CHAPTER III

OBJECTIVES AND RESEARCH METHODS

3. 1 Research Object

The objective of the research is build a new informative website for Capital Rugby Union Competition in the capital city of Papua New Guinea, known as Port Moresby. The research mainly focuses on structural concept on how to inform and update the rugby community about the happenings of the sport on a weekly basis.

3.1.1 History of Capital Rugby Union

The Capital Rugby Union competition is a rugby union competition that is staged in the capital city of Papua New Guinea known as Port Moresby located on the south coastal area of the country. The rugby union competition originally started in 1961 by a few Papua New Guinean's whom studied college in Australia, which was really famous in Australia. The CRU was once known as Port Moresby Rugby Football Union (POMRFU) until a recent name change in 1999. The competition generally hasn't had much international exposure due to lack of funding or support from the government in terms of infrastructures and facilities until recently, Papua New Guinea had an opportunity to stage the 2015 South Pacific Games in the capital city Port Moresby, which saw a funding of K25 million kina (USD13, 500, 000.00) was allocated to upgrade the rugby grounds facilities. The CRU, however, has not changed much in terms of its media coverages. Capital Rugby Union competition organizing committee still uses Newspaper to publish out every week results of

scores and updates of what's going on within the organization. Merchandise items of the league are usually sold off social media such as Facebook. CRU only hosts games in one location which is knowns as Sir John Guise Stadium. The competition has about 110 registered players from 5 different teams that compete in one elite level known as the premier grade.

Following are the list of teams:

1. Harlequins Rugby Union Club (HRUC)
2. Defense Rugby Union Club (DRUC)
3. Wanderers Rugby Union Club (WRUC)
4. University Peggie's Rugby Football Club (UPRUC)
5. Valley Hunters Rugby Union Club (VHRUC)

3.1.2 Vision and Mission of the Capital Rugby Union

Vision

The vision of the Capital Rugby Union competition is to be the leading rugby competition dedicated to excellence and providing elite rugby players to represent the capital Port Moresby in rugby tournament's around the country.

Mission

The mission of the Capital Rugby Union competition is to produce the best rugby athletes in the country for the cities entertainment and recreation.

3.1.3 Organizational Structure of the Capital Rugby Union

Here is the Organizational Structure of the Capital Rugby Union.

