

An Event Management Information System with Smart Budgeting using Apriori Algorithm: A Project Development Plan



Jovito P. Bolacoy, Jr.¹, Efhrain Louis P. Pajota²

¹Professional Schools, University of Mindanao, Davao City, Philippines,
jrjovito_bolacoy@umindanao.edu.ph

²College of Computing Education, University of Mindanao, Davao City, Philippines,
efhrain_pajota@umindanao.edu.ph

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ABSTRACT

Given the critical relevance of creating an enhanced information system for a business and the potential for resolving transaction-based issues for event organizations in the locality, this project plan proposes an Event Management System with Smart Budgeting using Apriori algorithm for an event organizing business. Furthermore, it mainly focuses on major processes such as organizing client information, processing of billing, creating of supplier, client, and admin modules, report generation and the integration of smart budgeting approach using a data mining algorithm. The project plan employs the use of V-model software development for designing the structured and organized work breakdown structure. A total of 148.21 mandays with a total cost of P376, 985.47 were computed for the completion of the proposed information system. The plan employs the use of different technologies for the development. Additionally, the project team are also carefully identified based on specific qualifications and standards. Test cases, test schedules, and documents are all classified in the plan including the strict implementation of the methodology. A one-year sales projection was also presented to check the breakeven point and to determine the cost and benefits of the plan. The results show that there is an increase of sales after the time spent of catering each client is decreased to 65%. Thus, the cost of the project plan will be regained after a few months. It is recommended to employ new technologies including augmented and virtual reality, live streaming and simulative in the conduct of the events for better user experience.

Key words : Information Systems, smart budgeting, Apriori algorithm, event management system, Project Management Plan, Chatbot

1. INTRODUCTION

Many people today attend events to celebrate momentous occasions- weddings, birthdays, conferences, public gatherings, and the like. An event is a term indicating a

gathering of people with the same interests to carry out an activity [1]. Organizing events begin to resurface as early as the time of Cleopatra being the first known event planner [2]. Also, event industries promote education, export, and investment as well as generating employment across the world because of its growing size valuing at \$1,135.4 billion in 2019 [3].

Events management is also linked to project management [4][5]. These are interconnected to harmoniously conduct events in an orderly manner. A survey also revealed that there is a need for financial, management, marketing, analytical and ethical skills to succeed in the events industry [6]. Hence, these industries need to embrace gradual growth focusing on developing these skills.

Customer experience is also essential to events [7]. Many event planning services are challenged to deliver quality services to its customers by providing advanced amenities. There are difficulties and challenges that every event planning services face when arranging an event. Interested clients visit the establishment for bookings and reservations of dates. Individuals determine the quality of service provided by manual processes, necessitating ongoing training for employees to keep them engaged and ensure they are following proper procedures.

A common problem in every business is the recording of information by mistake, resulting in inconsistency in data entry or handwritten orders [8]. This creates issues with customer service, but also preventing information from being used for reporting or data discovery. Keeping track of paper records, finding information, and keeping details safe requires more time and physical space. When errors occur or adjustments and corrections are required, a manual transaction must often be fully redone rather than simply changed. Customer inquiries can be difficult to respond to because information is stored in multiple locations, and you may need to locate the appropriate person before you can respond.

Aside from these concerns, many clients are having a hard time to allocate budgets for the events they request. They often end up choosing pre- defined packages by the event planners without considering other factors in the event. Hence, a smart budgeting feature using a well- defined algorithm in a system should be realized to help decide what is best for them. Another major concern in the preparation of the event is the constant communication and collaboration to affiliate businesses who supplies other necessities for the event such as flowers, venues, gowns and formal wears, and the like. Some of these businesses are challenged in delivering their services on time and at a right track. Thus, a communication tool where all of them can communicate is necessary.

One rising technology in the events management section is the web-based customer experience (CX) automation platform. This platform helps individuals manage their organization’s integrations with their current and potential customers in real time [9][10]. This technology could help the business in organizing and synchronizing all the data to provide services to clients in real- time and to quickly respond to issues that may arise from the event planning up to the event proper as well as to automate daily tasks [10].

