

SYSTEM DEVELOPMENT PROJECT

A

REPORT

ON

ADVANCED DOCUMENT CONTROL SYSTEM

FOR



SUBMITTED IN THE PARTIAL  
FULFILLMENT OF

MASTER OF COMPUTER APPLICATIONS

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TO WHOMSOEVER IT MAY CONCERN


This is to certify that Ms. Ripudaman Sethi has undergone training in our Management Information Systems (MIS) Group from 6 January 1997 to 20 May 1997. She has successfully completed her project on PRIS-Advanced Document Control System. During her training period she was found to be sincere and professional in her conduct.

We wish her all the best in her future endeavours.

For SGS-THOMSON Microelectronics (India) Ltd

  
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Human Resource Manager

  
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**CHAPTER ----- 1**

**INTRODUCTION**

# 1. INTRODUCTION

The main objective of this report is to present the details of the Project done in my 'System Development Project' in the period from 6th of January 1997 to 20th May 1997 in SGS-Thomson Microelectronics (I) Pvt. Ltd. **SGS-Thomson is a key World player in the Microelectronics industry.** Its product line includes Smart Power ICs, All Power ICs, Dedicated Telecom ICs, Dedicated Automotive ICs, EPROM & EEPROM Memories etc. For maintaining this diverse product line and large number of customers **SGS-Thomson Microelectronics has a Management Information Systems (MIS) department which maintains an INGRES based relational database for storing the voluminous quantities of data required.** Software applications are developed using **Windows4GL as GUI based Front-end and SQL for inserting, manipulating & updating the data etc while reports are created using 'C' and embedded SQL.**

In the second chapter a brief description of the organization is provided. Topics like **About the organization**, market position of the organization, **Begining in INDIA** , various groups in SGS-Thomson are discussed in this chapter.

In the third chapter ,Aspects of Software Engineering which have a bearing to the project work are discussed. This chapter also give the description of the **Software Engineering procedures** followed in the MIS department .

Fourth chapter explains the working of the project group which I have joined

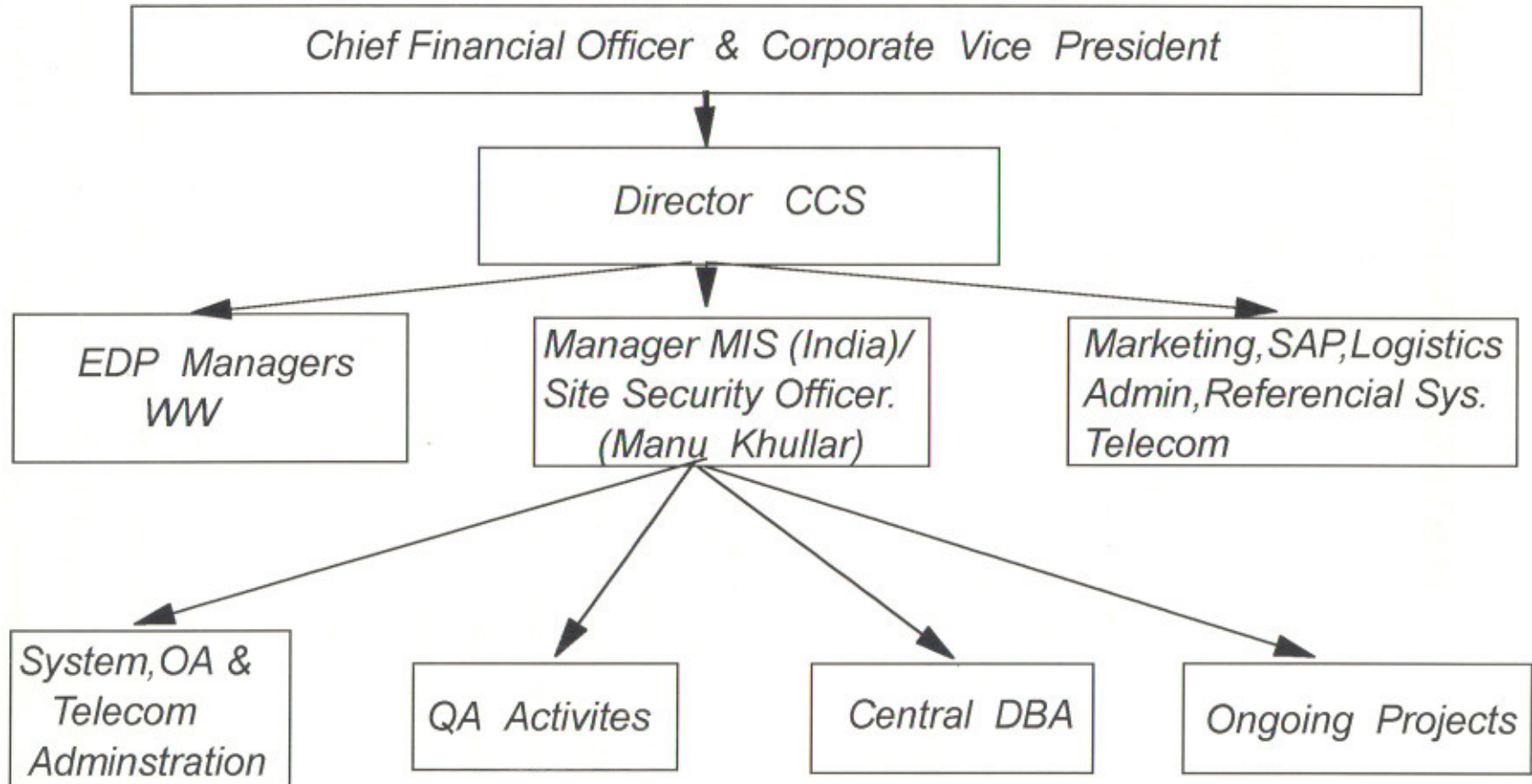
here i.e it gives the description of **PRIS-ADCS** . It also gives the brief description of **PRIS** and how the information related to the various phases of the product manufacturing is managed by **ADCS**.It includes the various functions of the **ADCS** .,architecture of **ADCS**.

In the fifth chapter, description of the application (**PDB/PQC**) which is assigned to me is provided. It includes the description of the various phases in the software development of **PDB/PQC** application .

*CHAPTER ----- 2*

*ABOUT THE  
ORGANIZATION*

## ORGANIZATION CHART



## 2 ABOUT THE ORGANIZATION

### 2.1 INTRODUCTION

*Microelectronics is vital to the success of the World Economy, and it is essential for the advancement of industry, commerce, science, medicine and the arts. S.G.S.-THOMSON is a key player in this arena. The main objective of SGS-THOMSON being, to provide its customers' and partners around the world with leading edge technology necessary for their strategic advantage, the company strives to achieve this through stress on service, quality and innovation.*

*SGS-THOMSON is a truly international company, operating on a global scale in a world-wide market. The Company's commitment to service is total and is customer-driven. SGS-THOMSON Microelectronics is a **global independent semiconductor company** that designs, develops, manufactures and markets a broad range of semiconductor integrated circuits ("ICs" and discrete devices) including telecommunications systems, computers systems, consumer products, automotive products and industrial automation and control systems.*

*On the basis of the most recently available industry data, SGS-THOMSON is the world's leading supplier of EPROMs (electrically programmable read-only memories), analog ICs, mixed-signal ICs, power ICs, dedicated telecommunication ICs and dedicated analog automotive ICs. The Company's products are manufactured and designed using a board*

range of manufactured and designed using a board range of manufacturing processes and proprietary design methods. To complement this depth and diversity of process and design technology the Company also possesses a broad intellectual property portfolio that it has used to enter into cross-licensing agreements with many major semiconductor manufacturers and an equipment development alliance a major supplier of design software.

*The company currently offers more than 3,000 main types of products to more than 1,500 customers, including Alcatel, Bosch, Creative Technology, Ford, Hewlett-Packard, IBM, Motorola, Nokia, Northern Telecom, Phillips, Seagate Technology, Siemens, Sony and Thomson Consumer electronics.*

*SGS-THOMSON was formed in July 1987 as a result of the combination of Thomson Semiconductors of France and SGS Microelettronica of Italy. Since its formation, the Company has significantly broadened and upgraded its range of products and technologies and has strengthened its manufacturing and the Asia-Pacific region. This capacity expansion process is currently still ongoing with upgrading of existing facilities and the announcement of the construction of two more 8" submicron fabs one to be built in Italy and one outside Europe, to join the two existing ones in Colles(France) and Phoenix(Arizona) and the now under construction in Catania(Italy) and Rousset (France).*

*In 1995, SGS-THOMSON's net revenues were US\$3,554 million and net earnings were US\$526.5 million. To guarantee continuous technological*

development and consistently offer customers true leading-edge products,SGS-THOMSON each year invests a significant proportion of its in R&D and capital expenditures.In 1995,it invested \$1002 million in capital expenditure,equivalent to 28.3% of revenues, and invested US\$440.3% million or 12.4% of revenues in research and development. The company is active in collaborative research projects worldwide,and is a key player in Europe's advanced technology research programs such as JESSI.

*Corporate Headquarters are located in Saint Genis(France),close to Geneva (Switzerland),where the European Headquarters and Service center are also based. The Company's U.S. Headquarters are based in Singapore, and Japanese operations are headquartered in Tokyo.*

## **2.2 BEGINING IN INDIA**

*SGS-THOMSON Microelectronics made a modest entry into India in 1985 with the setting up of a Liaison Office for SGS Microelectronics Pte.Ltd ., Singapore. The office was located in a Greater Kalash,New Delhi. Following the merger of SGS Microelectronics & Thomson Semiconductors in June 1987,the india office became the Liaison office of SGS-THOMSON Microelectronics,with the mission of marketing the ST products in INDIA.*

### **2.2.1 DESIGN & RESEARCH CENTER**

*Company's recognition of the technical skills available in this country motivate to set up a Design and Software Centre in NOIDA. From January*

1990 the company set up a 100% Export Oriented Unit for Integrated Circuit & Design, CAD Tools and Computer software.

### 2.3 VARIOUS PROJECT GROUPS IN INDIA CENTER

Currently, the India Centre has following projects groups:

#### ➤ **PROGRAMMABLE PRODUCTS GROUPS (PPG)**

This group provide high quality semicustom libraries to the internal and its world wide external customers, fully dedicated and documented on any platform requested by the market.

#### ➤ **ASIA PACIFIC DESIGN CENTRE (APDC)**

This group is fully dedicated to develop and design full custom IC for consumer, telecom and computer peripheral application.

#### ➤ **CENTRAL RESEARCH & DEVELOPMENT (CR&D)**

This group has the responsibility to develop, maintain and support the libraries consisting of standard Cells, I/O Cells, Memory Blocks and Mixed macro\mega cells in the leading state of the art submicron/ deep submicron CMOS/BiPOLAR processes eg HCMOS5(0.5micron), HCMOS6(0.25 micron) etc for multi purpose semiconductor applications.

#### ➤ **NEW VENTURES GROUP (NVG)**

Company's products are manufactured and designed using a board. This Project Group support SGS-THOMSON's entry into new areas of

*bussiness activity leveraging the company's technology strengths, manufacturing capabilities and sales coverage.*

➤ **MANAGEMENT INFORMATION SYSTEM(MIS)**

*This Project Group is mainly reponsible for providing Computer and Communication services to SGS-THOMSON world wide. About this Project Group, more information is available in next topic.*

## **2.4 MANAGEMENT INFORMATION SYSTEM (MIS INDIA )**

*MIS INDIA is a part of Computer & Communication group(CCS) group.CCS group is responsible for providing Computer and Communication services to SGS-THOMSON world wide. MIS INDIA is responsible for Corporate MIS s/w Development, Implementation & Support world wide.*

*MIS group is engaged in the development of software for the corporate use,primarily in sales,pricing, marketing, product information and many more.*

*MISSION of MIS INDIA is to increase the effectiveness of our internal customers by providing a set of information systems & services making best use of Advanced Technology. This group support NOIDA operations in telecommunications,office automation and information security.*

## **2.4.1 OBJECTIVES OF MIS INDIA**

*Main Objectives of MIS are*

- *Development of mission critical corporate systems that are front edge in terms of functionality, user friendliness and underlying technology .*
  
- *Wide range of technical Competence in s/w development area. High level of support for h/w, Telecom & office automation to India Design center.*
  
- *Ensuring IT Security for the site.*

## **2.4.2 CORPORATE PROJECT & SUPPORT SYSTEMS**

*All the projects in MIS are divided into three types of systems*

- *Bussiness/Marketing Systems : These systems include **Order Entry, Quotation/Automatic Scheduling/Pricing.***
  
- *Referential Systems : **Customer Information, Corporate Ref. Systems** come under the heading of Referential Systems.*
  
- *Product Information Systems : These systems include **Product Information, Manufacturing Process, Marking.***

## 2.5 *TECHNICAL ENVIRONMENT WE WORK ON*

**MACHINES** : *HP 3000 / 92X, 918  
HP 9000 / 7XX, G40, K100, Xterms, PCs*

**NETWORK** : *TCP / IP (Star Topology)*

**ARCHITECTURE** : *Client / Server ; Future move to 3 Tier  
architecture; Message oriented  
middleware, TP Monitors.*

**COMMUNICATION** : *EMAIL(Openmail), Omni 220  
EPABX(Siemens), Leased Lines STVIN,  
STNET(2 x 64 Kbps links to Singapore &  
France)*

**RDBMS** : *INGRES, W4GL, MS-ACCESS, Future move  
to ORACLE, Searching for a new Frontend.*

**LANGUAGES** : *C, C++, X-Windows*

**PACKAGES** : *WP, SmartSuite, Reflection X, Windows.*

## 2.6 TYPES OF PRODUCTS

In the electronics industries, components are classified into two categories:

➤ **PASSIVE COMPONENT:** These are the electronics components which do not modify the electrical signal like capacitors, resistors, connectors

➤ **ACTIVE COMPONENT:** Those components which modify the electrical signal that do functions like amplification or regulation, memorization and calculation or logic circuits. These are called integrated circuits.

**SGS-THOMSON** Microelectronics manufactures **ACTIVE** components of electronics. **SGS-THOMSON** Microelectronics Designs, Manufactures and markets semiconductors. Semiconductors are the basic components of any electronic component. Main applications of electronics components are the following:

**Consumer market:** In the consumer market, rising of the microelectronics start with the transistors that replace tubes valves in the radio sets initially. After that semiconductors then rapidly penetrate household goods applications like TV, VCR, Hi-Fi etc.

**Telecom market:** Semiconductors are the building blocks of the

- Telephone networks
- Minitel terminals, handsets, cellular phone, videophone
- Space communications (satellites)

*Automotive market* : In the automotive market, semiconductors are used in

- Electronic alternators
- Electronic regulators
- Electronic ignition

*Industrial market* : This market includes following items where the semiconductors play important role:

- Robots
- Parking meters
- Oscilloscopes

*Computer Industry* : This is the most important outlet for semiconductor companies.

*Other applications where semiconductors play important role are*

- Space market*
- Military market*

*CHAPTER ----- 3*

***SOFTWARE  
ENGINEERING***

## 3 SOFTWARE ENGINEERING

### 3.1 INTRODUCTION TO SOFTWARE ENGINEERING

*Software Engineering is defined by IEEE as 'The systematic approach of the development, maintenance and retirement of software ; where software is ; Computer Programs , associated documentation and pertaining to the operation of the Software System.'* It is one of the single most important consideration in any kind of Software activity . The main goals of software engineering are :

- *Low Cost of the development effort*
- *High reliability of the product*
- *Good Performance of the product*
- *Easy Maintenance of the software product*

*Over the years the cost ratio of hardware , software development and software maintenance is increasingly being tilted in the favour of software maintenance , with some estimates showing that around sixty percent of the total incurred cost is due to software maintenance alone . The need of Software Engineering can be understood bby the following factors :*

- ◆ *Current state of technology is that hardware is very reliable and inexpensive . Good methods exist for development and testing etc.*
- ◆ *Software is expensive as it is Labor intensive and unreliable also.*

- ◆ *More than half of the Software projects are late and behind schedule.*
- ◆ *About a quarter of software projects undertaken are abandoned midway during development.*
- ◆ *Demand for Software is increasing, there are more areas where automation is desired.*
- ◆ *Complexity is increasing faster than Software technology.*

*Software Engineering encompasses a set of three key elements - **Methods, Tools and Procedures**, that enable the manager to control the process of software development and provide foundation for building high software in a productive manner.*

*Methods provide the technical tasks for building software including*

- ▶ *Project planning and estimation.*
- ▶ *System and software requirements analysis.*
- ▶ *Design of data structure.*
- ▶ *Program architecture and algorithm procedure.*
- ▶ *Coding, testing and maintenance etc.*

*Tools provide automated or semi-automated support for methods. Tools are integrated so that information created by one tool can be used by another. These include-*

- ▶ Software
- ▶ Hardware
- ▶ A software engineering database
- ▶ A data structure containing important information about analysis,
- ▶ Designing, coding and testing.

Procedures integrate Tools and Methods and rational and timely development of computer software. Procedures define -

- ▶ Sequence in which methods will be applied.
- ▶ Required documents, reports & forms.
- ▶ Controls needed to ensure quality and coordinate change.
- ▶ A way for tracking the progress of the project.

### **3.2 Software Quality Assurance**

*All of the Tools, Methods and Procedures of software engineering are oriented towards a single goal: To produce high-quality Software.*

*Software Quality can be defined as 'Conformance to explicitly stated functional and performance requirements, Explicitly documented development standards, and implicit characteristics that are expected of all professionally developed software'.*

*Software Quality Assurance (SQA) is an "umbrella" activity that is applied throughout the Software Engineering process. SQA encompasses*

- Application of technical methods

- *Conduct of Formal Technical reviews*
- *Software Testing. ➤Enforcement Of Change.*
- *Control Of Change.*
- *Measurement and Reporting mechanisms.*

*Software Quality is designed into a product or a system. For this reason, SQA actually begins with the set of technical methods and tools that help the analyst to achieve a high-quality specification and the designer to design a quality design.*

*Once a specification (prototype) has been designed and created, each must be assessed for quality. The central activity that accomplishes quality assessment is the formal technical review. The formal technical review is a stylized meeting conducted by technical staff with the sole purpose of uncovering quality problems.*

*Software Testing combines a multi-step strategy with a series of test cases that help ensure effective error detection.*

*If formal (written) standards and procedures exist, then an SQA activity must be established to ensure that they are being followed. An assessment of compliance to standards may be conducted by software developers themselves (unit testing) and later if necessary by the SQA group for quality checking.*

*A major threat to software quality comes from a seemingly benign source: changes. Every change to software has the potential for*

introducing an error or creating side effects that propagate errors. The change control process contributes directly to software quality by formalizing requests for change, evaluating the nature of change, and controlling the impact of change. **Change control is applied during software development and later, during the maintenance phase.**

*Measurement* is an activity that is integral to any engineering discipline. **An important objective of SQA is to assess the impact of methodological and procedural changes on improved software quality. To accomplish this software metrics must be collected.**

*Record Keeping and recording for SQA provide procedures for the collection and dissemination of SQA information. The results of reviews, audits, change control, testing and other SQA activities become part of historical record for the project and should be published to the development staff on need-to-know basis. For e.g. the results of each formal **technical review** for a procedural design **are recorded** and can be placed in a folder that contains all technical and SQA information about that module.*

***Software Quality Assurance takes place by reviews which are carried out in tandem with major steps of the SDLC: The Detail Design phase and the Construction phase.***

*Each component of a software application is extensively **tested with the help of a specific Quality Control Checklist** which specifies the standard for various types of software components used as building blocks in the software application. First unit testing is performed by the developer*

- c) *3GL Procedures - for performing fast and efficient transactions ( mostly written in C language )*
- d) *DB Procedures - included DB procs written on database level to check different conditions at the time of transaction.*
- e) *Constants & Global Variables - for application wide use .*
- f) *User Classes - for handing data communications and mapping tables.*

➤ *The Server Part - The coding language used is INGRES defined SQL.*

*The software development activity concentrates in the following areas:*

- a) *Generation of DDL - Creating and maintaining Data Bases, Data Tables , Views.*
- b) *Database Procedures and Rules - Creation and maintainance of procedures which are fired by specific Rules built in upon the Data Table fields. There are three kinds of rules - **Bussiness rules, Foreign Key Checks and Mandatory Check rules.***
- c) *Providing Grants and Roles for users.*

*In MIS there is a very systematic and extensive implementation of Software Engineering methods & procedures. There is a concept of*

*Internal Customer* which exist in the organization. Whenever a department provides a service, the department to which it is provides is its customer. **MIS India** is the corporate department which develops Corporate Bussiness Applications. These are deployed within SGS-Thomson Locations Worldwide. The software engineering activity takes place across a Software Application's life which is called **System Development Life Cycle (SDLC)**. There are various procedures to be followed at each of the checkpoints in the SDLC :

- **GENERAL DESIGN PHASE** : In this step, **Information Systems study** is done by the customers of the MIS India ( also known as the *General Designers*, situated in St. Genis France ). The **initial design and analysis of the application** is done by them and the **technical specifications of the application are discussed in detail**. At the end of the step an initial prototype and general design documents are delivered to MIS India for construction.
  
- **DETAIL DESIGN** : After receiving the prototype from the general designers, there is a **detailed analysis** of the proposed design of the application. Also this phase serves as a begining step for the construction phase. The detail design aims at developing a system in conformance with the Design Specifications. In the detail design phase **all the development standards are implemented** into prototype . Usability analysis is carried out for each components are added to

*the prototype. During this phase all of the client and server components are formally defined and analyzed. The objective of this step is to completely purge out any design errors lurking in the application and to provide a seamless integration to the construction phase.*

- **QA OF DETAIL DESIGN PHASE :** *As each software component of the application undergoes the detail design phase, it is **unit tested** by the developer and reviewed by a **QA personel** for any errors in incorporating company standards. The **QA** activity is done with the use of **Quality Checklists**.*
  
- **CONSTRUCTION PHASE :** *The coding phase of the application takes place according to the work plan made in the detail design phase.*
  
- **TESTING PHASE :** *The **unit testing** of the software components are performed by the developer and these are reviewed by a quality assurance personel. The **QA activity** again requires the use of **Quality Checklists** which are filled by the developer and reviewed by the **QA personel**. The errors or bugs that are found in any of the testing phases are removed by the developer. After unit testing and **Quality Checks** of individual software components, **Regression Testing** is performed by the **QA personel** and the developer if required. **System /Integration testing** is performed by the **Project Leader**. After sucessful completion of the same, **Alpha testing** is performed by the **General Designers**. Later the application is deployed in a limited way in the real world sites and **Beta testing** is performed. In each of the*

testing stages, the emphasis is on to detect as many bugs as possible in the application. After keeping the application on hold in the Beta stage for some time, the application is fully deployed. The applications are constructed with the support of a Reusable Object Library which is shared among all the applications. This gives an added boost to the development & maintainence process.

### 3.4 CLIENT-SERVER ARCHITECTURE

*As* computing network becomes more and more prevalent in today's computing environments, **database management systems must be able to take advantage of distributed processing capabilities.**

*Distributed Processing uses more than one processor to divide the processing for a set of related jobs. **Distributed processing** redices the processing load on a single processor by **allowing different processors to concentrate on a subset of related tasks**, thus improving the performance capabilities of the system as a whole One of the ways of applying the **Distributed Processing paradigm is the Client-server architecture.***

*The Client-Server paradigm divides communicating applications into two broad catagories, depending on whether the application waits for communication or initiates it. It uses the **direction of initiation to categorize whether a program is Client or Server.***

*In general an application that **initiates peer-to peer communication is called a Client.** End users usually invoke client software when they use a*

network service. Most client software consists of conventional application programs. Each time a client application executes, it contacts a server, sends a request and awaits response. When the response arrives, the client continues processing. **Clients are often easier to build than servers, and usually require no special system privileges to operate.**

*On the other hand a Server is any program that waits for incoming communication requests from a client. The server receives a clients request , performs the necessary computations , and returns the result to the client. As servers need to access data,computations, or protocol ports that the operating system protects. Server software requires special system privileges.*

*Servers must contain code that handles the issues of :*

- **Authentication** - verifying the identify of the client.
  
- **Authorization** - determining whether a given client is permitted to access the service the server supplies.
  
- **Data Security** - guaranteeing that data is not unintentionally revealed or compromised.
  
- **Privacy** - keeping information about an individual from unauthorized access.

➤ **Protection** - guaranteeing that network applications do not abuse system resources.

In the organization, **INGRES RDBMS** is used for the development of **Client-Server Applications**. This considerably lowers the complexity level required for coding application, as **INGRES** provides a **Fourth generation language, Windows4GL** for the development of clients. The server part is largely standardized and provided for by **INGRES**. **INGRES** provides for its own **SQL** (Structured Query language) which is used for granting and controlling access and authorization, perform data manipulation on the database and guarantee protection & privacy.

