INTERTWINE™

Figure 1: INTERTWINE System Operation Flow

Features

- **Improved Maintenance Efficiency**

- **Better Utilization of Labor**

- **Better Use of Materials**

- **Reduced Operating Costs**

- **Smooth Inter-Departmental Information Flow**

- **Automatic Approval Routing**

- **On-Line Information Access**

- **Minimum Paper Generation**

- **Improved Productivity**

- **Easy to Use**

- **Minimum Training Requirements**

- **Distributed Relational DBMS Architecture - INFINITY**

- **Terminal Independent Programs - TSX**

- **Menu Driven**

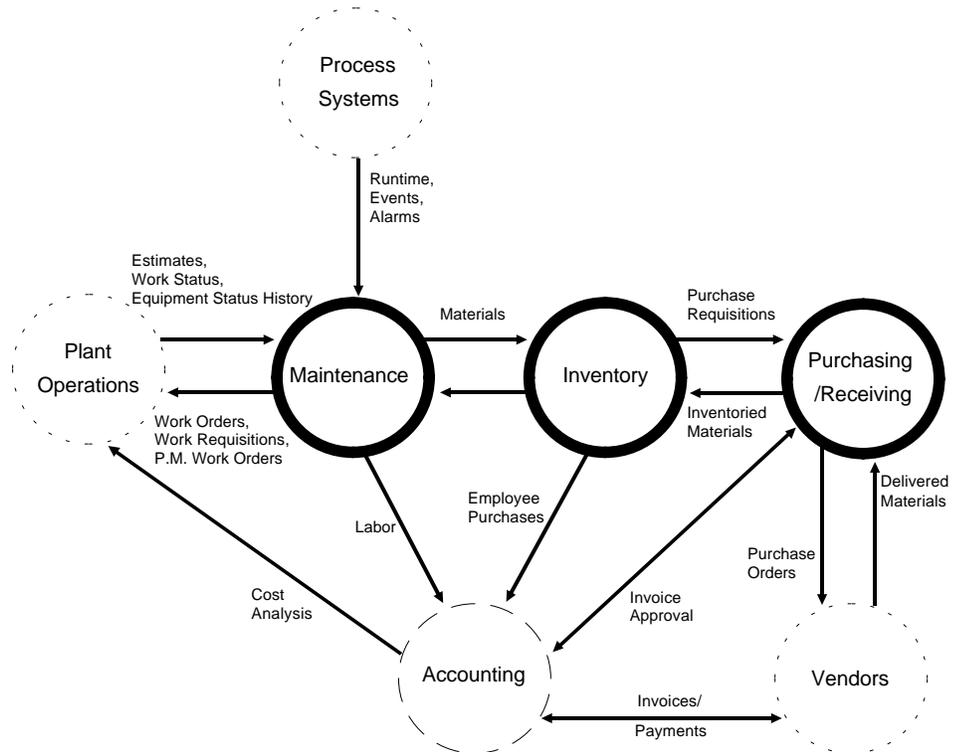- **Interfaces with PCs and Mainframes**

INTERTWINE is an innovative real-time system that integrates INTERTWINE software applications such as Maintenance, Inventory, Purchasing, and others on a "pick and choose" basis. Modules can be purchased in one or more increments with full compatibility assured, making it easy for your corporation to step forward into 21st century computing.

INTERTWINE MAINTENANCE creates an efficient and cost-effective vehicle for managing all maintenance functions for a plant. It handles all phases of work requests, estimation,

approvals, scheduling, and dispatching to efficiently coordinate labor and material resources. Along with INTERTWINE INVENTORY and INTERTWINE PURCHASING (which are self-contained and capable of supporting plant-wide activities other than maintenance), it becomes a component of a powerful system capable of drastically reducing paperwork and the delays inherent in paper shuffling.

With LDC's INTERTWINE MAINTENANCE program online, Preventive Maintenance procedures can easily be

pre-scheduled and thoroughly planned. More importantly, Emergency Maintenance procedures can quickly be approved and documented through the use of simple data entry screens, so implementation is not delayed. As the system is used, it builds up a wealth of information including machine maintenance histories, commodity descriptions in more than one format, commodity cross-referencing, and vendor data. In addition, information concerning storeroom supplies on hand (on backorder, on reserve, etc.), current status of work orders, material requisitions, purchase requisitions, and purchase orders, and much more is available for immediate access from a terminal or personal computer at your desk or work station.

