# INFORMATION SYSTEM MODELS, ITS IMPLEMENTATION IN SAN BEDA COLLEGE ALABANG
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## Introduction

Over the past 50 years, a number of different approaches or models have represented an information system. Each new model has evolved because of the shortcomings and limitations of its predecessor. There are basically five different information system models namely Manual Process Model, Flat File Model, REA Model, Database Model and ERP Model. In San Beda College Alabang, there are several Information System Models that support several physical databases which are housed in 5 different database servers a flat file environment.

The table below shows the data model used in each information system.

| Information System | Primary User | Model |
|---|---|---|
| HRIS (Human Resources Information System) | Human Resources | Flat File |
| PRISM (PrinceTech Integrated School Management System) | Academe, Registrar, Finance, Student | Database |
| Library System | Student, Academe | Flat File |
| Wi-Fi Management System | Institutional | Flat File |
| POS | Institutional | Flat File |
| Parking Management | Institutional | Flat File |
| IMC | Student, Academe | Manual Process |
| Property Management System | Institutional | Flat File |
| RFID Card System | Institutional | Flat File |

Using the REA Model approach, the four main resources involved in establishing an information system model in an educational institution are students, employees, property and academic/non academic services. There is a need to integrate the database used by the different information systems to form a shared database. With this, there will be a real time update of student and personnel database for every department.

**Review of Related Literature**

Over the past 50 years, a number of different approaches or models have represented AIS. Each new model has evolved because of the shortcomings and limitations of its predecessor. An interesting feature in this evolution is that the newest technique does not immediately replace older models. Thus, at any point in time, various generations of systems exist across different organizations and may even co-exist within a single enterprise.

The **Manual Process Model** is the oldest and most traditional form of accounting systems. Manual systems constitute the physical events, resources, and personnel that characterize many business processes. This includes such tasks as order-taking, warehousing materials, manufacturing goods for sale, shipping goods to customers, and placing orders with vendors. Traditionally, this model also includes the physical task of record keeping.

The **Flat-File Approach** is most often associated with so-called legacy systems. These are large mainframe systems that were implemented in the late 1960s through the 1980s. Organizations today still use these systems extensively. Eventually, modern database management systems will replace them, but in the meantime accountants must continue to deal with legacy system

technologies. The flat-file model describes an environment in which individual data files are not related to other files. End users in this environment own their data files rather than share them with other users. Thus, stand-alone applications rather than integrated systems perform data processing.
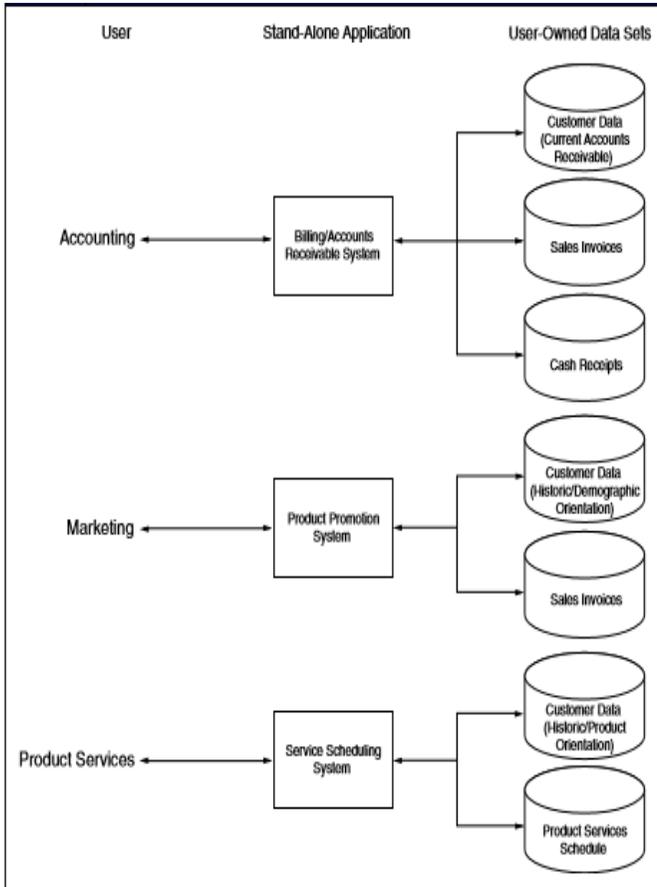