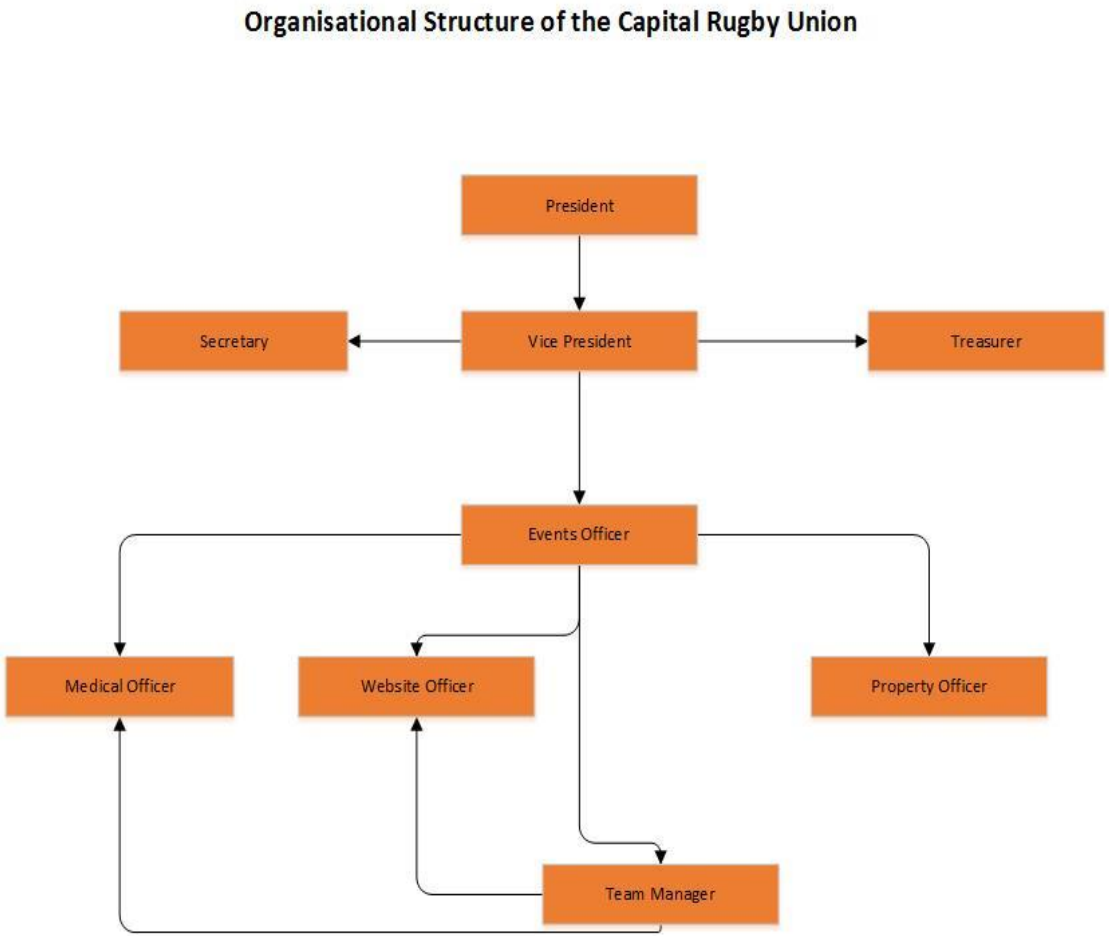


Figure 3.1 Organizational Structure of CRU

3.1.4 Job Description

Job description of the Capital Rugby Union is explained further below:

1. **President**
    a. Lead activities provided by CRU organization in general
    b. Plan and schedule meetings when need be.
    c. Chose, decide, control assignments during board meetings
2. **Vice-President**
    a. Steps in when the President isn't available and becomes the acting president
    b. Assist the President in decision making
    c. Keep order during a meeting and overseeing project committee's
3. **Secretary**
    a. Arrange activities and schedule given by the President/Vie President
    b. Compile and save archives
    c. Attend meetings as a companion of the President
    d. Prepare meeting agendas and reports
4. **Treasurer**
    a. Oversee financial administration of the organization.
    b. Review procedures and financial reports.
    c. Advice the board on financial strategy and fundraising

5. **General Manager**
    a. Manager's events and schedules discussed in board meetings to be carried out by the respective officers in the Capital Rugby Union competition.
    b. Receives critics and concerns from the officers to be discussed further in monthly meetings.
    c. Ensures that the respective officers are on time and working effectively to reach goals of the organization.
6. **Medical Officer**
    a. Medical check-ups for every player associated in the capital rugby union before registration
    b. Weekly medical check-ups before games
    c. Injury Concerns during and after the game.
7. **Event Officer**
    a. Arrange game schedules, results and referees before the weekend games
    b. Ensure teams are on time for each game
    c. Time keeping
    d. Score sheets
8. **Property officers**
    a. Ensures the paddock ready for the games
    b. Cleaning and ensuring the stadium is neat and in order for weekend games

c. Ensure all the teams tent is set up with drinking water

9. **Website Officer**

    a. Update news, photos, schedules, results and handles

    b. Merchandise sales

    c. Record keeping

10. **Team Managers**

    a. Organizes their teams before the games

    b. Merchandise sales

    c. File a report if need be (medical, foul play, sin bin)

    d. Team sheets

3.2 Research Methods

The research method is a systematic approach that can be used to obtain facts, collect, record, and analyze data, specifically to be used in a particular study. The research method used in this research is the qualitative research method, which involves the use of qualitative data, such as interviews, documents, and participant observation data, to understand and explain social phenomena.

