**

**3.1. Proposed Computer Hardware**

The researchers planned a computer that is efficient enough to operate the business needs. The following hardware is enough and has support for upgrades.

**Desktop Computer**

A desktop computer or a personal computer is designed for regular use, and it can also host websites for businesses.

**Printer**

A printer is a computer peripheral for printing files. Printing is needed in the business process to provide owners' copies of sales data, payrolls, and also customers' receipts, contracts, and blueprints.

Computer Hardware	Specification	Unit Cost	Qty	Total Cost
Desktop Computer	Core i3-8100	P13,080	1	P13,080
	8GB RAM			
	120GB SSD+ 500GB HDD			
AIO Printer	HP DeskJet 2320 All-in-One	P3,450	1	P3, 450
			<b>Total:</b>	<b>P14, 530</b>

Table III: Proposed Computer Hardware

Table 3 shows specifications and cost of the proposed computer hardware Dojo Upholstery will use to host the website and run software applications.

**3.2 Proposed Operating System Platform**

Researchers plan an operating system that can store files, use multiple software applications, and host a website for e-commerce.

**Microsoft Windows 10 Operating System**

Windows 10 is familiar and easy to use; it has built-in security features and is designed to run with the hardware and application software that businesses use.

OS Platform	Specification	Unit Cost	Qty	Total Cost
Microsoft Windows	IA-32, x86-64, ARMv7, ARM64, Digital License key	P1,735	1	P1,735
Overall OS Platform Cost:				<b>P1,735</b>

Table IV. Proposed Operating System Platforms

Table 4 shows the proposed Operating System Platforms. Windows 10 is the most suitable operating system for the proposed Information System. It has a user-friendly interface and has a lot of program supports and optimizations.

**3.3 Proposed Enterprise Software Application**

The potential that enterprise program (ES) has presented to the world through innovation has moved how businesses develop and keep their operational and vital activities beneath control and up to date.

**Customer Relationship Management (CRM) Software**

Customer relationship management (CRM) looking through client information to create way better deals, choices and track customers' behavior. CRM is a crucial undertaking tool to oversee and optimize intuitions whereas building connections with prospects. CRM systems also provide customer-facing staff individuals on customers' data, purchase history, buying inclinations, and concerns.

**Online Transaction Processing Web Application**

Online Transaction Processing Web Application is a computerized processing system. Transactions are processed in real-time and can process multiple transactions simultaneously without any interruptions.

**Autodesk AutoCAD**

Autodesk AutoCAD is software used for 2D and 3D computer-aided design. AutoCAD is commonly used and prevents factory errors by providing accurate blueprints of the product designs. The researchers plan to use the software for printing blueprints for the customized products requested by customers and as well as the pre-existing product designs.

Enterprise Software Application	Specification	Unit Cost	Qty	Total Cost
Customer Relationship Management (CRM) Software	Records all customer's shopping behavior and sends updates to the customers. To be embedded within the web app.	Free	1	Free
Online Transaction Processing Web Application	Receives orders and payments; provides a seamless contactless transaction process.	Php 30,000	1	Php 30,000
Autodesk AutoCAD	Creates layout for creating blueprints needed for manufacturing	Php 600	1	Php 600
<b>Overall Cost Enterprise Software Cost:</b>			<b>Php 30,600</b>	

Table V. Proposed Enterprise Application Software

Table 5 shows the proposed enterprise application software, including AutoCAD. CRM comprises the product customization feature in the website and automation of sending order details and updates to the customers.

**3.4 Proposed Data Management**

The researchers propose this kind of data management to receive, move, organize, and secure accurate, exact, accessible, and confirmed information.

Data Management	Specification	Unit Cost	Qty	Total
Microsoft Office	Word, Excel, PowerPoint, OneNote, Access(Digital License Key)	Php 1,526	1	Php 1,526
MySQL Database	Data warehousing for the e-commerce	Free	1	Free
<b>Overall Data Management Cost</b>				<b>Php 1,526</b>

Table VI. Proposed Data Management

Table 6 shows the proposed data management. MySQL is the most used database and it is very efficient in data management. Microsoft Office does the editing files needed for printing.

**3.5 Proposed Network and Telecommunication**

Since the proposed system involves web hosting, the researchers suggest a WAN infrastructure. A fiber internet connection with a speed of 35 Mbps would suffice web hosting and connect to customers at any time. The researchers suggest Converge FiberX plans for it has less reported downtime than any other ISP in the Philippines.

Network and Communication	Specification	Unit Cost	Qty	Total
Converge FiberX plan 1499 (35mpbs)	Fiber Optic connection guaranteed high download and upload speeds(Modem and cabling included)	Php 1,500	1	Php 1,500

<b>Overall Data Network and Communication Cost</b>	<b>Php 1,500</b>
--	------------------

Table VII. Proposed Network and Communication

Table 7 shows the proposed Network and Communication. The researchers proposed a fiber optic internet connection as it is the fastest type of connection today.

### 3.6 Internet Platform

The increase of consumers' choice of convenience is one of the significant factors of business growth. Deploying an Online platform will most likely leverage the business.

#### E-commerce

E-commerce is the buying and selling goods and services or transmitting funds or data over an electronic network, primarily the Internet. Customers can also pay online via bank transfer and mobile e-money such as Gcash that has 33 million users.