### **3.5 STANDARDS**

There are many standards existing in MIS which are to be enforced, some of them are :

- **Naming Standards** : In the organization there are fixed naming standards for all software components. They are defined for both Client and Server Software components.
- **GUI standards** : Standard enforced only on the client side and details the look and feel of software applications.
- **Menu Bar** : Standard enforced only on the client side. It details the functionality of the menu bar, which is maintained constant both through and across software application.

➤ **Programming Rules** : These are standards for the client side. They include things like performance standards , use of standard programming practices etc.

➤ **Functional & Technical Documentation** : These are mostly concerned with the documentation of Client and Server components. They exist separately for Client and Server Components.

A) **Test cases** : The functional test cases provided by the developer for the client software components. They should be complete i.e. they should derived from requirements specification . They (Test Cases ) should also be satisfied when the software component is executed.

### **3.6 FOURTH GENERATION TECHNIQUES**

The term fourth generartion techniques (4gt) encompasses a broad array of software tools that have one thing in common : Each enables the software developer to specify some characterstics of the software at a high level .The tool then automatically generates source code based on the developers specification. A software development environment normally supports the following tools -

- Nonprocedural languages for database query.
- Report generation .
- Data manipulation.
- Screen interaction and definition
- Code generation .
- High level graphics capability etc .

*The 4GT paradigm begins with the **requirements gathering** step. A customer would describe requirements and these would be directly translated into an operational prototype. Then it is necessary to develop a design strategy for the project. Implementation using a 4GL enables software developer to represent desired results. To transform a **4GT implementation into a product**, the developer must conduct thorough **testing, develop meaningful documentation** etc. In addition, the 4GT developed software must be built in a manner that **enables maintenance to be performed quickly**.*

*To summarize, fourth generation techniques have become an **important part of software development in the information systems application** area and are likely to be widely used in real time and engineering application in the near future.*

*This paradigm is applied for the software development activity, which is based upon **Client - Server Computing***

## 1. PRIS - AN OVERVIEW

### 1.1 INTRODUCTION

The key word is **PRODUCT REFERENTIAL INFORMATION SYSTEM**. PRIS is composed of two main modules:

• PRIS Planning (PRIS-P): PRIS-P manages planning and commercial information. It is a separate application which is used to generate a product plan, the product line, the product portfolio, etc.

## **CHAPTER ----- 4**

• PRIS Manufacturing (PRIS-M): PRIS-M is a complex product subscription with technical data management.

# **PRIS - ADCS**

Two key appointments are linked to ADCS for the engineering change level document used by the PRIS: its maintenance by ADCS. Any change in the documents must have the approval from ADCS. Main function of ADCS: communication and approval of all the documents related to above two applications.

All the subsystems in the PRIS have indeed to manage documents and data under the control of ADCS. PRIS-M application generates the ESA, EAS, TNE & Material Comparison assessments, and send them to ADCS for approval.

So PRIS is the major centralized repository of data regarding the "products" so that all the Manufacturing and Organizational units activities will have to be progressively aligned to its structure and philosophy.

## 4 PRIS - AN OVERVIEW

### 4.1 INTRODUCTION

*PRIS* is the key word for **PRODUCT REFERENTIAL INFORMATION SYSTEM**. *PRIS* is composed of two main modules.

- **PRIS-Planning (PRIS-P)** : *PRIS-P* manages planning and commercial data linked to each level of product. It is a separate application to automate the information required during the planning and production of a product, down the assembly line from its semifinished wafer state till the product is packaged and ready to be shipped.
- **PRIS-Manufacturing (PRIS-M)** : *PRIS-M* contain complete product description with technical data (manufacturing processes, manufacturing tools, testing programs and specifications, testing instructions: T&F and EWS, marking instructions , mask set data , and some fab data , ...) linked to products managed in *PRIS-Planning*.

*These two applications are linked to ADCS for the engineering change. Every document used in the PRIS is maintained by ADCS. Any change in the documents must have the approval from ADCS. Main function of ADCS is notification and approval of all the documents related to above two applications.*

*At the subsystems in the PRIS have indeed to manage documents and data under the control of ADCS. PRIS-M application generates the BSA , EWS, TNF & Marking Composition documents , and sends them to ADCS for approval.*

*So PRIS is the major centralized repository of data regarding the "products" so that all the Manufacturing and Organizational units activities will have to be progressively aligned to its structure and philosophy.*

## 4.2 *VARIOUS PHASES OF MANUFACTURING PRODUCT*

*As ADCS is the product related document control system. So Before discussing the PRIS-ADCS, we must know how a product is formed or the terminology of the product and relation between the various terms.*

- ▶ **WAFER:** *Intially there is a silicon bar, which is usually manufactured outside the company. Silicon bar is cut to form a WAFER.*
- ▶ **DICE & DIE:** *A wafer can contain hundreds or even thousands of DICE. A DIE come from a DICE. A small DICE which is the main part of the integrated ckt.*
- ▶ **FRONT-END PRODUCT:** *A large number of Dies' form Front-End Products. Front-End Products are the temporary products.*
- ▶ **RAW\_LINE:** *Then there is many to many relationship between Front-End Product and RAW LINE i.e. After the Front-End Product, Raw\_Line is the next step.*
- ▶ **FINISHED\_GOODS:** *One Raw\_Line give many Finished\_Goods.*
- ▶ **COMMERCIAL PRODUCT:** *After the Finished\_Good production, many Finished\_Goods give one commercial product. And commercial is the product which is ready for the customers. Relationship between various steps of products is shown on the next page.*

### 4.3 PRIS - ADCS

*ADCS* meant for **ADVANCED DOCUMENT CONTROL SYSTEM**. *ADCS* is basically product related document control system. All the documents related to a product at any specified stage are stored in a postscript format in a database and the product engineers with defined access will modify these documents as and when the product attains the next stage of it to production process. The main work involved in this project is to design a interface b/w this system and *PRIS-M* to facilitate the user of *PRIS-Mfg* to view the document through *ADCS*.

Before *ADCS*, there is old system for the storing , maintainance of the documents called **UDCS (Unified Document Control System)** .*ADCS* is the improvement over *UDCS* in the following concerns:

#### ➤DOCUMENT TYPE

*ADCS* supports all types of the files like **text file, data file, postscript file and history files** and use the postscript files for the binary types. But *UDCS* supports only text files.

#### ➤DOCUMENT CLASSIFICATION

*ADCS* takes the classification of the documents as the **object types**.But the *UDCS* takes the documents as **different catagories**.

#### ➤DOCUMENT ENVIRONMENT

*ADCS* runs on **USER PC** with no special conditions and it is more user friendly. *UDCS* runs only on **VAX** machine.

#### ➤USERS

For *UDCS*, users are the locally defined users i.e any body can have the access to *UDCS*. But *ADCS* access require **INTERLEAF LICENSE**.

## 4.4 DATA MANAGED BY ADCS

*As ADCS manages the data in various forms given below*

### ➤ DOCUMENT REFERENCE (AND REVISION NUMBER)

*Document Reference is the **internal codification of the document.** This reference must be known in PRIS-Manufacturing to allow an internal storage (in the PRIS database) of **all the DCS references managed inside PRIS-Manufacturing.***

*Document is needed in the PRIS-Mfg to **check consistency of the documents references as cross references.***

### ➤ DOCUMENT TYPE

*Document type **describes each documents group.** These data must be transferred to PRIS-database into a PRIS-entity called **DCS\_DOC\_TYPE.***

### ➤ DCS NAME

*All the allowed and standardized names in ADCS must be known by PRIS system and DCS Name will give you the valid ADCS users names that are in ORG/SEC system.'*

### ➤ CHANGE DESIGNATOR

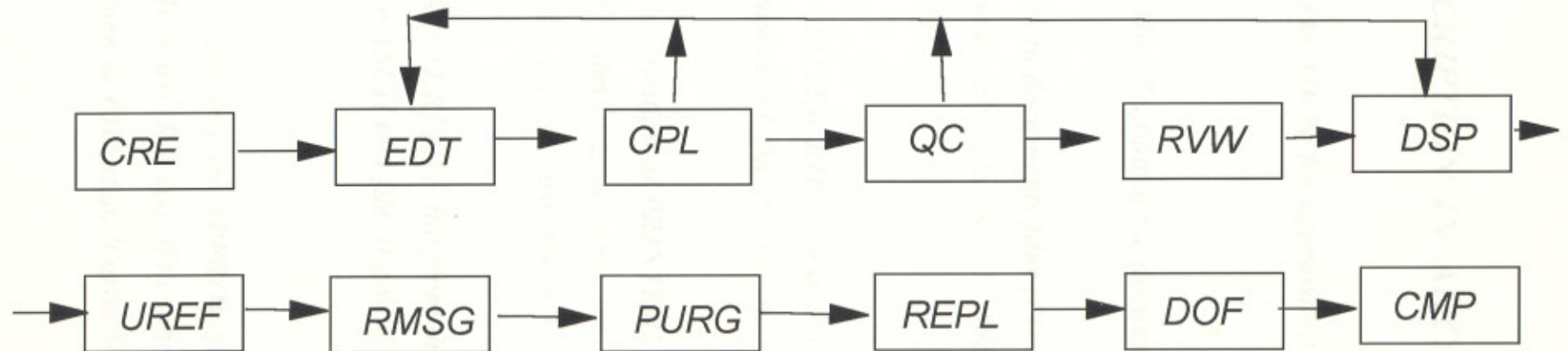
*This qualifies the engineering change number. These data must be known by PRIS Manufacturing. This entity is internally stored into a entity called **DCS\_ECN.** These data are very static and so don't need to be transferred from ADCS.*

---

*'ORG/SEC manages users access rights in relation with the corporate systems like (PRIS, CP , REF\_TABLES).in the document and again send the document to ADCS for approval.*

## *Various steps for Approval of Document in ADCS*

*ADCS works according to a cycle composed by the following steps :*



*Whenever a document comes for approval to ADCS. The document passes through various steps as given above. This object routing is mentioned for the objects managed by ADCS. This routing may be different for the different types of documents but majority confirm to above model.*

*The description of various steps is on next page.*

## 4.5 STEPS DESCRIPTION IN ADCS

After the document is sent to ADCS for approval, it passes through following steps :

- ▶ **CRE** : **Creation and Modification of the documents out of ADCS.**
- ▶ **EDT** : **Editon & check in documents files (POSTSCRIPT files). It can generate automatically POSTSCRIPT file. This step also start Cycle documents.**
- ▶ **CPL** : **This step take POSTSCRIPT file and create PRINTERLEAF file with extension .PL file. It gives the message to the Author.**
- ▶ **CPLD** : **Again allows the creation of PRINTERLEAF file from POSTSCRIPT files by generating the differences between PRINTERLEAF files. It gives the message to the Dispatcher.**
- ▶ **TDIF** : **Creation of PRINTERLEAF file from the current and previous versions of the ASCII text file. It give the message to the Dispatcher.**
- ▶ **QC** : **This step control and prepare APPROVAL (RVW) list, NOTIFICATION list (RMSG). If the above list is not OK, Document return to EDT step. It gives the message to the Approvers.**

- ▶ **RVW** : In the RVW step, Approvers **review the document** .If this step is 100% OK,then it enabled for the next step.
- ▶ **DSP** : Dispatcher release the Document here after the review step. If the **RVW step is not 100% OK , it sends the Document then to EDT step.**
- ▶ **UREF** : Here the **Document References are updated**. It is used to resolve cross - references b/w documents.
- ▶ **RMSG** : In this step , messages are realeased specific to the objects and then give the messages to NOTIFICATION list.
- ▶ **PURG** : During the whole cycle , all the drafts are kept. At this step, **purge all the drafts.**
- ▶ **DOF** : At this step, **Object file is deleted.**
- ▶ **REPL** : In this step, **document Replication is done if necessary.**
- ▶ **CMP** : It is the **Complete step of the cycle.**

#### ▶ WORK DOC DELETE

To delete the document from ADCS, WorkDocDelete tool is there. For the document which is in 'WORKING' status to be deleted. First condition is Document should be in 'EDT' step.

It accepts an object reference, checks its existence, and prior to attempting to abort the cycle, verifies if the document is in the 'EDT' step. If the document is

## 4.6 OVERVIEW OF THE MAIN FUNCTIONS the first revision

*Main functions which are accessed from PRIS handled by ADCS are given below. These functions are **executed on PRIS data server and access the ADCS data server.***

### ➤ **CYCLE'S ABORT** of the Document Documents in ADCS, there is

*After a document sends to ADCS for the approval cycle. i.e a user has started an approval cycle in ADCS. He wants to **abort the cycle of approval for some change in the document.** Then wants to restart the approval cycle after the changes have been made, whatever the result of the first cycle. For this first cycle of approval must be abort. He must be able to **abort the current cycle, before the status return by ADCS.** This accepts an object reference and check whether the document in the RVW step.*

*If it is so, then the remaining approvers will be overridden. This action force the document into the Dispatch(DSP) step. The document will then be sent back to the EDIT (EDT) step. **In the EDT step, user can make the changes Document can't be aborted when it is in some other step.***

### ➤ **WORK DOC DELETE :** a new revision If the Object is not located, it will

*To delete the document from ADCS, WorkDocDelete tool is there. For the document which is in 'WORKING' status to be deleted, **First condition is Document should be in 'EDT' step.***

*It accepts one object reference, checks its existence, and prior to attempting to abort the cycle, verifies if the document is in the 'EDT' step. If the document is*

in the 'EDT' step, **the current revision is deleted and if this is the first revision of the document , then the object will be deleted.** The associated object files will be deleted from the corresponding DCS vault server.

## ➤ STATUS RETRIVAL

To RETRIEVE the STATUS of the Document/Documents in ADCS , there is a procedure called **DocStatus**.

This procedure either accept a list of object refereces or a series of search criteria. It will return the data on the references provided or those returned by the criteria provided i.e it will **return the status of the Document/Documents in an output file.** It will retrive the status of upto 1000 documents at a time.

## ➤ DOCUMENT DOWNLOAD

This meant to **creation/updation of an object into DCS.** This procedure basically meant for **loading the Document in ADCS.** It also involve the **transfer of files to the ADCS valut servers.**

It accept a data file providing the **necessary information and the associated document files(native,Postscript ,history ) to create/update an ADCS object.** Then it checks the existence of the ADCS object and if it is in the **appropriate status, generates a new revision.** If the Object is not located, it will create a new DCS object. The associated object files will be transferred to the corresponding DCS vault server. And the Document will be placed in the Review cycle.

## ➤ DOCUMENT VIEW

This tool is used to **view the document with its own format**. It accepts a document reference. Then it will be tested for the existence. If the document is located, the last ACTIVE version is located and displayed on an X11 compatible terminal.

## 4.7 ADCS MONITOR

For managing above jobs, there is **one Online monitor**, and the job should be launched 24 hours a day. This online monitor called as ADCS monitor is an interface between ADCS and ADCS-INTERFACE. Whenever there is a request

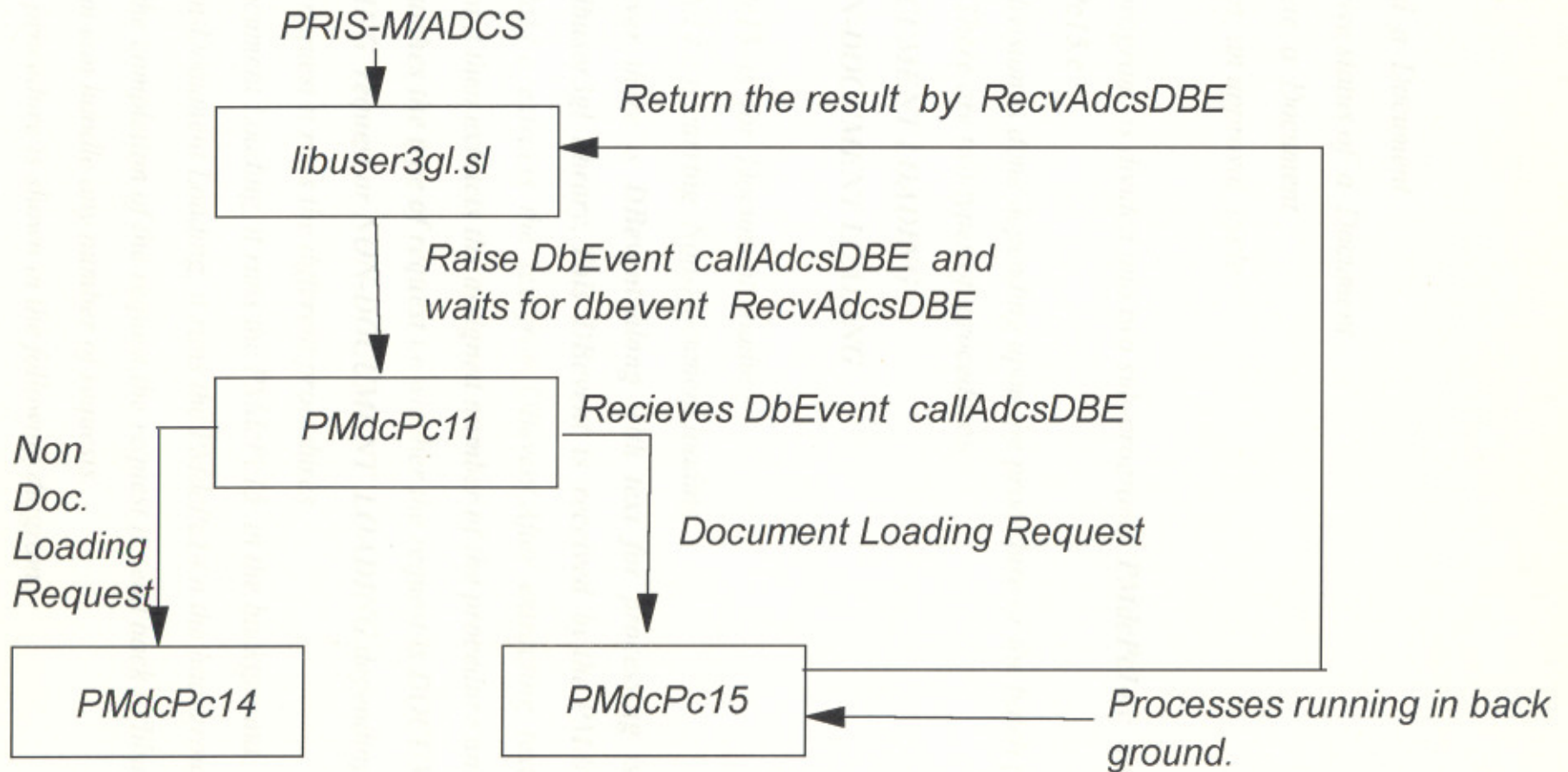
- To load the document.
- Check the status of a document.
- Abort the cycle in progress.
- Delete a document.

This program accepts the request and after processing return back the result to the initiating procedure or program. The **name of ADCS monitor is PMdcPc11.c**.

### DESCRIPTION OF WORKING

As it is OnLine Monitor, the job should be launched 24 hours a day. ADCSMonitor is waiting for DBEvent raised by PRIS and this will call some ADCS script to

## DESCRIPTION OF ADCS MONITOR:



PRIS-M sends the request to ADCS. libuser3gl library fetches the request and raise the DbEvent with text and is received by PMdcPc11 which is online monitor. This monitor distinguishes between types of requests and the accordingly batch process is called. PMdcPc14 and PMdcPc15 are running in background using the ADCS scripts (docload,objabort,objdelete,objstate,typecheck). Then these programs return the result of request to RecvAdcs DbEvent which is captured by libuser3gl.

- *Load a Document*
- *Retrive status of a Document*
- *Delete a Document*
- *Abort an approval cycle*

*This program is divided into two sub-programs **PMdcPc14.c** and **PMdcPc15.c***

*This division is done depending upon the procedure or the batch process to be called..There are two types of procedures:*

- **DOCUMENT LOADING**
- **NON-DOCUMENT LOADING**

*PMdcPc15 is for Document loading.*

*PMdcPc14.c is carring Non-Document loading.*

*Whenever there is **DBevent** along with text for processing is raised from **libuser3gl** library, This **DBevent** is received by the **PMdcPc11**.*

*PMdcPc11.c extracts the text from **DBevent**.After extracting text from **DBevent**,it then **extracts the assigned number of the procedure and distinguishes the type of request** i.e whether the request is **DOCUMENT LOADING request or NON-DOCUMENT LOADING**.depending upon the type of request it runs the different procedures.*

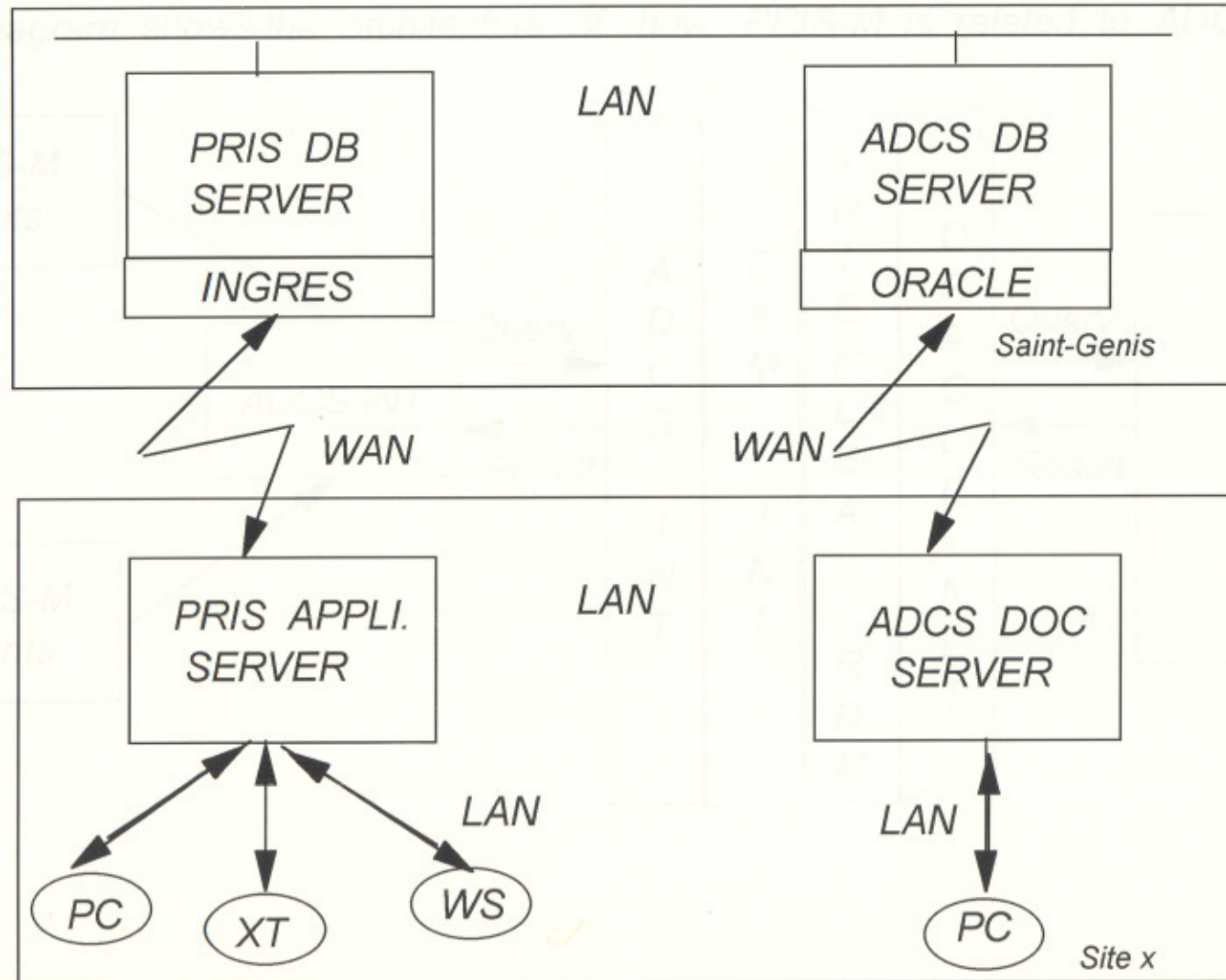
*For Document Loading, it runs the **PMdcPc15** in the background.*

*For Non-Document Loading, it runs the **PMdcPc14** n the background.*

*After the completion of the request,the request is send back to **libuser3gl**.This program can handle any number of requests.*