3.2.1 Research Design

A research design is the document of the study. The design of study defines the study type (descriptive, correlational, semi-experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research question, hypothesis, independent and dependent variables, experiment design and if

applicable, data collection methods and a statistical analysis plan. Research design is the framework that has been created to seek answers to research questions**.**

3.2.2 Types and Data Collection Methods

The types of data collection methods are as follows:

3.2.2.1 Primary Data Sources

Primary data are the data obtained directly from the system users. In this research, primary data were collected from direct interaction with the system users via the following data collection methods:

1. Observation

The researcher visited the site of the object of research, CRU office, to observe how the organisation runs. From this observation and queries of questions asked, the researchers were able to identify some problems associated with the CRU system.

2. Interview

This method involves face to face interaction with the system users, where the researcher asked system users some questions about the current system.

3.2.2.2 Secondary Data Source

Secondary data used in this research include records and documentation from the organization being researched, information from the organization's website and other internet sources, and from previous studies concerned with the problem at hand.

Analysis from secondary data, collected from secondary sources help support the primary data collected by the researcher.

3.2.3 Method and System Development Approach.

In this section the system development approach, the system development method, and the analysis and design tools will be described.

3.2.3.1 Systems Approach Method

The system approach method used in this study is the object-oriented approach. The object oriented approach focuses on objects rather than actions, and data rather than logic. For this study, the object oriented approach was chosen because objects are easier for people to understand, data and processes are not artificially separated, and code can be reused more easily.

3.2.3.2 Systems Development Method

The system development method used in this study is the development of a prototype model. A prototype is a model or a program which is not based on strict planning, but is an early approximation of the final product or software system. A prototype acts as a sample to test the process.

A prototype development method is employed when it is very difficult to obtain the exact requirements from the system end user. A prototype model makes it easier for the system user to clarify the user requirements specification to system developers. Developing a prototype models involves gathering user requirements for the desired system, and then developing a prototype system inclined to what the

system users really want. A prototype system is usually not the final or real system. However, it provides a display or preview of what the real system will look like. After the prototype system is evaluated by the end user, the system developers can be able to determine the system specifications in accordance with the wishes of system users, and thus create the real system. Following is a picture of a prototype model :

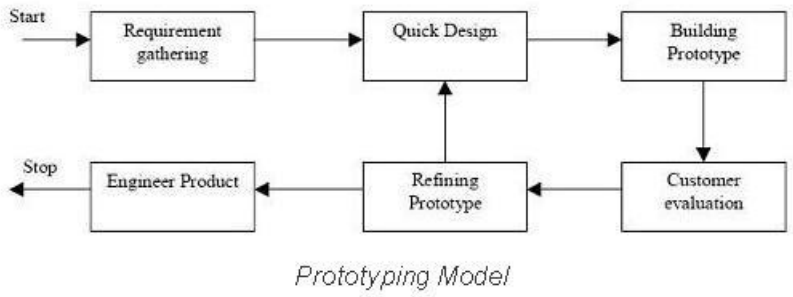


Figure 3.2 Prototype model

(Source: Prototyping model [online image] Retrieved May 7, 2015, from http://istqbexamcertification.com/what-is-prototype-model-advantages-disadvantages-and-when-to-use-it/)

The stages in the development of a prototyping involves gathering system requirements, making a quick design, and building a prototype of the required system. After the prototype is built, it is then evaluated and tested by the customer or end user. Iteration occurs in the development of prototypes in accordance with the wishes of the customer. Once the customer is satisfied with the prototype, the actual system is developed according to the customer's wishes.

Using the prototype model, following are the stages taken in the design and implementation of the Capital Rugby Union web-based information system:

1. Gathering system requirements

The first stage of this development method involves interviewing the system users or customers to collect the specific data requirements on how the system user wants the system to operate. Here the system data requirements and processes of the web-based information system of CRU are determined.

2. Building a prototype.

After gathering the specific system requirements, the next step involves building a prototype. The prototype is built in accordance to the analysis of the specific system requirement needs gathered in the previous stage.

3. Customers testing prototype

The final stage is the testing stage. Once the prototype is completed, it is then tested by the system user to see if it meets the initial system requirements. The testing stage is carried out to get feed back from the end user or customer. If the customer is not satisfied with the prototype, the system developer then repairs the prototype according to the customer feedback. Process undertaken should be in accordance with the order.