And you don't have to be a Data Processing professional to take advantage of INTERTWINE! It is specifically designed for use by all levels of employees--from the corporate boardroom to the plant machine shop. It's easy because each individual using the INTERTWINE system chooses the function he needs from a user-specific menu--he sees only those screens that are necessary for doing his job. But the integrated nature of the system makes it possible for the whole company to benefit from the data entered on each level.

INTERTWINE is ready to use or ready to be customized to meet your specific needs.
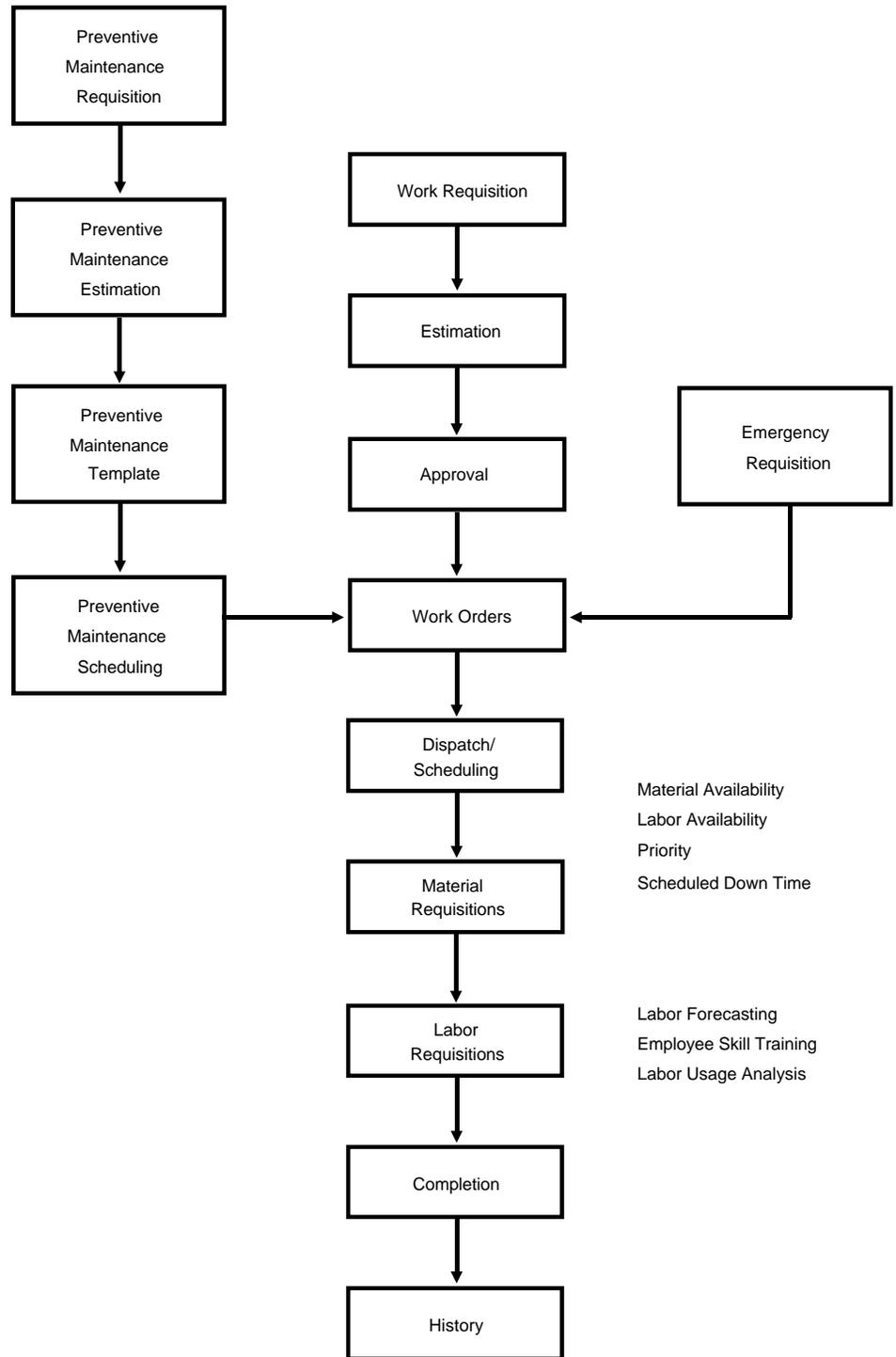
```
Preventive Maintenance Requisition
        │
        ▼
Preventive Maintenance Estimation
        │
        ▼
Preventive Maintenance Template
        │
        ▼
Preventive Maintenance Scheduling ──────┐
                                        ▼

Work Requisition
        │
        ▼
Estimation
        │
        ▼
Approval
        │                    Emergency Requisition
        ▼                           │
Work Orders ◄───────────────────────┘
        │
        ▼
Dispatch/ Scheduling
        │
        ▼                    Material Availability
Material Requisitions        Labor Availability
        │                    Priority
        ▼                    Scheduled Down Time
Labor Requisitions           Labor Forecasting
        │                    Employee Skill Training
        ▼                    Labor Usage Analysis
Completion
        │
        ▼
History
```