Another way used by companies nowadays in transforming raw data into relevant information is through data mining. It is a technique of discovering patterns in large data sets [11]. Apriori algorithm is the first associate rule mining algorithm that is mainly used for market basket analysis and helps to find products that can be bought together [12][13][14]. This can also be utilized in observing patterns on the consumers’ needs on planning an event.

This project proposal investigates the opportunity to establish a web-based management information system that caters leads and provide suggestions based on a specified budget for an event using Apriori algorithm.

1.1 Project Objectives

The purpose of the project is to design an events management information system that will allow the business to manage its resources and deliver its services more efficiently to its clients.

Specifically, these include the following:

1. Design a module that will allow the admin to view and record clients’ and event information.
2. Design an inventory system that can monitor the available supplies.
3. Formulate a website that would improve the website ranking in the search engine results pages through search engine optimization techniques.
4. Create a module that would allow the clients to book appointments online.
5. Provide a mechanism that would recommend best event packages based on client’s budget using a data mining approach.
6. Create a module that will automatically generate invoices, billing statements, and client payment history.

7. Provide administrators access to real-time reports and information.

1.2 Scope and Limitations

This project aims to design an event management information system specifically for Alas Creative Events. The system will include features such as maintaining records of clients, scheduling appointments online, presenting personalized service packages based on clients’ budget utilizing the Apriori algorithm, and tracking inventory of supplies. Additionally, the system will be capable of generating reports as required by both the owner and clients.

1.3 Project Stakeholders

The stakeholders involved in this project have been categorized into two groups - internal and external to the organization.

The external interface of the project consists of the following stakeholders: the owner, head coordinator, supplier coordinators, and event suppliers as shown in Figure 1.

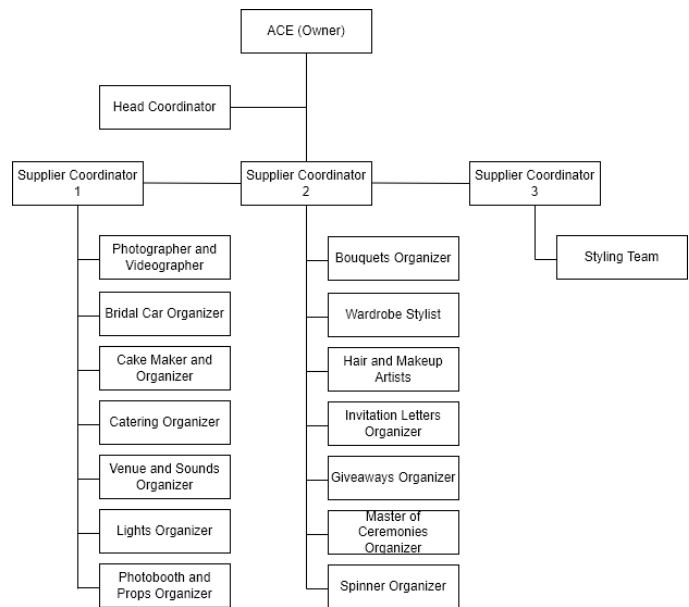


Figure 1: External Organization

The internal interface of the project includes the Project Sponsor, Project Manager, Lead and Junior Programmers, System Analysts/Designers, Software Testers, and the Database Administrator. The hierarchy of the internal interface is presented in Figure 2.

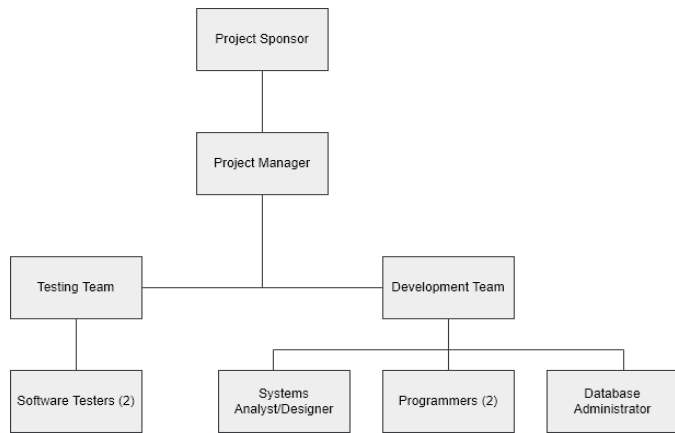


Figure 2: Internal Organization

2. MANAGERIAL PROCESS PLANS

In this section, the schedule and cost estimates for the proposed Information Systems are presented. The budget for the project has been determined through the ground-up costing method and is presented in the tables below. The cost for each level of the work breakdown structure is calculated and combined for each phase of the project.