3.2.3.3 Analysis and Design Tools

Since the system approach used in this study is the object oriented approach, the analysis and design tool used to model out the system's processes is the Unified Modeling Language (UML), The UML is a graphical language for specifying, visualizing, constructing and documenting the artifacts of software systems. UML is used to model the system that is being built. The basic building blocks of UML are:

i. Model elements (classes, interfaces, components, use cases, etc.)

ii. Relationships (associations, generalization, dependencies, etc.)

iii. Diagrams (class diagrams, use case diagrams, interaction diagrams, etc.)

The UML has numerous types of diagrams, each providing a certain view of your system. These diagrams are explained as follows:

1. Use Case Diagram

A use case model is a view of a system that emphasizes the behavior as it appears to outside users. A use case model partitions system functionality into transactions ('use cases') that are meaningful to users ('actors').

2. Activity Diagram

The purpose of the activity diagram is to model the procedural flow of actions that are part of a larger activity. In projects in which use cases are present, activity diagrams can model a specific use case at a more detailed level. Because it models

procedural flow, the activity diagram focuses on the action sequence of execution and the conditions that trigger or guard those actions.

3. Sequence Diagram

The sequence diagram is used primarily to show the interactions between objects in the sequential order that those interactions occur. One of the primary uses of sequence diagrams is in the transition from requirements expressed as use cases to the next and more formal level of refinement. Use cases are often refined into one or more sequence diagrams.

4. Collaboration Diagram

UML collaboration/communication diagrams like UML sequence diagrams, are used to explore the dynamic nature of your software. Collaboration diagrams show the message flow between objects in an Object Oriented application, and also imply the basic associations (relationships) between classes.

5. Class Diagram

Class Diagram provides an overview of the target system by describing the objects and classes inside the system and the relationships between them. It provides a wide variety of usages; from modeling the domain-specific data structure to detailed design of the target system. With the share model facilities, you can reuse your class model in the interaction diagram for modeling the detailed design of the dynamic behavior. The Form Diagram allows you to generate diagram automatically with user-defined scope..

6. Component Diagram

A component diagram describes the organization and wiring of the physical components in a system. Component diagrams are often drawn to help model implementation details and double-check that every aspect of the system's required functions is covered by planned development.

7. Deployment Diagram

A deployment diagram can be used to model the physical architecture and (in the case of networks or distributed systems) the topology of the software system being developed. It describes the hardware devices (known as *nodes*), the software components that run on them (known as *artifacts*), and the communication links between the various nodes and artifacts.

3.2.4. Software Testing

Software testing is an important technique for assessing the quality of a software product. The two main types of software testing techniques are black box testing and whitebox testing. Black box testing focuses on determining whether or not a program does what it is supposed to do based on its functional requirements. Black box testing attempts to find errors in the external behavior of the code in the following categories:

1. Incorrect or missing functionality;
2. Interface errors;
3. Errors in data structures used by interfaces;
4. Behavior or performance errors;

5. Initialization and termination errors.

Through this testing, we can determine if the functions appear to work according to specifications.

3.3. Analysis of Current System

System analysis is the process of breaking down a complete information system into components, in order to study how each component works, as to simplify the problem faced by an information system into component parts. This makes it easier for the system developer to define the problems faced by the system and find a way to solve these problems. In order to develop a new system, the system developer must analyze the current system, identify the problems faced with the current system, and analyze the system procedures and how the system works.

3.3.1. Analysis of current procedures.

The analysis of the current procedures aims at finding out how the current system works and what problems are faced with the current system procedures. In order to build a new system, the system developer must first know the current system procedures, as they will act as a foundation on which the new system will be built upon. The analysis of the current web-based information system at the CRU is as follows:

3.3.1.1.The current use case diagram of the CRU

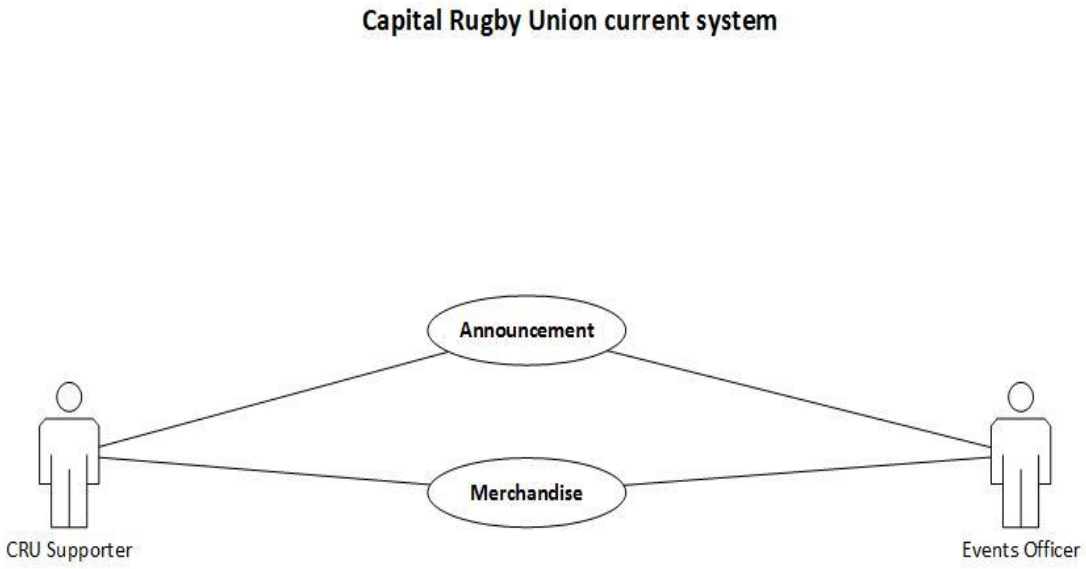


Figure 3.3 Use Case Diagram for the Capital Rugby Union system

3.3.1.2. Use Case

1. **Definition Of Actors**

Following is the definition of actors in the Capital Rugby Union system.

Table 3.1 Definition of Actors

No	Actor	Definition
1	CRU supporter	The CRU supporter is the person who seeks information from the CRU newspaper articles or merchandise sales on social media pages on Facebook.

2	Events Officer	Events Officer is the person who organizes the schedules, results on the newspaper and merchandise sales on social media.

2. Definition of the Use Case

Here is a description of the use case in the information system of CRU.

Table 3.2 Definition of Use Case

No	Actor	Definition
1	Announcement	Refers to the procedures involved in announcing news, schedules, score updates and gallery updates in CRU Facebook page.
2	Merchandise	Refers to merchandise sales of items

3. Use Case Scenarios

a) Announcement

Table 3.3 Use Case Scenario for Announcement

Use case Name	Announcement
Primary Actor	CRU Supporter
Supporting Actor	Events officer
Summary	In order for the CRU supporter to have access to news updates and merchandise sales, he/she must to purchase a newspaper every Mondays to see the updates of the Capital Rugby Union and have a Facebook account the to make a

	purchase on merchandise on the CRU Facebook page.
Pre- Condition	The CRU supporter has no clue of the score updates and table standings of the weekends game
Normal flow	1. Events officer publishes the weekends game results in the newspaper 2. The CRU supporter purchases a newspaper to see updates of the weekends game
Exceptions	-
Post Conditions	The person is a supporter of CRU competition.

b) Merchandise sales

Table 3.4 Use Case Scenario for Merchandise Sales.

Use case Name	Merchandise Sales
Primary Actor	CRU supporter
Supporting Actor	Events Officer
Summary	In order for the supporter to purchase CRU merchandise he/she must have a Facebook account to make an order.
Pre- Condition	Fees not paid.
Normal flow	1. Supporter place's an order for the desired merchandise item on CRU's Facebook fan page. 2. Events officer informs supporter the merchandise can be payed and picked up at the CRU stadium office on a given time and date. 3. Events officer records payment transaction 4. Supporter is given a receipt
Exceptions	-
Post Conditions	Fees paid

3.3.1.3. Activity Diagram

This section presents the flow of processes in the current system of the CRU, shown in activity diagrams.