Figure 2: INTERTWINE MAINTENANCE Work Order Cycle

Work Orders

INTERTWINE MAINTENANCE will handle the Work Order cycle from the creation of a Work Requisition to the completion of the Work Order and the recording of historical information. Work Requisitions are entered directly through an on-line terminal. They are then reviewed, and estimates of material and labor requirements are added. INTERTWINE MAINTENANCE allows management and monitoring of the approval process to eliminate the "red tape" and time delays that often snag the Work Order cycle. After approvals have been obtained, the Work Requisition becomes a Work Order ready for printing, scheduling, and dispatching. At the same time, the handling of the Material Requisitions necessary for completing the job will be streamlined with interfaces to INTERTWINE INVENTORY and INTERTWINE PURCHASING. The Current Status of the Work Requisition and Work Order can be monitored at any point in the Work Order cycle. Even after the Work Order is complete, relevant information can be utilized for historical purposes.

Preventive Maintenance

Preventive Maintenance is a major factor in running a cost-efficient plant. INTERTWINE MAINTENANCE makes it easy to devise (and modify, when necessary) pre-planned maintenance procedures so that equipment stays in optimal condition, preventing costly emergency maintenance situations. This helps avoid down time and optimizes plant operations. Since INTERTWINE MAINTENANCE allows for automatic scheduling by elapsed time (and can be enhanced to be sensitive to running time, alarm conditions, etc.), the best schedule can be devised for each piece of equipment. After the preventive maintenance scheduling has been done, Preventive Maintenance Work Orders are automatically generated at the correct times, including requisitions for material and labor required. Feedback entered to the system by the personnel doing the maintenance is recorded for future use, so each preventive maintenance operation is monitored by the system from beginning to end.

Emergency Maintenance

When equipment malfunctions or breaks down, time becomes critical--materials and labor must be found quickly to avoid loss of productivity. In critical situations, INTERTWINE MAINTENANCE permits Work Orders to be created directly, by-passing the estimating and approval cycle. In addition, the system supports highly flexible material location structures such as searches by Noun Name, Common Name, Manufacturer, Vendor, etc. Part information includes drawing references. Requisitioning materials can be streamlined with special issues for emergency situations.