2.1 Manpower Cost Estimates

A manpower cost estimates is an estimation of the most efficient combination of contract support and personnel for a proposed system. Table 1 shows the manpower personnel needed to run, manage, support, and train for the development and deployment of the system after it has reached its full operational deployment.

Table 1: Manpower Cost Estimates

Roles	Mandays	Rate/Day	Costs
Project Manager	55.96	P1, 756.68	P98,309.18
Project Sponsor	17.00	-	-
Systems Analyst/Designer	17.63	P1,422.95	P25,079.57
Software Tester 1	29.44	P1,876.77	P55,247.50
Software Tester 2	14.44	P1,876.77	P27,095.91
Lead Programmer	31.81	P1,825.91	P63,564.46
Junior Programmer/Web Developer	39.13	P1,073.23	P40,916.79
DB Administrator	9.13	P2,203.14	P20,103.62
SEO/Content Writer	8.25	P1,974.95	P13,330.94
Supplier Coordinator	2.625	P800.00	P2,100.00
Photographer and Videographer	2.125	P1,000.00	P2,125.00
Bridal Car Organizer	2.125	P1,200.00	P2,550.00
Cake Maker Organizer	2.125	P800.00	P1,700.00
Catering Organizer	2.125	P1,000.00	P2,125.00

Venue and Sounds Organizer	2.125	P1,500.00	P3,187.50
Lights Organizer	2.125	P1,000.00	P2,125.00
Photobooth and Props Organizer	2.125	P800.00	P1,700.00
Bouquets Organizer	2.125	P800.00	P1,700.00
Wardrobe Stylist	2.125	P1,000.00	P2,125.00
Hair and Makeup Artists	2.125	P1,000.00	P2,125.00
Invitation Letter Organizer	2.125	P800.00	P1,700.00
Giveaways Organizer	2.125	P800.00	P1,700.00
Master of Ceremonies Organizer	2.125	P1,000.00	P2,125.00
Spinner Organizer	2.125	P1,000.00	P2,125.00
Styling Team	2.125	P1,000.00	P2,125.00
TOTAL	257.78		₱376,985.47

2.2 Schedule Estimates

Schedule estimates are made up of organizing and estimating the lengths of the smaller schedule components, such activities, or tasks. Table 2 reveals the schedule estimates of the proposed plan.

Table 2: Schedule Estimates

Phase	Duration (Mandays)	Start Date	End Date
Definition Phase			
Project Approval	6.2505	Mon, 03-Jul-23	Fri, 14-Jul-23
Project Planning	7.1825	Mon, 17-Jul-23	Thu, 03-Aug-23
Project Kick-off	0.94	Fri, 04-Aug-23	Mon, 07-Aug-23
Business Process Documentation	6.00	Tue, 08-Aug-23	Wed, 16-Aug-23
Project Configuration and Setup	4.19	Thu, 17-Aug-23	Fri, 25-Aug-23
Phase Total	24.56		
Design Phase			
System Design	12.31	Tue, 29-Aug-23	Fri, 15-Sep-23
Coding and Unit Testing	46.78	Mon, 18-Sep-23	Mon, 30-Oct-23
Phase Total	59.09		
Testing Phase			
Test Planning	23.25	Tue, 31-Oct-23	Tue, 05-Dec-23
Test Execution	11.69	Wed, 06-Dec-23	Wed, 27-Dec-23
Phase Total	34.94		
Live Phase			

Go Live	0.50	Thu, 28-Dec-23	Thu, 28-Dec-23
Maintenance and Support	27.25	Tue, 02-Jan-24	Thu, 22-Feb-24
Project Closure	1.88	Fri, 23-Feb-24	Wed, 28-Feb-24
Phase Total	29.63		
TOTAL	148.21		

2.3 Hardware Cost Estimates

To create and implement the suggested system, hardware components are a must. Table 3 displays the needed project's anticipated cost.

