



CRIMINAL DATA WAREHOUSE PLANNING  
FOR KWAENG COURTS

by

Mr. Niratt Fukarnchananon

A Final Report of the Three - Credit Course  
CE 6998 Project

Submitted in Partial Fulfillment  
of the Requirements for the Degree of  
Master of Science  
in Computer and Engineering Management  
Assumption University

July, 2000



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Project Title            Criminal Data Warehouse Planning for Kwaeng Courts

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The Graduate School of Assumption University has approved this final report of the three-credit course, CE 6998 PROJECT, submitted in partial fulfillment of the requirements for the degree of Master of Science in Computer and Engineering Management.

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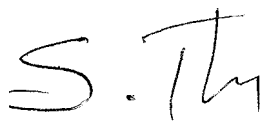
  
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## ABSTRACT

This project presents planning the criminal data warehouse of Kwaeng Court. Data Warehousing is a new way of database technology system. It makes the development of capabilities to handle large volumes of data and statistics efficiently and provides the data integration and the conversion tools so that improving and designing legal information for on-line analytical processing through all of courts in Thailand.

Nowadays Courts of Justice have been facing data chaos and legal data warehouse is becoming more important in this organization for supporting any legal data and statistics system for leaders to analyze and make decisions on judicial strategic plans.

The study of this project begins with presenting the existing system of Kwaeng Court and analyzing the weak points of the criminal information system. After that the project defines the types and kinds of criminal data and statistics of Kwaeng Court that are strongly required for the administrators. As for gathering these legal information need, the project also has gained widely in the concepts of quality improvement and discussed the statistical methods in making quality for legal information system management. In the aspects of planning the warehouse system, the project shows each step of developing the criminal data warehouse and establish its development processes.

The project believes that legal data warehousing is the effective method for developing the decision support system and the analytical information system of Courts of Justice so that judicial administrators can apply any legal information in analyzing the situations and decision on plans.

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# I. INTRODUCTION

## 1.1 Background of Project

We are here in the information technology age and today the information system is a 'part of most organizations. Without the information systems, there would be no business. The key elements of an organization now are its people, structure and operating procedures, politics, and culture. In addition, it includes management information systems. Information systems technology is one of the many tools available to managers for executing with the change. Many corporations are actively looking for new technologies that will assist them in becoming more profitable and competitive.

More important today, database system technology is the glue that holds the organization together. It is the instrument through which management controls and creates, it is an arrow in the manager's quiver. Most organizations build up database systems and management information systems for the decision support in a business environment. But each level of management has different information needs and information system requirements.

Interestingly, advances in database technology now make the development of a data warehouse providing credible and timely decision support information feasible. The modern database system, a data warehouse, is providing new capabilities to handle large volumes of data efficiently, as well as indexing strategies to retrieve data more efficiently and quickly. Data integration and conversion tools have improved and designing the database for On Line Analytical Processing moves any data through all the appropriate stages of life cycle for the development of your data •warehouse to be successful.



As for Courts of Justice of today, we need the decision support systems. Because the decision support systems provide legal data and statistics of courts to the judicial administrators so that they can analyze a situation and make the decisions on weak points or problems of courts, and write strategic plans. Decision support systems are legal information systems, but they are analytical systems. Analytical systems provide critical information used for analyzing any problem or situation. Their processing are primarily done through comparisons, or by analyzing patterns and trends.

Certainly, with my experience accumulated for almost one year as a judge and the director of judicial information service center, Ministry of Justice, I can dare say that Courts of Justice now needs the legal data warehousing. And after two years on the CEM course, we are more convinced of these thinkings, and would like to make the project.

## 1.2 Objectives

The legal data warehouse systems provide analytical information systems and the decision supporting systems On Line Analytical Processing. These legal information systems can support any management decision making. However to build up the data warehouse of courts for the quality information systems, the project should examine the systematical thinking. Thus this project has four main objectives as the following;

- (a) Presents the existing system of courts and analyzes the weak points of the legal information system.
- (b) Defines the types and kinds of legal data and statistics in the court that are needed for the administrators.
- (c) Creates a project plan and displays each step of developing the data warehouse of the courts. In particular, it also includes the establishment of the legal data warehousing development process.

(d) Finally, the project will show some of the advances and benefits on the designed information system.

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### 1.3 Scope

Courts of Justice are a large organization. And under the present system, there are three levels of courts. For example, The Court of First Instance, The Appeal Court, and The Supreme Court. Furthermore, in each level of court there are also several kinds. Court of First Instance,, includes Kwaeng Courts, Provincial Courts, the Civil Court and the Criminal Court, the Juvenile Courts, the Labor Courts, or the Tax Courts. Creating the legal information systems for quality, is the journey, not the destination.

Plans to build the data warehouse systems, it should be started by studying, analyzing, and creating the legal information systems of the small courts, after that planning to make them continuously be come other large ones. Thus the scope of the project is limited on developing the legal data warehousing of Kwaeng Courts.

Moreover, although Kwaeng Courts exercise in all Civil and Criminal cases, another scope of the project is also based on studying, analyzing, defining the legal data and statistics requirements of Kwaeng Courts in the procedures of the criminal cases only, and does not includes the civil cases.

## II. LITERATURE REVIEW

### 2.1 Data Warehouse Concept

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Data chaos crisis exists in almost every organization. Many organizations are not aware they have data chaos. Data chaos is the result of many years' accumulation of disparate data. Disparate data are data that are essentially not alike, or are distinctly different in kind, quality, or character. They are unequal and cannot be readily integrated to adequately meet the business information demand. In other words disparate data are ambiguous and unclear. This crisis that most organizations face today is rapidly increasing that conflict with an urgent need to integrate current and accurate data to support changing businesses needs. It means that any business cannot hide from the disparate data problem for long and still expects to survive. However, today some organizations recognize this data crisis but others do not. The bad new is that disparate data are being produced faster than they have ever been produced before, and few enterprises are doing anything about this chaotic situation.

Nevertheless, nowadays we are here as a result of computer and communication technologies. Many different information technologies are evolving. Each of these technologies promise tremendous benefits if it is implemented properly. As for the database system technologies at the present time, there is a new way of database technologies namely the Data Warehouse System.

A data warehouse, in popular meaning, is usually defined to be a subject-oriented, integrated, time variant, and non-volatile collection of the data in support of management's decision making process. (Barquin & Edelstein 1997)

Subject-oriented means the data warehouse focuses on the high-level entities of the business, in higher education's case, subjects such as students, courses, accounts, and

employees. This is in contrast to the operational system, which deals with processes such as student registration or rolling up financial accounts.

Integrated means the data is stored in a consistent format. For example, naming conventions, domain constraints, physical attributes, and measurements. Production systems may have several unique coding schemes for ethnicity. In the data warehouse, there is only one coding scheme.

Time-variant means the data association with a point in time. For example, semester, fiscal year, and pay period.

Lastly, non-volatile means the data do not change once it gets into the warehouse. (Single 1998)

The new database system is playing more important roles in many organizations for storing historical data to analyze trends and make decisions regarding business alternatives. Considerable information is available for evaluating the need for current, accurate, and integrated information. Some of them are more popular for management of time-variant data in order to analyze business trends and make projections. And it provides an opportunity to bring large quantities of data together and summarize data to high levels of generalization or to drill down to lower levels of details. In other words, data warehousing is the process whereby organizations extract value from their informational assets through the use of special stores called Data Warehouse. (Brackett 1996 )

Generally, data warehouse system is the new way to handle the information systems for quality. Data Warehousing has been taking the information industry by storm, and it is now poised to transform it. The warehouse is becoming the standard choice for delivering information to users throughout the enterprise and leading the charge are starting the new heroes within the companies. (Barquin & Edelstein 1997)



Modern information management system, the data warehouse, are happening because of the broad needs for competitiveness are rapidly conveying with' the availability of new client and server technologies and parallel database machines. These technologies and machines can harness the transactional data assets of organization and enable decision-making grounded on an enterprise-wide or department-wide information base. At the center of this revolution is the concept of data warehouse, which provides the infrastructure and enabling technology for business process reengineering and other mission-critical decision support and client support system.

As for the warehouse database architecture, it should be noted that data warehouse has a distinct structure. There are different levels of summarization and detail that describe the database systems. The components of the data warehouse are;

**(1) Current Data**

Far and away the major concern is the current data. Such as:

- (a) Reflects the most recent happenings, which are always of great interest.
- (b) Is voluminous because it is stored at the lowest level of granularity.
- (c) Is almost always stored on disk storage, which is fast to access, but expensive and complex to manage.

**(2) Older Data**

This data is infrequently accessed and is stored at a level of detail consistent with current detailed data. While not mandatory that it be stored on an alternate storage medium, because of the anticipated large volume of data coupled with the access of the data, storage medium for older data is usually removable storage such as an automatic tape library.

and data mining tools and have full use of multimedia to enhance their ability to act effectively on information and decision support systems. (Yazadani & Wong 1998)

The data warehouse is a key enabler of an exciting new technology called data mining. Data mining automatically recognizes patterns in the data to help you describe existing data and predict future behaviors based on current characteristics. Essentially, it is a way of answering questions you did not know enough to ask.

Furthermore, data warehouse gives you multidimensional view from relative databases. Multidimensional views of data store allow users to look at details and aggregates of business measurements. Measurement or fact is the number that quantify what the business process is doing, such as money sales, unit sales, or number of employees. (Yazdani & Wong 1998)

Dimensions are the attributes that describe the measurements such as product, sales unit, or time. These dimensions may have hierarchical relationships such as:

- (1) Product: category, packaging, brand.
- (2) Sales unit: region, state, office, person.
- (3) Time: year, quarter, month, week, day (Barquin & Edelstein 1997)

Benefits of a data warehouse, data warehousing improves the productivity of corporate decision makers through consolidation, conversion, transformation, and integration of operational data and provides a consistent view of the enterprise.

Examples of tangible benefits of a data warehouse initiative are:

- (1) Improved product inventory turns.
- (2) Decreased costs of product introduction with improved selection of target markets.

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(3) Determination of the effectiveness of marketing programs, allowing elimination of weaker programs and enhancement of stronger ones. (Yazdani & Wong 1998)

In addition to the evolution of information technology system, such as Data Warehousing, it has been charts from the era of Electronic Data Processing (EDP) with its operational focus on automation to management information system (MIS) which is producing some information but with strong focus on control. Data warehousing is the decision support system (DSS) which is addressing the productivity of knowledge workers by aiding less structured decision making. The role of information technology has always been to help organizations solve critical business problems or deliver new services by collecting data and statistic, turning them into information and turning information into knowledge quickly enough to reflect the time value of knowledge. (Kelly 1996)

End-users will need to apply the data warehouse to their specific tasks. The tools for the development of applications, the decision support and executive information systems are, again, a critical aspect of a data warehouse. Furthermore, a data warehouse without a DSS / EIS front end to assist end-users in making decisions about the business of business is probably an unsuccessful data warehouse.

Simply stated, data warehouse is a concept that provides a business solution to organizations. It is the method of storing historical and integrated data for use in decision-making systems and holds the promise to transform data into knowledge to help businesses complete. The data warehouse capabilities are to collect and store data of all kinds to analyze, summarize, and extract the knowledge from this data.