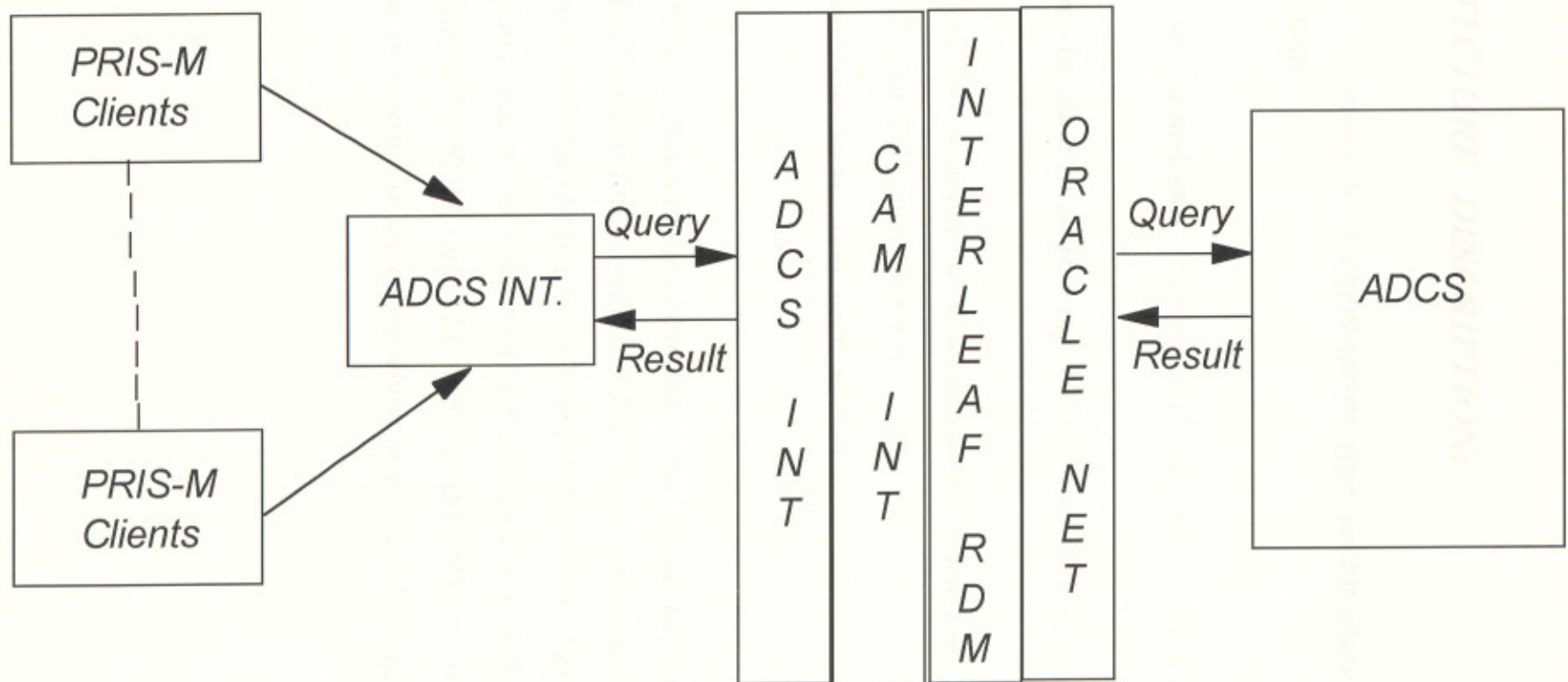
*Above procedure is shown in the following diagram.*

## ARCHITECTURE DESCRIPTION



## PRIS-M/ADCS INTERFACE ARCHITECTURE :

This diagram shows the architecture of how PRIS-M is related to ADCS :



## 4.8 ARCHITECTURE DESCRIPTION:

PRIS-ADCS works according to a **client-server type architecture**, with the following components :

- **Database server in Saint-Genis** (running HP-UX, AIX, and ORACLE DB)
- **Document Server in each site** (running HP-UX and INTERLEAF RDM)
- **PC (Windows Client), X Terminal or Workstation for each user.**
- **WAN between DB and Document servers**
- **LAN between document server and user station.**

Architecture description is shown in the above diagrams. These diagrams also show how ADCS INTERFACE is linked with the PRIS-Clients. Then how this ADCS-INT is next linked to CAM, ORACLE NET and INTERLEAF RDM at the server part. How a query goes from PRIS to ADCS INT and ADCS-INT sends the query to the INTERLEAF RDM, ORACLE DB, CAM INT and finally to ADCS monitor for the processing of the query which then sends back the result to PRIS-Clients.

## 5 PDB/PQC SUBSYSTEM

### 5.1 INTRODUCTION

The main goal for PQC subsystem is "PRODUCT QUALIFICATION AND CERTIFICATION" that is an information system which manages the PQC data.

## CHAPTER ----- 5

# ***PDB/PQC SUBSYSTEM***

### 5.1 LOGICAL DESCRIPTION

This subsystem is in charge of the printing of the certification documents, and of the storage of the data relevant to these documents. The certification documents are the official documents, the ST internal representations, that conduct the manufacturing phases of a product and its forecasted reliability.

## 5 PDB/PQC SUBSYSTEM

### 5.1 INTRODUCTION

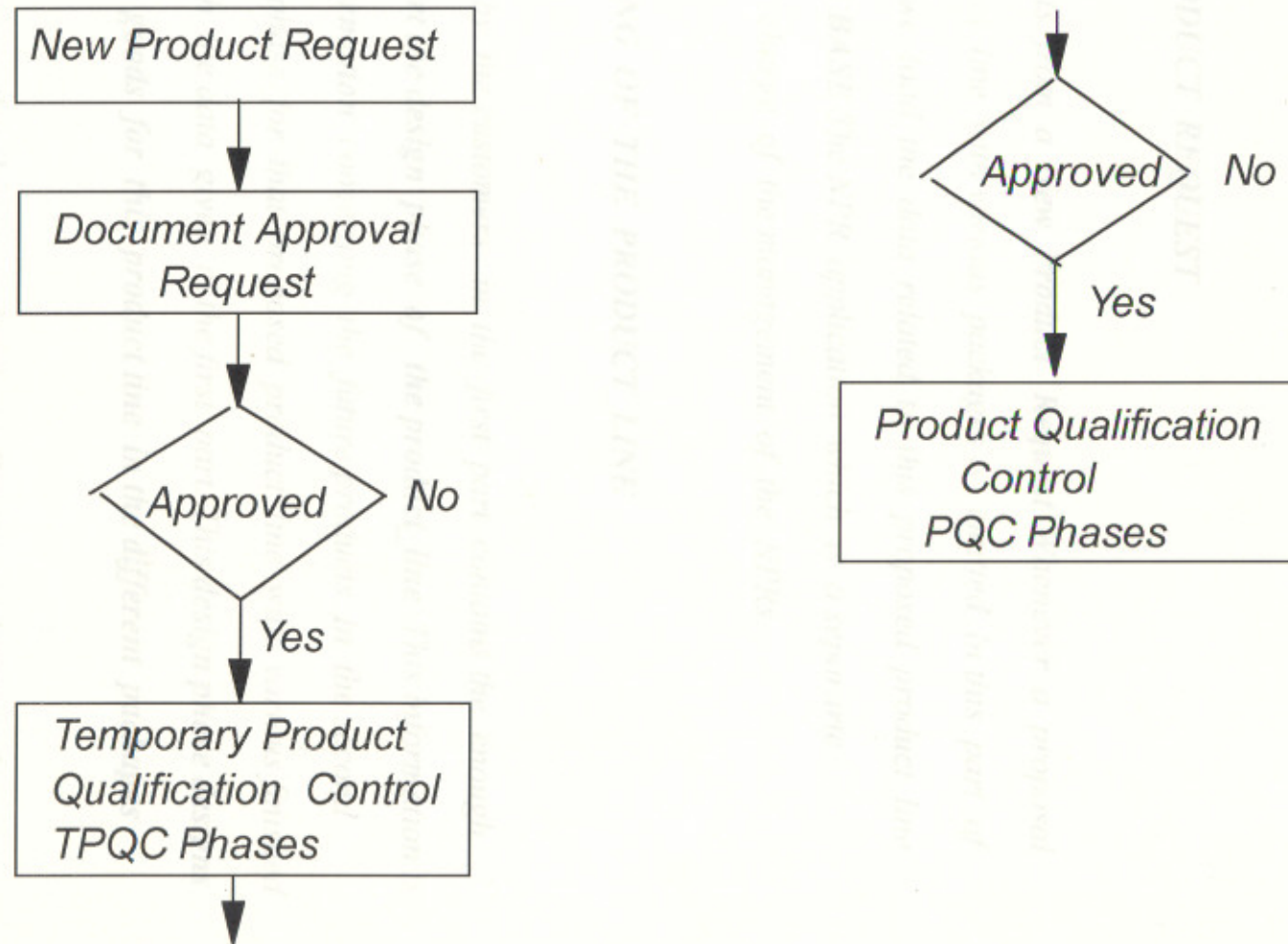
The code name for PQC subsystem is '**PRODUCT QUALIFICATION CERTIFICATION**'. PDB is an information system named '**PRODUCT DATA BASE**' that stores ST datas for three main groups related to products. Most of the **datas of the PDB are to be migrated in PRIS system**. Then the user can access them via the actual PRIS graphical user interfaces (PRIS-P, PRIS-M). Basic function of this subsystem is to **approve the request of new product for manufacturing**. Whenever there is a new product request from a customer. This subsystem takes that request with the all necessary information required in the various manufacturing phases of a new product. After that processing of the new product request is done and passes through various phases which are described in the next sections

### 5.1 LOGICAL DESCRIPTION

This subsystem is in charge of the printing of the certification documents, and of the storage of the data relevant to these documents. The certification documents are the **official documents**(in the ST internal organisation), that **conduct the manufacturing phases of a product, and its forecasted rentability**.

## Flow of different phases in PDB/PQC :

Summary of different phases of PDB/PQC and relation between them is shown here by means of a flow chart:



*This system is logically divided into FOUR parts:*

*The maturity of the product during the DAC phase is normally lower or equal*

### ➤ **NEW PRODUCT REQUEST**

*This system starts from a **New Product Request**. Whenever a proposal for a new product line with various packages is emitted. In this part of the application, we load the data related to this proposed product\_line into **PRIS DATA BASE**. The NPR application which is a separate phase application is in charge of the management of the NPRs.*

### ➤ **DESIGNING OF THE PRODUCT\_LINE**

*Data provided by the customers in the first part contains the enough information to **start the design phase of the product\_line**. This information is the **forecast information** concerning the future products. In the second part, the design phase for that proposed product\_line with various finished goods starts with the data given in the first part. This **design phase designs several finished goods for this product line in the different packages requested.***

*In order to approve the design realised, a **Document Apporoval Certificate (DAC)** is emmitted at the end of design phase. Some information during this phase is need to be stored. Part of this information is the forecast info which can consist on the same information as the NPR forecast informations with the corrected values, or the other information*

collected during this phase.

*The maturity of the product during the DAC phase is normally lower or equal to 20.*

### ➤ **TEMPORARY PRODUCT QUALIFICATION CERTIFICATION**

*If the design phase is approved by some special users of application. The data related to the design phase are frozen and manufacturing phase of the product\_line to reach a temporary product qualification is started.*

*Frozen means here that the revelant datas of the DAC are not to be updatable anymore, and if one tries to store new values for the DAC it won't have any effect. A defined user will have the authorization to freeze a DAC.*

*The TPQC phase is the manufacturing phase accomplished to reach a Temporary Product Qualification Certification. It stores the same corrected informations, but has no freezing mechanism.*

*This phase defines three subphases :*

*--TPQC with maturity  $\leq 21$*

*--TPQC with maturity  $\leq 26$*

*--TPQC with maturity  $\leq 29$ .*

### ➤ **PRODUCT QUALIFICATION CERTIFICATION**

*If the TPQC document with maturity 29 is signed by the special users , then the final phase of the manufacturing that product\_line with its*

*various commercial products is started. The same corrected data is stored during this phase.*

*Users will enter in the application PQC to store data of different phases (DAC, TPQC, PQC). They may also generate a document for each phase .*

*On the basis of the information gathered in the various phases, the manufacturing evolution of the product\_line and its various commercial products is done. The forecast of its evolution and rentability in terms of market over five years.*

*Main entity of this subsystem is PQC entity. . A PQC entity identifies all the information relevant to certification documents. An entry of the PQC is identified by a special type called source type.*

*There are three types of source entries*

- *NPR -- It is an entry of the NPR weekly loading.*
- *DAC -- It represent a DAC entry in the PQC.*
- *PQC -- A PQC entry can be created by user via user interface.*

*These three entries in the SOURCE are identified in the PQC differnetly.*

- *NPR entry of the SOURCE in the PQC is identified by*
  - *its product line .*
  - *its npr\_package.*
  - *its npr\_finished\_good*

- *A PQC entry of the SOURCE in the PQC is identified by*
  - *its finished\_good.*

- A **DAC** entry of the **PQC** is identified by
  - its package.
  - its product line.

There may be several entries in the **PQC** reflecting the several requests for new product. Each of the **PQC** entry contain **economic** information, **market** information corresponding to a new request..This **economic** information concerns to one customer for the maximum of five years.

There are some rules product which are as follows.

- An **NPR** entry has (optionally) **cost\_forecast** and **manufg\_forecast** infos, but has no **pqc\_complt\_infos**.
- A **PQC** entry has (optionally) **pqc\_complt** infos, but has no **manufg\_forecast** and **cost\_forecast** infos.
- A **DAC** entry has (mandatory) **dac\_info** but no **cost\_forecast**, **manufg\_forecast** or **pqc\_complt** infos.

## 5.2 SERVER PART

### 5.2.1 NPR\_LOADING

The **NPR** loading is a batch program scheduled by the **PRIS\_BATCH\_SYSTEM** which runs twice a week.. This batch program loads the **NPR** entries from the three files respectively called **FECONPR**, **FECONPR1**,**FECONNPR2** . For this application, data for the New Product Request is preloaded in these above mentioned files.

These three files namely **FECONPR**, **FECONPR1** and **FECONNPR2** are the **flat files** containing the **technical data** (used for the manufacturing of

the new product) and the **economical information** of the product being requested. The **format** of these files is of following specification

- Files are composed of lines.
- Each lines is sequence of fields.
- Each field is a fixed number of characters.

These tabular files are **related to each other by key fields** and this relation corresponding to the PQC table. These files contain the different information for the new product which are as follows:

- **Feconpr** File : corresponds to the loading of the **info\_forecast** and **eco\_forecast** tables.
- **Foconpr1** File : corresponds to the **manufg\_forecast** table.
- **Foconpr2** File : corresponds to **cost\_forecast** table.

This 3GL program reads these three tabular files. The **NPR\_BATCH\_SYSTEM** pass the location of the file via parameters. i.e location of these files , all the three files are passed to programs via parameters. This program so read these files sequentially and download the data to corresponding tables.

## 5.3 CLIENT PART OF THE APPLICATION

In the client part, this module is divided into three parts:

- **Freezing a DAC .**
- **Update of the DAC\_INFO.**
- **Printing a DAC document.**

Client part is developed in *Windows4GL/INGRES*. A special user can **freeze the information related to a PQC entry** or a user can **update the information** like *cost\_information*, *eco\_information* and the *manufg\_informtion*. Ultimately user can **print the documents** which are produced at various phases of the application like *DAC*, *TPQC* and *PQC*.

### 5.3.1 FREEZING A DAC

The *Freeze DAC* module enables a special user to freeze the **DAC info entries of PQC**. Freezing of the DAC means that after freezing the information regarding the PQC entry, **nobody will be able to modify the information concerning that PQC**. Only the information for a PQC can be frozen when it is in **DAC phase of the process**. Those entries of the PQC can be frozen for which **SOURCE.type='DAC'**. So this module concerns only to the 'DAC' entries of PQC. Special users or the groups who can freeze the data are '**Method Write Group**' and '**Product Engineer Write Group**'. These groups are defined by '*Organization Security*' project.

### 5.3.2 UPDATE OF THE DAC\_INFO

*A* NPR\_loading program loads the various information related to a New Product Request in the corresponding tables. **Dac\_Info** table contain the information needed at the various manufacturing phases of the product .

Each record in this table corresponds to a particular PQC entity.

The special user who belongs to either 'Method Write Group' or 'Product Engineer Write Group' can **update this information for a particular PQC entity (A unique combination of product line code, finished good code and package code).**

The special user can **update the PQC entity** i.e corresponding to a Product Line Code, user can choose another Finished Good Code and Package Code. User can **create** a new customer or **delete a customer** . Also can **update the economic information** related to a PQC entity and the **manufacturing or the cost information** corresponding to a particular PQC entity.

### 5.3.3 PRINTING OF A DAC DOCUMENT

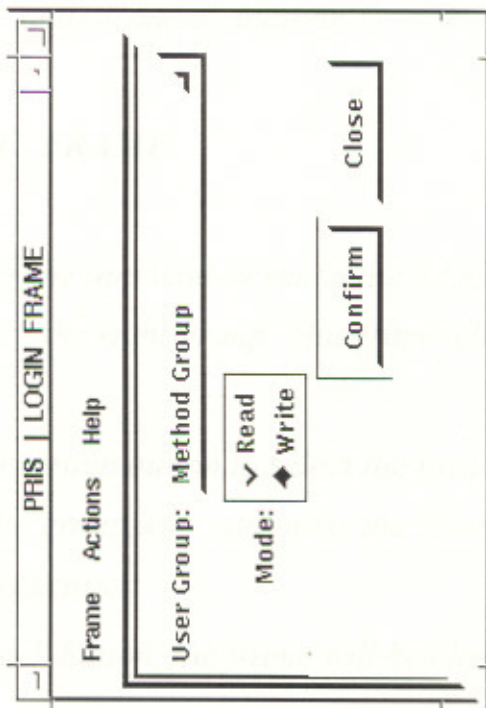
*A* user can print any document for each phase (DAC, TPQC & PQC). For this, user selects any **Document type, PQC entity** for which Document is needed and the some other information like product maturity code, raw line code etc. This information is then **passes to the Xi-writer program as parameters to generate the document and do the printing of the document.**

## 5.4 FRAMES DESCRIPTION

*As the client part of the application is being developed in Windows4GL /INGRES. So the application contains the frames on the client part. This PDB /PQC subsystem contains six frames in total which are named according to the naming standard here are as follows:*

- 1) PMpqF\_000 : This frame is the 'MAIN MENU' for this application.*
- 2) PMpqF\_110 : This frame is the 'FREEZE DAC' frame covering the 'Freeze DAC' module of the application.*
- 3) PMpqF\_320 : This frame is the 'ECONOMIC INFO' frame contains the economical information for the PQC entity for a particular customer.*
- 4) PMpqF\_330 : This frame is the 'MANUFACTURING FORECAST' frame which handles all the manufacturing data for a particular PQC.*
- 5) PMpqF\_301 : This frame is the 'MAKE COPY' frame which carries the various 'PQC' entities.*
- 6) PMpqF\_410 : This is the 'PRINT DOCUMENT' frame which is responsible for the printing of the Document.*

*Apart from above frames, there is one frame called Login frame for the application and which opens at the very beginning of the application. In this frame user has to specify the group to which he/she belong. After choosing the correct group user and confirming this frame, user can proceed to the application.*



## **PM\_\_F003 (LOGIN FRAME)**

### **DESCRIPTION**

*This frame is the **Access Frame** for the application. This frame allows the access of the application to the authorized users or groups. This frame has the following properties :*

*FRAME TITLE : **PRIS | LOGIN FRAME***

- a) This frame contains one button for the selection of the User;s Group.*
- b) Contains 'Confirm' and 'Cancel' buttons.*

### **WORKING OF THE FRAME**

*First frame opens after the application run is the 'LOGIN FRAME' . This frame allows the user to select the right group .This frame checks the existence of the user in that group .*

*User click on the User Group button to select the group to which user belongs. After the selection of the group,user can press the 'Confirm' button to go to the **Main Menu** of the application.*

*If the user press 'Cancel' button, the frame will be closed and application will be terminated.*

# PRIS - PDB (MAIN MENU)

## DESCRIPTION

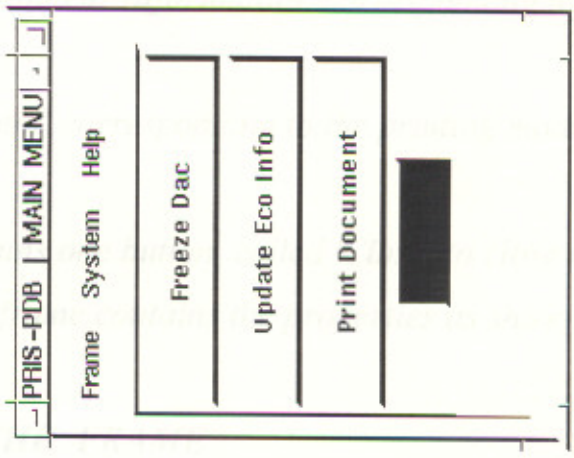
This is the main menu of the application. The menu items are listed in the table below.

The menu items are: Frame, System, Help.

## PRIS - PDB (MAIN MENU)

The menu items are: Frame, System, Help.

The menu items are: Frame, System, Help.



## WORKING OF

The user can click on the menu items to perform the following actions:

1. Frame

When the user clicks on the 'Frame' menu item, the application will open the 'Frame' dialog box.

The user can click on the 'Freeze Dac' menu item to freeze the DAC.

The user can click on the 'Update Eco Info' menu item to update the eco information.

The user can click on the 'Print Document' menu item to print the document.

The user can click on the 'Print Document' menu item to print the document.

The user can click on the 'Print Document' menu item to print the document.

## **PMpqF\_000 (MAIN MENU)**

### **DESCRIPTION:**

This is the Main Menu frame of the application. This frame allows to select or manipulate any option from the given options.

This frame has following Properties :

**FRAME TITLE : PDB/PQC MAIN MENU**

a) This frame contains the three buttons ,each corresponding to the three modules of the application which are as follows:

--- '**Freeze Dac**' corresponding to Freeze Dac module.

---'**Update Economical Information**' corresponding to the 'Update Dac\_Info.

---'**Print Document**' corresponding to the printing module of the application.

b) This frame contains one button called '**Close**' to close the application.

c) The menu of the frame contains the properties as shown in the diagram.

### **WORKING OF THE FRAME :**

After selecting the right group in the access frame , this frame opens with the Title '**Main Menu PDB/PQC**' .

Actions are as follows;

a)When the user clicks on the '**Freeze DAC**' button of the frame. This frame first checks the group to which the user belongs . Then it checks wheather the user is a special user 'Dac Approver' defined by Org-Sec. Depending upon that criteria this frame opens the next frame PMpqF\_110 in

-- **Update Mode** : If the user is '**Dac Approver**' and belongs to '**Method Write Group**' or '**Product Engineer Write Group**' .

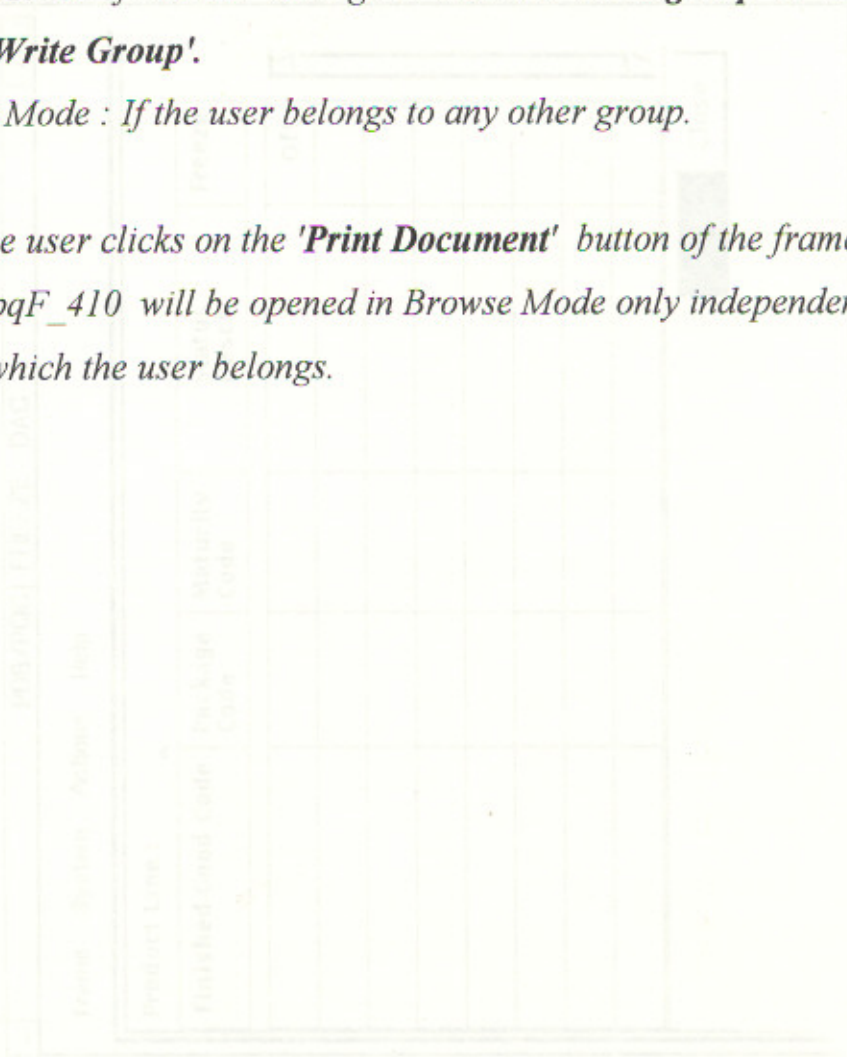
-- **Browse Mode** :If the user does not satisfy the above condition.

b) When the user clicks on the '**Update Eco Info**' button of the frame. This frame first checks the group to which the user belongs .Depending upon the Group, next frame is opened in

--**Update Mode** : If the user belongs to '**Method Write group**' or '**Product Engineer Write Group**'.