E-commerce Requirements	Specification	Service Fee
Domain Name	Custom Domain Name	Php 750/year
SSL Certificate	Custom SSL	Free
Web Hosting Services	Firebase Web Hosting	Php 1,500
<b>Total E-commerce Cost:</b>		<b>Php 2, 250</b>

Table VIII. Proposed Internet Platform

Table 8 shows the proposed data management. MySQL is the most used database, and it is very efficient in data management. Microsoft Office arranges the editing of files needed for printing.

### 3.7 IT Manpower

The proposed information systems still involves human effort to operate day-to-day. Expert in using digital designing may also be needed.

IT Manpower	Task	Cost
Operational Staff	Operates softwares and assists customers' orders	Php 12,000/month
Web Developer	Patches websites to improve usability.	Php 6,000/ patch
<b>Total Cost</b>		<b>Php 18,000</b>

Table IX. Proposed IT Manpower

Table 9 shows the Proposed IT Manpower. The researchers suggest an employee facilitates software application or is an expert with business transactions using a computer. And a web developer for website patches.

## 4. CONCLUSION ANDRECOMMENDATION

### 4.1 Conclusion

The following table shows the initial deployment expenses and approximate annual expenses of running the new business process.

Initial Deployment Cost	
Online Transaction Processing System	Php 30, 000
Computer Hardware	Php 14,530
Software Applications	Php 2,126
<b>Total</b>	<b>Php 46,656</b>
Approximate Annual Costs	
Fiber Internet Subscription	Php 19, 200
Web Hosting	Php 18, 000
IT Manpower	Php 144,000
<b>Total</b>	<b>Php 181, 200</b>

Table X. Initial Deployment and Annual Cost

If Dojo Upholstery wish to operate multiple branches, they only have to deploy Computer Hardware, Software Applications, and an internet subscription per sub-branch. Operating multiple branches will increase their cost, but it will also expand their market reach, delivery speed, and their profits grow.

### 4.2 Recommendation

The following are the researcher's recommendation for the Dojo Upholstery:

- The required Internet connection speed for sub-branches is not necessarily fast or overkilling speeds. They only have to secure a fast connection for the branch that hosts the website.
- Survey the customer's approach to e-commerce usability so the developer can also change unusable designs.

## REFERENCES

- [1] J. Li, E. Michael, and D. R. K. Ports, "Eris: Coordination-Free Consistent Transactions Using In-Network Concurrency Control KEYWORDS distributed transactions, in-network concurrency control, net-work multi-sequencing," *Sosp*, vol. 17, pp. 104–120, 2017, [Online]. Available: <https://doi.org/10.1145/3132747.3132751>.
- [2] J. Meehan *et al.*, "S-store: Streaming meets transaction processing," *Proc. VLDB Endow.*, vol. 8, no. 13, pp. 2134–2145, 2015, doi: 10.14778/2831360.2831367.
- [3] A. Kemper *et al.*, "Transaction Processing in the Hybrid OLTP&OLAP Main-Memory Database System HyPer," *IEEE Data Eng. Bull.*, vol. 35, no. 1, pp. 46–51, 2013, [Online]. Available: <http://webkemper1.informatik.tu-muenchen.de/~roediger/papers/kemper2013hyper.pdf%5Cnhttp://citeseerx.ist.psu.edu/viewdoc/summary?doi=10.1.1.310.4975>.
- [4] S. Kaushik and S. Puri, "Online transaction processing using enhanced sensitive data transfer security model," *2012 Students Conf. Eng. Syst. SCES 2012*, pp. 0–4, 2012, doi: 10.1109/SCES.2012.6199098.
- [5] P. P. Tallon, J. M. Huntsman, T. Coltman, and R. Sharma, "A I S ssociation for nformation systems Business Process and Information Technology Alignment: Construct Conceptualization, Empirical Illustration, and Directions for Future Research Magno Queiroz," *Journal*, vol. 17, no. 9, pp. 563–589, 2016.
- [6] K. Saira, M. A. Zariyawati, and M. N. Annuar, "Information System and Firms' Performance: The Case of Malaysian Small Medium Enterprises," *Int. Bus. Res.*, vol. 3, no. 4, 2010, doi: 10.5539/ibr.v3n4p28.
- [7] A. Khan, N. Ehsan, E. Mirza, and S. Z. Sarwar, "Integration between Customer Relationship Management (CRM) and Data Warehousing," *Procedia Technol.*, vol. 1, pp. 239–249, 2012, doi: 10.1016/j.protcy.2012.02.050.
- [8] S. M. Tseng, "Exploring the intention to continue using web-based self-service," *J. Retail. Consum. Serv.*, vol. 24, no. C, pp. 85–93, 2015, doi: 10.1016/j.jretconser.2015.02.001.
- [9] Z. Xing, "The impacts of Information and Communications Technology (ICT) and E-commerce on bilateral trade flows," *Int. Econ. Econ. Policy*, vol. 15, no. 3, pp. 565–586, 2018, doi: 10.1007/s10368-017-0375-5.
- [10] M. Kaptein and P. Parvinen, "Advancing e-commerce personalization: Process framework and case study," *Int. J. Electron. Commer.*, vol. 19, no. 3, pp. 7–33, 2015, doi: 10.1080/10864415.2015.1000216.
- [11] S. Tangchaiburana and K. W. Techametheekul, "Development model of web design element for clothing e-commerce based on the concept of mass customization," *Kasetsart J. Soc. Sci.*, vol. 38, no. 3, pp. 242–250, 2017, doi: 10.1016/j.kjss.2016.07.007.