## 2.2 Why Do the Courts of Justice Need Legal Data Warehousing?

Under the present Constitution, the Kingdom of Thailand provides important roles for Courts of Justice to promote and take action to keep the justice achieve the social goals for Thai people. These roles have been constructing the troublesome responsibilities for the leaders of the administrative control sections or the top managers of the Courts to enhance capabilities to handle the large organizations as the Courts of Justice. The high demand for legal data and statistics of courts are needed urgently. Courts need to establish the next criterion for our definition of a legal data warehouse.

At this time planning to build up the legal information center or the legal data warehouse of courts are extremely important. And then collecting legal information from a lot of disparate sources, analyze and use data or statistics to create strategic plans and make any projects to finish the judicial goals defined by the constitution for Thai people. In other ways, we are talking about using legal information systems in the best way by creating the right legal information in the right form at the right time. Now Courts of Justice must use legal information systems to be a weapon to achieve judicial goals and we dare say that legal data warehousing of courts is the best way to do so.

Look closely into the internal organization, Courts of Justice are now divided into three tiers namely, Courts of First Instance, The Courts of Appeal, and The Supreme Court. And there are a lot of courts around Thailand and each court also has many cases that judges must run or make decisions on cases both the civil and the criminal areas. In addition Courts of Justice also consist of the Office of the Secretary, the Office of the Judicial Affair, and the Legal Execution Department. These sections are responsible for service and support the administrative works of courts. Therefore, not only Courts of Justice are large organizations but also are more multifaceted.



The handling of legal information systems at the present time is poor and the technologies used are out of date. Traditional methods of legal information analysis, based on human handling directly with the legal data and statistics database systems are available. Then it can not help the minister or the managers of Courts understand and analyze large bodies of legal information which remains the difficult and unsolved problems of Courts. Data chaos crisis exists in the organization is free from doubt.

Existing operational systems of Courts today cannot meet the legal information system for quality. Because we lack on-line historical data, the data required for analysis resides in different operational systems, the query performance is extremely poor which in turn impacts performance of operational systems, the operational DBMS designs are inadequate for decision support. Once, the concept of a data warehouse has been adopted, Courts of Justice should have the analytic support systems and decision-making systems by creating an integrated legal data and statistics of consistent, subject-oriented, historical information. In particular, in Chapter III, we will show the critical areas or weak-points of the existing information system of Kwaeng Courts.

Significantly, legal information systems of Courts themselves can help contribute to success in a firm. It means using the legal information systems as competitive tools to take many forms and increase revenues, open new judicial strategies and goals, provide better services and time savings, reduce expenses and productivity gains are associated with using legal data warehouse for proceeding on cases. (Mensing & Adams 1991)

We would like to say that Courts of Justice now face these disparate data crisis and need a new way to handle the amount of legal data and statistics. Not much time is available to understand, evaluate, and completely implement the needs before the damage wave arrives. Courts of Justice require quality legal information systems and abrupt legal data warehousing of all courts should start now and here. Data warehousing

of Courts is the process of integrating enterprise-wide corporate legal data and statistics into a single repository from which the minister or leaders of Courts can easily" run queries, make reports, and perform analysis to manage and solve the problems on each part of the internal organization. In a nutshell, it means that Courts must use legal data warehouse systems mapping and analyzing the internal problems and solve them.

When we look over the courts, the business environment today is changing rapidly, and both the rate and magnitude of change are constantly increasing. These changing excessively effects the roles and working of courts. Courts of Justice are evaluating their judicial proceeding and making changes in position. Courts are analyzing what lines of judicial proceeding they want, or are required, to have and what activities are needed to support those lines of judicial affairs effectively and efficiently. Changing judicial businesses require the abilities to understand and integrate disparate data within Courts of Justice and adjust to the new way for their legal information systems. The successful data warehouse systems are needed for the courts. The leaders of Courts of Justice should believe these.

Technically, data warehouses provide the primary support systems for on-line analytical processing, decision support system, and executive information systems. For instance, the Intranet Data Warehouse is a way that provides the tools needed to access and analyze legal data and statistic inform of Online Analytic Processing (OLAP). The broad OLAP gives four separate capabilities of these analytic functions: Query and Reporting, Multidimensional analysis, statistical analysis, and Data mining for the leaders of Courts. (Tanler 1997)

These information systems provide legal statistics and data or analytical information system for the managers of courts so that they can analyze the situation and make decisions on the judicial strategies and plans. The decision may be long-term

strategic decision-making, such as plans to build new courts. Decision-making could also be short term and tactical in nature, such as annual plans to remove the judges. Analytical information systems are systems that provide essential data and statistics used for analyzing the problems and situations of Courts. Analytical processing is primarily done through comparisons, or by analyzing patterns and trends.

As to achieving the quality of legal information systems and to finish the goal of the court organization followed by the Constitution, Courts of Justice of today have to design the plans and projects to build up Data Warehouse for legal information systems of courts. These mean that the leaders of the judicial administrative sections must make understanding about the warehouse' concepts. Study types of legal data and statistics systems that managers of Courts need to know for support the decision-making of the judicial management and write strategic plans to collect them effectively. After that design the decision support environments or the computing environments in which the legal data warehouse will operate.

Legal Data Warehouse of Courts of Justice should have three primary uses for the leaders.

First, it is used for making standard reports and graphs.

Second, it provides any type of query and reporting, which also facilitates comparing results across different dimensional values, especially time periods.

Lastly, the data warehouse is a key enabler of the exciting new technology called data mining. Data mining automatically recognizes patterns in the data to help the leaders or the administrators describe existing legal information and predict future behaviors based on current characteristics. It is a way to answering any questions judges did not know enough to ask. (Barquin & Eldelstein 1997)

Furthermore, the legal Data Warehouse provides different levels of summarization and details that describe, the components of warehouse database of Courts are divided into four kinds of data as follows. (Single 1998)

- (a) The Current Legal Data and Statistics
- (b) The older Legal Data and Statistics
- (c) The summarized Legal Data and Statistics
- (d) Metadata

The Current data shows the current legal statistics and information of all Courts to support the top and middle managers for making the decision in managerial ways.

The older data offers the yearly historical data of Courts so that the manager of Courts can analyze trends to handle judicial administration such as changing the statistics of criminal cases of all courts in ten years.

Both current and old data are used for the presentation of standard reports and graphs.

The summarized data, also support a type of query and reporting called dimensional analysis, which greatly simplified looking at legal data summaries across the number of important attributes called dimensions. This capability is useful when the Court managers try to answer the questions about why something happened as opposed to what happened. For example, why are some cases tried so late?

And finally Metadata, it is data about data. Metadata is used as the directory to help in locating the contents of the legal data warehouse. On the other hand, it is a guide to mapping of legal data as the data is transformed from the operational environment to data warehouse environment.

The new legal database system of data warehouse are providing new capabilities for managers of Courts to handle large volumes of legal data efficiently, as well as



indexing strategies to retrieve legal data more efficiently and quickly. The significant advantages of this legal data warehouse are they support strategic decision-making, support integrated judicial administration value chain, empower workforce, speed up response time to business queries, data quality, document organizational knowledge. This success of data warehouse is built not on specific technologies or platforms, but on finding the appropriate solution to judicial problems. All the above- mentioned project shows in detail why Courts of Justice need legal data warehousing urgently.

### 2.3 A Road Map to Data Warehousing

A road map is valuable for whoever has an idea where they would like to travel, a data warehousing of own business.

Commonly used, for data warehouse project. There are a two-stage approach to categorizing the data warehouse that medium and large organizations are currently exploring, Data warehouse in the most appropriate or all of these categorize.

First, project should display the categories defined by types of information users needed and the computing environment in which the data warehouse will operate.

In addition, the first two decisions that will define the data warehouse project are: (Barquin & Edelstein 1997)

- (1) Whether to acquire new computers or use existing hardware and
- (2) What information is needed on the new system designed to meet. The term "virtual warehouse" describes the time-tested environment in which users gain query access to operational system

This approach continues to provide value in organizations that have sufficient processing power on their mainframes and departmental transaction systems. Some retail organizations, for example, perform transaction processing at night and have excess capacity during the day. But as the benefits of data mining and complex historical

pattern analysis become better understood and as the number of potential users grows from a dozen to a thousand, new equipment becomes inevitable. Thus in time, most organizations will migrate part or all of their data warehousing activities to computers dedicated to data warehousing or data mining tasks. When operational data is mirrored on a separate computer for decision support, it is called an operational data store.

When extensive historical data is maintained, well beyond that in the operational system, the new system is usually called a data warehouse or data mart. (Barquin & Edelstein 1997)

Second, project shows how the size of project budget and the focus of responsibility for that budgets, affect the types of warehouses that is being built. (Barquin & Edelstein 1997)

For those who have made the decision to build a data warehouse of any company, the choice between a data mart or data warehouse are two usually not controlled by technological considerations. Rather, the controlling factors are size of budget and the responsibility for that budget. Where budgets are smaller or where control is in user departments, data mart and distributed data marts become far more common.

The differentiation between a data mart and an enterprise data warehouse is focus. Data marts are usually single-department warehouses containing a small number of subject areas. Enterprise data warehouses are grand schemes to bring all decision-making data together from across the organization.

Multi-tiered data warehouses are combinations of enterprise data warehouses and data marts. The data marts are fed from transaction systems through the enterprise data warehouse and also from data that has never been in transaction systems.

Distributed data marts are collections of departmental data marts, sometimes centrally managed, but without a central core of data. They occur when multiple departments decide to build data marts independently. (Barquin & Edelstein 1997)

Whichever approach you take enterprise data warehouse, data mart, distributed data marts, or a multi-tiered data warehouse, you will face a series of questions as follows:

- (1) How do you, justify the warehouse?

Ways to justify a data warehouse are to use generations. The most common ways are to save money, to speed information retrieval, to become better quality, to improve the proceedings through improved access of the data and statistics, and the all time favorite for this type of system, to improve decision-making of leaders.

- (2) Data organization and migration:

Where do the data originate? What extracts the data, transforms it, and cleans it ? What middle ware links the sources with the warehouse?

- (3) Database management, hardware and networking:

In what database are the warehouse data stored? On what computer systems are the data stored?

- (4) Information analysis and delivery:

How do people find the information they need? What special techniques speed the retrieval? How is the data delivered to end users? query and reporting systems? multi- dimensional database systems? Relational On-Line Analytical Processing (OLAP) systems? What development tools create applications for an Executive Information System

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(EIS) and a Decision Support System (DSS)? How is value added through alerts?

(5) Management:

What manages the process? What manages the systems? (Barquin & Edelstein 1997)

However, you must understand that data warehousing is a journey. It is not the destination. Getting started on legal data warehouse of Courts should be done step to by step. It should be approached convincingly and must be continuously improved. As for Courts of Justice, the data warehouse is, in brief, the knowledge of legal data and statistics systems. The future holds great potential.



### III. THE EXISTING SYSTEM OF KWAENG COURTS

Building the data warehouse for decision support systems, project should be approached on two serious stages. Defining the types of information requires and choosing the computing environment of data warehouse. As for planning of the criminal data warehouse of Kwaeng Courts, this project should study the existing system of Kwaeng Courts of today. The systems mentioned include overview of the court, the current criminal information system, and identifying the critical weak points of the existing legal database systems for those who have made the decision can draft a good plan to build the criminal data warehouse project.