-- **Browse Mode** : If the user belongs to any other group.

c) When the user clicks on the '**Print Document**' button of the frame. Next frame PMpqF\_410 will be opened in Browse Mode only independent of the Group to which the user belongs.





## **PMpqF\_110 (Freeze Dac)**

### **DESCRIPTION**

*Only 'Dac Approver' can update or freeze the information of DAC. So if the user is the 'Dac Approver' and belongs to the right group, then this frame is opened in the update mode.*

*This frame is the 'Selection Criteria' + 'Detail List' frame. This means depending upon some criteria, details will be displayed and you can update the information. With reference to NEW PRODUCT REQUEST (NPR) to design a product in a **PRODUCT\_LINE** with various **PACKAGES** corresponding to the chosen **PRODUCT\_LINE**. The updation of the table 'dac\_info' for freeze/unfreeze will be done only for entries for which data has changed. The updation will be fired as soon as 'Save' button or come out of the frame.*

**FRAME TITLE : PDB/PQC | FREEZE DAC**

*This frame has the following properties:*

- a) In the selection Criteria, this frame contains only **Product Line Code** i.e. User enter only the Product Line Code. And based upon that Product Line Code, all the information will be displayed.*
- b) Contains the table fields **'Finished Good Code, Package Code, Maturity Code, Status Descr** and a toggle button **'Freeze'**.*
- c) Contains the **'Close'** and **'Save'** Button.*

### **WORKING OF THE FRAME**

*After the frame is opened, user has to enter the Product Line Code in the Product Line field. Based upon this selection criteria, after pressing 'Enter', user will get all the information related to this product line code in the table*

fields.

*Valid entries are also available on the product line code i.e after pressing 'F2' on the product line field, all the valid product line codes will be displayed. Now the user can select any product line code from these valid entries, And all the information related to selected line code will be displayed. In the **Update** mode, user can **Freeze or unFreeze** the data related to this product line code with the toggle button 'Freeze'.*

*In the **Browse** mode, user can only view the data related to a selected product line code.*

*After updating the data, If the user press the 'Save' button all the information will be updated in the Dac\_Info table. If the user presses the 'Close' button, then it will ask for saving the changes or not. And in the browse mode the save button will be dimmed.*

*After preesing the 'Close' button, frame will be closed after asking for the save changes or not in the update mode and control will go back to Main Menu.*

*In the browse mode frame is simply closed.*

Frame Actions System Help

Mngt\_Eco\_Info

Product Line Code :

Finished Good Code :

Package Code :

Customer Name :

Rank : 0

ECONOMICAL INFO FORECAST

Year	Tam (K\$)	ST Sales (K\$)	A.S.P (K\$)	Stpr Sale (K\$)

Tam Total      St Total      Asp Avg      Stpr Total

0	0	\$0.00	0.000
---	---	--------	-------

Prv    Nxt    ██████████    Close

## **PMpqF\_320 (UPDATE ECO INFO)**

### **DESCRIPTION**

This frame is the 'DETAIL FRAME' i.e it contain the various type of information. It contains the '**Selection Criteria**' and **table fields**. For a given finished\_good/package\_code in a given product\_line\_code, the frame displays the economical information for each customer. Economical information is defined for 5 customers maximum.

The user is able to **create a customer and delete an existing customer** for the selected PQC. When a new customer is created, forecasting information will be inserted for that customer in table '**eco\_forecast**' & '**info\_forecast**' for five years. The user can copy the forecasting information for one customer from some other PQC by going to frame 'PMpqF\_301'.

The user can also manipulate technical information, which is stored in table 'pqc\_complt' and is maintained in the frame PMpqF\_330. This frame is called from the current frame by clicking on the button 'Mngt\_Eco\_Info'.

When the frame is initially opened, the frame is opened in '**Browse**' mode with all fields landable except 'product\_line\_code', 'finished\_good\_code' and 'package code'. After entering the data in these three fields, a select statement is fired which decide the mode of the frame.

### **FRAME TITLE : PDB/PQC |UPDATE ECO INFO**

This frame has the following properties :

- a) Contains the **PQC entity** i.e a combination of product line code, finished good code and package code.
- b) Contains the **Customer Name, Rank of the customer** for which the Economical Information is to be forecasted.

- c) Contains the **Economical Information Forecast for a customer** i.e table fields ' Year, Tam, ST Sales, ASP , Stpr sale ' for a Customer. i.e here economical information of five years of a Customer is provided.
- d) Contains the '**Prv**', '**Nxt**' buttons used to display the previous and next customer for the particular PQC entity.
- e) Contains the '**Close**' and '**Save**' Button.
- f) contains one button on the top right of the frame which gives the **details of the manufacturing information, cost information** for a particular PQC entity.
- g) Contains one option 'Make Copy' in the Action Menu which will display the all possible PQC entities i.e all finished good codes and package codes for a particular Product Line Code.

### **WORKING OF THE FRAME**

*After the frame is opened, User has to enter the Product Line Code and Package Code either through Valid entries available after pressing 'F2' or manually.*

*After entering the Product Line Code, user can take the help of 'Make Copy' option in the Action Menu. After click on this option, user will be able to get all the combination of Finished Good Code and Package Code corresponding to the Product Line Code in the next frame 'Make Copy' . User can select any record from this select list frame .*

*After selecting the PQC entity, User has to enter the customer name and the rank of the customer either through Valid entries or manually.*

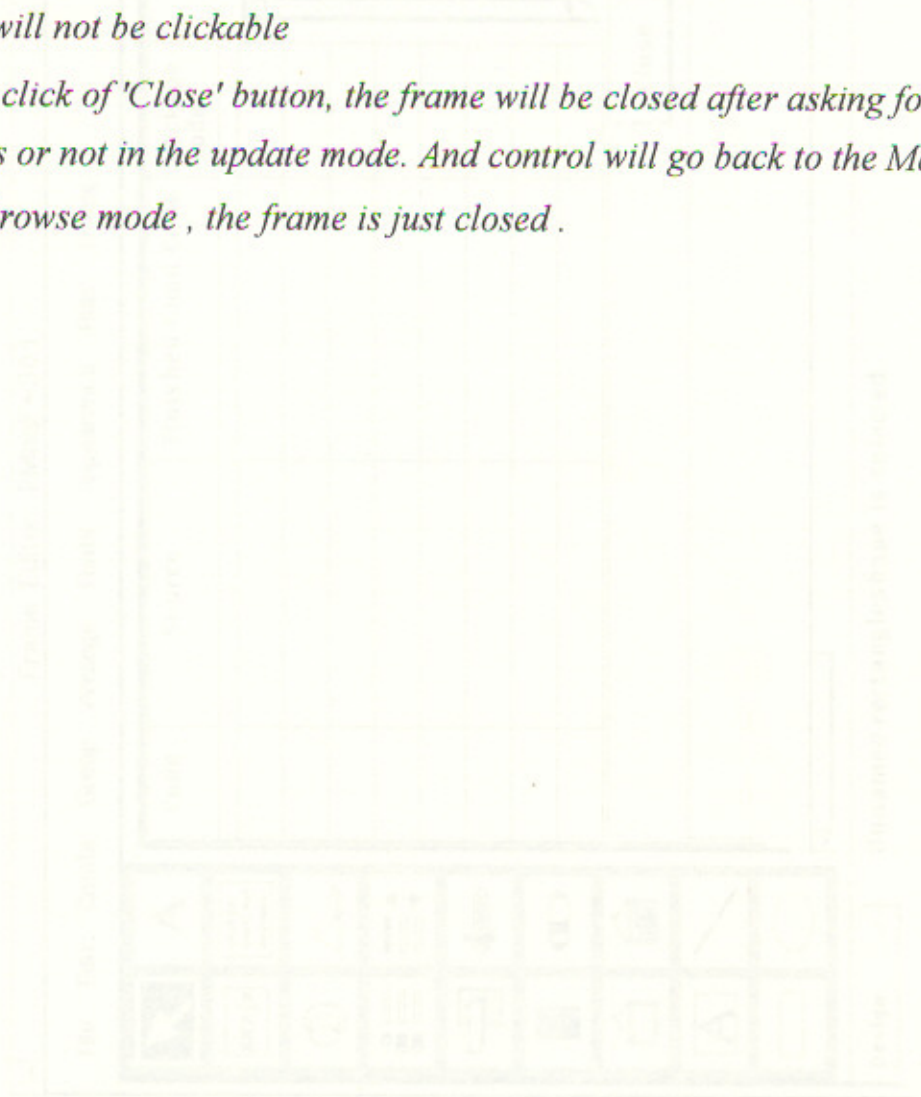
*When all this information is entered , all the economical information for that customer will be displayed.*

*If the user belongs to right group who can update the data, then only user can update the economical information for that customer.*

'Prv' , 'Next' buttons are used for the **previous , next customer**.

If the user wants to update or just view the manufacturing information, cost information then user can click on the 'Mngt\_Eco\_Info' button on the top right corner of the frame. This will open 'ECONOMICAL INFO DETAIL FRAME' . When the user clicks on the 'Save ' button ,all the updation will be reflected in the corresponding tables in the update mode. In the 'Browse' mode the 'Save' button will not be clickable

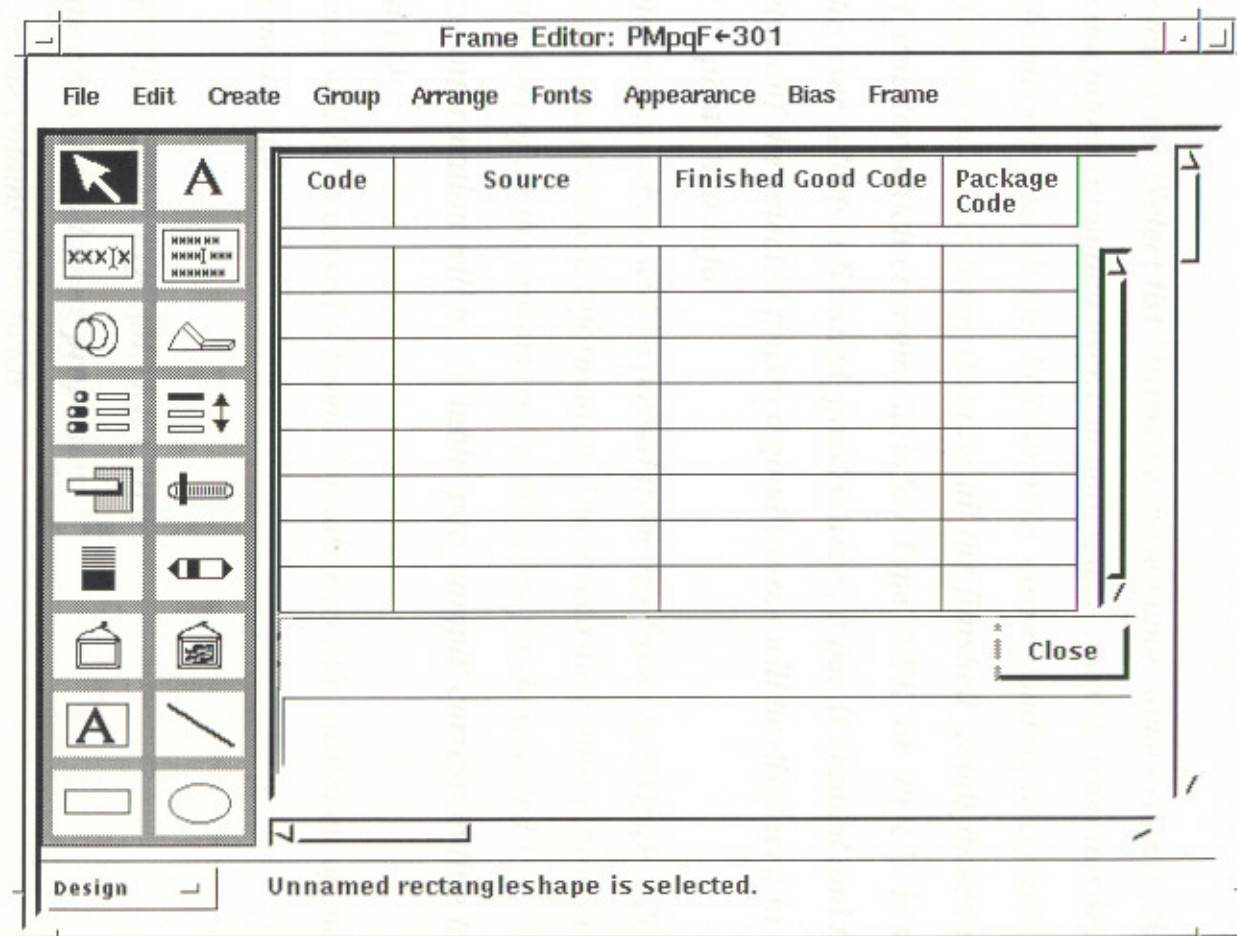
On the click of 'Close' button, the frame will be closed after asking for the save changes or not in the update mode. And control will go back to the Main Menu. In the browse mode , the frame is just closed .



This frame is called from the 'Make Copy' option in the Action menu of the

### WORKING ON THE FRAME

by clicking the button



## **PMpqF\_301 (MAKE COPY)**

### **DESCRIPTION**

*This frame is the 'Select list' frame i.e based upon some criteria, this will display the information and user can only select records from this select list. So this frame will give all the PQC entities corresponding to a particular Product Line code. This frame displays **all the finished\_goods** linked to the **product\_line** for which economical info. (Type 'NPR' or 'PQC') is defined. Once the user selects a finished\_good/source, a pqc is created and the only details of the selected finished good/source will be displayed in Detail Frame 'Update Eco Info'.*

*The information which will be passed from this frame to PMpqF\_320 will be forecasting and technical information. The forecasting information corresponds to information of all the customers for all years for theselected PQC. The technical information will be in table 'pqc\_complt' corresponding to the selected PQC.*

*This frame will be accessed if frame 'Update Eco Info' has been opened in Add/Update mode only.*

**FRAME TITLE :PDB/PQC |MAKE COPY**

*This frame has the following properties:*

- a) This frame contains table fields*
- b) And one close button.*

### **WORKING OF THE FRAME**

*This frame is called from the 'Make Copy' option in the Action menu of the*

frame PMpqF\_320 (UPDATE DAC INFO).

*After entering the product line code in the frame UPDATE ECO INFO ,click on the Make Copy option in the Action menu. This frame will give all the possible PQC entities. User acn select only one record from this select list. After selecting the record from the select list, control will go back to the UPDATE ECO INFO frame and the PQC entity will be displayed on this frame On the click of the 'Close' button, the frame will be closed and the control will go back to UPDATE ECO INFO frame.*

MPPQG : ECONOMICAL INFO DETAIL FRAME			
Frame Actions System Help			
Code :	<input type="text" value="0"/>		
Start Date :		Device Cost YTD \$ :	<input type="text" value="0"/>
ASP Date :		Resources (M/YR) :	<input type="text" value="0.000"/>
Maturity 20 Date :		Die Cost :	<input type="text" value="0.000"/>
Maturity 30 Date :		Wws Cost :	<input type="text" value="0.000"/>
Device Wafers :	<input type="text" value="0.000"/>	Asp \$ :	<input type="text"/>
No of Masks :	<input type="text" value="0"/>	Standard Marg :	<input type="text"/>
NPR Approv Date :	<input type="text"/>		
			<input type="button" value="Close"/>

## **PMpqF\_330 (ECONOMICAL INFO DETAIL FRAME)**

### **DESCRIPTION :**

*This is the **Detail Frame** i.e it carries the different type of information .It contains the **cost information,manufacturing information**.The information **regarding the completion of PQC** (starting from the product design till Product Approval) is handled in this frame which handles a table 'pqc\_complt'.*

### **FRAME TITLE : PDB/PQC \ ECONOMICAL INFO DETAIL FRAME.**

*This frame has the following **properties***

- a) Fields for manufacturing information like device Wafers, No of masks etc.*
- b) Contains some cost information fields like Die cost, Wws Cost etc.*
- c) Contains the Maturity date, start date and NPR Apporov date etc.*
- d) Contains the 'Save' and 'Close' button.*

*Basically this frame carries the various type of fields related to manufacturing step of the NPR..*

### **WORKING OF THE FRAME**

*This frame is called from the UPDATE ECO INFO frame ,After the user enters the PQC entity in the UPDATE ECO INFO frame.Click on the 'Mngt\_Eco\_Info' button. This frame will be opened in the mode same as that of the ' UPDATE ECO INFO'.*

*This frame will display all manufacturing and the cost information for a NPR . If the user opened up this frame in the update mode then user can change the information in this frame.*

If the user has opened it up in the **Browse** mode, Then Save button will be dimmed and user can only view the information in this frame.

On click of the 'Close' button, frame will be closed and the control will go back to UPDATE ECO INFO frame in browse mode and in update mode before closing it will ask for the saving of the changes.

On the click of the 'Save' button, all the changes will be updated only in update mode and this button is not clickable in the browse mode.



Frame Actions System Help

Report Type :

DAC REPORT

Product Line Code

Commercial Product Code	Cp Maturity Code	Finished Good Code	Fg Maturity Code	Raw Line Code
-------------------------	------------------	--------------------	------------------	---------------


Confirm

Cancel

## **PMpqF\_410 (PRINT DOCUMENT)**

*Document will be printed*

### **DESCRIPTION**

*This is the **Detail Frame** containing the various type of information needed for the generation and the printing of the document. And this frame is called from the MAIN MENU frame.*

*Information concerning the **genealogy, the manufacturing, economical, market, cost forecast of specific finished\_good having a given maturity** and is printed in a structured manner and can be sent to a specific user for approval. The actual generation of report (Document) will be done by a **XI-writer program**. Only the **parameters**(product line code, commercial product code, CP maturity code, finished good code and Raw line code) **will be passed to the XI-WRITER program**.*

### **FRAME TITLE : PDB/PQC | PRINT DOCUMENT**

*This frame has the following **properties***

- a) Contains the field for type of the document to print.*
- b) Contains the field Product Line Code*
- c) Contains the table fields Commercial Product Code, Cp Maturity code, Finished Good Code, Fg Maturity Code and RawLine code*
- d) 'Confirm' and 'Cancel' buttons.*

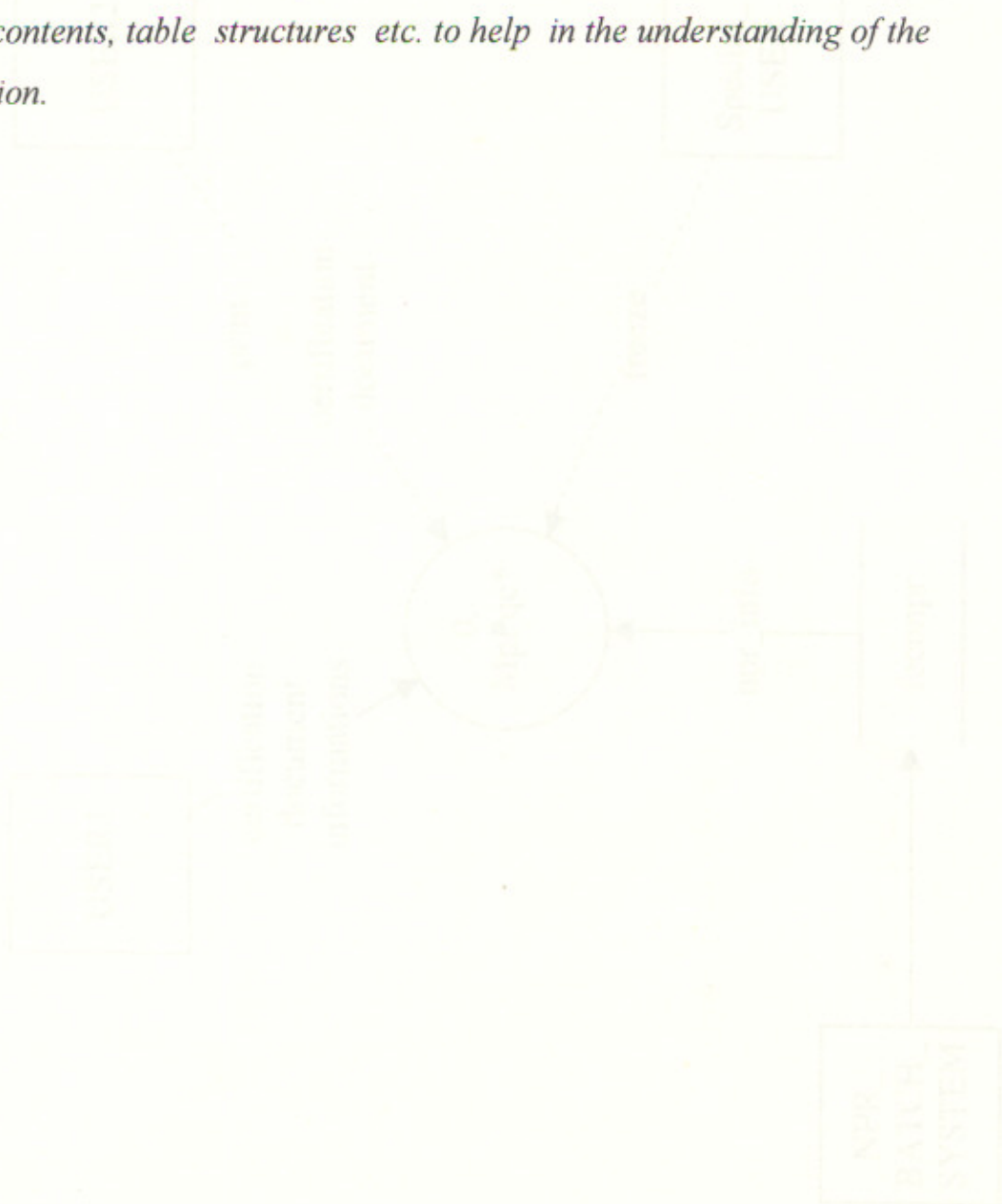
### **WORKING OF THE FRAME**

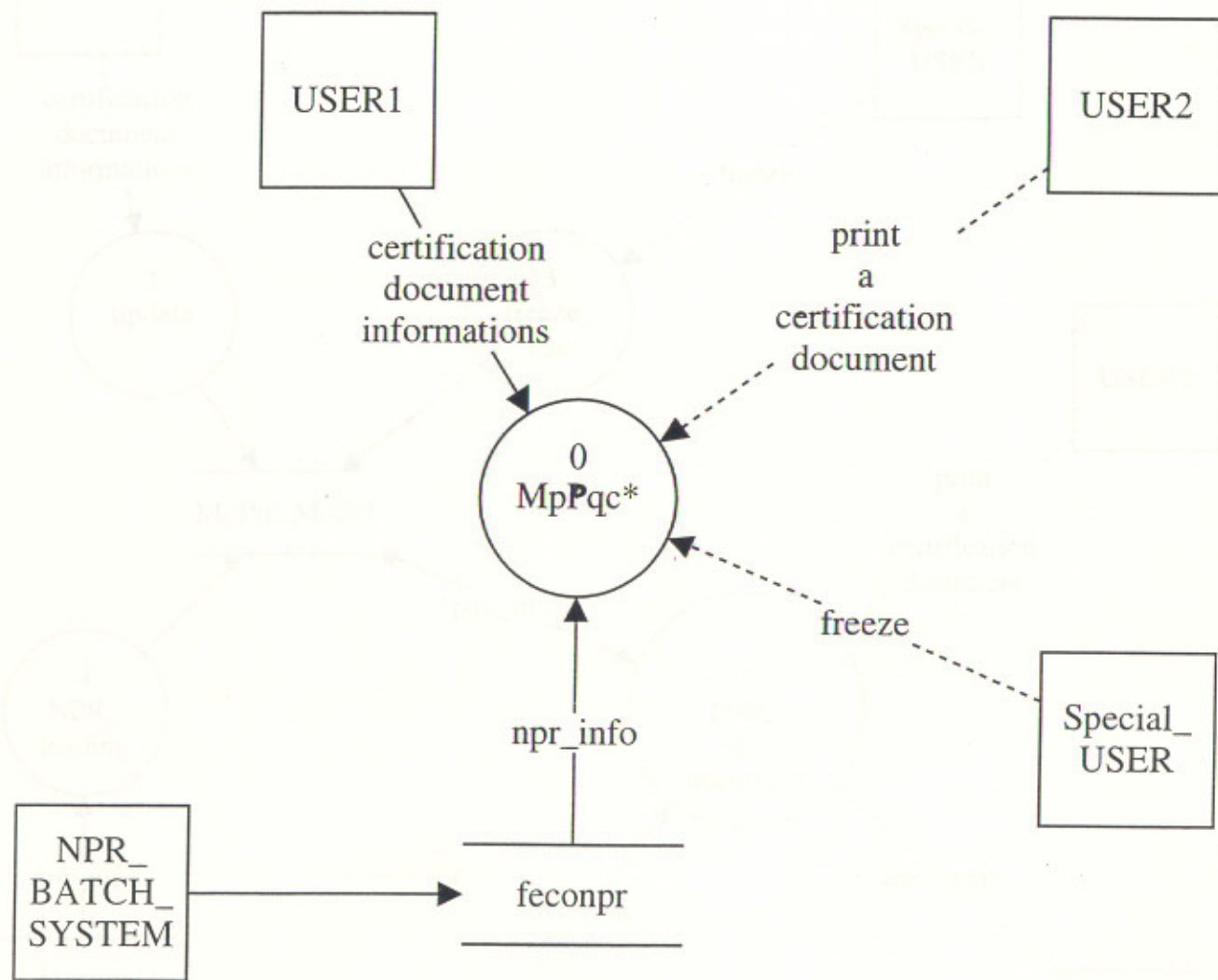
*After the frame is opened, user has to select the type of the document to print and then enter the Product Line Code.*