Table 3: Hardware Cost Estimates

Hardware	Specification	Qty	Price	Total Cost
Desktop Computer	Intel Core i5-10400F Processor H510M-H Motherboard (4GBx2) 8gb DDR4 MEMORY 1TB HDD GT730 2GB VIDEO CARD 23.8' LED MONITOR Computer	1	₱ 40,000.00	₱ 40,000.00
Printer	Xprinter Label Barcode Printer Receipt Bar Code Print 20mm-80mm Sticker Printer Bluetooth WIFI LAN USB	1	₱ 5,000.00	₱ 5,000.00
Total cost				₱45,000.00

Table 5: Project Cost Summary

Year	Month	WBS Cost	Technology Cost	Audit Cost	Effort Cost	Total Cost	Cumulative Cost
2023	July	₱ 25,014.05		₱5,000.00	₱1,854.70	₱31,868.75	₱31,868.75
	August	₱ 67,594.24		₱5,000.00	₱2,583.00	₱75,177.24	₱107,045.99
	September	₱ 46,747.60	₱29,419.00	₱5,000.00	₱4,600.87	₱85,767.47	₱192,813.46
	October	₱ 63,686.98	₱15,110.00	₱5,000.00	₱3,700.63	₱87,497.61	₱280,311.07
	November	₱ 48,586.76	₱249.00	₱5,000.00	₱5,763.93	₱59,599.69	₱339,910.76
	December	₱ 64,153.94	₱249.00	₱5,000.00	₱4,561.46	₱73,964.40	₱413,875.16
	January	₱ 44,998.84	₱249.00	₱5,000.00	₱5,035.80	₱55,283.64	₱469,158.80
	February	₱ 16,203.06	₱249.00	₱5,000.00	₱4,499.88	₱25,951.94	₱495,110.74
	TOTAL	₱376,985.47	₱45,525.00	₱40,000.00	₱32,600.27	₱495,110.74	

2.6 Financial Viability Evaluation

The first stage in determining the project's financial feasibility is to get the existing expenses associated with the duties performed by the center in order to deliver their regular services to their consumers. The cost of performing an activity is determined by multiplying the total number of hours spent on each activity by the person's hourly wage.

Table 6 shows the time spent for each of the processes identified. It clearly shows the improvement of catering clients. The processing time is reduced to 45 minutes from the previous 130 minutes, in total.

2.5 Project Cost Summary

Monthly budget allocation for the project, which encompasses Work Breakdown Cost, Technology Cost, Audit Cost, and Effort Cost, is presented in Table 5.

2.4 Software Cost Estimates

Table 4 lists the software needed for the project and its approximate cost. The anticipated final price is ₱15,250.00.

Table 4: Software Cost Estimates

Software	Qty	Price	Total Cost
Domain Name	1	₱ 3,000.00	₱ 3,000.00
Web Hosting	1	₱250/month	₱ 2,250.00
XAMPP	1	Free	Free
PHP Laravel	1	Free	Free
Sublime	2	₱ 5,000.00	₱ 10,000.00
Total cost			₱15,250.00

Table 6: Time spent: Current vs Proposed Processes

Processes	Current	Proposed	Difference
Appointment Process	15 mins	5 mins	10 mins
Inventory Process	60 mins	30 mins	30 mins
Billing Process	10 mins	5 mins	5 mins
Preparation of Sales Report Process	45 mins	5 mins	40 mins
Appointment Process	15 mins	5 mins	10 mins
Total	130 mins	45 mins	85 mins

Table 7 shows the computations of the expenses for the current and proposed processes.

Table 7: Expenses: Current vs Proposed Processes

Processes	Current	Proposed	Difference
Appointment Process	P25.00	P8.33	P16.67
Inventory Process	P100.00	P50.00	P50.00
Billing Process	P16.67	P8.33	P8.34
Preparation of Sales Report Process	P75.00	P8.33	P66.67
Total	P216.67	P74.99	P141.68

One of the identified problems of the business is the number of their catered clients per month due to a lack of way in monitoring each event's expenditures and resources at the same. The business does not practice double bookings at the same day due to the mentioned reason. Once the system is established, it is projected that the number of clients will gradually increase at the course of a year. Hence, Table 8 shows the projected 12-month sales projection for the business. As shown, it would accumulate P34, 400,000.00 after a year.