#### 3.1 The Basis Roles of Kwaeng Courts

The main roles of Kwaeng Courts is to exercise in all Civil and Criminal cases, but not including bankruptcy and disposal within its jurisdiction. The jurisdiction of Kwaeng Courts is local and limited. It means that Kwaeng Courts are to dispose criminal matters which run on the criminal offences punishable with a maximum of three years imprisonment and fines not exceeding 60,000 bahts or both. As for the civil matters, Kwaeng Courts rule the civil cases where the amount of claim does not exceed 40,000 bahts.

Generally to try or make the decision on each civil and criminal case, Judges of Kwaeng Courts sit singly. However, in criminal cases where a judge needs to determine the imprisonment on each case for more than six months, it must have another judge to sign on the judgement together. Usually, there are at least two judges in each Kwaeng Court. But where the works or cases are load, heavy and continuous, more than two judges could be appointed in that court. For example, Kaweng Dusit Court now has nine judges to try the cases.



And when judges of Kwaeng Courts made decision-making on the cases, the parties in cases who do not agree with the judgements, are able to appeal them to the Appeal Court and continue to the Supreme Court under provisions of the law. The appeals from their decisions lie both on questions of law and on questions of fact.

As for management system of these Courts, Kwaeng Courts has a Chief judge who has direct responsibilities both for the general administrative works of court and the administrative works on case system. In other words, the Chief judge is the top manager of Kwaeng Courts. However, in aspects of administrative works of court, he has a registrar who is responsible to him and takes any action on the administrative works.

At the present time, there are more than 27 Kwaeng Courts in Thailand, six having jurisdiction over the areas of Bangkok, and twenty over the certain districts in the provinces where the volume of litigation is large. (Annual Judicial Statistics 1993-1996)

### **3.2 Structures and Functions**

The organizational structures and functions of Kwaeng Courts can be divided into two main sections as the following:

- (1) One is The General Administrative Affair Section
- (2) Another is The Section on Case

Chief judge must take two momentous roles. Notwithstanding, the sections on case, there are at least two judges or more to help him to handle the procedure of any cases in court. And in the administrative affairs section, there is a registrar and his staffs who are his assistants to control and monitor the administrative works of court and directly report, but the registrar does not have judicial powers to decide cases.

The General Administrative Affair Section

Each Kwaeng Court has administrative affairs to be performed by the court staffs headed by the registrar under the supervision of the secretaries of court who are

officially responsible to the Chief judge. The administrative affair section has a serious role to support and promote the processes of any case in court. This section looks like the secretarial-section of court. Its duties include the service of documents and taking of evidence to judge, parties and related-persons, and accounting of court. In criminal case it also involves the procedures for the receipt and delivery of prisoners.

The Chief judge has full powers to issue some regulations for administrative works of court, for example to issue the order about keeping, custody and disposal of case-list or judgement-list or other lists of court and of all files of cases.

In this section, it can also be divided into two parts as the following:

(a) The Case Administrative Work

This part has the important roles to sustain the proceeding of judges on cases in court. Broadly stated, the administrative work supports the proceedings of cases. Their main functions are in details as the following:

(1) Admission of complaints

The Admission is responsible for receiving all of complaints, answers, or motions filed with the court of the parties.

(2) Warrants and summons

This handles all warrants and summons issued by court under the provisions of the codes.

(3) Record file of cases and related-documents

To keep custody, and disposal of files of cases and other judgement, documents, and to keep together, in the file, of cases, the memoranda and documents submitted to or drawn up by the court and the orders and judgements of the court and to keep them in safe custody.

(4) Court clerks recording

The work is the personal secretary section of the judge's. In sitting, by court with respect to the trial of cases, such as for setting issues, taking evidence, making inquiries, hearing applications and oral argument. There are court staff as the private secretary of each judge to take care of service of document and evidence.

(5) List and judgement

Typing all judgements of court, collecting and keeping. The work includes to making copies of judgement and orders disposing of cases and to keep them in their order and in safe custody. In addition, some staff are responsible for recording the judgement-list of such court in all cases.

(6) Public relations

Public relation takes care of advertising the quality information of court to parties and any, persons who come to court. Furthermore, this work has also another important duty about handling the bail contracts to judges.

(b) The General Administrative Work

This work is like the general management section of most organizations, because it takes care of the accounting and notifications of court.

(1) Accounting Work

To handle account and is responsible for money of court.

(2) Notification and Statistics

To collect and keep any notices and recording all statistics of court, and send them to the judicial information service center.

The Administrative Affair Section

Chief Judge



Figure 3.1. The Administrative Affair Section.

## (2) The Section on Case

The most important part of every Kwaeng court is the section on Cases, because Judges in each court have main responsibilities for hearing and make the decisions on cases. The section relates to any act done by a judge or the order of a judge as provided by the Procedure Code. In particular, it involves a wide range of proceedings which includes the submission of a plaint to a court for acknowledgment, protection, or enforcement of a right or duty. It is the whole proceeding in any court prior to the adjudication or disposal of a case by judgement or order of such court.

The hearing of any case in courtrooms shall take place in the presence of the parties attending the court and in open court. Judges shall proceed with the hearing of any case without adjournment until the trial is over and judgement given. The Civil and Criminal Procedure Code of Thailand govern the procedure of legal execution in courts.

In a Criminal Case where the charge is found to conform with law. Court must make a preliminary examination in case where a person is the prosecutor. But where the case is entered by the Public Prosecutor, court need not hold a preliminary examination.

As for Kwaeng Courts, the case section is same as the above. But it should be emphasized that Kwaeng Courts dispose of small cases, civil case where a mount of claim does not exceed 300,000 bahts and criminal case with maximum of three years imprisonment and fine not exceeding 60,000 bahts or both. And the procedure in cases is so quick and easy. Only a judge can make the legal decision in the case.



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## The Section on Case

Chief Judge

(Top Manager in the Kwaeng Court)



(to dispose small cases quickly and jurisdiction is local and limit)

Figure 3.2. The Section on Case.

### 3.3 The Computer System of Today

Nowadays Kwaeng Courts use the computer and information technologies to handle any working system, but it is also in the period of the getting started.<sup>4</sup>

The court staffs have used the computers and some applications such as Microsoft Word, Microsoft Access, Microsoft Excel to operate and run their tasks day by day. Furthermore, Kaweng Courts of today develop the internal network computer system and make easy database, RDBMS, to record the essential information of court. These information usually assist the court staff in making the decisions and running their jobs more effectively and perfectly.

To make the understanding of the computer systems of Kwaeng Courts, the project will present details as the following:

(1) The server computer

Microprocessor of the server is the pentium MMX 200 Mhz, 64 MB Ram, 512 KB cache memory. Hard disk can fill 4 GB with the controller of Utra SCSI-III.

(2) The client computers

Microprocessor of the clients is the pentium MMX 166 Mhz, 64 MB Ram, 512 KB cache memory. Hard disk can fill 4 GB with controller of Utra SCSI-III.

(3) The network architecture

Kwaeng Courts now have set up the new internal network system. The type of the network is the local area network or LAN and the Star Network Architecture is used. It means that there is a hub that is responsible for running the internal network of court and all messages are routed through the center computer or the server computer. Commonly, there is a server

computer and it is down in the room of the registrar. As for the client computers, there are four or five computers in each Court. These computers are generally settled in the administrative affairs section. For example, Admission of Complain, Courts Clerks Recording, Lists and Judgement, Accounting, or Public Relation. It should be noted that there is now no internetworking between the courts.

(4) The network software

Network Software of courts use Microsoft Window NT server 4.0 to connect internal networking system.

(5) The database software

The database of court is Microsoft Access 2.0. Today the Courts use the Relation Database Management System or RDBMS of Microsoft Access to design the information system of courts. The data and statistics collect information and set up the relation of these tables by determining the many-to-many of relation.

(6) The software applications

Microsoft Word, Microsoft Excel, Microsoft Power points are the favorite applications that court staff often apply to do their tasks such as making the documents or the reports.

### 3.4 The Criminal Data and Statistics of Kwaeng Court

The main concepts in collecting and storing of the criminal data and statistics of Kwaeng Courts are based on the cases and theirs procedures. The annual statistical reports made by judicial information service center made to the Ministry, show important matters of these data and statistics as the following:

### (1) Figure of cases

Data and statistics show the figures of the criminal cases in details on four important areas below:

- (a) Pending cases from previous years
- (b) The new cases
- (c) The cases disposed of
- (d) The Pending cases for following year

In addition, Statistics of criminal cases submitted to Kwaeng Courts is classified by offences. And the offences also are divided into two kinds such as the offences under the criminal code and the offences under other legislations.

Offences under the criminal cases show, for example, statistics of:

- (a) Against the King
- (b) Against internal security of the Kingdom
- (c) Against the friendly relations with foreign states
- (d) Against officials
- (e) Malfeasance in office
- (f) Against the judicial officials
- (g) Relating to religion
- (h) Secret society and Criminal Associations
- (i) Breach of the peace
- (j) Arson and causing explosion
- (k) Relating to causing public danger
- (m) Relating to currencies
- (n) Relating to seals, stamps and tickets

(o) Relating to documents

(p) Relating to trade

Rape and indecent acts

Offences relating to sexuality under section 282-287

Murder under section 288-289

(a) Against life ( murder not included )

(b) Against bodily harm

(c) Abortion

(d) Abandonment of children, sick or aged persons

(e) Against liberty

(f) Disclosure of private secrets

(g) Defamation

(h) Theft and snatching

(i) Extortion, blackmail

(j) Robbery

(k) Gang-robbery

(m) Cheating and fraud

(n) Cheating against creditors

(o) Misappropriation

(p) Receiving of stolen property

(q) Damage of property

(r) Trespass

(s) Petty offences

Offences under other legislations show, for example, statistics of:

(a) Act prescribing wrongful act of certain juristic persons



(b) Drug offences act

- (1) heroin
- (2) opium
- (3) morphine
- (4) marijuana
- (5) narcotic substances
- (6) Alcohol act
- (7) Gambling act
- (8) Revenue code
- (9) Customs act
- (10) Tax and duty laws
- (11) Conscription act
- (12) Firearm, ammunition, explosives, firework and imitation firearm act
- (13) Registration of Alien act
- (14) Scales and measurement act
- (15) Printing control act
- (16) Public health act and contagious disease control act
- (17) Forestry act, preservation of national forests act national parks act
- (18) Fishery park act
- (19) Mineral act and tin control act
- (20) Land traffic act
- (21) Automobile act, vehicle act and land transportation act

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- (22) Thai vessels act, sailing in Thai territorial waters act and prevention of vessel collision act
- (23) Anti- prostitution act
- (24) Immigration act
- (25) Act governing criminal liability of cheque transaction
- (26) Other offences

Moreover, statistics also show some details of alleged offences and convicted persons. For example;

Sex, show male or female

Age, show age that is not over 14 years of age, over 14 years, etc.