Figure 1 Flat File Model

An organization can overcome the problems associated with flat files by implementing **the database model** to data management. With the organization's data in a central location, all users have access to the data they

need to achieve their respective objectives. Access to the data resource is controlled by a Database Management System (DBMS). The DBMS is a special software that is programmed to know which data elements each user is authorized to access. The user's program sends requests for data to the DBMS, which validates and authorizes access to the database in accordance with the user's level of authority.
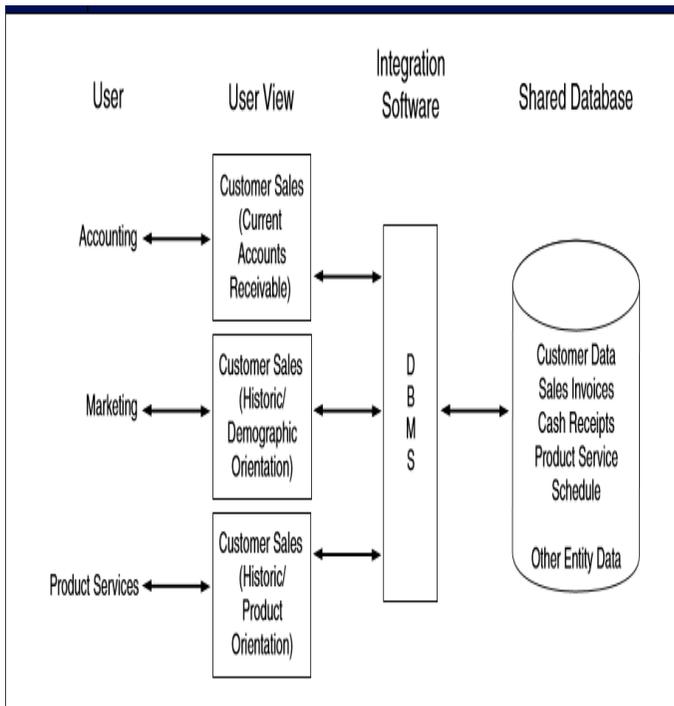


Figure 2. Database Model

**REA model** is an accounting framework for modeling an organization's critical resources, events, and agents (REA) and the relationships between them. Once specified, both accounting and non-accounting data about these phenomena can be identified, captured, and stored

in a relational database. From this repository, user views can be constructed that meet the needs of all users in the organization. The availability of multiple views allows flexible use of transaction data and permits the development of AIS that promote, rather than inhibit integration. The REA model was proposed in 1982 as a theoretical model for accounting.3 Advances in database technology have focused renewed attention on REA as a practical alternative to the classic accounting framework. The following summarizes the key elements of the REA models.

**Enterprise Resource Planning (ERP)** is an information system model that enables an organization to automate and integrate its key business processes. ERP breaks down traditional functional barriers by facilitating data sharing, information flows, and the introduction of common business practices among all organizational users. The implementation of an ERP system can be a massive undertaking that can span several years. Because of the complexity and size of ERPs, few organizations are willing or able to commit the necessary financial and physical resources and incur the risk of developing an in-house ERP system.

**Methodology**

The researcher in his capacity as former Head of the Information and Communication Services was able to gather data about the different information system platform. However, since there might be some new technology implemented a formal interview was conducted with one of the personnel of ICTS Office in the person of Mr. Joemar Dela Cruz.

# Findings

## Table 1 Descriptive Summary of IS Platforms

| Information System/ Business Process | Information | Database Model | Data Storage/Server | Physical and Logical Location |
|---|---|---|---|---|
| PRISM Enrollment | Student, Classes, Grades, Collection, Faculty | Database | Microsoft SQL Server 2012 Enterprise Edition | Server A* |
| PRISM HRID | Personnel Static Information | Flat File | Microsoft SQL Server 2012 Enterprise Edition | Server A* |
| WI-FI Management System | Student, Wi-Fi Log | Flat File | Microsoft SQL Server Database 2008 | Server B* |
| Library | Student, Books, Library Transactions | Flat File | Microsoft SQL Server 2008 Express Edition | Server C* |
| POS System | Bookstore Inventory and Sales | Flat File | MySQL | Server D* |
| Car Sticker Management | Students, Parents, Personnel, Accredited School Drivers | Flat File | Microsoft Access Database | Microsoft Access Stand - alone Database* |
| Property Tagging System | Physical Assets | Flat File | Excel Spreadsheet | Microsoft Excel Database Table* |
| RFID Card System | Student, Personnel and their log | Flat File | MySQL | Server E* |
| IMC Transaction System | IMC materials and Transaction with Students and Personnel | Manual process | Excel Spreadsheet | Paper Based and Microsoft Excel File |