*After entering the product Line Code, all the corresponding information will be displayed in the table fields.*

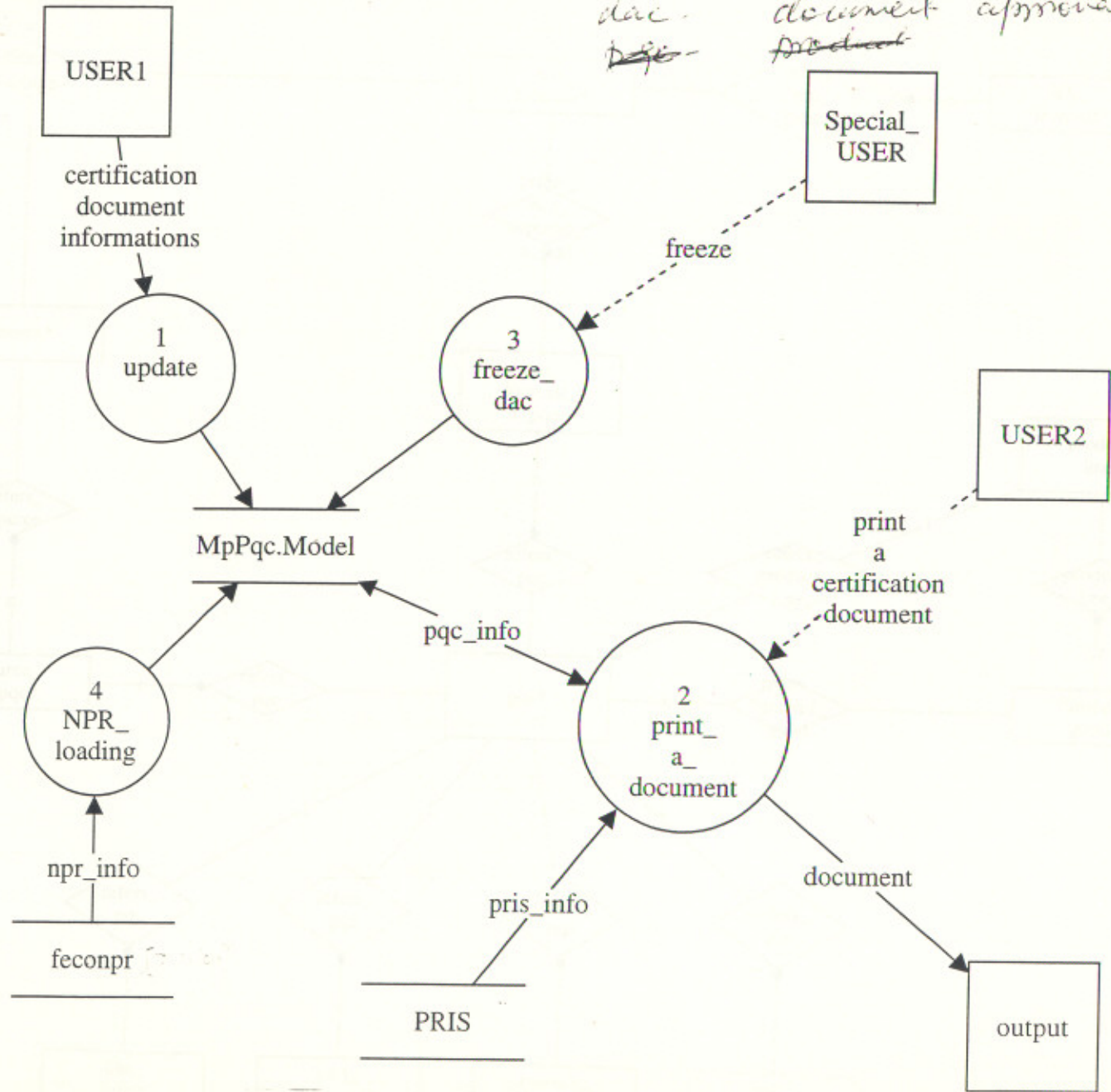
## DESIGN PHASE OF PDB/PQC

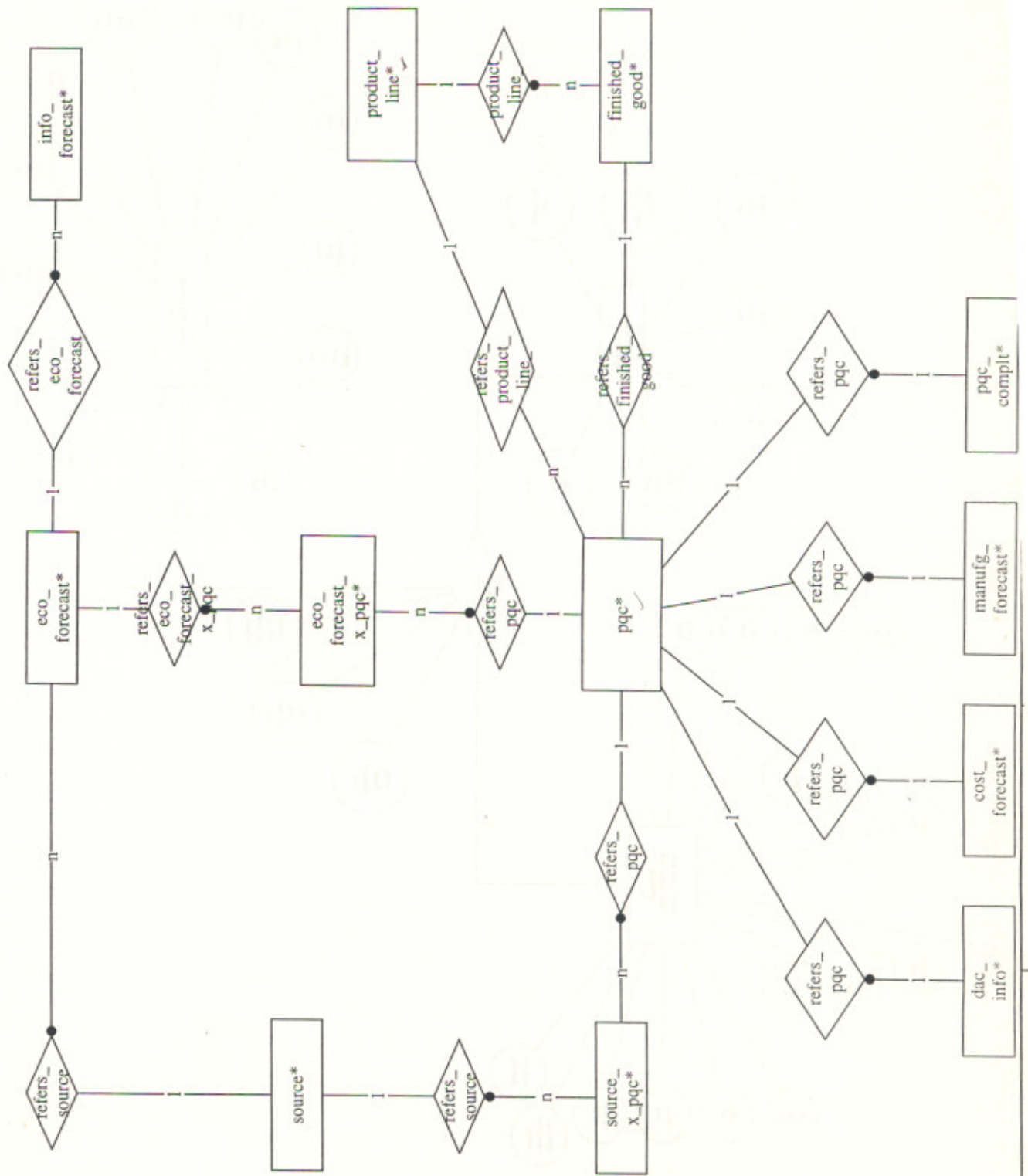
Next given some diagrams give you the description of the PDB/PQC frame contents, table structures etc. to help in the understanding of the application.



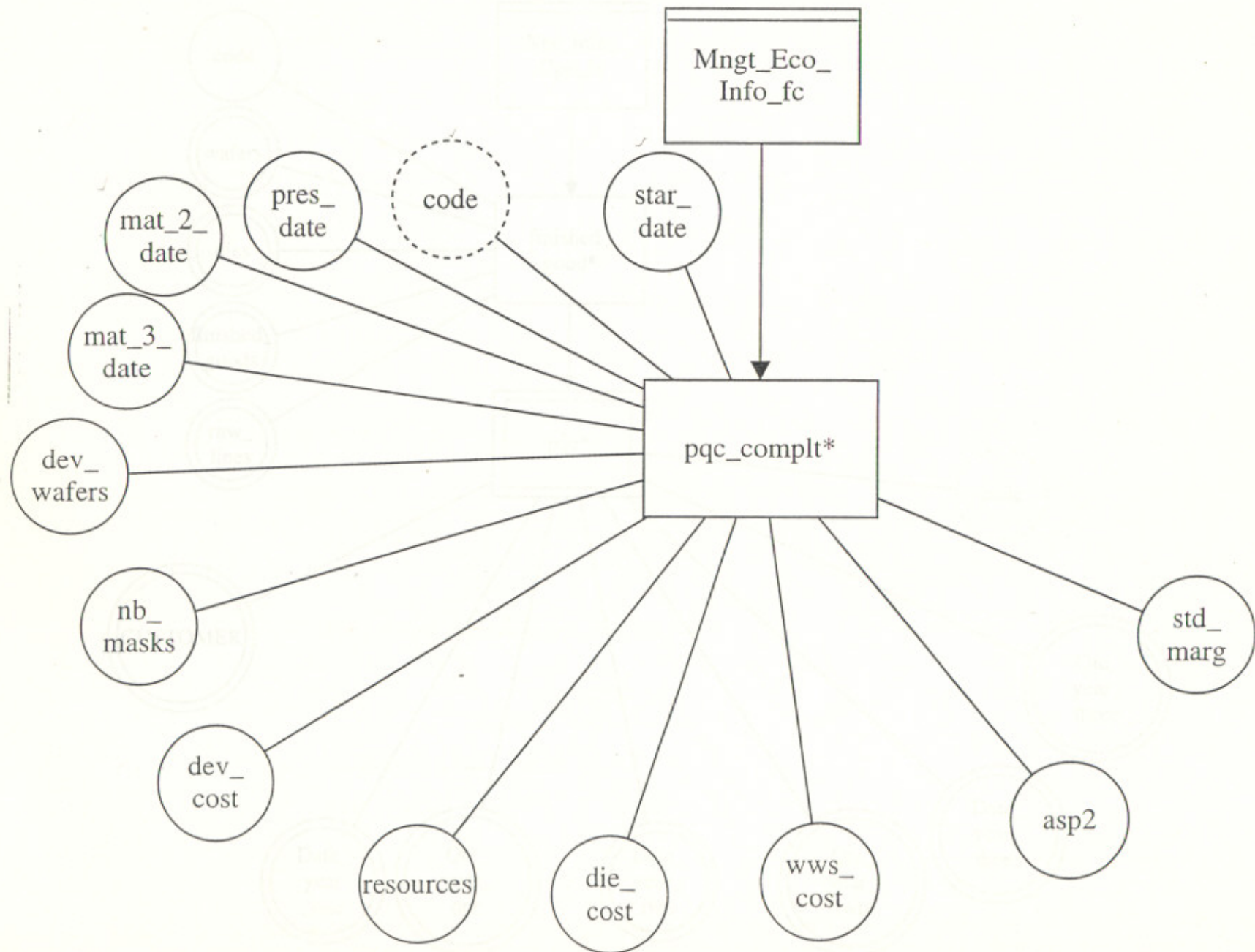


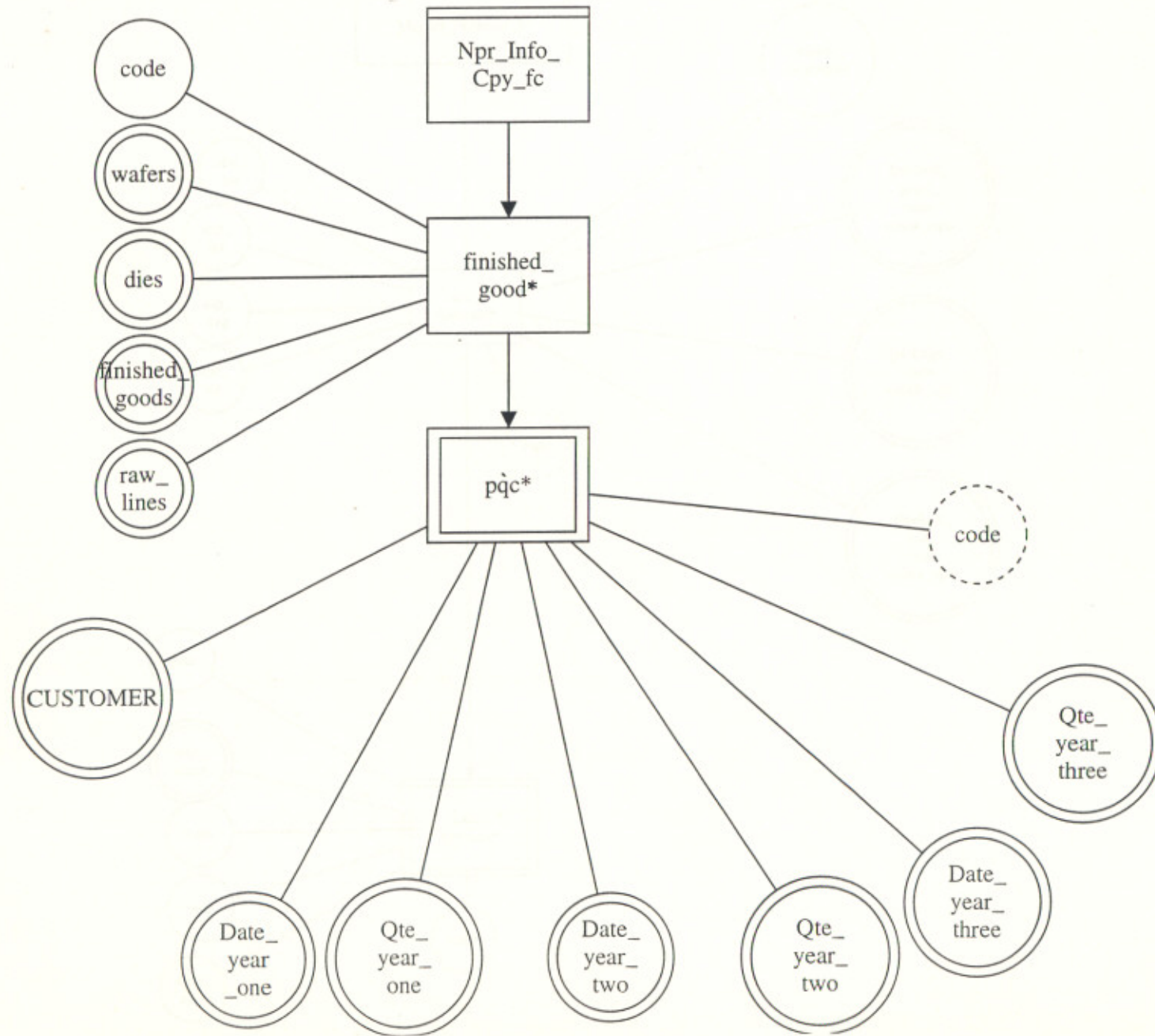
npr- new product request.  
dac- document approval certification.  
~~defe-~~ ~~product~~