The activities or processes that are carried out in the current system of the CRU are as follows:

1. **Activity diagram for Announcement's at the CRU.**

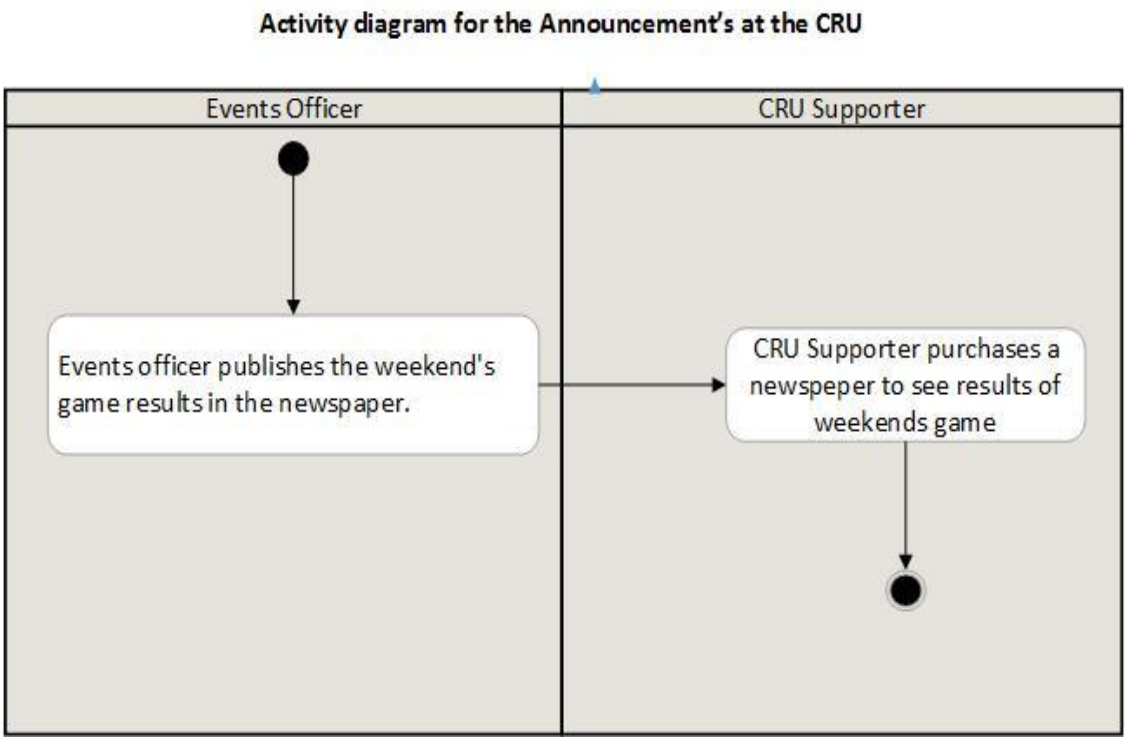


Figure 3.4 Activity diagram for the Announcement's at the CRU

2. Activity diagram for Merchandise sales at CRU.

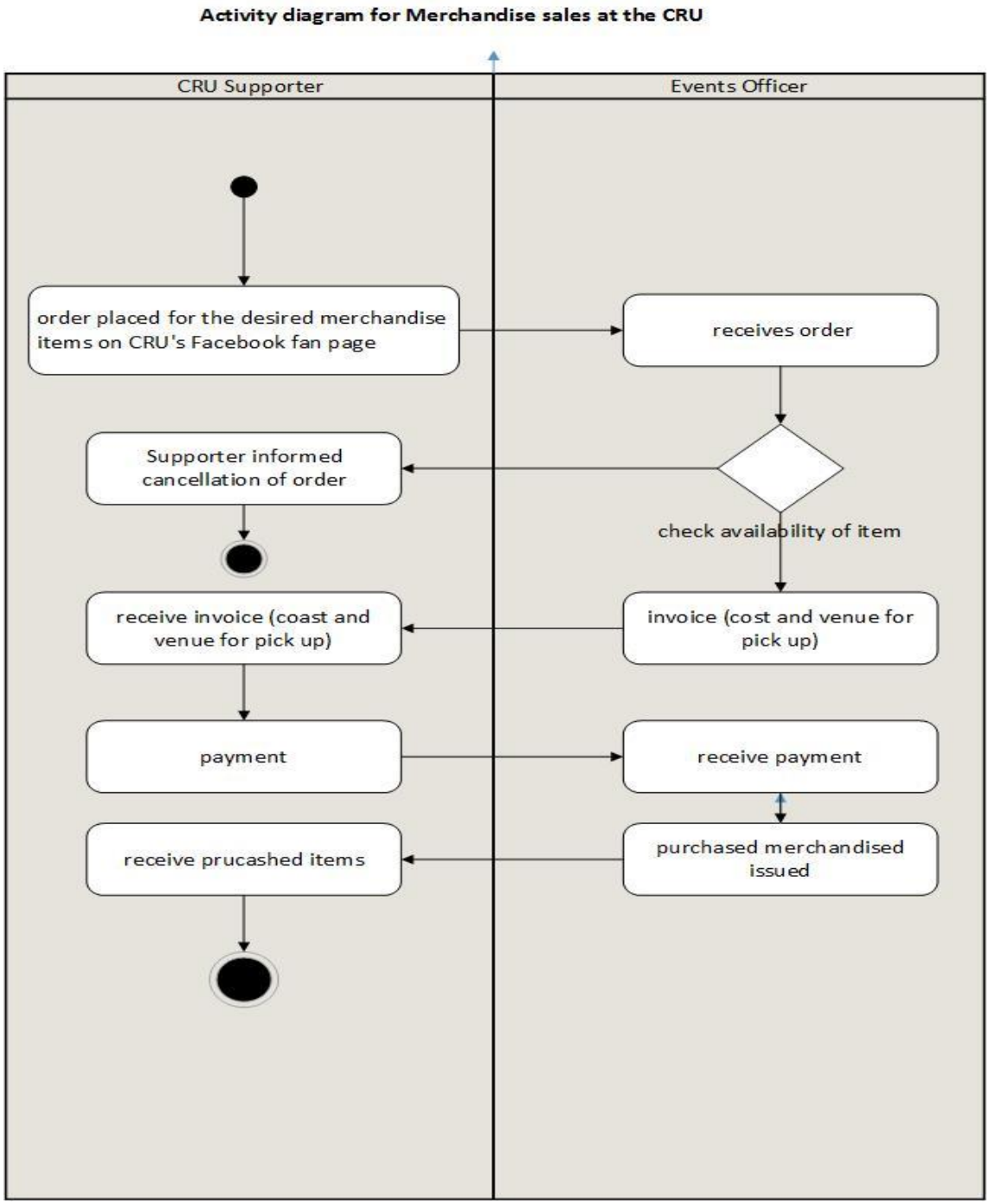


Figure 3.5 Activity diagram for Merchandise sales at the CRU

3.4. Evaluation of current System

After the analysis of the current Capital Rugby Union system, it can be seen that there are some flaws in the current system. Most of the system flaws are time related, due to most of the system procedures being done manually. The following table shows the evaluation of the current system's problems as well as the proposed solutions to these problems.

Table 3.5 Evaluation of the Ongoing System

Problem	**Solution**
1. The Capital Rugby Union semiprofessional competition does not own a current website for its fans and any individual involved.	Create a web-based information system where CRU supporters can have accessed to for information updates.
2. The current system still uses the newspaper to publish out schedules, results and the ladder of the weekend's game to the CRU supporters.	Create a web-based information system for the CRU, where there is a schedule section that displays schedules, results and ladder of every team that partakes at the CRU competition weekly.
3. The CRU system doesn't have a platform in place for its fans to have access to which teams associated with the union and its player profiles.	Create a web-based information system, where there is a team section that displays the each team's history and profile so as players profile and positions.
4. The current situation with merchandise sales for the Capital Rugby Union is done on its Facebook fan page	Create a web-based information system, where there is a merchandise section to display merchandise from the teams affiliated with CRU.
5. CRU uses its Facebook fan page to display galleries of the rugby matches.	Create a web-based information system, where there is a gallery section that displays photos of the weekend's game from the teams affiliated in the CRU competition.