The table above shows a descriptive summary of information system platforms. Their physical location and IP address are withheld for security and confidentiality reasons.

**Interpretation and Findings**

Findings show that the three common information by each information system are students, personnel and properties. With regard to technology, the most common server is Microsoft SQL Server. Using the theoretical framework of an REA Model, the Agents involved in the information systems are the personnel (teaching and non-teaching), students and resources such as the physical assets and academic/non-academic services. However, since each information system does not share the common database mentioned, there is the problem of redundancy which is coherent in a flat file system. The problems is associated with data redundancy as applied in the case of San Beda College Alabang are:

- Multiple update of personnel as well as students and asset information delegated in each department;
- Costly storage and maintenance of information since there are multiple servers involved;
- Task data dependency (formal request of student information and personnel information from the PRISM) instead of having a real time connection in the shared database; and
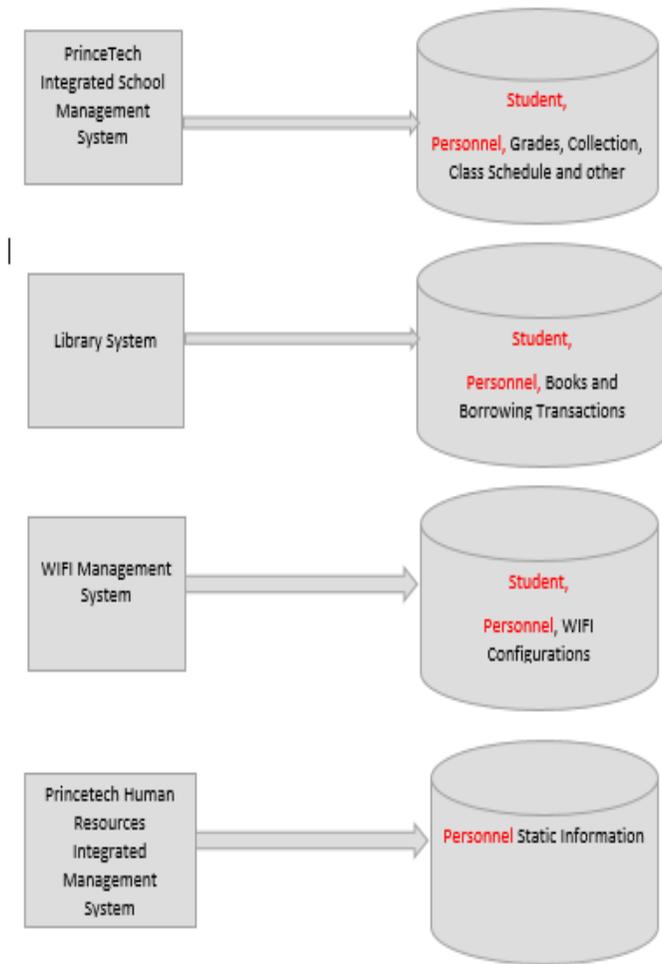- Lack industry standard for a shared and secured database server.

**Figure 3. SBCA Systems with Independent Databases**

## Conclusion and Future Consideration

Based on the technical findings above there is a need to convert the database platform from a relatively stand-alone flat file system to a shared database system. In this scenario, all Microsoft Excel, Access and paper based files will be converted to SQL Server File. However, one complexity of that solution is the overall reengineering of some of the front end application that

will support each of the database systems if they will be converted from one platform to another. One alternative is to design a mechanism to bridge the transfer of information from one database server to another particularly the transfer of information from HRID, Enrolment and Property Tagging Database System to Library, WI-FI, RFID Card and other functional departments. Another alternative in the future is the feasibility study of having a totally integrated system or Enterprise Resource Planning System.

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