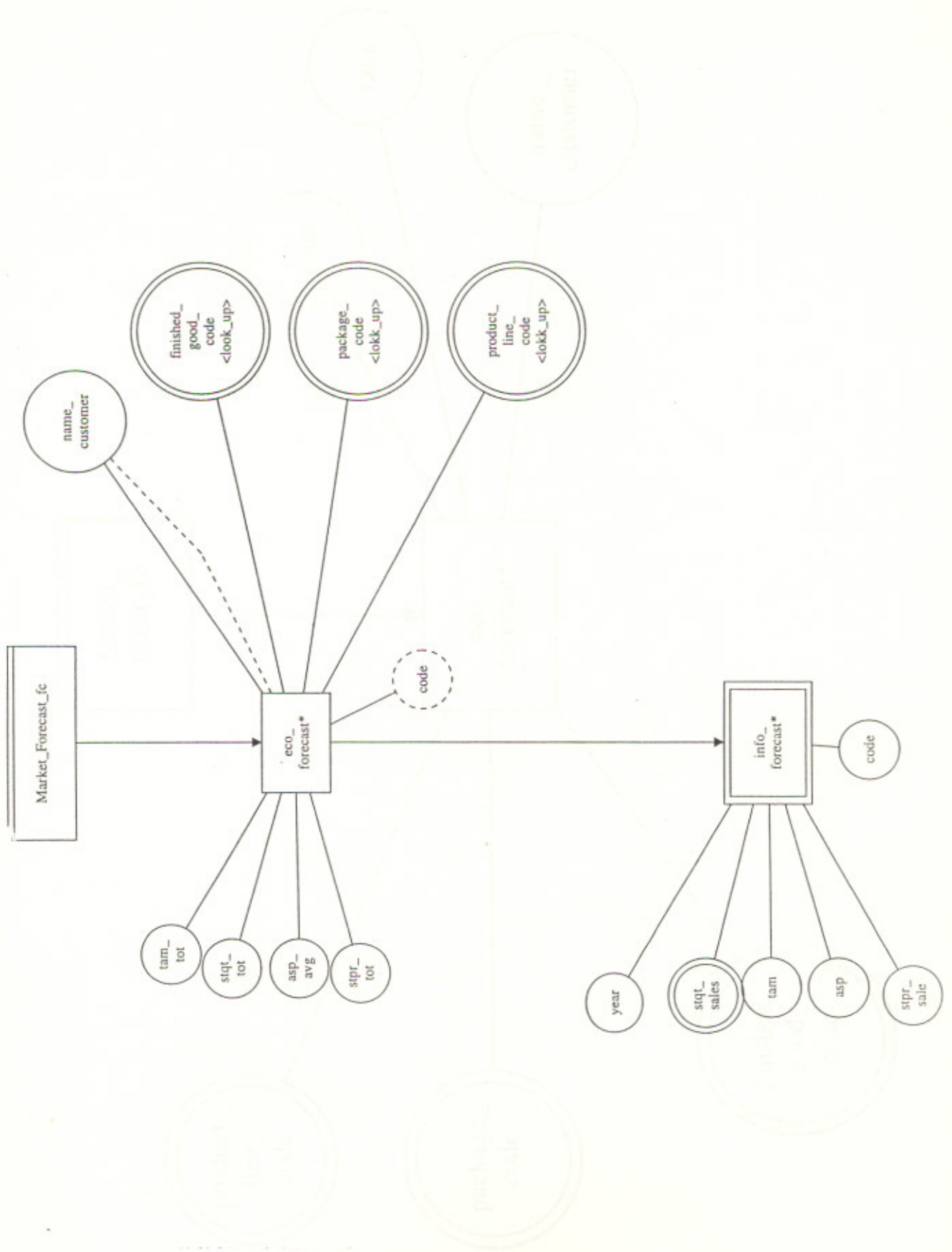


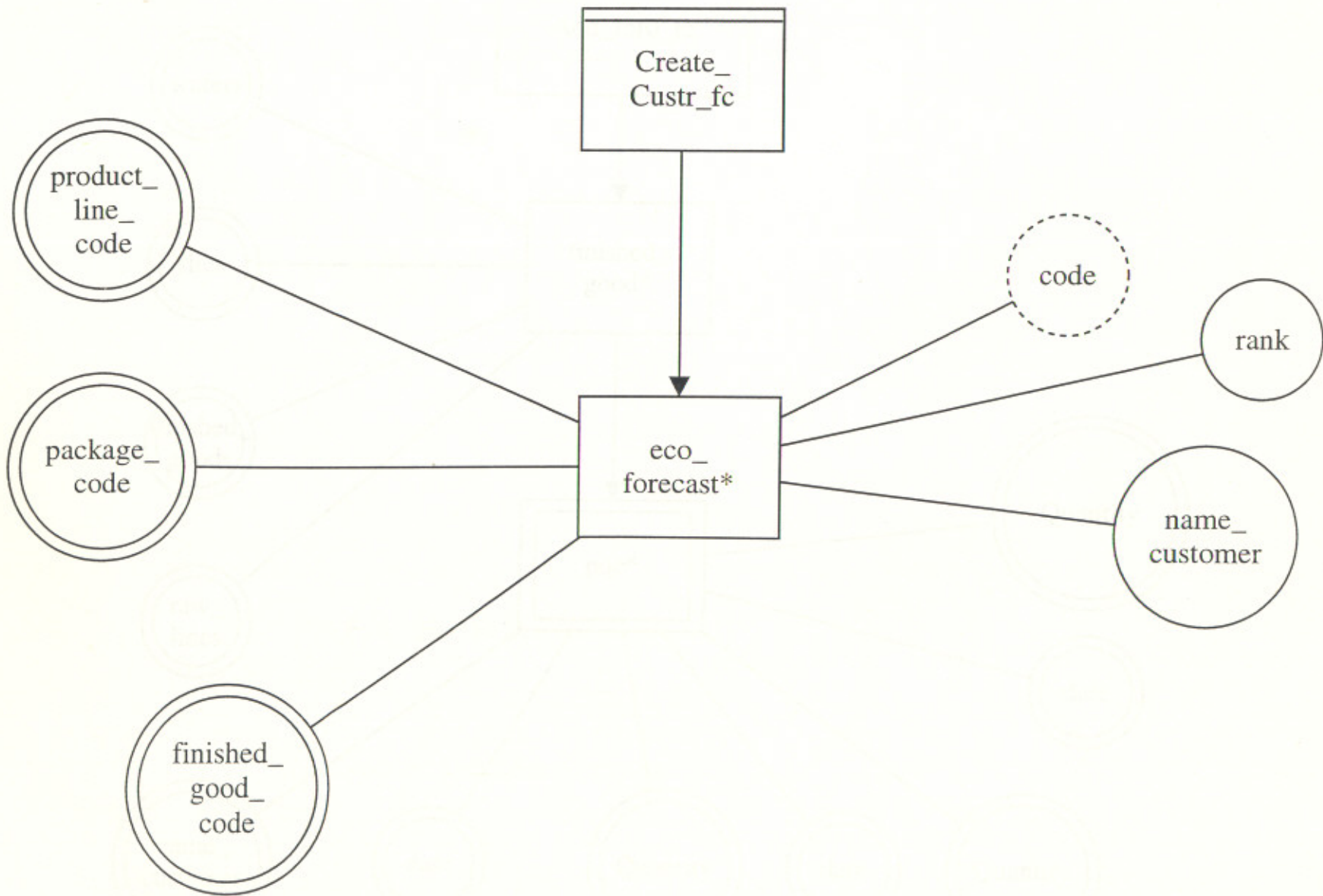


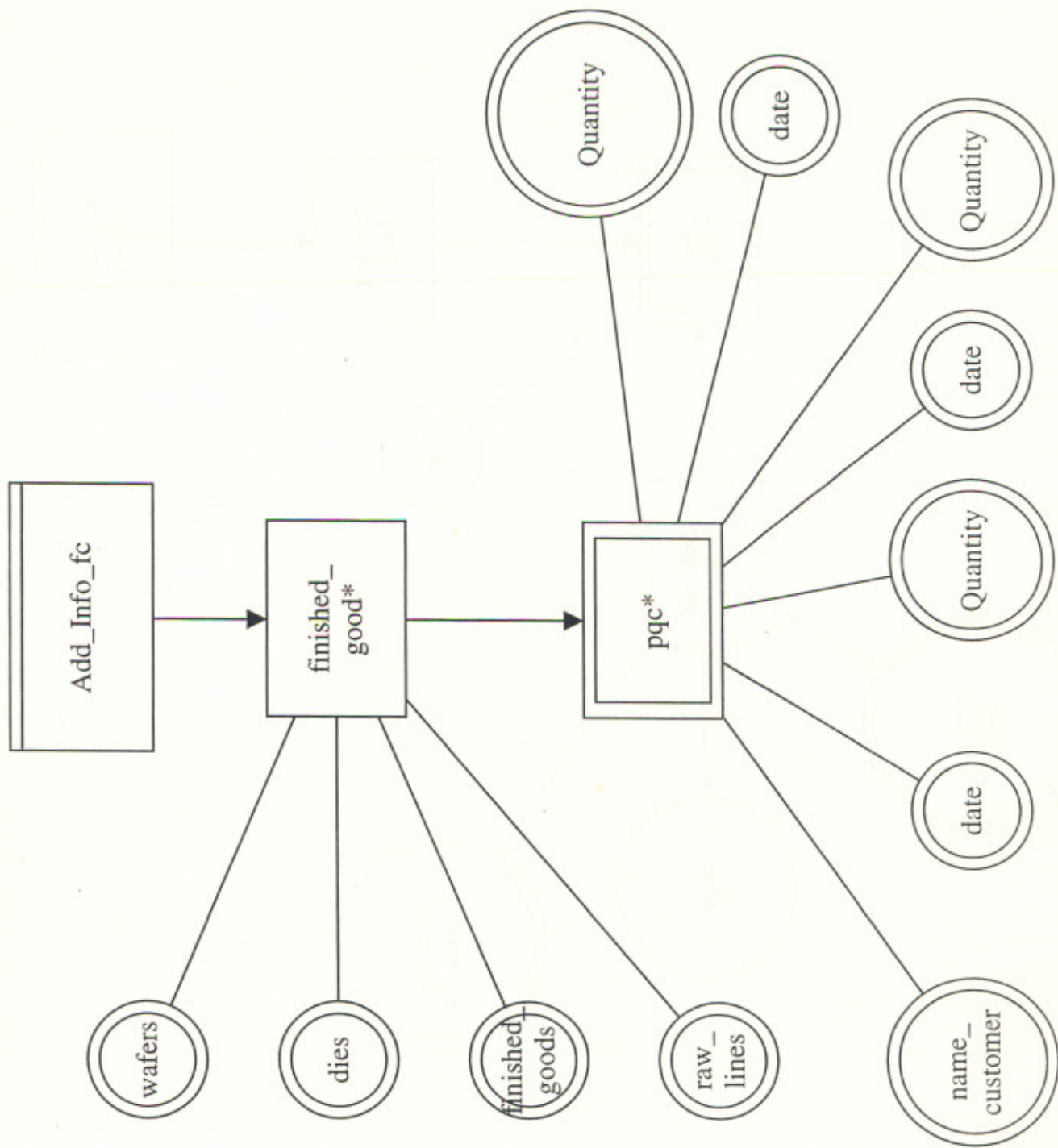


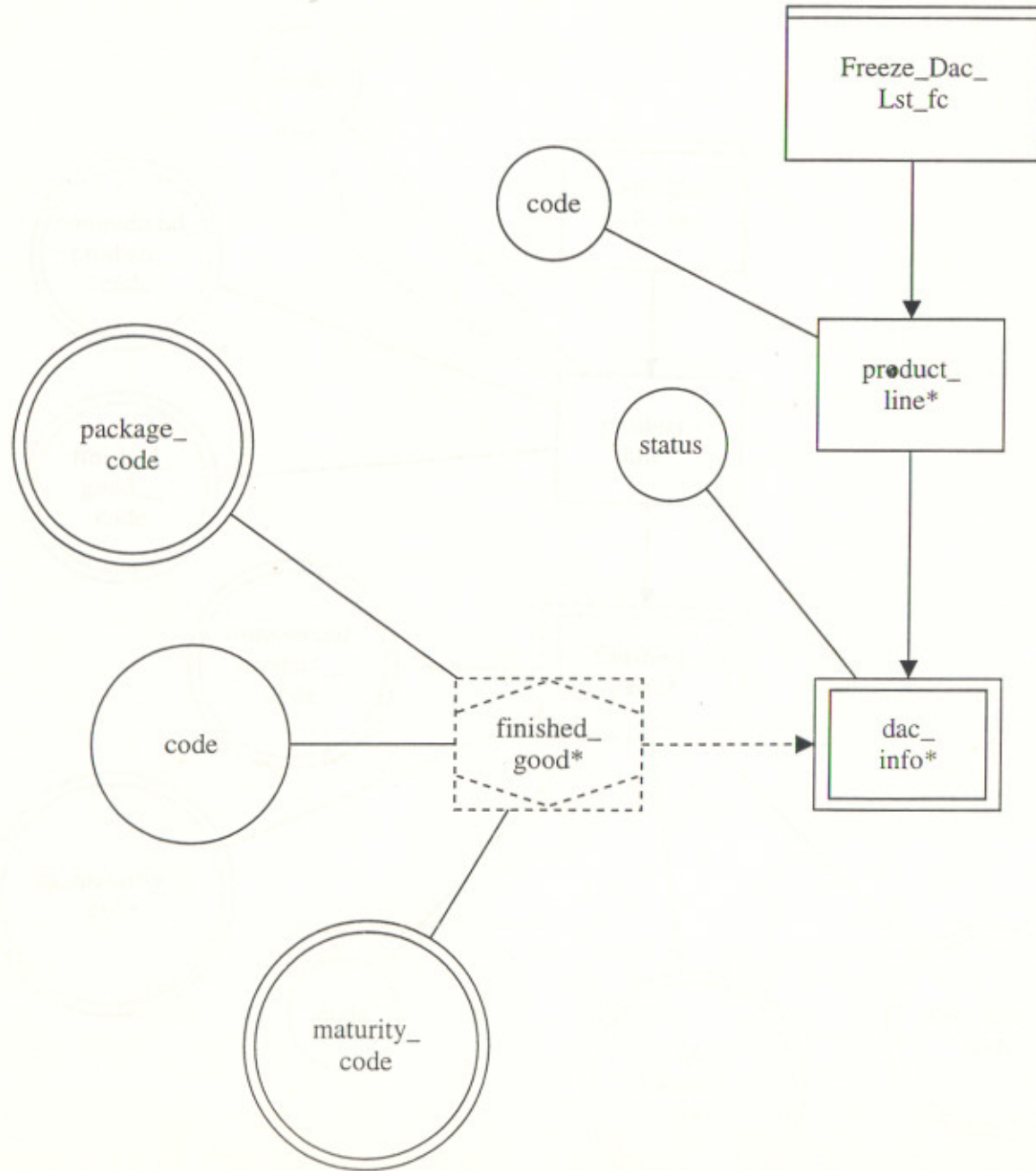


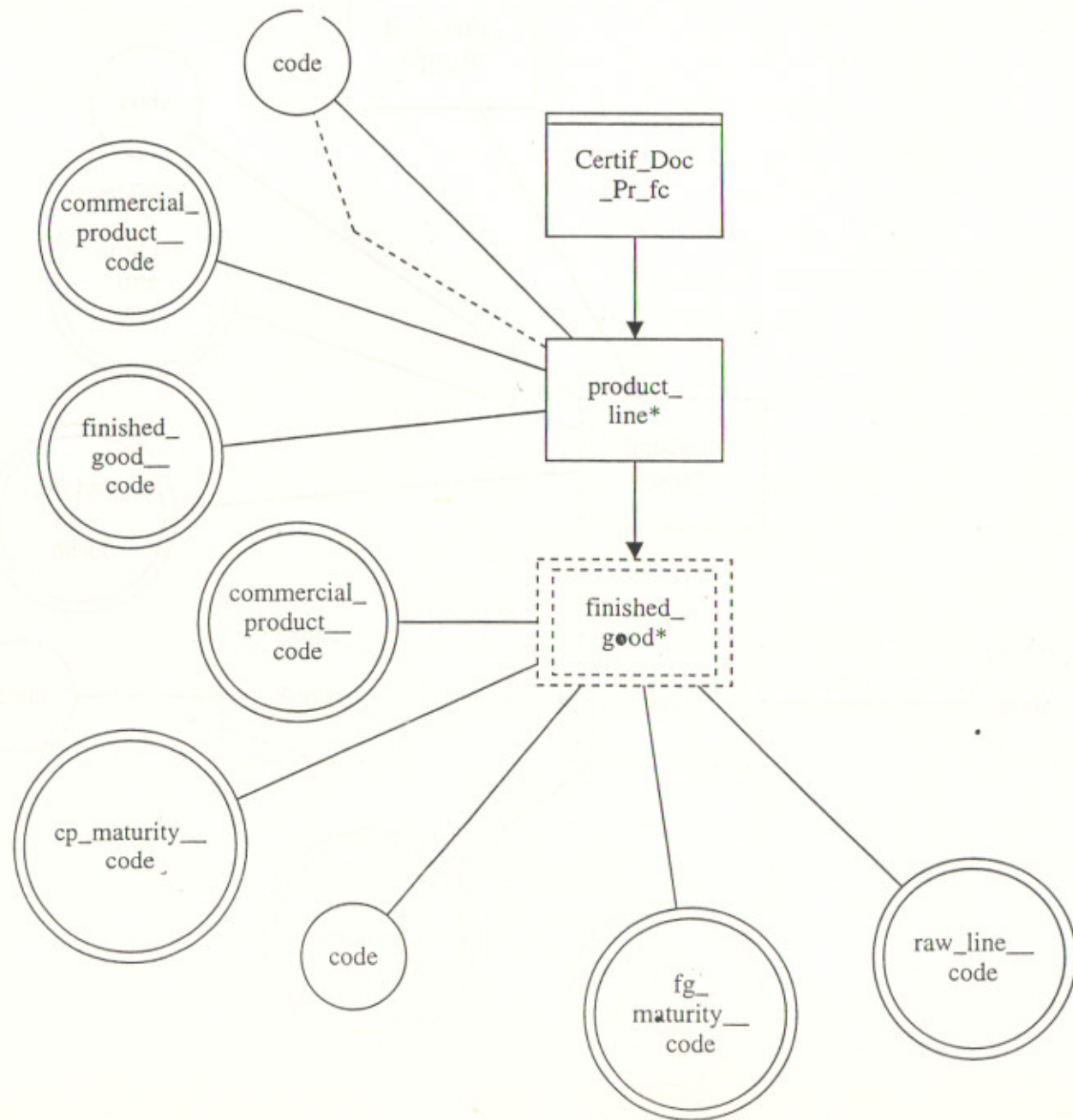


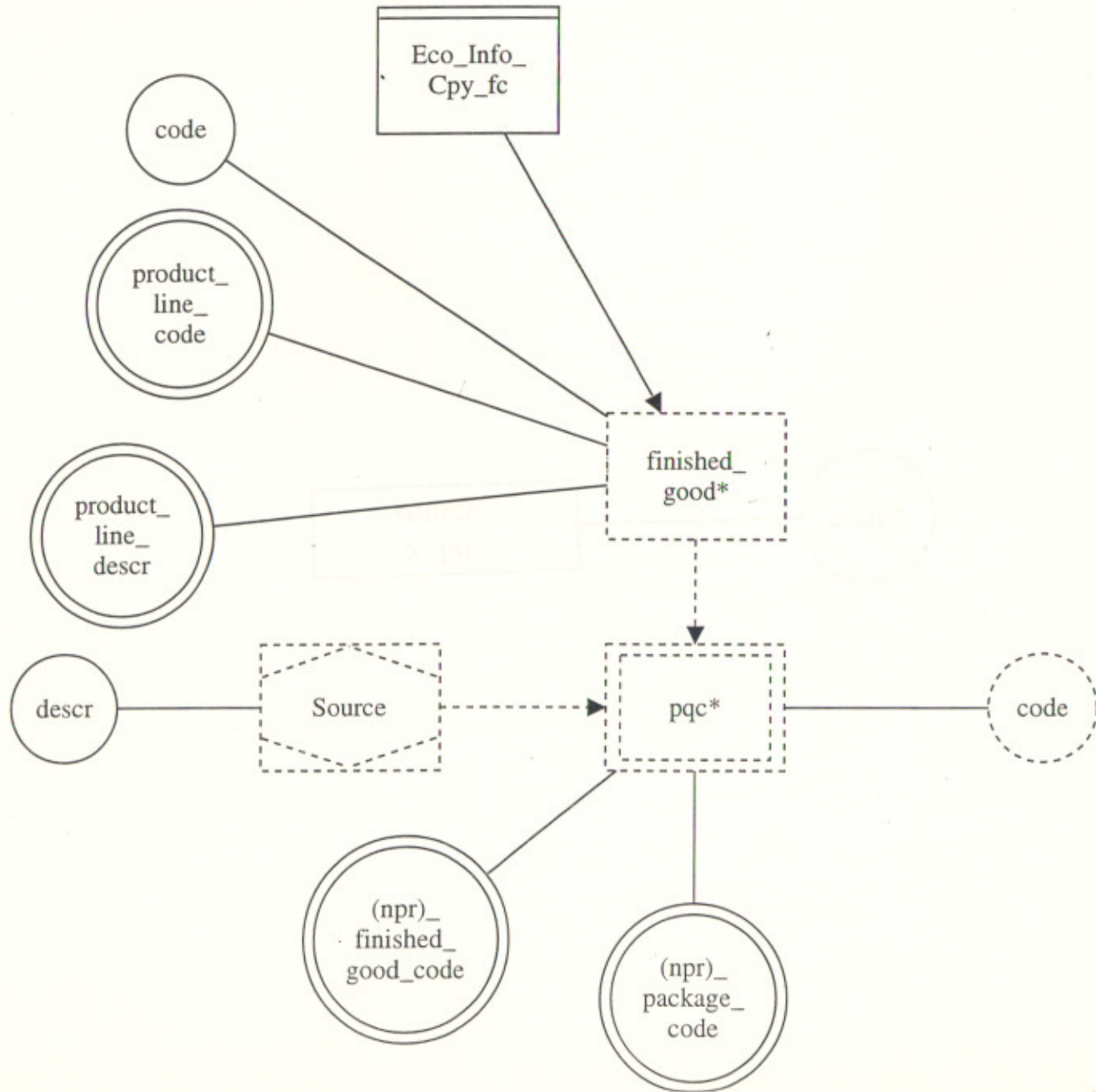


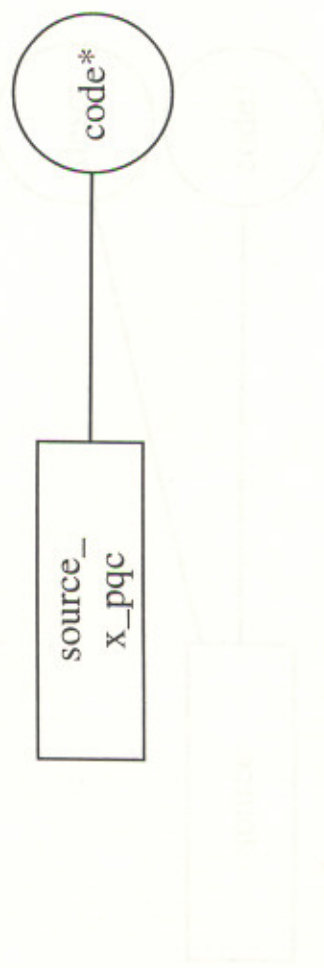




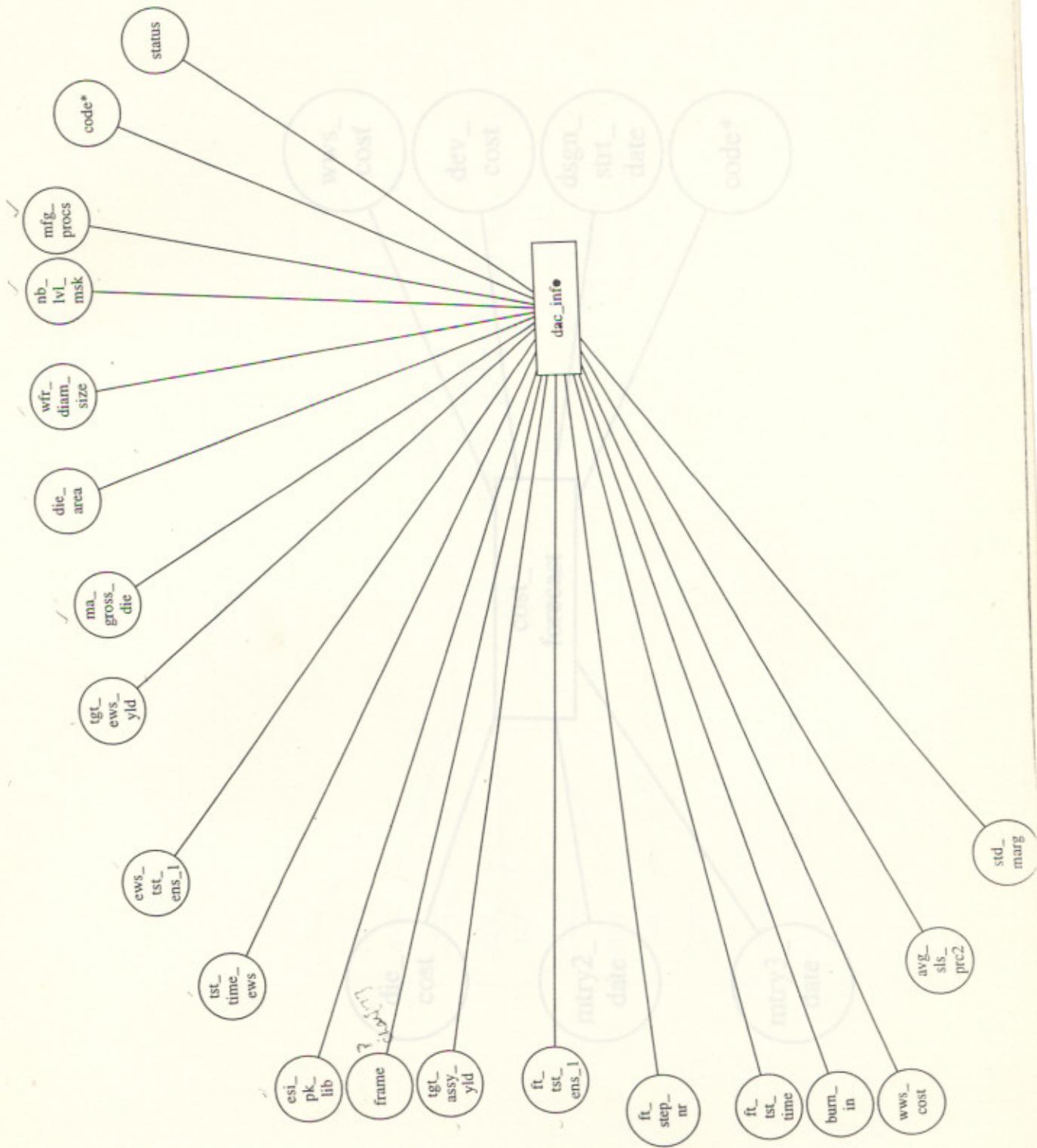


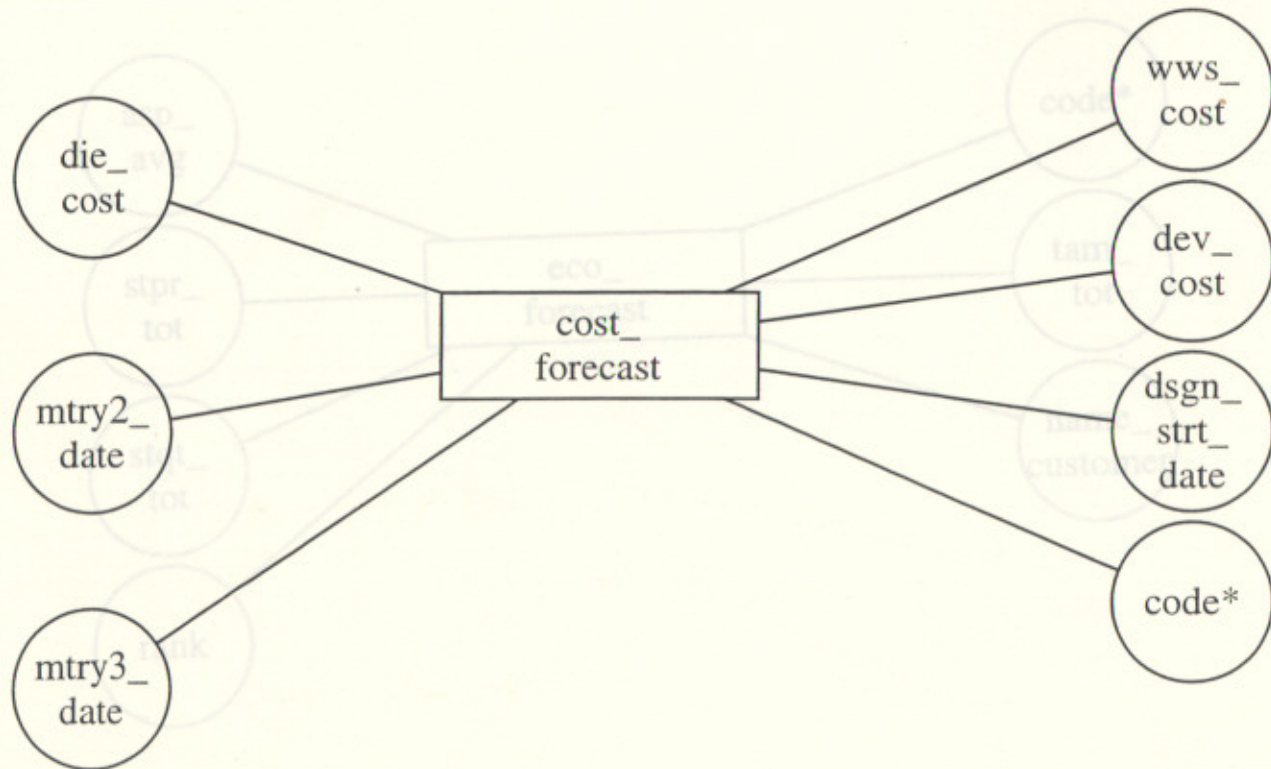


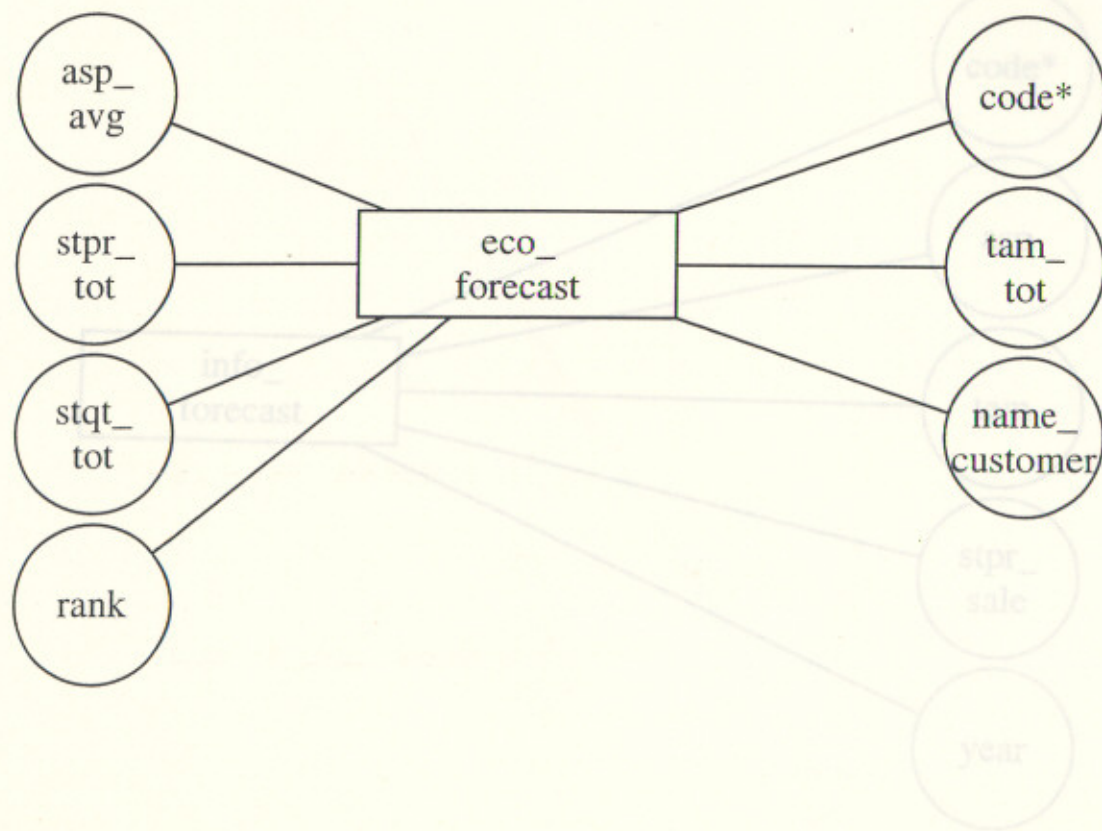


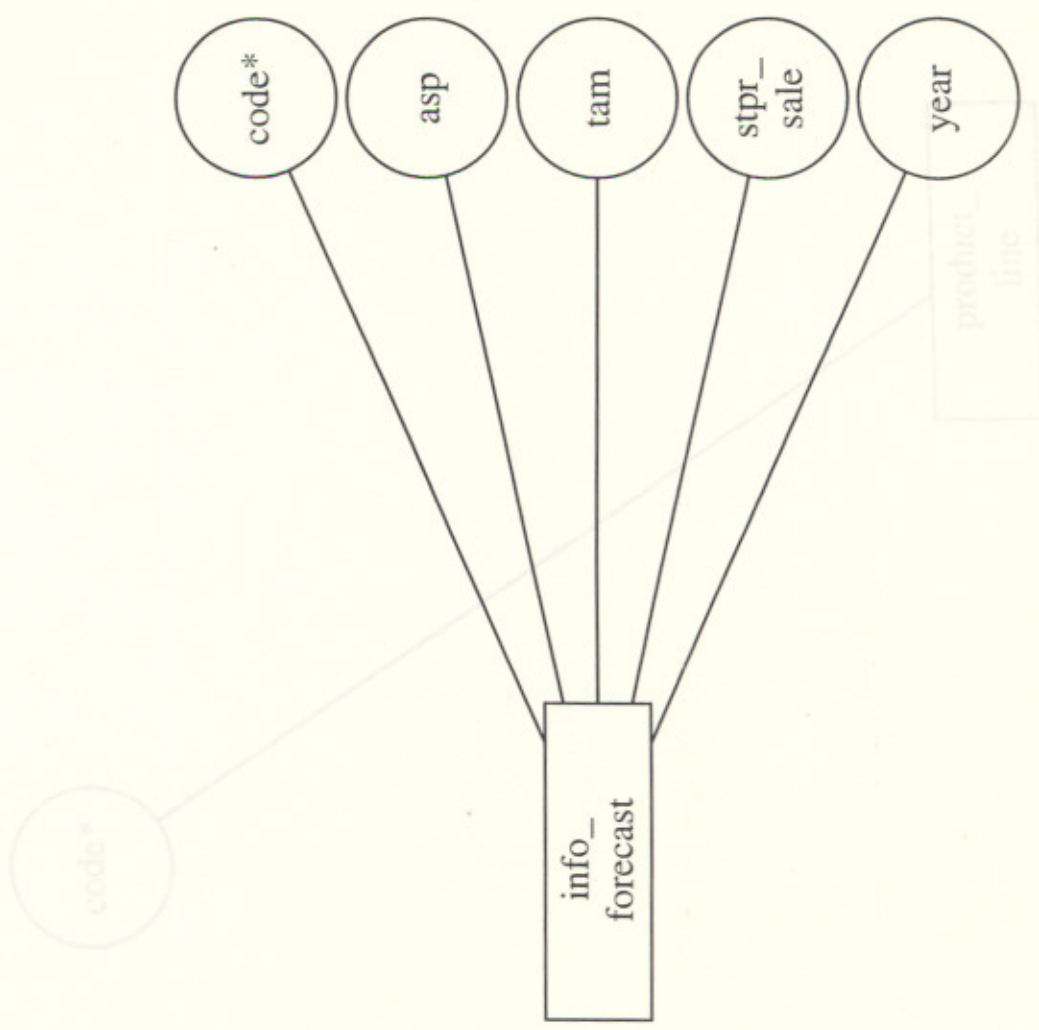


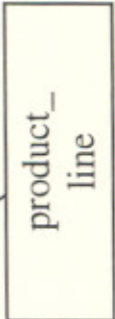
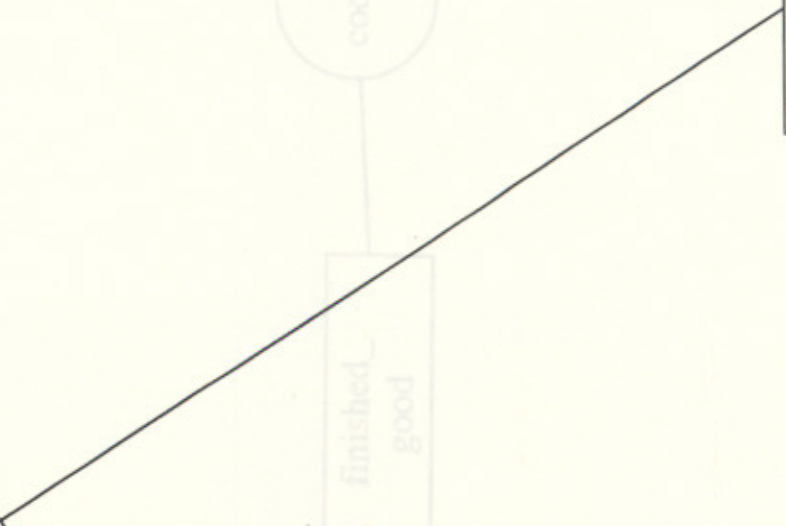
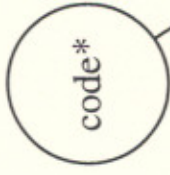




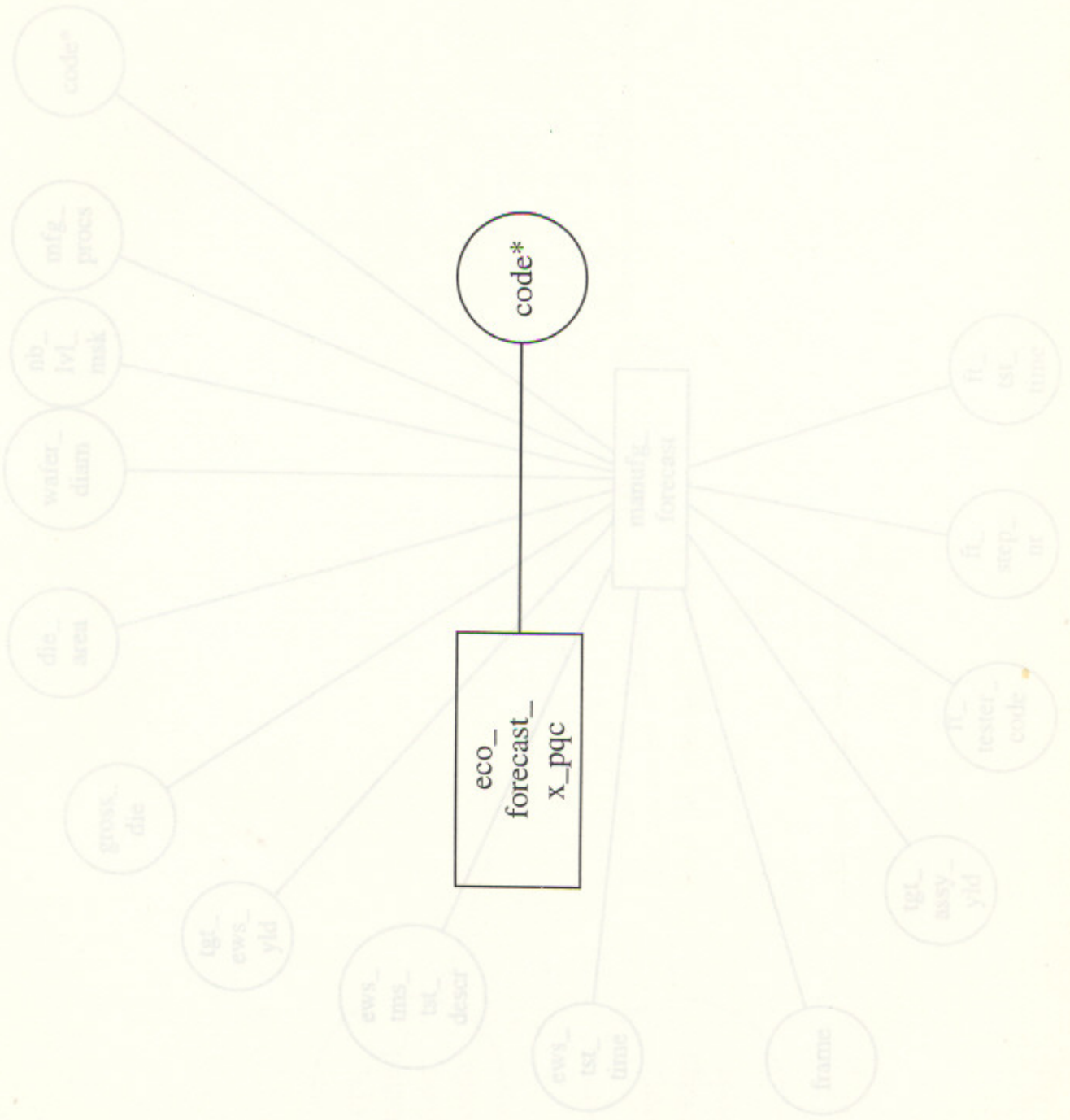


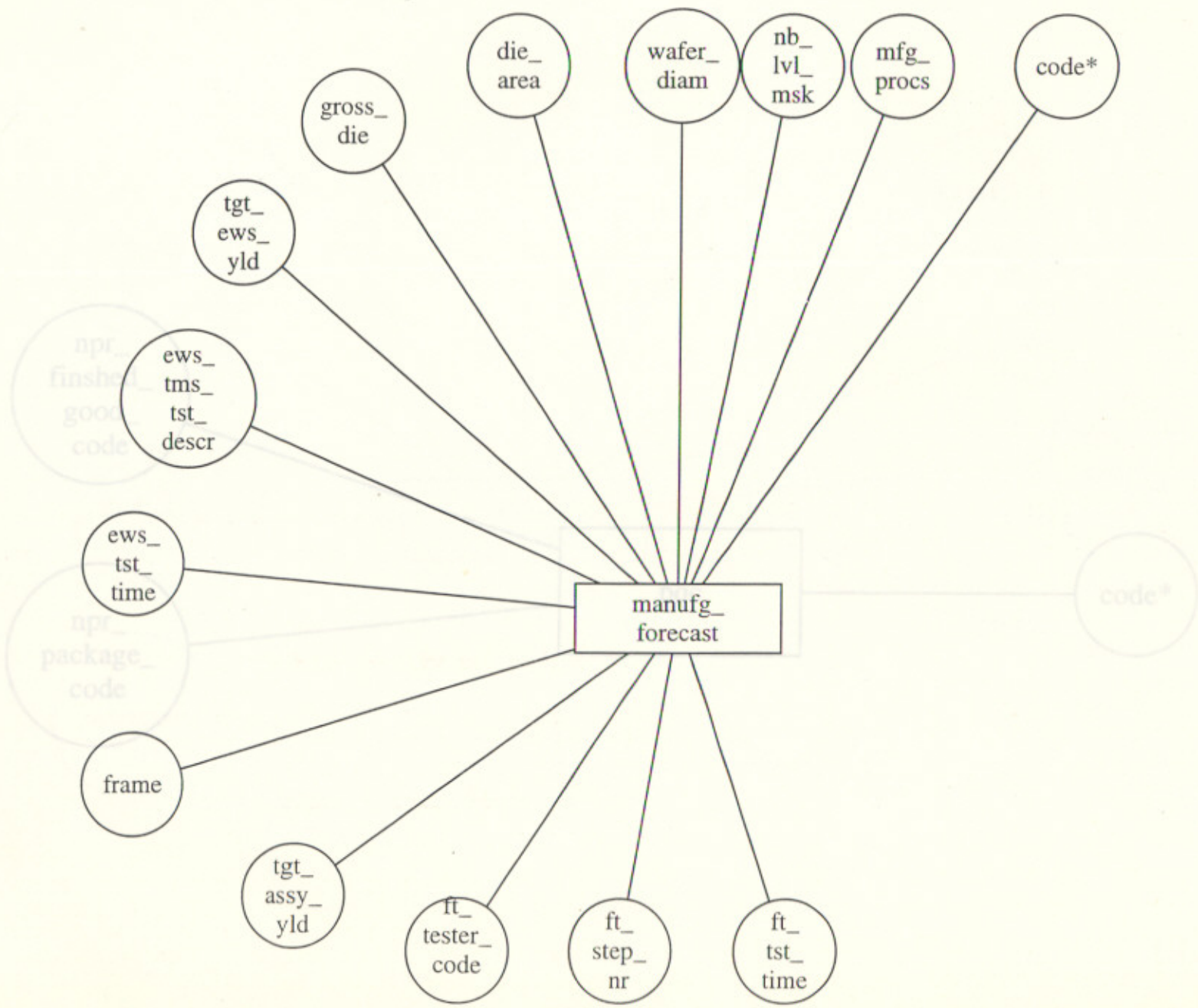


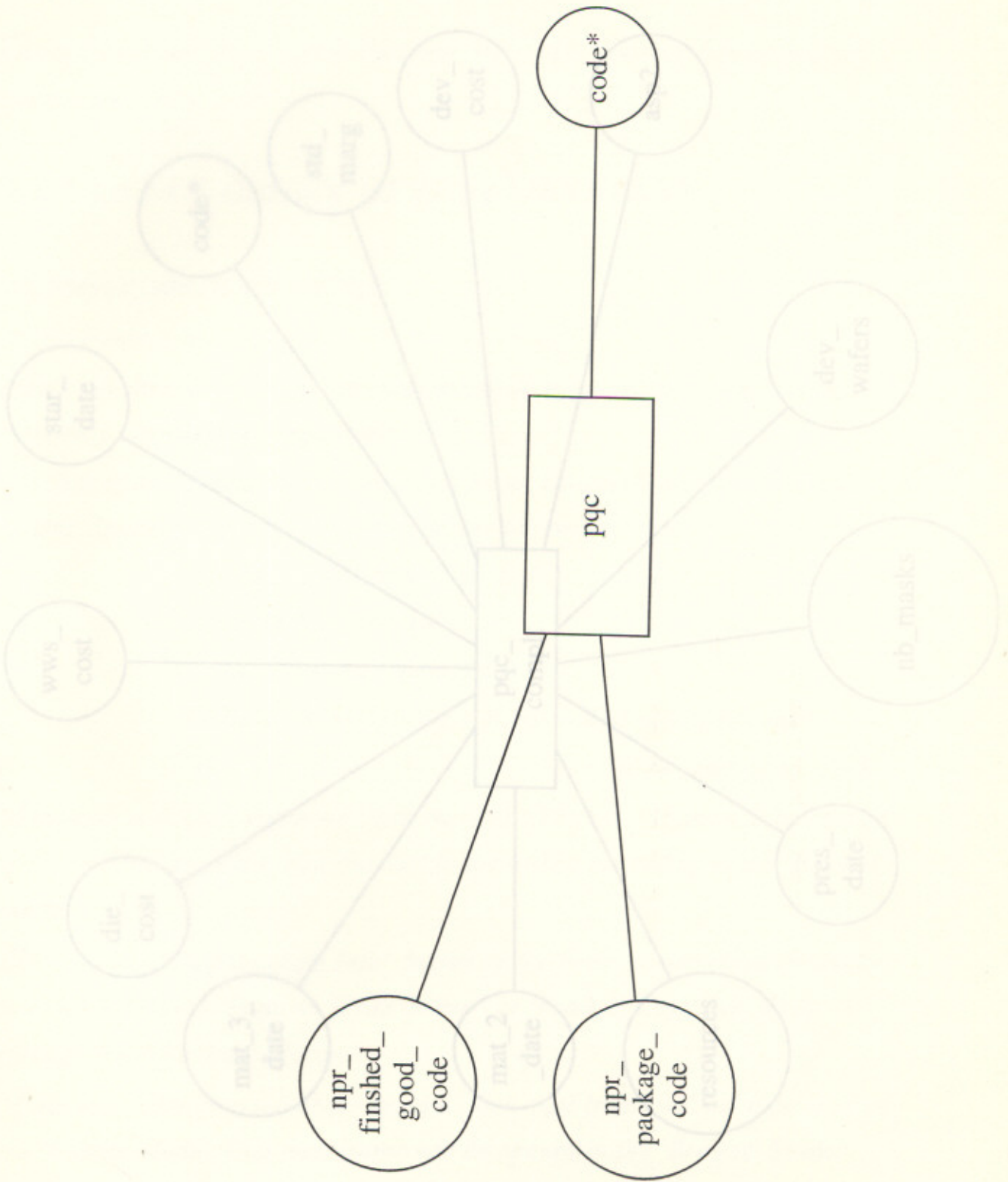


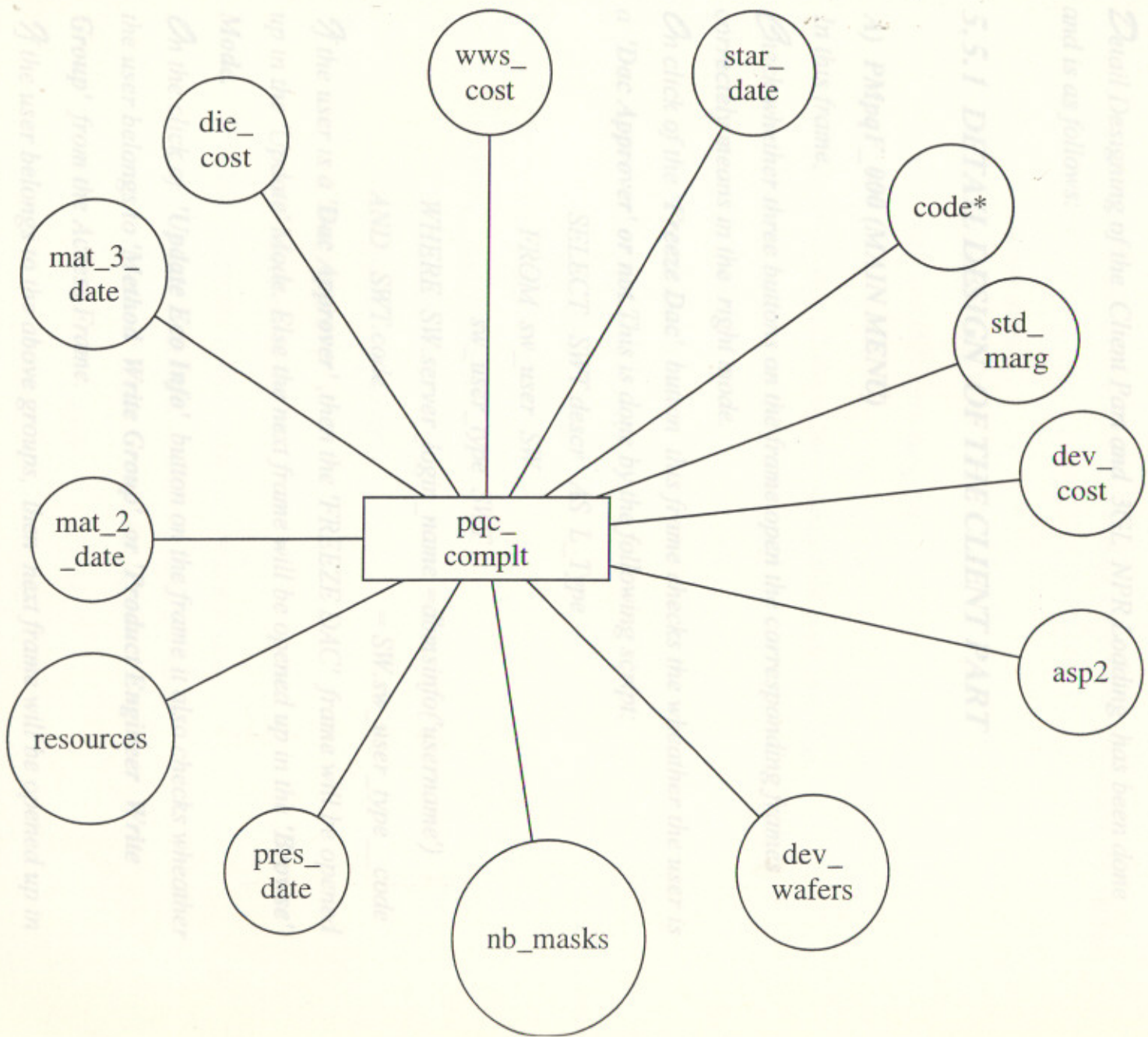












## 5.5 DETAIL DESIGN PHASE

Detail Designing of the Client Part and 3GL NPR Loading has been done and is as follows:

```
SELECT code,descr
```

### 5.5.1 DETAIL DESIGN OF THE CLIENT PART

```
WHERE code is LIKE 'product_line + %'
```

#### A) PMpqF\_000 (MAIN MENU)

In this frame, it gives you all the valid product line code and descr.

Check whether three buttons on the frame open the corresponding frames correctly means in the right mode.

On click of the '**Freeze Dac**' button this frame checks the whether the user is a '**Dac Approver**' or not. This is done by the following script:

```
SELECT SWT.descr AS L_Type
FROM sw_user SW,
FROM pqc sw_user_type SWT
WHERE SW.server_login_name = dbmsinfo('username')
AND SWT.code = SW.sw_user_type_code
```

If the user is a '**Dac Approver**', then the '**FREEZE DAC**' frame will be opened up in the '**Update**' Mode. Else the next frame will be opened up in the '**Browse**' Mode.

On the click of '**Update Eco Info**' button on the frame it also checks whether the user belongs to '**Method Write Group**' or '**Product Engineer Write Group**' from the Access Frame.

If the user belongs to the above groups, then next frame will be opened up in the '**Update Mode**'. Else next frame will be opened in the '**Browse**' Mode.

'**PRINT DOCUMENT**' frame will always be open in '**Browse**' Mode. so no check is done here.

**B) PMpqF\_110 (FREEZE DAC)** *able field corresponding to a particular product line code.*

*In this frame, Valid entries on the field 'Product Line ' are provided by using the script :*

```
SELECT code ,descr
FROM product_line
WHERE code is LIKE 'product_line +%'
```

*this script will gives you all the valid product line code and descr.*

*After the selection of the Product Line Code, all the table field entries are displayed using the script:*

```
SELECT P.finished_good_code ,
       FG.product_maturity_code,
       T.package_code,
       A.descr
FROM pqc P, dac_info D,
     source_x_pqc SXP,