Table 8: Twelve-month Sales Projection

Month	Package	No. of Clients	Total Income	Cumulative Income
December-23	P100,000.00	20	P2,000,000.00	P 2,000,000.00
January-24	P100,000.00	22	P2,200,000.00	P 4,200,000.00
February-24	P100,000.00	23	P2,300,000.00	P 6,500,000.00
March-24	P100,000.00	24	P2,400,000.00	P 8,900,000.00
April-24	P100,000.00	25	P2,500,000.00	P 11,400,000.00
May-24	P100,000.00	26	P2,600,000.00	P 14,000,000.00
June-24	P100,000.00	27	P2,700,000.00	P 16,700,000.00
July-24	P100,000.00	28	P2,800,000.00	P 19,500,000.00
August-24	P100,000.00	29	P2,900,000.00	P 22,400,000.00
September-24	P100,000.00	30	P3,000,000.00	P 25,400,000.00
October-24	P100,000.00	30	P3,000,000.00	P 28,400,000.00
November-24	P100,000.00	30	P3,000,000.00	P 31,400,000.00
December-24	P100,000.00	30	P3,000,000.00	P 34,400,000.00
TOTAL		344		P 34,400,000.00

Based on the table shown, the total cost will be regained in mid-February 2024 after implementation, and it is the breakeven point.

3. QUALITY CONTROL

A company's efforts to maintain or raise product quality are achieved through the quality control (QC) process. The establishment of a culture of perfection among management and staff is necessary for quality control. This is accomplished by staff training, the development of product quality norms, and product testing to look for statistically significant variances.

3.1 Software Development Methodology

In this proposal, a collection of techniques employed by businesses to meet quality standards or objectives and continuously enhance the organization's capacity to guarantee that a software product will meet those standards are provided to deliver efficient and high quality system. A testing phase is linked to each relevant development step in the V-Model, which is an extension of the waterfall model. This implies that there is a testing phase that is directly related to each and every phase of the development cycle. This is a very structured approach, and the start of the subsequent phase only occurs after the conclusion of the preceding phase. The V-Model parallel plans the corresponding testing phase of the development phase. Therefore, Validation stages are on the other side of the "V" than Verification phases. The V-two Model's sides are connected during the coding phase as shown in Figure 3.

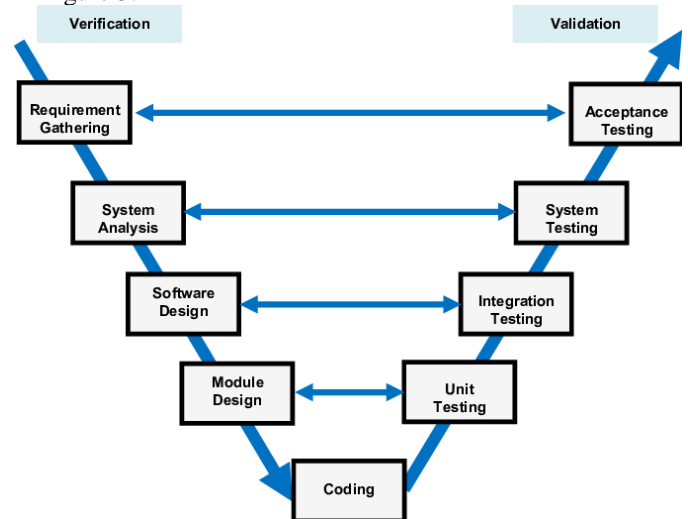


Figure 3: V-Model Software Development and Testing Methodology

3.2 Risk Management Process

Identification, assessment, and control of financial, legal, strategic, and security threats to the assets and profits of an organization constitute the process of risk management. These dangers or risks could be caused by a wide range of things, such as monetary instability, legal liabilities, poor strategic

management, mishaps, and natural calamities. Figure 4 shows the risk management process that will be utilized in the project.