(2) Reports show the duration of arrears

The reports divide these data and statistics on seven areas as the following:

- (a) Not more than six months
- (b) More than six months, but not more than one year
- (c) More than one year, but not more than two years
- (d) More than two years, but not more than three years
- (e) More than three years, but not more than four years
- (f) Four years to five years
- (g) Footnote

(3) Reports show the reasons of arrears

The reports divide these data and statistics into nine areas as the following:

- (a) Service of the summons to answer on the defendant
- (b) Preliminary examination

- (c) Taking evidence
- (d) To sent the point of case to other court
- (e) Mapping
- (f) Waiting the other cases
- (g) Provisional strike the case out
- (h) other reasons
- (i) footnotes

(4) Reports show the works of judges

The works can be shown as the following:

- (a) Name of judge
- (b) Examination of the plaint or the request
- (c) Cases in arrears from previous month or new cases
- (d) How many numbers of taking evidence
- (e) Cases finished (by judgment or order, compromise, abandonment or withdrawal of plaint)
- (f) Cases in arrears for following month (not more than three months, more than three months, six months, one year, and two years)
- (g) Footnotes

(5) Territorial jurisdiction of courts

It shows territorial areas of jurisdiction of the new cases and some footnotes.

(6) Reports for requests of the power to grant monthly

It shows in details of the requests in arrears, the new requests, and for the following month.

- (7) Reports for requests of the charge delay monthly

It shows in detail of the requests in arrears, new requests, and for the following month.

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- (8) Reports for any cases that judges make the search with a warrant between investigation and inquiry. It shows in detail the kind of case, numbers of cases, cases that permit or not permit, persons who request to make a search.

In addition, the criminal data and statistics show the managers of courts by three months, six months, and a year. These reports present the summary of data and statistics of all Kwaeng Courts.

### **3.5 Judicial Information Service Center**

Today Courts of Justice has the Computer Center or the Judicial Information Service Center, and located within the Ministry building, is the center of collection for legal data and statistics. It is divided into four sections, namely:

- (1) The Administrative Work Section
- (2) The Data Preparation and Microfilm Section
- (3) The System Development Section
- (4) The Operation Section

Fundamentally, this center has main responsibility to collect and store any legal data and statistics of all courts, and after that summarizes them including making some annual reports to the Minister, the Permanent Secretary and his staff, Chief judges, or the related managers. The reports are usually structured every three and six month or by each year.

### **3.fi Methods of Gathering the Legal Information**

The traditional methods to collect the legal data and statistics of all courts now are mainly based on the humans dealing directly with the legal information.

Commonly, there are two steps methodically to get the legal information of all courts as the following:

(1) Stages of Kwaeng Courts

These stages are the collecting and storing the legal data and statistics in the Kwaeng Courts. In particular, it means that the officers of Kwaeng Courts whom the registrar assigns take care of these responsibilities, have to gather any ,data and statistics of the court following the special formats of each. After finishing it the related officers must summarize them as the new ones, the statistical documents, and transmit to the judicial information service center. And every step of the gathering of the legal information is done by hand on papers. The staff will make the reports and send any statistical document to the judicial information service center every month.

(2) Stages of the Computer Information Center

After the judicial information service center, the second step, already received any statistical document from all Kwaeng Courts. Subsequently, the statistical staff of this center will analyze and summarize the statistical documents of all Kwaeng Courts. What makes the new special reports explaining the overview and some details of the legal information system required to the Minister, the Permanent Secretary, Chief Judge of Kwaeng Courts, or related- others. The special statistical reports show the legal data and statistics every three and six months, or by each year. All stages of collecting and recording the statistical data have also been done by hand on standard papers.



### 3.7 The Weak Points of the Information System

Gathering methods of the traditional information system now are based on human operations. Although both Kwaeng Courts and the judicial information service center have had some computer machines, they haven't used them to collect the legal information of courts systematically. Handwriting on the special statistical formats has also been applied at the present time. As a result of these, the project found three serious problems on the traditional methods as the defined areas below:

#### (1) Area of computer environment

The computer system of Kwaeng Courts now apply only to four or five computer machines to set up the network system or LAN system of the courts. One is the server computer and the others are the client computers. However there are more than five functions within each court. Therefore we can see a problem about the lack of computer machines arising, because the information technology systems or the computing systems of Kwaeng Courts of today are not enough to support all functions or the internal working system of courts. Designing the criminal data warehouse of Kwaeng Courts, the present information system has been evaluated and it has been determined that additional computer machines and other hardware must be acquired and replaced. And the hardware acquisition should support to the satisfying of data warehouse software needs.

An aspect of the database software, Kwaeng Courts now have operated information with Microsoft Access 2.0 and setting up the current database system of courts. This database is just like the relation database management system or RDBMS. RDBMS tools appropriate to the small organizations or the personal levels. While data warehouse software has the multi-dimension

database management system or MRDBMS. The multi-dimension prepares any special tools handling the deluge of legal information and massive amounts of data and statistics and provides the recent effective ways to gain and sustain the advantages of legal information systems.

To plan the criminal data warehouse of Kwaeng Courts, it must be stressed that software is the heart of data warehousing. However the acquisition ,of data warehouse software can be substantially more complex than the acquisition of hardware. There are more aspects to the data warehouse software acquisition process. Project must plan to purchase warehouse software from a vendor and design, implement, and install them directly in information system of courts.

## (2) Area of the Management and Engineering

Traditional management and engineering to gather the legal information systems of Kwaeng Courts now are breaking down. The failure of the judicial information system staff to communicate with its user community can be a serious problem. Historically, the lack of communication has caused friction between the computer center area and court staff The judicial information service center can be a very powerful tool. It allows continuous contact between them and offer training sessions for the users. In addition, there are no standards and procedures exactly established for the related-staff in order to meet the quality of information system management. Standards and procedures include programming and documentation standards, hardware and software standards, and data definition and usage standards.

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To implement goals and objectives it is necessary to develop a series of standards and procedures. Obviously, information system management of courts should apply the quality concept. The manager of computer center of courts has to use judgment in setting goals, develop standards, and its procedures.

Courts of Justice today need the quality systems management and should have a comprehensive master plan for improving quality for information system of courts. The most effective method to gain and sustain the benefits of using the legal information of courts is to develop the quality information strategies, and apply good management or engineering for legal information systems

## (3) Area of information system

Besides that, current legal data and statistics of Kwaeng Courts is out of date, and its methods for collecting and storing has not been efficient and effective. Legal information can not be used to support the judicial decision-making.

The data and statistics of Kwaeng Courts is too old, and they have already been used for more than 50 years. The present information is not appropriate for leaders of Courts of Justice to support the decision-making of the strategic plans, because the business environments have been changing rapidly, and changing society requires the ability to understand and integrate disparate data and statistics from within and without Courts of Justice. Deploying the legal information system adequately supports justice needs. In conclusion, the areas of the problems we are talking about approach the quality concept and apply information system.

#### IV. THE CRIMINAL INFORMATION OF NEW DESIGNED SYSTEM

Now we are moving into the new-fashioned world of process improvement and continuous quality enhancement. The Information technology view is about to enter a novel golden age of activities characterized by fundamental reengineering of old applications into the quality management.

In Chapter III, project talks about any weak point areas of the legal information system in Kwaeng Courts. In addition, today the roles and structures of Courts of Justice are changing quickly. The Information technology is increasingly becoming one of the most important levers of effective change, because it is the most effective way to gain and sustain the judicial advantage administrations. The way to building up the legal information systems for quality of Courts, the driving management principles for controlling or solving the problems; weak points and any changes are the quality principles.

Getting started in gathering the new model of the criminal data and statistics of Kwaeng Courts, the project should involve making up concepts of quality as applied to the world of legal information systems and services. It means that we are telling something about the quality revolution upon planning the criminal data and statistics of Kwaeng Courts. In other words, the quality improvement is the strategic tool for improving the legal information systems of Courts.

When we talk about the quality improvement, Project would like to discuss, in detail, the two critical levels as follows:

- (1) Quality for the Information System
- (2) Statistics Methods for Quality Improvement

information technology being applied as a lever, not necessarily as the cornerstone, of change. (Cortada 1995)

Quality practices integrate various techniques and management principles. These usually include quality function deployment, statistical process control, just in time practices, root-cause analysis, and vision-based strategic planning. The ultimate aim is nothing less than the implementation of quality practices in all activities throughout the organization.

#### 4.2 Statistical Methods for Quality Improvement

Statistical methods are effective tools for improving the judicial processes and reduce its defects. The leaders of Courts of Justice often try to reduce the defects by tracing directly back to the cause. The first step in finding the true cause is careful observation of the phenomenon of the defect. After, such careful observation, true cause becomes apparent.

Statistical tools lend objectivity and accuracy to observation. The maxims of statistical way of thinking are:

- (1) Give greater importance to facts than abstract concepts.
- (2) Do not express facts in terms of senses or ideas. Use figures derived from specific observational results.
- (3) Observational results, accompanied as they are by error and variation, are part of a hidden whole. Finding that hidden whole is observation s ultimate goal.
- (4) Accept regular tendency which appears in a large number of observational results as reliable information. (Kume 1998)

The statistical way of looking at things and use of statistical methods are a most affective means for this observation. Statistical methods provide a very effective means

for the development of new technology and quality control in judicial administration processes. Lastly, the leaders should emphasize that the important thing is not just the knowledge of statistical methods itself, but one's mental attitude toward using it. (Kume 1998)

#### 4.3 How to Collect Information

Information is more important for leaders of Courts of Justice. Project provides the four areas acceptable to, collect quality legal data and statistics of Kwaeng Courts.

##### (1) Have Clear Defined Objectives

Legal information is a guide for our actions. From data and statistics leaders learn pertinent facts, and take appropriate actions based on such facts. Before collecting legal information, it is important to determine what you are going to do with it.

In quality control of industrial manufacturing, objectives of collecting data are:

- (a) Controlling and monitoring the production process
- (b) Analysis of the non-conformance, and
- (c) Inspection.

Any data collecting has its own purpose and should be followed by action. (Kume 1998)

##### (a) What is your legal information?

Once the object for collecting data is found, the types of comparison which need to be made are also determined, and this in turn identifies the type of data which should be gathered. For example, if court wants to know in what ways defectives are produced by two



criminal cases, it is necessary to take their samples separately so that the performance of each judge can be compared.

- (b) Are measurements reliable?

Even if the samples have been taken properly, a wrong judgement will be made if the measurement itself is unreliable. In case of a sensory measurement such as visual inspection, differences due to individual inspectors are very common. This fact must be taken into account when collecting and analyzing data.

- (c) Find right ways to record data

Once legal information is gathered, various statistical methods are used for analyzing them so that it will become a source of information.

The origin of legal information must be clearly recorded. Information whose origin is not clearly known becomes dead data. Quite often, little useful information is obtained despite the fact that a week was spent gathering data on quality characteristics, because staffs forgot on what days of the week the data was collected. Data should be recorded in such a way that can be used easily. Since data is often used later to calculate statistics such as means and ranges, it is better to write it down the manner in which it will facilitate these computations. (Kume 1998)

#### 4.4 Gathering Requirements of the Criminal Data and Statistics System

As to gathering the criminal information requirements of Kwaeng Courts for developing the criminal data warehouse, Project applies three activities as the following to collect and determine the criminal information requirements for the Courts.

- (1) Survey the related documents of the current system to determine existing operational systems that is likely to be sources for the criminal 'data warehouse and major reporting or decision support systems.
- (2) Review existing researching documents of courts to look for the problems of judicial administration processes.
- (3) Draft and design some papers for interviewing the key leaders of Courts.