     finished_good FG,
     technical T,
     activity_status A
```

```
WHERE P.product_line_code = :product_line
      AND FG.product_line_code =:product_line
      AND SXP.pqc_code = P.code
      AND SXP.source_code = 2 (DAC)
      AND D.pqc_code = P.code
      AND A.code =D.activity_status_code
      AND T.activity_status_code ='30'
      AND FG.activity_status_code ='30'
```

Above script will display all the table field corresponding to a particular product line code.

Now for freezing the DAC info, User must be the 'Dac Approver'. After the Dac Information is updated, updation will be refleted in the database using the script

```
SELECT code,descr
UPDATE dac_info D,
WHERE pqc = P, status_code = '30'
```

Valid entries for the finished\_good FG field are obtained by using the following script

```
SET D.activity_status_code='30'
WHERE P.product_line_code =:product_line
AND P.finished_good_code =:finished_good_code
AND D.pqc_code status_code = P.code
AND product_line_code =:product_line_code
```

Above script will run when the user presses the 'Save' button.

SQL for selecting the package code is as follows:

```
SELECT PK.code, PK.descr
FROM technical T,
finished_good FG,
package PK,
pqc P
WHERE FG.code = P.finished_good_code
AND T.code = FG.technical_code
AND PK.code = T.package_code
AND FG.activity_status_code = '30'
AND T.activity_status_code = '30'
```

After the three field entries are entered, then the mode of the frame is selected using the following script:

### C) PMpqF\_320 (UPDATE ECO INFO)

Valid entries on the **product line code** will be displayed by using the following script

```
SELECT code,descr
FROM product_line_code
WHERE activity_status_code = '30'
```

Valid entries for the **finished good code** field are obtained by using the following script

```
SELECT code,descr
FROM finished_good
WHERE activity_status_code = '30'
AND product_line_code = :product_line_code
```

SQL for selecting the **package code** is as follows:

After the mode of PQC, for which follow

```
SELECT EF.finished_good FG,
       EF.package PK,
       EF.pqc EF.st P_tot, EF.asp_avg
WHERE FG.code_tot = P.finished_good_code
AND T.code_foreca = FG.technical_code
AND PK.code_foreca = T.package_code
AND FG.activity_status_code = '30'
AND T.activity_status_code = '30'
```

After the three field entries are entered, then the mode of the frame is selected using the following script:

```

SELECT count(*)
  AS L_Counter
FROM pqc P,
  source_x_pqc PXS,
  source S,
WHERE P.finished_good__code =:finished_good__code
AND P.product_line__code =:product_line__code
AND P.npr_package__code =:package__code
AND PXS.pqc__code =P.code
AND PXS.source__code =3 (ECO)
IF (L_Counter == 0)
  Mode ='Add'
ELSE
  Select the record associated with chosen PQC.