Figure 4: Risk Management Process

3.3 Project Framework

The project aims to address the identified pains of the organization by developing an information system that will include the following modules as shown in Figure 5:

- a. Website module- This module will allow the prospect clients to navigate to the website, view testimonials, customize packages and services, and secure an appointment slot.
- b. Admin module- This module will allow the administrator, specifically, the owner of the business, to view all of the clients, event schedules, reports and manage the modules available in the system.
- c. Appointment module- This module will allow the clients to book an appointment through the website.
- d. Inventory module- This module will allow the supplier coordinator to monitor and manage the inventory of supplies.
- e. Billing module- This module will allow the administrator to manage the billing information for each client.
- f. Reporting module
 - i. Dashboard- this module will allow the organization to view data and statistical information which is crucial for decision-making.
 - ii. Reports- this module will allow the administrator to generate different reports necessary for the organization.

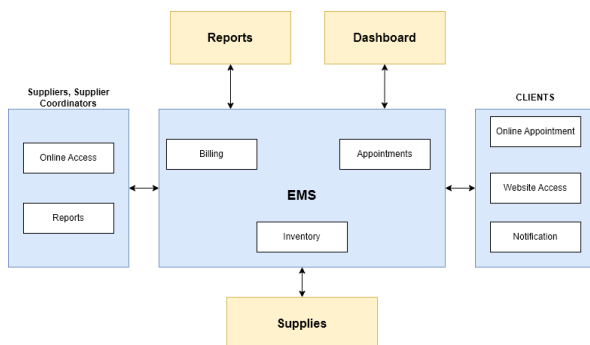


Figure 5: Project Framework

3.4 System Architecture

Figure 6 shows the system architecture of the event management information system. The users are the clients, suppliers, supplier coordinator, and the owner of the business. A web-based application will be deployed where all the users can access through the Internet.

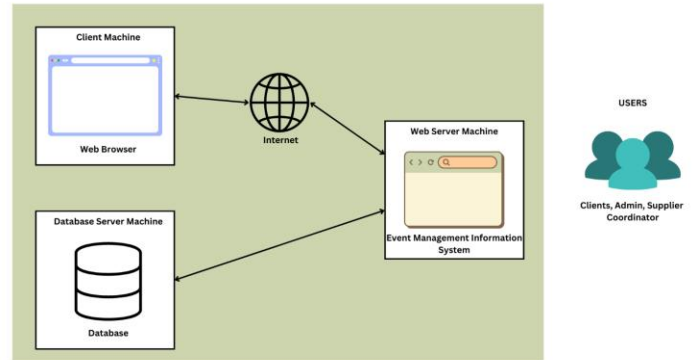


Figure 6: System Architecture

3.4 Continuous Improvement

To handle and manage problems during the development stage, Figure 7 shows the processes that will be implemented:

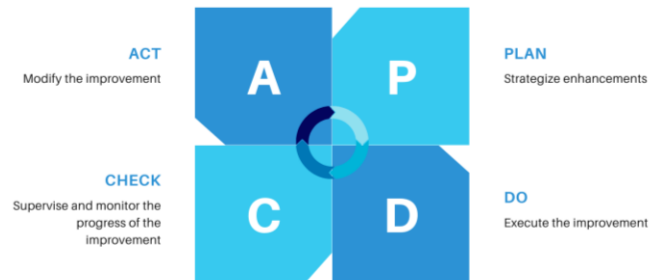


Figure 7: Continuous Improvement Process

4. CONCLUSION

Event management systems are essential tools for businesses and organizations to efficiently plan, organize, and execute events of any scale. These systems provide a centralized platform to manage various aspects of event planning, including registration, ticketing, promotion, venue management, scheduling, and communication.

By utilizing event management systems, event organizers can save time, reduce costs, improve attendee experience, and gather valuable data for future events. With features such as real-time reporting and analytics, event management systems also enable organizers to measure the success of their events and make informed decisions for future events.

Overall, event management systems have become indispensable for event planners and businesses, allowing them to streamline event planning and management, enhance attendee engagement, and ultimately drive business growth.

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