Features

- **Work Requests**

- **Labor and Material Estimating**

- **Approvals**

- **Budget Commitment**

- **Drawing References**

- **Tool/Equipment Reservations**

- **Material Substitution**

- **Work Orders**

- **Preventive Maintenance**

- **Dispatching/Scheduling**

- **Actual Labor/ Material Tracking**

- **Departmental Cross-Charging**

- **Work Order History**

- **Equipment Status History**

- **Standard Procedures**

INTERTWINE INVENTORY

Features

- **Multiple Storerooms**

- **Material Requisitions**

- **Material Reservations**

- **Material Issues, Transfers, Returns**

- **Back Orders**

- **Cash/Payroll Deduction Issues, Returns**

- **Search by: Noun Names, Part Numbers, Vendors, Manufacturers, Common Names**

- **Plantwide Material Location**
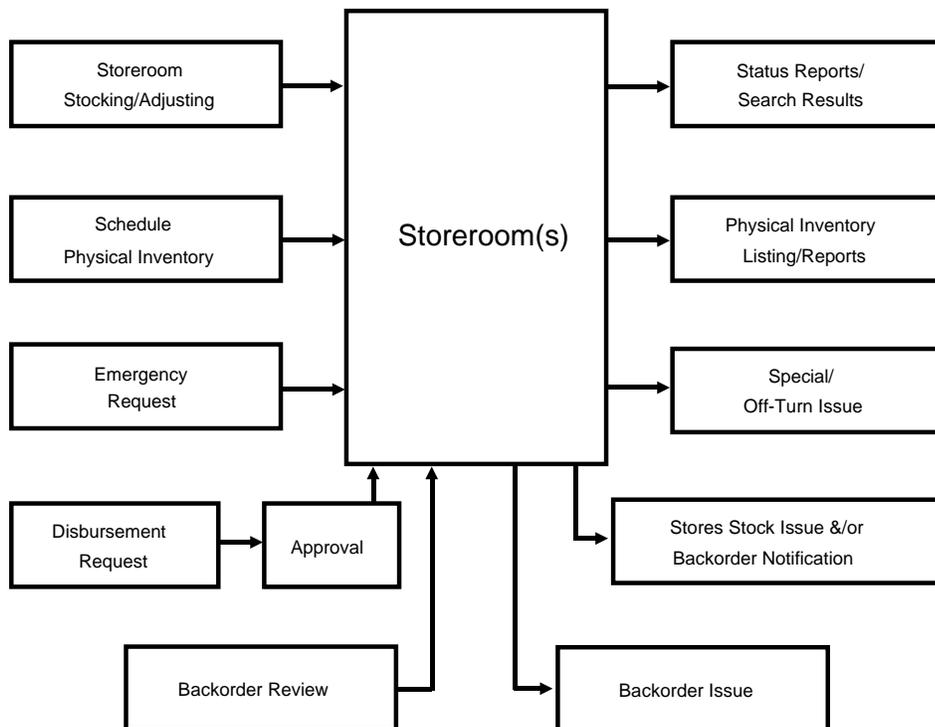
- **Physical Inventory**

- **Usage History**

- **Purchase History**

Figure 3: INTERTWINE INVENTORY Functions

Requesting and Receiving Materials

A smooth-running system for the disbursement of materials stocked in plant storerooms to departments or individuals brings effective time management one step closer to reality. Time wasted by employees filling out repetitive forms, getting the necessary approvals, and then waiting for the issue of the materials needed for a job doesn't make sense to anyone. When INTERTWINE INVENTORY is in use, a minimum amount of data entry is necessary on a Material Requisition screen, approval screens require entry of an ap-

proved quantity for each item, and the Stock Issue screen requires the entry of the amount issued and the amount to be placed on backorder. All other information is displayed from data already in the system's files. The Material Requisition need never be physically printed (unless the originator wants a copy to keep in his own files) since the system keeps track of the current status of the entire process for each request and allows inquiries to be made for review of entered data.

INTERTWINE INVENTORY is designed so that Stock Reservations can be made by

4

authorized employees for planned tasks, in addition to the automatic Stock Reservations placed by the system when preventive maintenance routines are up-coming. This helps assure that necessary materials for preventive maintenance will be available when needed. Insufficient quantities of any item may be added to a backorder list directly from the Stock Issue screen. In addition, various reports compare quantities available with maximum and minimum points and list commodities that need to be reordered.

Emergency issuing of materials can be done quickly when authorized employees use the Special Issue or Off-Turn Issue screen.

Physical Inventory

Two screens are provided in INTERTWINE INVENTORY for handling physical inventory functions. The first allows a storeroom supervisor to systematically schedule Physical Inventory operations for their storeroom by having the INTERTWINE INVENTORY program prepare a list of Commodity Items that need to be inventoried in their storeroom according to a coded Inventory Frequency Type. The second allows a storeroom employee to do a physical inventory report by entering the actual quantities on hand for the Commodity Items specified by the schedule established by the storeroom supervisor.