Conduct the interviewing with the key leaders of Courts of Justice to determine the criminal information the system needs.

The criminal information systems of Kwaeng Courts are based on the key leaders satisfaction. The key leaders mean the customer aspect of quality practices for continuous improvement. Because the leaders exercise and apply the criminal data and statistics, the legal information system of Kwaeng Courts support the decision of the judicial strategies or plans. Project defines the customers as the follows:

- (1) President of Supreme Court
- (2) Vice President
- (3) The Permanent Secretary of Ministry of Justice
- (4) The Vice Permanent Secretary
- (5) The assistant Permanent
- (6) Secretary-general of the Judicial Affair
- (7) Vice Secretary
- (8) Chief Judges of Kwaeng Court

The objectives of Interviewing are to ask any official questions with the key leaders of Court, and define the criminal data and statistics the Kwaeng Courts need. These legal information systems should be exercised to become decision support systems of legal data warehousing. The systems provide the critical data and statistics

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for the administrators so that they can analyze a situation and make the decisions. The analytical systems are systems that accommodate the legal information used for analyzing the judicial processing problems or situation.

Table 4.1. Population and Sample Size.

Customer	Population	Number of Samples
President of Supreme Court	1	1
Vice President	3	3
The Permanent Secretary of Ministry of Justice	1	1
The Vice Permanent Secretary	2	2
The Assistance Permanent	2	2
Secretary-general of the Judicial Affair	1	1
Vice Secretary	2	2
Chief Judge	27	27

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From handling interviewing with leaders of Courts of Justice the above-mentioned project can summarize the criminal data and statistics of Kwaeng Courts needed for the administrators as details below:

- (1) Data and statistics of the related persons

Table 4.2. Judge.

No.	Questionnaire	Agree	Not Agree
1.	Personal Code of Judge	39	-
2.	Name / Surname	39	
3.	Sex	39	-
4.	Age	39	
5.	Position	39	-
6.	Address	39	-
7.	Education Background	39	-
7.	Academic Research / Works	39	-
8.	Special Knowledge / Capability	39	-
9.	Experience of Judicial works	39	-
10.	Experience of works before being Judge	39	-
11.	Data/ Month /Year comes into court	31	8
12.	Data /Month /Year moves out court	25	14
13.	Others	-	-

Table 4.3. Records on File of Cases.

No.	Questionnaire	Agree	Not Agree
14.	How many file of cases a judge receives, when he/she comes into Court.	39	-
15.	Which year of old file of cases a judge receives and amounts of each year.	31	8
16.	Kind and offence of each case, and amounts of each.	39	-
17.	Which process the file of cases are being on court and amounts of each	39	-
18.	How many new file of cases a judge receives, and its kind, offence, amounts.	39	-
19.	All files of cases that a judge must take care on court.	39	-
20.	Others	-	-

Table 4.4. Records in the Trial of Case.

No.	Questionnaire	Agree	Not Agree
21.	How many cases a judge make preliminary examination, taking evidence, adjourn, or operate other proceeds and amounts of each.	39	4
22.	How many persons a judge take evidence.	36	3
23.	How many cases a judge adjourn.	36	3
24.	Analyze the • any reasons of adjournment.	39	
25.	Analyze that the cases have been adjourned, are the cases of any years and amounts of each.	39	-
26.	Analyze that in each time fixed for hearing, how long among them.	36	-
27.	Others	-	-

Table 4.5. Records on the Cases Disposed Of.

No.	Questionnaire	Agree	Not Agree
28.	How many cases that they disposed of	39	
29.	Which year of the cases disposed of and amounts of each.	39	-
30.	Analyze that which kind and offence of the cases disposed of and amounts of each.	39	-
31.	Analyze that the cases disposed of, are the cases which the accuse pleads guilty, refuses guilty, or finished by the other reasons. And amounts of each.	39	-
32.	Analyze that the cases disposed of, in each case how long it takes the time on court.	39	-
33.	Others.		-

Table 4.6. Records of the Pending Cases.

No.	Questionnaire	Agree	Not Agree
34.	How many of the pending cases	39	-
35.	Analyze that the pending cases, which year of each and amounts.	39	-
36.	Analyze that the pending cases, which process each case is being on court and amounts of each.	39	
37.	Analyze any reasons of the cases delay.	39	
38.	Analyze that the pending cases, how many cases that the accused are detained.	39	
39.	Others		-

Table 4.7. Injured Person, Prosecutor, or Joint Prosecutor.

No.	Questionnaire	A&ree	Not Agree
40.	Name/surname	39	-
41.	Sex	39	-
42.	Age	39	-
43.	Nationality	39	-
44.	Address	39	-
45.	Occupation	39	-
46.	Work office	39	-
47.	Education	39	-
48.	Other	39	-
49.	Analyze and summarize	39	-
50.	Other	-	-

Table 4.8. Public Prosecutor.

No.	Questionnaire	Agree	Not Agree
51.	Name/surname	2	37
52.	Sex	2	37
53.	Age	2	37
54.	Position	1	38
55.	Others	-	-
56.	Analyze and summarize	-	-



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Table 4.9. Inquiry Official.

No.	Questionnaire	Agree	Not Agree
57.	Name/surname	1	38
58.	Age	1	38
59.	Position	1	38
60.	Work Station	1	38
61.	All files of cases that an inquiry official must take care.	-	39
62.	Others	-	-

Table 4.10. Alleged Offender.

No.	Questionnaire	Agree	Not Agree
63.	Name/surname	39	-
64.	Sex	39	-
65.	Age	39	-
66.	Nationality	39	-
67.	Address	39	-
68.	Occupation	39	-
69.	Work Station	36	3
70.	Education	39	-
71.	Records of the committal	39	-
72.	Unsound mind	39	-
71.	Others	-	-
72.	Analyze and summarize	39	-

Table 4.11. Accused.

No.	Questionnaire	Agree	Not Agree
73.	Name/surname	39	-
74.	Sex	39	-
75.	Age	39	-
76.	Nationality	39	-
77.	Address	39	-
78.	Occupation	39	
79.	Work Station	36	
80.	Education	39	-
81.	Records of the committal	39	-
82.	Unsound mind	39	-
83.	Others	-	-
84.	Analyze and summarize	39	-

Table 4.12. Convicted Person.

No.	Questionnaire	Agree	Not Agree
85.	Name/surname	39	-
86.	Sex	39	-
87.	Age	39	-
88.	Nationality	39	-
89.	Address	39	-
90.	Occupation	39	-
91.	Work Station	36	3
92.	Education	39	-
93.	Records of the committal	39	-
94.	Others	-	-
95.	Analyze and summarize	39	-

Table 4.13. Volunteer Attorney.

No.	Questionnaire	Agree	Not Agree
96.	Name/surname	28	11
97.	Age	30	9
98.	Number of Permission Document	18	21
99.	Education	30	9
100.	Experience on case work	35	4
101.	Other	-	-
102.	Analyze and summarize	39	-

Table 4.14. Professional Attorney.

No.	Questionnaire	Agree	Not Agree
96.	Name/surname	18	21
97.	Age	20	19
98.	Number of Permission Document	5	34
99.	Address	11	28
100.	Other	-	-
101.	Analyze and summarize	39	-

Table 4.15. Assured Person.

No.	Questionnaire	Agree	Not Agree
102.	Name/surname	11	28
103.	Sex	30	9
104.	Age	31	8
105.	Address	26	13
106.	Occupation	25	14
107.	Work station	19	20
108.	Relation to Parties	39	-
109.	Other	-	-
110.	Analyze and summarize	39	-

Table 4.16. Oral Evidence.

No.	Questionnaire	Agree	Not Agree
111.	Name/surname	5	34
112.	Sex	32	7
113.	Age	18	21
114.	Work station	19	20
115.	Education	9	30
116.	Relation to Parties	29	10
117.	Summoned evidence	5	34
118.	Attended evidence	7	32
119.	Other	-	-
120.	Analyze and summarize	39	-

(2) Data and statistics of the related place

Table 4.17. Place Where Person Arrested.

No.	Questionnaire	Agree	Not Agree
121.	Thambon	29	10
122.	Amphur	29	10
123.	Province	29	10
124.	Analyze and summarize	39	-
125.	Other	-	-

Table 4.18. Place Where the Offence Committed.

No.	Questionnaire	Agree	Not Agree
126.	Thambon	35	4
127.	Amphur	34	5
128.	Province	35	4
129.	Analyze and summarize	39	-
130.	Other	-	-

Table 4.19. Place Where Proceeding of Inquiry.

No.	Questionnaire	Agree	Not Agree
131.	Police Station	5	34
132.	Other	-	-
133.	Analyze and summarize	39	-

(3) Data and statistics for putting off the criminal prosecution and keeping detention

Table 4.20. General Information.

No.	Questionnaire	Agree	Not Agree
134.	In each week or month how many of applying the request to court, and which applies and amount of each.	26	13
135.	How many of the unfinished requests.	25	14
136.	Which applies the requests are going on, amount of each.	28	11
137.	Analyze the reasons of applying the requests and amount of each.	39	-
138.	Analyze the kinds of case and offence, amount of each.	39	
139.	Analyze how many of cases that The alleged offenders are kept custody, and reasons of applying.	39	-
140.	How many of the finished requests and their reason.	35	4
141.	How many of cases that prefers a criminal charge within 48 hours.	9	30
142.	Others.	-	-

Table 4.21. The First to Third Requests of Putting Off the Criminal Prosecution.

No.	Questionnaire	Agree	Not Agree
143.	How many of cases that putting off the criminal prosecution.	30	9
144.	Cases allow and how many days of each.	29	10
145.	Cases aren't allowed and analyze the reasons.	30	9
146.	How many of cases that keeping the detention.	28	11
147.	How many of cases that taking the insurance and analyze the security.	35	4
148.	Others.	-	-

Table 4.22. The Fourth to Fifth Requests of Putting off the Criminal Prosecution.

No.	Questionnaire	Agree	Not Agree
149.	How many of cases that putting off the criminal prosecution.	28	11
150.	Cases allow and analyze how many of the oral evidence.	25	14
151.	Cases allow how many days of each.	29	10
152.	Cases aren't allowed and analyze the reason, and how many of the oral evidence	30	9
153.	How many of cases that keeping the detention.	31	8
154.	How many of cases that taking the insurance and analyze the security.	32	7
155.	Others	-	-



Table 4.23. Cases That the Director-General of the Public Prosecution Department Allows to Prefer a Criminal Charge.

No.	Questionnaire	Agree	Not Agree
156.	How many of cases that allow to Preferring a criminal charge.	5	34
157.	Analyze the reasons of allowance.	9	30
158.	How many of cases are allowed.	5	34
159.	How many of cases keeping the detention.	5	34
160.	How many of cases that taking insurance and analyze the security.	5	34
161.	Others	-	-

(4) Data and statistics of cases that make a preliminary examination.

Table 4.24. Entry of Charge.

No.	Questionnaire	Agree	Not Agree
162.	In each day, week, month, or year how many of criminal cases are instituted in Court, and amount of each.	39	-
163.	Analyze which kind of offence and amount of each.	39	-
164.	How many of the petty offences, amount of each	39	-
165.	How many of cases those ask for an increase of punishment	39	-
166	Others	-	-

Table 4.25. Checking and Ordering the Criminal Charge.