```

After the mode of the frame is decided, select the record associated with chosen PQC, for which following script will work:

```

SELECT EF.customer_name,
  EF.rank,
  EF.tam, EF.stqt_tot, EF.asp_avg,
  EF.stpr_tot
FROM eco_forecast EF,
  eco_forecast_x_pqc EFXP,
VALUES pqc P,
  finished_good FG,
  source_x_pqc SXP,
  source S
WHERE P.finished_good__code = :finished_good__code

```

D) PMpqF\_330 (AND PXS.pqc\_code =P.code

AND PXS.source\_code = 3 (ECO)

As this frame is AND EFXP.pqc\_code = P.code of the PQC entity

Based upon the AND EF.code = EFXP.eco\_forecast\_code

SELECT code,die\_cost,mat\_3\_date,mat\_2\_date,

If the user has the permission to manipulate the information, then only the user can make the updation in this frame.

SQL to create a customer is as follows

INSERT INTO eco\_forecast

FROM pqc (code,source\_code,asp\_avg,stpr\_tot,name\_customer,  
WHERE pqc\_tam\_total) :code

VALUES (<ro.code 1>,3,:asp\_avg,:stpr\_total,

If user made any change customer\_name,:tam\_total).d, the changes have to be reflected in the table pqc\_complt as follows:

UP INSERT INTO info\_forecast

SET table (code,eco\_forecast\_code,year,stpr\_sale,tam,asp)

WH VALUES (<ro.code>,<ro.code 1>,info\_forecast[\*].year,  
info\_forecast[\*].stpr,info\_forecast[\*].tam,  
info\_forecast[\*].asp)

E) PMpqF\_301 (MAKE COPY)

The select state INSERT INTO eco\_forecast\_x\_pqc /source linked to product\_line

(parameter fro (code,eco\_forecast\_code,pqc\_code)

SEL VALUES

(code generated,<ro.code 1>, :pqc\_code)

P.npr\_package\_code

FROM pqc P.

source S.

#### D) PMpqF\_330 (ECONOMICAL INFO. MANAGEMENT)

WHERE P.product\_line\_code=:product\_line\_code

As this frame is called from the PMpqF\_320 after the insertion of the PQC entity.

Based upon the PQC entity, information is displayed by the following script :

```
SELECT code,die_cost,mat_3_date,mat_2_date,
```

```
ORDER BY resources,pres_date,nb_masks,dev_wafers,asp2,code
```

After the selection of dev\_cost,std\_marg,star\_date,wws\_cost passed to

PMpqF\_320 AS his pqc\_complt\_code,die\_cost,mat3\_date,mat2\_date,

```
SEL resources,pres_date,nb_masks,dev_wafers,
```

```
AS std_marg,start_date,wws_cost
```

```
FROM pqc_complt
```

```
WHERE pqc_code=:pqc_code =:L_Product_Line_Code
```

```
AND npr_finished_good_code=:npr_fg_code
```

If user made any changes in the information displayed, the changes have to be reflected in the table pqc\_complt as follows: Update Eco Info', this frame will be

closed UPDATE pqc\_complt

```
SET table_field_name=:frame_field_name
```

F) PMpqF WHERE code=:pqc\_complt\_code;

In this frame, to print the document at the various manufacturing steps the user

#### E) PMpqF\_301 (MAKE COPY)

The select statement to display all the finished\_good/source linked to product\_line (parameter from PMpqF\_320) is : FG code,CP product\_maturity\_code,

```
SELECT S.descr,product_maturity_code,
```

```
P.npr_finished_good_code,
```

```
FROM P.npr_package_code CP,
```

```
FROM pqc P,finished_good FG,
```

```
source S,good_x_raw_line FXR,
```

```

source_x_pqc SXP
WHERE P.product_line_code=:product_line_code
AND SXP.pqc_code = P.code
AND SXP.source_code = S.code
AND S.code IN (1,3)
ORDER BY P.npr_package_code,npr_finished_good_code,S.code

```

After the selection of the record from current frame has to be passed to PMpqF\_320, This information is passed by the following script:

```

SELECT code
AS L_pqccode
FROM pqc
WHERE product_line_code = :L_Product_Line_Code
AND npr_finished_good_code =:npr_fg_code
AND npr_package_code = :npr_package_code

```

After the information is passed to the frame 'Update Eco Info', this frame will be closed.

#### **F) PMpqF\_410 (PRINT DOCUMENT)**

In this frame, to print the document at the various manufacturing steps the user have to enter only the product line code and report type. The records will be displayed in frame by the following select statement :

```

SELECT CP.code,FG.code,CP.product_maturity_code,
       FG.product_maturity_code,
       FXR.raw_line_code
FROM commercial product CP,
       finished_good FG,
       finished_good_x_raw_line FXR,

```

pqc P,

### 5.5.2 DETAIL DESIGN source\_x\_pqc SXP, PROCEDURE

```
(NPR_LOAD WHERE SXP.source_code = :report_type
AND P.product_line_code = :product_line_code
AND P.code = SXP.pqc_code
AND CP.product_line_code=:product_line_code
AND FG.product_line_code=:product_line_code
AND FG.code = P.finished_good_code
AND CP.technical_code = FG.technical_code
AND FXR.finshed_good_code=FG.code
AND FG.activity_status_code='30'
AND T.activity_status_code = '30'
AND CP.activity_status_code = '30'
npr_finished_good_code (PQC) = 16 char
```

After the display of all the information, the user will select one record and press 'Confirm'. At this the parameters are passed to XI-WRITER program which is responsible for the generation and printing of the document.

```
asp (eco_forecast) = 6 char
spr_sale (eco_forecast) = 9 char
```

Here we keep the information like tam,asp,spr\_sale for each customer for 5 years.

The file 'TECONPRI' (manufg\_forecast) consists of

```
product_line_code (PQC) = 4 char + 2 char (group code)
npr_package_code (PQC) = 2 char
npr_finished_good_code (PQC) = 16 char
mfg_procs = 5 char
nb_fm_nsk = 2 char
wafer_diam = 1 char
```

### 5.5.2 DETAIL DESIGN OF THE 3GL PROCEDURE

#### (NPR\_LOADING)

The NPR\_LOADING is a batch program which loads New Product Request (NPR) entries from three files (FECONPR,FECONPRI,FECONPR2).The files have information (technical as well as forecasting) ,which is needed to start the design of the product. The structure of the files is decided in the detail design part.

#### Structure of Files

The file 'FECONPR' (Info\_forecast & Eco\_forecast) consists of

product_line.code (PQC)	= 4	char +2 char (group code)
npr_package__code (PQC)	= 2	char +2 char(group code)
npr_finished_good_code (PQC)	= 16	char
name_customer(eco_forecast)	= 20	char
year (eco_forecast)	= 4	char
tam (eco_forecast)	= 7	char
asp (eco_forecast)	= 6	char
stpr_sale (eco_forecast)	= 9	char

Here we keep the information like tam,asp,stpr\_sale for each customer for 5 years.

The file 'FECONPRI' (manufg\_forecast) consists of

product_line.code (PQC)	= 4	char + 2 char (group code)
npr_package__code (PQC)	= 2	char
npr_finished_good_code (PQC)	= 16	char
mfg_procs	= 5	char
nb_lvl_msk	= 2	char
wafer_diam	= 1	char

die\_area = 9 char

5.5.2 gross\_die = 11 char

tst\_ews\_yld = 6 char

Various types of reports are needed for the application. Reports generated are of the following types:

1) DAC Data frame = 4 char

2) TPQC 21 tgt\_assy\_yld = 6 char

3) TPQC 21 ft\_tester\_code = 2 char

4) TPQC 21 ft\_step\_nr = 1 char

5) PQC ft\_tst\_time = 4 char

The file 'FECONPR2' (cost forecast) consists of generated at the end of design phase of the NPR (N product\_line.code(PQC) DAC = 4 char + 2 char(group code) by some special use npr\_package\_code(PQC) = 2 char

TPQC(Ter npr\_finished\_good\_code file = 16 Cert) Documents are with different maturity like dsgn\_start\_date = 6 char

Only when dev\_cost C 29 is approved = 14 char persons in the management.

PQC (Fin mtry2\_date the approval of = 6 NPR char can be started.

These vari die\_cost of the reports gr = 9 the va char types of information like economical mtry3\_date n ,manufactura = 6 inform char cost information or the

market info wws\_cost of the Request = 8 char

Only after the approval of the various reports at each step, Request of the New

This NPR\_LOADING program insert the data from all the three files (input) files

to PRIS database. Once the data is inserted in the database from these files, we can continue

to manipulate it through the client part of the application. generate the document to

This program insert the data from three files to the corresponding tables as shown in the

structure of the tables. arts are attached here with.

## 5.5.2 *DETAIL DESIGN OF REPORTS*

*Various types of reports are needed at each phase of the application. Reports generated are of following types:*

- 1) DAC Document*
- 2) TPQC 21*
- 3) TPQC 26*
- 4) TPQC 29*
- 5) PQC*

***DAC** (Document Approval Certificate) is generated at the end of design phase of the NPR (New Product Request). DAC Document should be approved by some special users, then only the next phase for the request will be conducted.*

***TPQC** (Temporary Product Qualification Certificate) Documents are with different maturity like 21 days, 26 days or 29 days.*

*Only when the TPQC 29 is approved by the special persons in the management,*

***PQC** (Final phase of the approval of the NPR) can be started.*

*These various types of the reports give the various types of information like economical information, manufacturing information, cost information or the market information of the Request.*

*Only after the approval of the various reports at each step, Request of the New Product will be accepted.*

*These reports are generated and printed through 'C' program. Frame '**PRINT DOCUMENT**' will pass the parameters needed to generate the document to these 'C' programs which then generate and print the reports.*

*Format of these reports are attached here with.*

	<b>DESIGN APPROVAL CERTIFICATE</b>	<b>APPENDIX F</b>	/4
	INTERNAL PROCEDURE	<i>Date:</i>	

Line code: <product_line.code>	Com. prdt : <finished_good.code>(*1)
Description: <product_line.descr>	PL family: <product_pnl_family.descr>
Market segment: <product_line.prodt_mktg_segt_descr_code>	Design location: <n_y_s>

### WAFER PROCESSING

Production area: <production_area.descr (*3)>		code: <wafer.production_area_code (*3)>
AM: <(*4)>	SICOM: <wafer.code>	
Process: <(*5)> <(*6)>	Version:	Rtn84: <(*39)><n_y_s>
Wafer size (mm2): <(*7)>	Wafer size (inches): <(*8)>	
Mask set: <(*9)>		
Tasks: <n_y_s (10*)>		

### EWS

VS Plant: (*11) (*12) (*11)	WIPS Number: <(*40)>		
Target Yield: <die.planning_ews_yield>	WWS Yield: <die.wws_ews_yield>		
<b>Step</b>	<b>Type</b>	<b>Program</b>	<b>Test time</b>
<(*13)>	<(*14)>	<(*15)>	<(*16)>ms
Order: <(*17)>			
<(*13.1)>	<(*14.1)>	<(*15.1)>	<(*16.1)>ms
Order: <(*17.1)>			
<(*13.2)>	<(*14.2)>	<(*15.2)>	<(*16)>ms
Order: <(*17.2)>			
			ms
Total test time:			<(*16)> + <(*16.1)> + <(*16.2)>ms

### ASSY

Specific frame : <del>Y</del> or No <n_y_s>		
Target Yield (%): <raw_line.planning_assembly_yield>	WWS Yield (%): <RL.wws_assembly_yield>	
<b>Raw Line</b>	<b>Plant</b>	<b>BSA</b>
<.code>	<(*18)>	<dc_s_doc_ref.code (*42)>

	<b>DESIGN APPROVAL CERTIFICATE</b>	<b>APPENDIX F</b>	/4
	INTERNAL PROCEDURE	<i>Date:</i>	

Line code: #Line_code#	Com Prdt : #Commercial Product#
Description: #Description#	PL family: #PL family#
Market segment: #Market segment#	Design location: #Design location#<n_y_s>

**TESTING AND FINISHING**

Raw Line code: <RL.code>				
Target Yield (%): <RL.plang_tnf_yield>	WWS Yield (%): <(*19)>			
Testing Plants : <(*20)>				
<b>Step</b>	<b>Type</b>	<b>Program</b>	<b>Class</b>	<b>Test Time</b>
<21>	<(*22)>	<(*23)>		<(*24)>
Order: <(*25)>				
<21.1>	<(*22.1)>	<(*23.1)>		<(*24.1)>ms
Order: <(*25.1)>				
<21.2>	<(*22.2)>	<(*23.2)>		<(*24.2)>ms
Order: <(*25.2)>				
				ms
<b>TOTAL TEST TIME</b>				<(*26)>ms

<b>TECHNICAL DOCUMENTATION</b>	<b>NB</b>	<b>DATE</b>
Product request	<n_y_s>	<n_y_s>
Design Rule Manual	<n_y_s>	<n_y_s>
Development Report	<n_y_s>	<n_y_s>
Electrical evaluation	<n_y_s>	<n_y_s>
Preliminary rel. test	<n_y_s>	<n_y_s>
Preliminary Data Sheet	<n_y_s>	<n_y_s>

**FRIGHT DELIVERY REQUEST**

CUSTOMER	Date	Quantity	Date	Quantity	Date	Quantity

	<b>DESIGN APPROVAL CERTIFICATE</b>	<b>APPENDIX F</b>	/4
	INTERNAL PROCEDURE	<i>Date:</i>	

Line code: #Line code#	Commercial or PL family#	Com. Prdt. : #Com. Prdt.#
Description: #Description#	<product_line	PL family: #PL family#
Market segment: #Market segment#		Design location: #Design location"<n_y_ε>

ITEM	NPR (ref. = Peak Year)	DAC
PROCESS		
Mask levels		
Wafer size (inches)		
Die size (mm2)		
Gross by wafer		
EWS target yield (%)		
EWS tester		
EWS test time		
ackages		
Time <i>Frame</i>		
Asy target yield (%)		
Final tester		
# of steps		
Final test time (sec)		
Burn-in		
T. & T. target yield		
WWS cost		
A.S.P.		
STD margin		
Tot. sales 199. (KMS)		
Tot. sales 199. (KMS)		
Tot. sales 199. (KMS)		
Tot. sales 199. (KMS)		
Tot. sales 199. (KMS)		
Qualification expected date		
Volume production start		

**FIRST DELIVERY REQUEST**

CUSTOMER	Date	Quantity	Date	Quantity	Date	Quantity

APPROVED BY: \_\_\_\_\_  
GROUP GENERAL MANAGER

	<b>DESIGN APPROVAL CERTIFICATE</b>	<b>APPENDIX F</b>	/4
	INTERNAL PROCEDURE	<i>Date:</i>	

*mat 20*

Line code: <*(2)>	Commercial product : <*(1)>
Description: <product_line.descr>	PL family: <product_line.pnl_family_descr_code>
Market segment: <product_line.product_mktg_segt_descr_code>	Design location: <design_center_descr>n_y_s>

**MAIN TECHNICAL DATA**

Wafer code: <wafer.code>	Process: <process_group.descr>
Diffusion plant: <production_t_x_area.descr (*34)>	Wafer size (inches): <*(8)>
Die size (X Y, mm): <die_size.die_x_dim>, <die_size.die_y_dim>	Die size (mm2): #mult(X,Y)#
Gross by wafer: <die.gross_dice_nr>	Packages: <package.descr>

**ECONOMIC INFORMATION**

<b>umulative 5 years:</b> <first(info_forecast.year)> - <last(year)>	<b>Peak sales year:</b> <info_forecast.year>
Sales (KM\$): <i>sum(&lt;eco_forecast.stpr_tot&gt;)</i>	Sales (KM\$): <i>sum(&lt;info_forecast.sdtpr_sale&gt;) (*37)</i>
Man. margin (MM\$): <pqc_complt.std_marg>	A.S.P. (\$): <i>max(&lt;info_forecast.asp&gt;) (*37)</i>
Development cost (M\$): <pqc_complt.dev_cost>	Unit man.cost (\$): <n_y_s>
Payback time (Y)/compl. year:<n_y_s>	Man. margin (M\$): <*(38)><n_y_s>

This document states that the product satisfies electrical specification and then preseries can start to characterize it, to optimize testing and to perform reliability test.

SIGNED BY :	NAME	DATE	SIGNATURE
Program manager			
Designer			
Product Engineering			
Division manager			
<b>APPROVED BY:</b>			
GROUP GENERAL MANAGER			

**TEMPORARY PRODUCT  
QUALIFICATION  
CERTIFICATE  
OR ADVANCED ORDER  
ENTRY**

**APPENDIX  
H**

/4

INTERNAL PROCEDURE

*Date:*

Line code:	Sales types :
Description:	PL family:
Market segment:	Design location:

ITEM	NPR(ref. = Peak Year)	D.A.C.	T - PQC
Date of documents			<*(27)>
Process			<*(28)>
Mask levels			<*(29)>
Wafer size (inches)			<*(30)>
Die size (mm2)			<*(31)>
Loss by wafer			<DI.gross_dice_nr>
EWS yield (%)	Ref :		#EWS."Target Yield"#
EWS tester	Peak		#EWS.Tester *(32)#
EWS test time	Year		max(list(#EWS."Test time"#))
Packages			<Package.code>
Assy yield (%)			#ASSY."Target Yield"#
Final tester			<*(33)>
# of steps			<*(34)>
Final test time (sec)			<n_y_s>
Burn-in			<n_y_s>
T. & F. yield			<*(35)>
WWS cost			<finished_good.wws_val>
A.S.P.			<eco_forecast.asp_avg>
STD margin			<pqc_complt.std_marg>
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Qualification expected date			<n_y_s>

INFORMATION STOCK	Date	Quantity
Wafers	<*(27)>	@Certif_Doc_Pr_fs.wafers@
Dices	<*(27)>	@Certif_Doc_Pr_fs.dies@
Raw line	<*(27)>	@Certif_Doc_Pr_fs.raw_lines@
Finished goods	<*(27)>	@Certif_Doc_Pr_fs.finished_goods@

**TEMPORARY PRODUCT  
QUALIFICATION  
CERTIFICATE  
OR ADVANCED ORDER  
ENTRY**

**APPENDIX  
H**

/4

INTERNAL PROCEDURE

*Date:*

Line code:	Sales types :
Description:	PL family:
Market segment:	Design location:

**ASSY**

Specific frame : Y or N

Target Yield (%):		WWS Yield (%):		Preseries yield (%): <n_y_s>
TC	Plant	F.C.A.	M.B.A.	Bonding

**TESTING AND FINISHING**

Technical code:	MSS:	WIPS:		
Target Yield (%):	WWS Yield (%):		Preseries Yield (%):	
Testing Plant:				
Step	Type	Program	Class	Test time
Tester:				
				ms
Tester:				
				ms
Tester:				
				ms

If more step, see attached page

<b>TECHNICAL DOCUMENTATION</b>	Nb	Date
Development Report		
Characterization Report		
Reliability Report		
Application Report		
Data Sheet		

	<b>TEMPORARY PRODUCT QUALIFICATION CERTIFICATE OR ADVANCED ORDER ENTRY</b>	<b>APPENDIX H</b>	/4
	INTERNAL PROCEDURE	<i>Date:</i>	

Line code:	Sales types :
Description:	PL family:
Market segment:	Design location:

WAFER PROCESSING		
Diffusion plant:	Department:	
CAM:	SICOM:	
Process:	Version:	Rtn84:
Chip size (mm2):	Wafer size (inches):	
Mask set:		
Masks:		

EWS			
EWS Plant:	WIPS Number:		
Target Yield:	WWS Yield (%):		Preseries yield (%): <n_y_s>
<b>Step</b>	<b>Type</b>	<b>Program</b>	<b>Test time</b>
			ms
Tester:			
			ms
Tester:			
			ms
Tester:			
			ms
TOTAL TEST TIME			ms

APPROVED BY: [Signature]

DATE: [Date]

IF YOU HAVE ANY COMMENTS OR CUSTOMER REQUESTS, PLEASE CONTACT THE CUSTOMER SERVICE

	<b>TEMPORARY PRODUCT QUALIFICATION CERTIFICATE OR ADVANCED ORDER ENTRY</b>	<b>APPENDIX H</b>	/4
	INTERNAL PROCEDURE	<i>Date:</i>	

Maturity 21 <input type="checkbox"/>	Maturity 26 <input type="checkbox"/>	Maturity 29 <input type="checkbox"/>
Line code:	Sales types :	
Description:	PL family:	
Market segment:	Design location:	

MAIN TECHNICAL DATA	
Wafer code:	Process:
Diffusion plant:	Wafer size (inches):
Die size (X Y, mm):	Die size (mm2):
Gross by wafer:	Packages:
ECONOMIC INFORMATION	
Cumulative 5 years:	Devel. cost YTD (k\$)
Sales (M\$):	Standard cost (\$):
A.S.P. (\$):	Standard margin(%):
Man. margin (M\$):	Payback time(Y)/compl.year:

This document states that the product can be diffused and sold. Quality of the product is guaranteed even though complete qualification is not complete.

SIGNED BY :	NAME	DATE	SIGNATURE
QA Manager "for info"			
Program manager			
Division manager			
APPROVED BY:			
GROUP GENERAL MANAGER			

EXPIRATION DATE :

Note :

- If the temporary is relative to a customer request (maturity 21), please attach the customer request.

	<b>PRODUCT QUALIFICATION CERTIFICATE</b>	APPENDIX G	/4
	INTERNAL PROCEDURE	<b>Date:</b>	

Line code :	Sales Types :
Description :	PL family :
Market segment :	Design location :

ITEM	NPR (ref. = Peack Year)	D.A.C.	PQC
Date of documents			
Process			
Mask levels			
Wafer size (inches)			
Die size (mm2)			
Gross by wafer			
EWS yield (%)			
EWS tester			
EWS test time			
Packages			
Assy yield (%)			
Final tester			
# of steps			
Final test time (sec)			
Burn-in			
T. & F. yield			
WWS cost			
A.S.P.			
STD margin			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Tot. Sales199. (M\$)			
Volume production start			

INFORMATION STOCK	Date	Quantity
Wafers		
Dices		
Raw line		
Finished goods		

**PRODUCT QUALIFICATION  
CERTIFICATE**

APPENDIX G

/4

INTERNAL PROCEDURE

Date:

Line code:	Sales types :
Description:	PL family:
Market segment:	Design location:

**ASSY**

Specific frame : Y or N

Target Yield (%): <n_y_s>	WWS Yield (%):
Raw Line	Plant
	BSA

**TESTING AND FINISHING**

Raw_line code: <RL.code>	MSS : <*(45)>	WIPS NB : <*(46)>
Target Yield (%): <n_y_s>	WWS Yield (%):	Preseries Yield (%):
Testing Plant:		
<b>Step</b>	<b>Type</b>	<b>Program</b>
		<b>Class</b>
		<b>Test time</b>
Tester:		ms
Tester:		ms
Tester:		ms

If more step, see attached page

TECHNICAL DOCUMENTATION	NB	DATE
Development Report		
Characterization report		
Reliability report		
Application report		
Data Sheet		

	<b>PRODUCT QUALIFICATION CERTIFICATE</b>	APPENDIX G	/4
	INTERNAL PROCEDURE	Date:	

Wafer code:	Sales types :
Description:	PL family:
Market segment:	Design location:

**WAFER PROCESSING**

Diffusion plant:		Department:
Wafer M:	SICOM: <wafer.code>	
Process:	Version:	Rtn84:
Wafer size (mm2):	Wafer size (inches):	
Mask set:		
Masks:		

**EWS**

WVS Plant:		WIPS Number:	<*(44)>
Target Yield:		WWS Yield (%):	Preseries yield (%):
<b>Step</b>	<b>Type</b>	<b>Program</b>	<b>Test time</b>
			ms
ster:			
			ms
ster:			
			ms
ster:			
			ms
TOTAL TEST TIME			ms

## **5.6 CONSTRUCTION PHASE**

*Construction of the Client and 3GL program for NPR\_LOADING has been done but cannot discuss here because of the Company's Policy.*