Ordering Materials

If you are a buyer or an expediter for your plant, your day to day tasks will become less tedious when INTERTWINE PURCHASING is installed. Much of your time is necessarily spent gathering information about vendors, commodities, and prices. Imagine having immediate access to all of this information without leaving your desk and being able to transfer much of it onto Purchase Requisitions, Requests for Quotations, and Purchase Orders without any handwriting or a lot of typing.

Automation of the approval cycle for Purchase Requisitions will also speed the processing of requisitions, in addition to cutting down the shuffling of paperwork from one desk to another. The computer can also do an analysis on information returned from Requests for Quotations, so the best price for an item or for all items being ordered can be easily determined.

The actual creation and printing of Purchase Orders, Standing Order Releases, and Blanket Order Releases will require less time because of several special features provided by INTERTWINE PURCHASING. For Purchase, Standing, or Blanket Orders, you will have the option of transferring in all or part of the data from an old Order that is similar or from the approved items on a related requisition and quote analysis. You may then make whatever changes are necessary,

Features

- **Requisitions**

- **Approvals**

- **Vendor Information**

- **Request for Quotation**

- **Quote Analysis**

- **Purchase Orders**

- **Standing Orders/Releases**

- **Blanket Order/Releases**

- **Agreement Orders**

- **Change Orders**

- **Cancellations**

- **Purchase Order Status/ History**

- **Receiving**

- **Accounts Payable Interface**

specify the standard heading or trailing notes to be printed on the Order, type in any non-standard notes, then release the Order to the Purchasing Print Queue for printing on your Purchase Order forms. Standing or Blanket Order Releases will be even simpler-- they are automatically created and released to the Purchasing Print Queue when the last required approval is entered to the system for the Release Request. Provisions have also been made to allow the system to handle special cases such as Agreement Orders, Change Orders, and Cancel Orders from creation to completion.

Receiving and Distributing Materials

When materials are received or services rendered, the receiving clerk need only bring up all of the relevant information from the Purchase Order on the receiving screen, then indicate which services or specific quantities (complete or partial) have been received. If all of the quantities on an Order have been received in their entirety, it will be even easier--only one entry is required to record all of the received quantities. Communications Network messages will automatically be
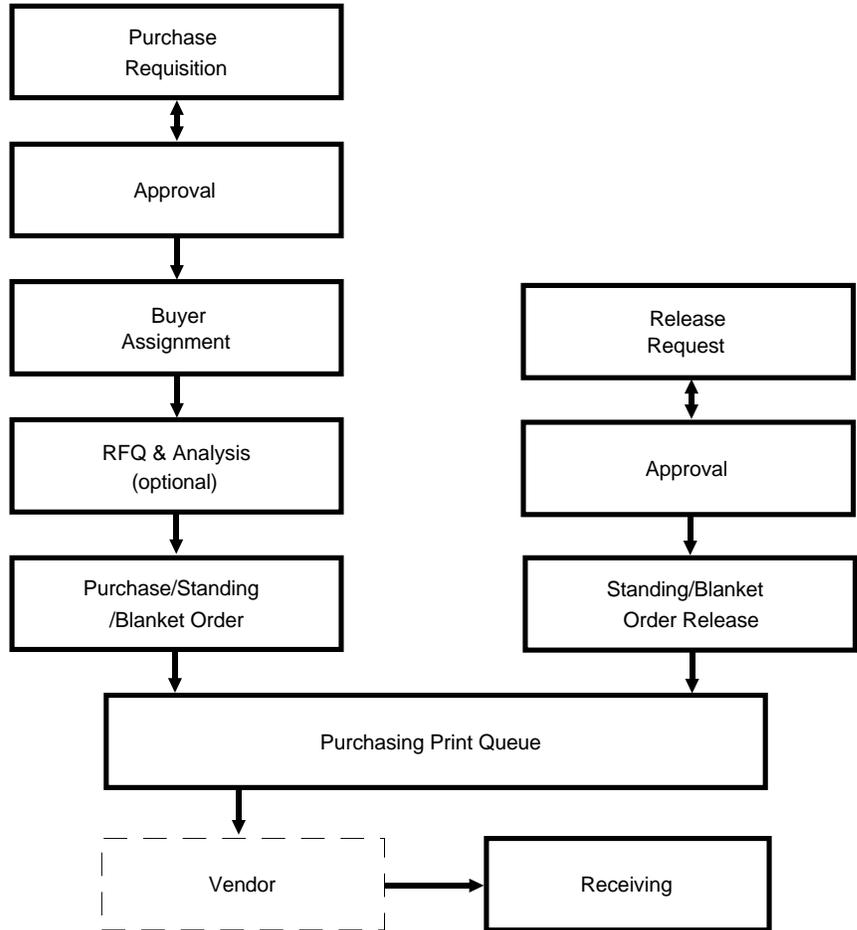
Figure 4: INTERTWINE PURCHASING Cycle