No.	Questionnaire	Agree	Not Agree
167.	How many of cases those accept the charge for trail	30	9
168.	How many of cases those order to correct the charge, or dismiss or refuse to accept the charge.	31	8
169.	Analyze the reasons of order	39	-
170.	Others	-	-

Table 4.26. The First Time Fixed for the Preliminary Examination.

No.	Questionnaire	Agree	Not Agree
171.	How many of cases those hold the preliminary examination.	39	-
172.	How many of cases those don't appear at the first time fixed for the hearing, and the charge shall be dismissed.	39	-
173.	How many of cases those adjourn the preliminary examination.	39	-
174.	Analyze the reasons of the adjournment.	39	-
175.	How many of cases those the accused appear at the court.	39	-
176.	How long between the day entry of a charge to the first time fixed for the preliminary examination.	38	1
177.	How long between the first time fixed for the preliminary examination to the another hearing	37	2
178.	Others	-	-

Table 4.27. The Other Time Fixed for the Preliminary Examination.

No.	Questionnaire	Agree	Not Agree
179.	How many of cases those hold other preliminary examination	39	-
180.	How many of cases those adjourn the preliminary examination.	39	-
181.	Analyze the reasons of the adjournment.	39	-
182.	How long between the each time fixed for the preliminary examination.	39	-
184.	Analyze that how many of hearing for the preliminary examination in each case.	39	-
185.	Analyze that how long of each case that holds the preliminary examination.	39	-
186.	Others	-	-

Table 4.28. Other Details.

No.	Questionnaire	Agree	Not Agree
187.	How many of cases those accept the charge or dismiss, and amount of each.	39	-
188.	Analyze the reasons of dismiss.	39	-
189.	How many of cases those lodge a Appeal or Dika appeal	39	-
190.	Others	-	-

(5) Data and statistics of cases in the trial and the taking evidence

Table 4.29. Entry of Charge.

No.	Questionnaire	Agree	Not Agree
191.	In each day, week, month, or year how many of the criminal cases are instituted in Court, and amount of each.	39	-
192.	Analyze that how many of non-compoundable offences or compoundable offences, amount of each.	39	-
193.	Analyze that how many of the offences and the sections of law which enact such act constitute the offence.	39	-
194.	Analyze that how many of the petty offences, amount of each.	39	-
195.	Analyze that how many of the cases asked for increase of punishment.	39	-
196.	Others	-	-

Table 4.30. Checking and. Ordering the Criminal Charge.

No.	Questionnaire	Agree	Not Agree
197.	How many of cases those accept the charge for trial	38	1
198.	How many of cases those order to correct the charge, or dismiss or refuse to accept the charge.	37	2
199.	Analyze the reasons of order	39	-
200.	Others	-	-

Table 4.31. The First Time Fixed for Taking the Evidence of the Prosecutor.

No.	Questionnaire	Agree	Not Agree
201.	How many of cases those take the evidence for the prosecution.	39	-
202.	How many of cases those the prosecutor does not appear at the time for hearing and in case where the court dismisses.	39	
203.	How many of cases those the prosecutor does not appear at the time for hearing and in case where the court order the adjournment.	39	-
204.	Analyze the reason of the adjournment.	39	-
205.	How far between the date of the offence charged with the first time fixed for the adducing evidence.	39	-
206.	How far between the first time fixed for the adducing evidence with the other time fixed.	39	-
207.	How many of cases those the accused absent.	39	-
208.	How many of cases those issue the summons or warrant of arrest of the accused for trial and amount of each.	39	-
209.	How many of cases those the accused asks for the lawyer.	39	-
210.	How many of cases those the accused pleads guilty to the charge.	39	-
211.	How many of cases those judge takes additional evidence before gives the judgment.	39	-
212.	How many of cases those the accused refuses guilty.	39	-
213.	How many of cases those the accused is detailed by warrant of the court.	39	-
214.	How many of cases those the accused is released with the bail.	39	-
215.	Analyze the bail and security before release taking place.	39	-

Table 4.31. The First Time Fixed for Taking the Evidence of the Prosecutor.  
(Continued)

No.	Questionnaire	Agree	Not Agree
216.	How many of cases those the accused is released without the bail.	39	-
217.	Others.	-	-

Table 4.32. The Other Time Fixed for Taking the Evidence of the Prosecutor.

No.	Questionnaire	Agree	Not Agree
218.	How many of cases those take the evidence.	39	-
219.	How many of cases those order the adjournment of case.	39	-
220.	Analyze the reasons of the adjournment.	39	-
221.	How far between each other time fixed for taking the evidence of prosecutor.	39	-
222.	Analyze that how many of cases those taking the evidence of prosecutor.	39	-
223.	Analyze that how long of all time on the case taking the evidence of prosecutor.	39	-
224.	Others.	-	-



Table 4.33. The Time Fixed for Taking the Evidence of the Accused.

No.	Questionnaire	Agree	Not Agree
225.	How many of cases those taking the evidence of the accused.	39	-
226.	How many of cases those order the adjournment of case.	39	-
227.	Analyze the reasons of the adjournment.	39	-
228.	How far between each other time fixed for taking the evidence of the accused.	39	-
229.	Analyze the kinds of cases or any defence charged those order the adjournment of case.	39	-
230.	Analyze that how long of all time on the case taking the evidence of the accused.	39	-
231.	Others.	-	-

Table 4.34. The Time Fixed for Ordering the Adjournment of the Case.

No.	Questionnaire	Agree	Not Agree
232.	Can't send off the summonses or other writs.	39	-
234.	Analyze that why it can't send off the summonses or other writs.	39	-
235.	Court orders the adjournment of case.	39	-
236.	Parties or oral evidences ask for the adjournment of case.	39	-
237.	Analyze why parties or oral evidences ask for the adjournment and amount of each.	39	-
238.	Others.	-	-

(6) Data and statistics of cases in the trial for cases disposed of

Table 4.35. The Cases Disposed Of

No.	Questionnaire	Agree	Not Agree
239.	Withdrawal of the complaint or the criminal prosecutor, and analyze the reasons.	39	-
240.	By the lawful compromise and analyze the reasons.	39	-
241.	Abandonment • of the case, and analyze the reasons.	39	-
242.	Others.	-	-

Table 4.36. The Cases Disposed Off by the Judgment.

No.	Questionnaire	Agree	Not Agree
243.	Judgment of court gives the prosecutor winning the case.	39	-
244.	<b>Defining the rate of</b> imprisonment, and analyze the kinds of the offence charged.	39	-
245.	Analyze the reasons of all the acts alleged to have been committed by the accused.	39	-
246.	In cases where the court suspends the infliction or determination of the punishment, amount of each.	39	-
247.	Analyze the reasons of the suspension.	39	-
248.	In cases where the court gives the habit control.	39	-
249.	In cases where release the taking place.	39	-
250.	In cases where order the matter of measure of safety	39	-
251.	Judgment of court orders to dismiss, or does not punish with the imprisonment, amount of each.	39	-
252.	Analyze the reasons of the order to dismiss or release.	39	-

(7) Data and statistics of the cases above should be report by

Table 4.37. The Report of Data and Statistics.

No.	Questionnaire	Agree	Not Agree
253.	By weekly	4	-
254.	By monthly	29	-
255.	By three months	6	-
256.	By year	-	-
257.	Others.	-	-

#### 4.6 Summarizing the Criminal Information Requirements

For better understanding of the criminal information requirements of Kwaeng Court, project must consider the results from interviewing the manager of the court as follows:

(<sup>1</sup>) Data and statistics that the managers need more

Group of criminal data and statistics in which the managers assent more than 75 % of all in each item. The ideas of primary legal information are:

- (a) Data and statistics of the related-persons, include any information for judge no. 1 to no. 12, injured person no. 40 to no. 49, alleged offender no. 63 to no. 72, accused no. 73 to no. 82 and no. 84, convicted person no. 85 to no. 93 and no. 95, assured person no.103 to no.106 and no. 108, no.110, oral evidence no. 112, 116, and 120.
- (b) Data and statistics about records on file of cases no. 14 to no. 19, records in the trial of cases no. 21 to no. 26, records on the cases disposed of no. 28 to no. 32, and records of the pending cases no. 34 to no. 38.

- (c) Data and statistics for putting off the criminal prosecution and keeping detention, they include general information no. 134 to no. 140, the to third requests of putting off the criminal prosecution no. 143 to no. 147, the fourth to fifth requests of putting off the criminal prosecution no. 149 to no. 154.
- (d) Data and statistics of cases that make a preliminary examination, they include entry of charge no. 162 to no. 165, checking and recording the criminal charge no. 167 to no. 169, the first time fixed for the preliminary examination no. 171 to no. 177, other times fixed for the preliminary examination no. 179 to no. 185, and other details no. 187 to no. 189.
- (e) Data and statistics of cases in the trial and the taking evidence, they include entry of charge no. 191 to no. 195, checking and recording the criminal charge no. 197 to no. 199, the first time fixed for taking the evidence of the prosecutor no. 201 to no. 216, the other times fixed for taking the evidence of the prosecutor no. 218 to no. 223, the time fixed for taking the evidence of the accused no. 225 to no. 230, the time fixed for ordering the adjournment of case no. 232 to no. 237.
- (f) Data and statistics of cases in trial for cases disposed of, they include the cases disposed of no. 239 to no. 241, the cases disposed off by the judgement no. 243 to no. 252.
- (g) Data and statistics of the related-place, they include places where persons arrested no.121 to no.124, place where the offence committed no.126 to no.129.

(h) Other data and statistics need no. 96 to no. 97, no. 99 to no. 100, no. 102.

(2) Data and statistics that the managers require

Group of the criminal data and statistics means that the managers agree with from 50 % to 74 %. They involve:

(a) Data and statistics for professional attorney no. 97 and no. 101.

(3) Data and statistics that the managers do not need

Group of the criminal data and statistics not needed by the managers, less than 50 % of all required.

(a) Data and statistics for public prosecutor no. 51 to no. 54, for inquiry official no. 57 to no. 60.

(b) Data and statistics for volunteer attorney no. 98, for professional attorney no. 96, no. 98 to no. 99, for assured person no. 102, for oral evidence no. 111, no. 113 to no. 115, no. 117 to no. 118.

(c) Data and statistics of place where proceeding for inquiry no. 131

(d) Data and statistics of putting off the criminal prosecution and keeping detention involving general information no. 141.

(e) Data and statistics of cases that the director-general of the public prosecution department allows preferring a criminal charge no. 156 to no. 160.

Conclusion, data and statistics of section 5.1 and section 5.2 are needed for Creating the criminal data warehouse of Kwaeng Courts, but no need for section 5.3. The reports of the criminal data and statistics should be brought to managers monthly.

## V. DEVELOPING THE CRIMINAL DATA WAREHOUSE

To develop the criminal information system, Courts of Justice should undertake legal data warehousing project in order to satisfy the criminal data and statistics needs of the administrators of Court. To be effective, project must systematically be applied to all activities. In order to satisfy the information required by their users, the first priority developing a data warehousing strategy should be done. Data warehouse strategy provides the opportunity to align data warehouse efforts to Courts of Justice' business goals and plans.

### 5.1 Setting the Criminal Data Warehouse Strategy

The criminal data warehouse project needs analytic frameworks to help users focus on any problems of judicial procedures in a trial by Kwaeng Courts. It has been the solutions. One solution for them is to build decision support solution to provide an integrated view of judicial proceeds. The solution if viewed as isolated efforts alone. Perhaps before embarking, project is an overall strategy to address legal data warehousing requirements.

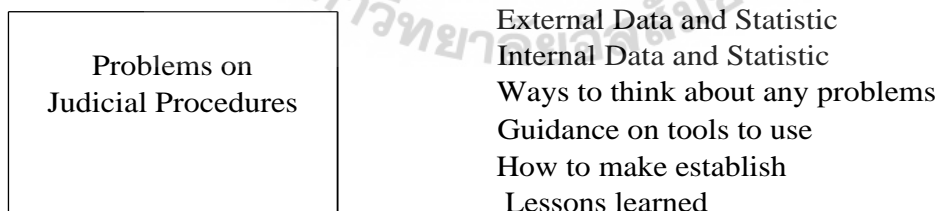


Figure 5.1. Problem on Judicial Procedures.

The main objective of data warehousing strategy study is to assess the extent of the legal information needs of the Courts of Justice. It is to support strategic decision-



making and is to satisfy and to recommend a course of action in a trial about the area of critical data and statistics and legal data warehouse system addresses these needs."The initiative should facilitate the creation of a suitable architecture that will enable timely capture and dissemination of strategic legal information for decision support purposes.

The data warehousing strategy development consists of two phases. (Barquin & Edelstein 1997)

(I) Gather criminal information requirements

This phase is interviewing key leaders of Courts to determine legal information needs.

(2) Develop recommendations

The recommendation based on understanding of judicial procedure in a trial priority, legal information needs, and application, and technology environments and recommend a course of action for legal data warehousing. Present the recommendations to the administrators of Courts and gain support to proceed.

In particular, project shows the table of contents of the legal data warehousing strategy document. The content of data warehousing strategy should at least consist of the following: (Barquin & Edelstein 1997)

(1) Executive Summary

This section concisely summarizes the key recommendations pertaining to the legal data warehousing strategy of Kwaeng Courts. It should emphasize the rationale for legal data warehousing, stressing qualitative judicial benefits that can be expected, especially as they relate to strategic judicial initiatives. It includes technology and organizational

requirements, costs, and indicates incremental results to be achieved within acceptable timeframe.

### (2) Current Assessment

This section summarizes the findings resulting from the interviews and other requirements.

#### (a) Management Priorities

Management priorities consist of judicial subject areas that must be addressed to support strategic decision making and effectively management of the Kwaeng Courts. It should be possible to cite specific functional areas and information needs that might be addressed and list the query examples provided by interviewees. The queries should illustrate decision support requirements and demonstrate why consolidated legal data and statistic are needed to support strategy analysis.

#### (b) Granularity (Level of detail)

Indicate the Kwaeng Courts need for legal data and statistics at the lowest individual level of transactions to support data mining. State the requirements for summarized aggregated data that will support a strategic perspective, such as trend analysis of key measures.

#### (c) Legal Data Quality

Legal information for quality describes the correctness and completeness of data system.

#### (d) Others

Current Assessment also consists of Data Consistency and Integrity, Data Access, Usage Patterns, Timeliness and History, Data Sources and End-User Workstation tools.

#### (3) Data Warehouse Architecture

This section describes the key components recommended for inclusion in the data warehouse architecture. Its components are discussed in the following:

- (a) Data warehouse systems
- (b) Source systems
- (c) Data model
- (d) Transformation
- (e) Metadata repository
- (f) Decision support application
- (g) Warehouse management layer
- (h) End user decision support tools

#### (4) Technical Architecture

In this section of strategy study, technology platform and related tool requirements are addressed.

- (a) Hardware, software and communications network
- (b) Data warehousing management / Productivity tools
- (c) End user decision support tools
- (d) Metadata repository

## (5) Organizational Requirements

The data warehousing strategy documents in this section discuss the placement of the legal data warehousing team in the Kwaeng Courts. Indicate the roles and responsibilities of the legal information systems. Indicate staffing level, skills, and training required. For example:

### (a) Warehouse Managers

- (1) ,Establish data warehouse strategy
- (2) Plan and manage data warehouse
- (3) Communicate warehousing objectives

### (b) Metadata Administrator

- (1) Define metadata standard
- (2) Manage metadata repository and user directory

### (c) Database Administrator

Create physical database structures, monitor load, and query performance.

### (d) Users

- (1) Describe data
- (2) Specify business rules
- (3) Test transformation results

### (e) Conversion Analysts/ Programmer

- (1) Map source data to data warehouse
- (2) Create programs to select and load data

### (f) Training Specialist

Provide training in accessing data warehouse.

(6) Development Process

The document is an opportunity to introduce the concept of the process used to build the legal data warehouse. It is an iterative methodology in which the Court of Justice continues to improve and extend the legal data and statistic based on changing judicial administration requirements.

(7) Development Timeline

Suggests an implementation and development sequence suitable for the Kwaeng Courts and reflects the iterative, phase oriented methodology. The requirement for addressing legacy systems transition and elimination is also discussed.

Implementation Sequence can develop based on the data warehousing strategy interviews and reflective of the findings in regard to:

- (a) Management decision making needs
- (b) Patterns of subject area demand
- (c) Lack of current access to data
- (d) Core system redevelopment plans
- (e) Data reconciliation and consistency
- (f) Responsiveness and processing cycle time
- (g) Eliminating non value-added processes
- (h) Eliminating redundant or obsolete systems

As for the legacy systems replacement along with the data warehouse implementation sequence, indicate which legacy reporting systems and files are likely to be replaced and the approximate timeframe. Adequate time must be planned for transitions that involve users of the existing systems as well as legacy applications support personnel.

## (<sup>8</sup>) Proof-of Concept Project

The purpose of conducting a proof of concept project is to develop and test the legal data warehouse in a controlled, limited environment in order to identify and correct any deficiencies in methods or tools wherever technically feasible.

Project of concept project success factors, determine the critical success factors for the project such as:

- (a) Performance
- (b) Functionality
- (c) Ease of use
- (d) Access to data using ad hoc queries and applications
- (e) Flexibility
- (f) Transparency

Project implementation plan, develops, a high level project implementation plan estimating scope, costs, time, and resources.

## (9) Management Considerations

It includes objectives, benefits, critical success factors and performance Measures, high level assumptions, risk factors with suggestions for mitigating risks, and a discussion on managing expectations.

These items are drawn from the survey, findings, observations, and recommendations and help to solidify the environmental factors for a successful legal data warehouse implementation.

Data warehouse objectives its presented and should address the problems of Kwaeng Court and opportunities that exist. Objectives should enable the users to



concrete improvements that legal data warehousing enables. Some examples of objectives are the following:

4

- (a) Supports strategic decision making
- (b) Supports integrated business value chain
- (c) Empowers workforce
- (d) Speeds up response time to business queries
- (e) Legal data quality
- (f) Document's organizational knowledge
- (g) Streamlines systems portfolio

Critical Success Factors includes the following examples:

- (a) Provide a single source of consistent data
- (b) Provide quick response to management queries
- (c) Improve legal data timeliness
- (d) Access to data by empowered workforce

Assumptions, There are several areas of assumptions that need to be considered:

- (a) Technical assumption
- (b) Scoping assumption
- (c) Organizational assumption
- (d) Management assumption

Data warehousing risk assessment examples are of:

- (a) Technical risk area
- (b) Scoping risk area
- (c) Organization risk area
- (d) Risk area of management / administration

Managing expectations is important to set realistic expectations in the leaders and legal information systems community.

Summary approach for developing legal data warehouse of Kwaeng Courts. The study team must gain a clear understanding of judicial procedures in training information needs and priorities coupled with an assessment of how well the current systems environment can meet these needs. (Barquin & Edelstein 1997)

## 5.2 Criminal Data Warehousing Development Process

The data warehouse development process focuses primarily on the activities required to build up the legal database to apply legal data in subject areas for a variety of analytical and strategic purposes.

There are several steps to develop the legal data warehouse processes as follows:

### (1) Initiate Project

This activity establishes mutual expectations for the project of legal data warehouse of Kwaeng Courts and produces the project plan. Its components include legal data and statistics scope, deliverables, technology infrastructure, resources, skill, team training, roles and responsibilities, methodology approach, change management process, issue resolution process, project tracking, and detailed project schedule.

### (2) Establish Technical Environment

This activity selects, acquires, and implements technical components and resources that will be required for the project, including platforms, DBMS, network communications, develop tools, end user access tools and technical and operational personal. Additional, activities are the establishment of service level objectives for availability, loading, maintenance, and query performance.

## (3) Develop Legal Information Architecture of Kwaeng Courts

This step determines a conceptual framework or big picture that represents legal data shared across the Kwaeng Courts. As a logical structure, this legal data model cuts across existing application systems and is irrespective of current physical system constraints. It adheres to the principle of legal data standardization for critical data shared across Kwaeng Courts and, serves as blueprint for incremental development of subject-oriented legal data warehouse databases. Standards for metadata will need to be defined. Standards help to ensure understanding, promote reuse, and avoid redundancy and inconsistency.

## (4) Design the Legal Data Warehouse Database

Develops a physical structure for the Legal data warehouse based on leader requirements, focusing on a single major subject areas, in contrast to the enterprise model. These sessions, determine data requirements and definitions, including facts and dimensions, examples of data access and analysis activities, data sources and data quality issues, and security.

The major deliverable from this phase is a database design suitable for legal data warehousing.

## (5) Data Transformation

This activity determines and implements the programming logic to extract legal data consistently, compute data derivations and summaries, and prepare the data for loading to target warehouse structures.

## (6) Manage Metadata

This set of activities addresses the need of document, reuse, and communicate the meaning of data and its system component relationships.

This step creates confidence in the data because the data's definition, origin and subsequent derivations are stated and available for inquiry. Metadata repositories should be populated with keys and attributes, judicial data description, physical data structures, source structure, mapping and transformation rules, frequency, derivation, summarization algorithms, data stewardship, codes, defaults, security requirements, changes, and limits of data over time. Metadata generated from multiple data warehousing tools must be coordinated.

(7) Develop End-user Interface Applications

This activity consists of building structures decision support query and Reporting applications or implementing software packages that use warehouse data. This activity follows a typical software development lifecycle with prototyping and should discuss relations to the Kwaeng Courts's development process. The strategic document should address the degree to which data warehousing will take a synchronous or asynchronous development approach. Synchronous data warehouse development is built to meet the needs of specific decision support.

Asynchronous data warehouse development is built separately from application efforts, based on an understanding of legal data and statistics needs.

(8) Manage Production Environment

The data warehouse must be managed like any other organization-wide system. It must meet quality requirements for acceptance in the judicial procedure in a trial environment, including unit and integration testing.

(9) Manage Decision Support Tools and Applications

This activity provides support for a standard set of end-user access tools, including maintenance and enhancement of structured decision support applications. Support for the technology infrastructure, including platforms, networks, and workstations is necessary, but might not be unique to the data warehouse, and should follow technical services and help desk practices.

(10) Develop Warehouse Rollout

This activity addresses the tasks needed for successful integration of the data warehouse into the organization's workflow. It includes establishing an advisory committee, training, ongoing communications, and user feedback. Training sessions will be needed that are suitable for different levels of the organization, managers, analysts, inspectors, and other users.