sent by the system to inform the department that placed the order that items have been received.
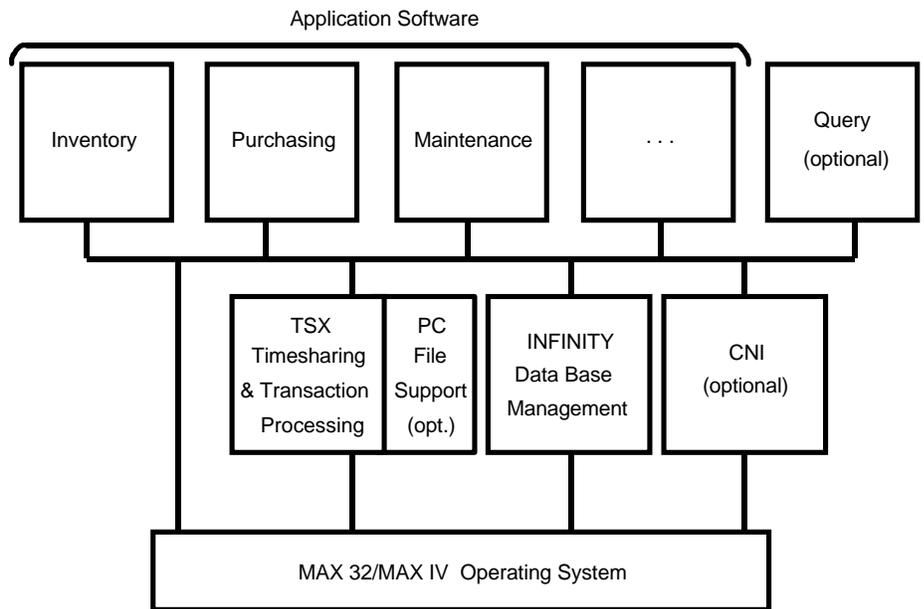
INTERTWINE PURCHASING and INTERTWINE INVENTORY are integrated at this point for the stocking of items that go to plant storerooms. Stocked items will be logged in and the storage location confirmed or recorded on a stocking

screen by a storeroom clerk. Again, most of the information on the screen will be displayed from data already in the data base--the storeroom clerk need only enter the quantities stocked and enter a location code if this is a new item in the storeroom. If all received quantities from the Order are actually stocked in your storeroom, a single entry records them all.

SYSTEM ARCHITECTURE

INTERTWINE is implemented in a highly modular, layered software architecture totally independent of terminal communication and data storage facilities. The modular approach simplifies changes to individual application programs and makes it easy to add additional features as your needs change.

All data base functions are handled efficiently by INFINITY, a distributed Data Base Management System. INFINITY can even allow access by other computer systems to on-line information, thereby easily integrating distributed systems. All user communication management security and terminal dependency is handled by TSX. TSX revolutionizes terminal control, allowing a mix of terminal types to have access to common applications. These two layers of software are hosted by either the MODCOMP* MAX IV or MAX 32 operating system, one of the most efficient real-time multitasking operating systems available. The operating system coordinates the execution of hundreds of programs, with the system hardware providing efficient use of all resources. The Operating System includes a wealth of software development tools to provide for future growth and maintenance.