The training should include the following:

- (a) Data warehouse principles
- (b) Data availability
- (c) Judicial data view
- (d) Query and reporting techniques
- (e) Data access tools
- (f) Services and feedback. (Barquin & Edelstein 1997)

### 5.3 The Phases of Project

There are a number of phases within the project to system development methodologies which basically follow the traditional system development cycle.

In this project the phases of project as follows:

Table 5.1. The Phases of Project.

Phase	Sub-phase
Planning	SP System Planning
	SA System Analysis
Information	GI Gathering Legal Information Requirements
Design	UI User Interface Design
	SS System Structure Design
	PS Program Structure Design
Construction	PG Programming
Testing	PT Program Test
	IT Integration Test
	ST System Test
Implementation	OT Operational Test
	ME Maintenance & Evaluation

Table 5.2. The Planning Phase.

Sub-phase	Process
System Planning	<ul style="list-style-type: none"> <li>• Strategic Planning / Information System Development Plan</li> <li>• Project Plan</li> </ul>
System Analysis	<ul style="list-style-type: none"> <li>• Analyze current Kwaeng Court system</li> <li>• Analyze system requirements</li> <li>• Design Hardware, Software, and Network system</li> <li>• Set up system structure</li> </ul>

Table 5.3. The Information Phase.

Sub-phase	Process
Information	<ul style="list-style-type: none"> <li>• Interview and determine legal information needs</li> </ul>



Table 5.4. The Design Phase.

Sub-phase	Process
User Interface Design	<ul style="list-style-type: none"> <li>• Produce design specifications</li> <li>• Produce operational test plan</li> <li>• Finalize hardware, software, and network system and facilities</li> <li>• Manage and support project</li> </ul>
System Structure Design	<ul style="list-style-type: none"> <li>• Design process logic and divide into programs</li> <li>• Generate physical files</li> <li>• Design performance, operations, recovery / restart Procedures</li> <li>• Generate system performance and module test specifications</li> <li>• Install hardware, software tools, facilities for Development environment</li> </ul>
Program Structure Design	<ul style="list-style-type: none"> <li>• Design program logic</li> <li>• Design integration test specifications</li> <li>• Create program test environment</li> <li>• Start conversion manual</li> </ul>

Table 5.5. The Construction Phase.

Sub-phase	Process
Programming	<ul style="list-style-type: none"> <li>• Design, code and test modules</li> <li>• Install hardware, software, network system and Facilities for production environment</li> <li>• Continue project management and support</li> </ul>

Table 5.6. The Testing Phase.

Sub-phase	Process
Program Test	<ul style="list-style-type: none"> <li>• Integrate modules and test complete program</li> <li>• Validate interfaces</li> <li>• Test operations and conversion functions</li> <li>• Generate integration test environment</li> <li>• Start user's and operation's manuals</li> <li>• Start preparing Kwaeng Courts environment</li> <li>• Development performance test tools</li> <li>• Continue project management and support</li> </ul>
Integration Test	<ul style="list-style-type: none"> <li>• Integrate programs into processes</li> <li>• Validate interfaces with external system</li> <li>• Verify operational aspects</li> <li>• Generate system test environment</li> <li>• Continue project management and support</li> </ul>
System Test	<ul style="list-style-type: none"> <li>• Integrate processes into system</li> <li>• Test for functionality, performance, reliability, operability</li> <li>• Perform trial data conversion</li> <li>• Generate operational test environment</li> <li>• Continue project management and support</li> </ul>

Table 5.7. The implementation Phase.

Sub-phase	Process
Operation Test	<ul style="list-style-type: none"> <li>• Certify all aspects of system</li> <li>• Carry out conversion</li> <li>• Put system into production</li> </ul>
Maintenance and Evaluation	<ul style="list-style-type: none"> <li>• Monitor system in production</li> <li>• Fix minor errors</li> <li>• Compare with Kwaeng Courts to allow incorporation of new functionality</li> <li>• Evaluate project and document</li> </ul>

Input the scheduled start and end dates for easy process into overall schedule.

Table 5.8. Project Plan.

Phase	Month			
	1	2	3	4
<b>Planning</b>	--- SP ---- ---- SA ----			
<b>Information</b>	---- GI ----	--- GI -----		
<b>Design</b>			---- UI ----	---- UI ---- ---- SS ----
<b>Construction</b>				
<b>Testing</b>				
<b>Implementa- -tion</b>				
Phase	Month			
	5	6	7	8
<b>Planning</b>				
<b>Information</b>				
<b>Design</b>	---- SS ---- ---- PS ----	---- PS ----		
<b>Construction</b>			---- PG ----	
<b>Testing</b>				--- PT ---- --- IT ---- --- ST ----
<b>Implementa- -tion</b>				
Phase	Month			
	9	10	11	12
<b>Planning</b>				
<b>Information</b>				
<b>Design</b>				
<b>Construction</b>				
<b>Testing</b>				
<b>Implementa- -tion</b>	---- PT ---- IT ---- ST ---- OT ----	OT ---- ME	ME	ME

Table 5.9. Duration of Phase.

Phase	Start	End
Planning	1	30 <sup>4</sup>
Information	1	60
Design	61	80
Construction	181	210
Testing	211	270
Implementation	241	360



## VI. CONCLUSIONS AND RECOMMENDATIONS

### 6.1 Conclusions

Fundamental to the concept of project is understanding and improving the criminal information system of Kwaeng Courts. The information system provides legal data and statistics in the criminal cases of any Kwaeng Court so as to support the decision - making of the judicial administrators. They can use the related-legal database system, analyze any problem or situation and make the best of something on the strategic plans.

From the results of studying and the analyzing its function and the roles, we have found that Kwaeng Courts are to dispose the small cases and its jurisdiction is local and limit. And for the criminal cases, amount of imprisonment with a maximum of three years and of fine not exceeding 60,000 bahts or both. Any case is disposed so quickly and easily. In general, a judge can make the legal decision on the trial and adjudication.

Unfortunately, however, the traditional methods of gathering the legal information systems of Kwaeng Courts now operate with human handling directly with the data and statistics available. The existing ways of collecting and keeping the information cannot meet the quality for the information system. After that the project analyzed widespread any related-documents and any research papers, In addition, it also has a good chance to interview some court administrators.

The summarized views in three critical areas of the problem; why the existing information systems of the courts do not work efficiently enough for the decision support system, have been found in the following areas:

- (1) Area of the computing environment
- (2) Area of the management and engineering
- (3) Area of the information system

Aspects of information system area, Courts faced the data chaos crisis and the disparate data problems are ambiguous and unclear. We need the new way to handle amounts of data and statistics of Courts. In other words, we wish to have the legal information systems for quality. The quality information systems sometime are called the analytical information systems and the decision support systems.

More interesting now, advances in the new database technology is called the data warehouse. It provides a lot of capabilities to handle large volumes of information efficiently, including indexing strategies to retrieve data more efficiently and quickly. Improving and designing the database through the on-line analytical processing moves any data for all the stages of life cycle to development of the data warehouse of your organization to be successful.

Academically, planning for building up the project for the legal data warehousing of Kwaeng Courts, consists of two-stage approaches to categorize the data warehouse.

- (1) Defining the types and kinds of the legal information that the court administrators needs.
- (2) Designing the computing environment in which the data warehouse will operate.

As for defining the criminal information systems needs, the project has gained wide quality improvement for legal information system, and also discussed on the statistical methods to quality improvement.

The quality improvement for the information system, is applying the quality concept or quality practice to building up the criminal data warehouse of Kwaeng Courts. The main lines of thinking for quality are the definition of quality for legal information systems of Courts of Justice, and the ways to achieve them. In the above-



mentioned question, the project shows the effective ways in developing a useful definition for the criminal information system in Kwaeng Courts.

Furthermore, the main thinking about quality improvement should be defined from the customer satisfaction and their processes and should focus on continuous improvement. The customer views of the project are information requirements of the administrators of the Courts of Justice. The project, data warehousing of Kwaeng Court, defines the customer as. the following persons:

- (a) The President of Supreme Court
- (b) The Vice President
- (c) The Permanent Secretary of Ministry of Justice
- (d) The Vice Permanent Secretary
- (e) The Assistance Permanent
- (O) The Secretary-General of the Judicial Affair
- (g) The Vice Secretary
- (h) The Chief Judge of Kwaeng Court

With the continuous improvement of the quality area, project means that understanding and improving the operations of legal information Systems should have reforms in the concept of the continuous processing. The results of improving continuously in the judicial businesses are indisputable: higher quality of service, increased productivity, improved operational efficiency, and low costs.

However, the continuous improvement for legal information system. Also is inclusive of studying, analyzing, and researching the types or kinds of legal information needed. It is not just interviewing the court administrators. As such the information is required for the first time in making the project. But legal information systems should be adjusted or changed continuously and appropriately all the time. To improve new

information systems through all appropriate stages of life cycle for development of legal data warehouse of the Courts.

## 6.2 Recommendations

Project suggests that Courts of Justice now should establish The Research and Development Institution for the information system management. The institution has gained gradually the data and statistics activities in education as well.

And in case of the statistical methods to quality improvement, project believes that statistical methods are effective tools for improving the processes and reduce its defect. Process elements of the operational viewpoint in any court look like any productive processes in industrial manufacturing. There are three elements common to any productive process, transformation, feedback control, and repeatability. Don't try to reduce the defects by tracing directly back to the cause. But project suggests in finding true cause by observing carefully the phenomenon of the defects. After such careful observation, the true defect or cause becomes apparent.

Project offers the lines of thinking about statistical ways to observation and ways to collect legal information. And the project emphasizes faithfully on giving greater importance to facts than abstract concepts. Statistical tools lend objectivity and accuracy to observation and the lines of thinking project designs the form of questionnaire to interview the leaders of court. Observational results of the questionnaire, accompanied the related-information between the judges, the cases, the proceeding, and the time.

- (1) The judges aspects of data and statistics of them
- (2) The cases aspects of data and statistics of trial case
- (3) The proceeding aspects of data and statistics of trial proceeding
- (4) The time aspects of data and statistics of the adjournment, the duration, or all times of case.

These criminal data and statistics above of the warehouse database system provides them inform of the current data, the older data, and summarized data. Database system end-users can use any legal information with the ability of on-line analytical processing and data mining tools to enhance their decision support system.

Moreover, the data warehouse gives end-users multidimensional views from relational database. Dimensions are the attributes that describe the measurements to observe carefully such. as the hierarchical relational information between the judge, the cases, the proceeding, and the time. Legal data warehousing improves the productivity of Kwaeng Courts through consolidation, conversion, transformation, and integration of operational data and provides a consistent view of the courts.

Another aspect of designing the computing environment in which the data warehouse of Kwaeng Courts will operate is, project presents each stage to approach the data warehouse plan. The phase of project is as follows:

- (1) Planning the project, includes system plan and system analysis.
- (2) Planning the information requirement, includes studying, analyzing, and gathering the legal data and statistics end users need.
- (3) Planning the design, design user interface, design structure, design program structure.
- (4) Construction, means programming.
- (5) Testing, including program test, integration test, system test.
- (6) Implementation, including operational test, maintenance and evaluation.

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