Application Software

| Inventory | Purchasing | Maintenance | . . . | Query (optional) |

| TSX Timesharing & Transaction Processing | PC File Support (opt.) | INFINITY Data Base Management | CNI (optional) |

MAX 32/MAX IV Operating System

Figure 5: Typical Layered Software Configuration

By using the standard report writer QUERY along with INTERTWINE, the user is able to easily generate additional reports and displays even beyond those delivered.

The system is highly maintainable, allowing new features to be added on any layer or module without affecting other modules. This architecture has been proven reliable and flexible over many years of service.

CUSTOMIZATION

INTERTWINE can be easily adapted to a wide range of industries and speaking languages. LDC personnel can assist you in determining your exact requirements. We can then modify INTERTWINE to meet your requirements or advise your programming staff, as desired.

SYSTEM CONFIGURATIONS

INTERTWINE can be implemented on a family of computers ranging from the small MODCOMP II/15 to the powerful MODCOMP 32/85 (capable of handling up to 250 megabytes of main memory) with either the MAX IV or MAX 32 operating system. These MODCOMP systems have a real-time architecture proven to be time-efficient, suitable for a large number of users, and capable of supporting communications with other systems.

INTERTWINE MAINTENANCE, INVENTORY, and PURCHASING are designed to interface to parallel systems such as Accounting (LDC's or your present accounting program). All relevant data can be interfaced, including purchase order data, receipt data, cost center data, labor accrual data, etc.

Optional custom interfacing is also available upwardly to corporate mainframe systems via HASP and 3780, and to other systems using MAXNET, CNI, X.25, and other protocols. Data can be recorded on magnetic tapes, or electronic connections can be established for direct transmission of data over communications facilities.
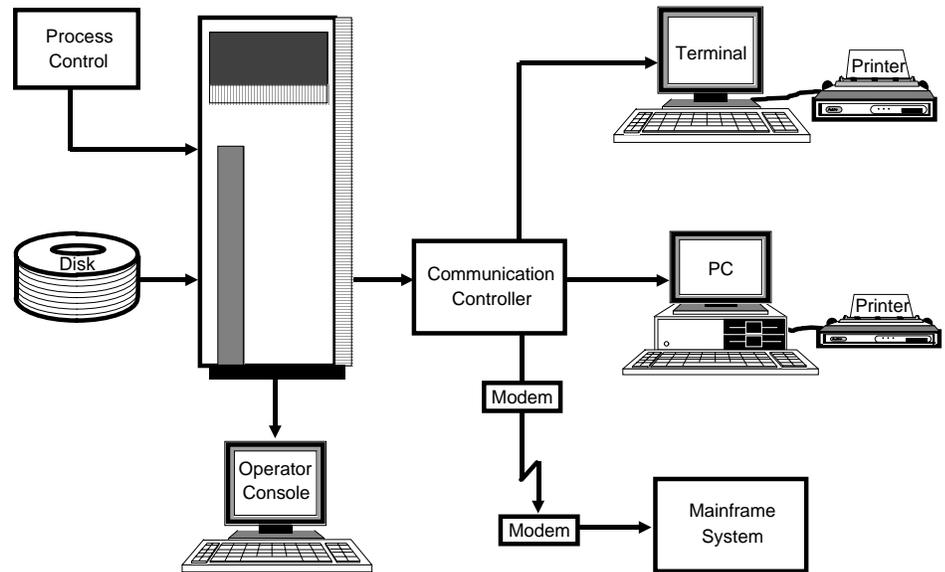

Figure 6: Typical Hardware Configuration

Downward interfacing to a group of Personal Computers can also be provided when desired. Personal computers can serve as terminals for the INTERTWINE system if individuals also need to do local computing, eliminating redundant equipment. PC users can extract information from the INTERTWINE system's data base for incorporation onto spreadsheets, into word processing text files, and even to create graphic presentations.

CUSTOMER SERVICES

Logical Data Corporation supplies a complete range of services including consulting, configuration design, site planning, installation, training, and support. We have the experience to advise you every step of the way to insure a successful, cost-effective installation.

LOGICAL DATA CORPORATION