



***factoryInsite***<sup>®</sup>

# **Shop Floor Applications**

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Product Family Overview



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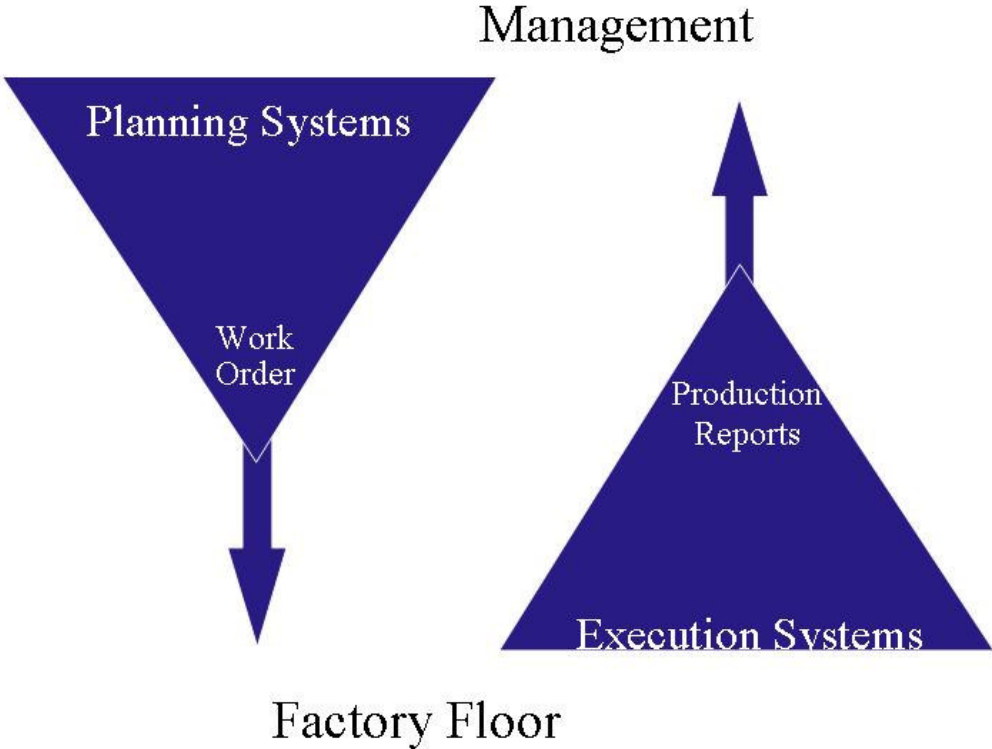
## Focus of *factoryInsite*<sup>®</sup> Shop Floor Applications

To provide high quality factory floor data collection and analysis systems tailored so that employees can accurately determine and improve the efficiency of their manufacturing environment. - Mission Statement of Factory Insite, Inc.

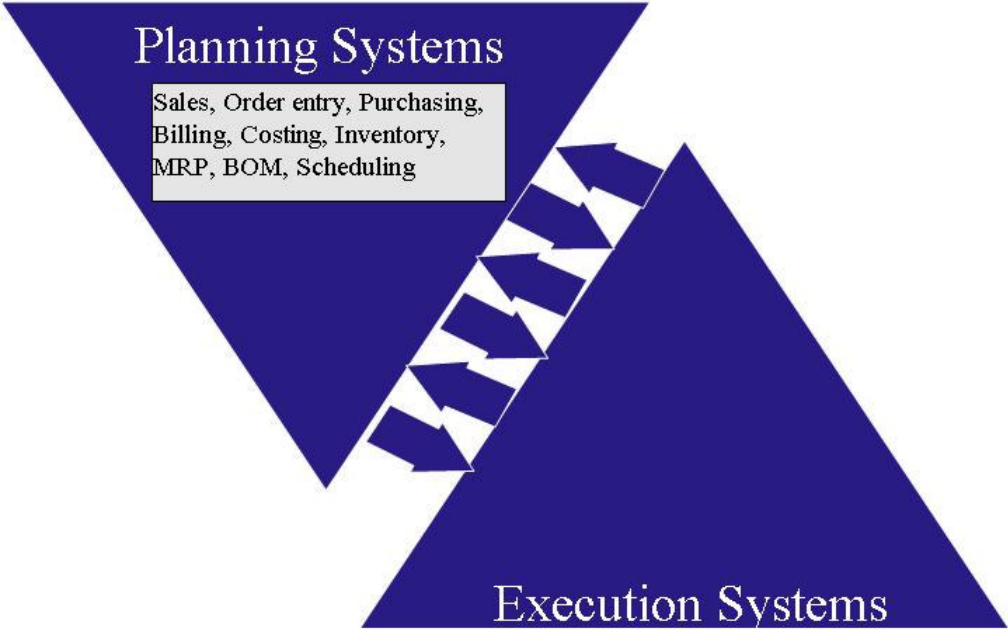
### Synergy Through Insite

Factory Insite, Inc. has a vision where our customers retain their uniqueness and are able to build upon what has made them successful in the marketplace. Our goal is to provide an integrated view of the operation to workers and supervisors so that they can react in a timely manner to slight changes in production that could result in the difference between profit and loss.

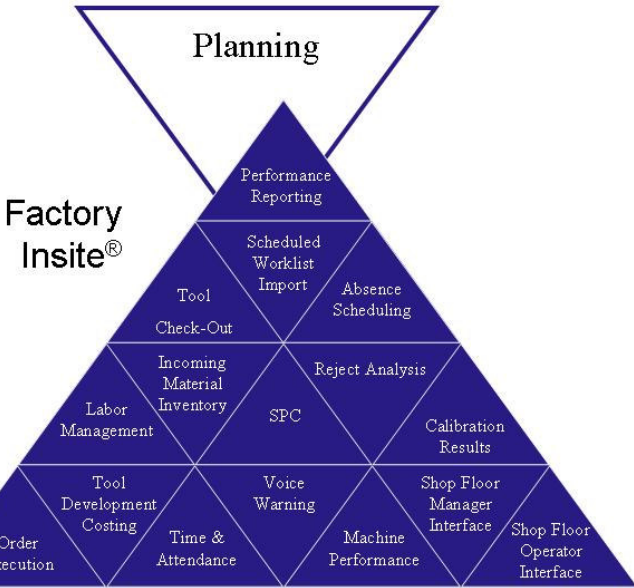
We view the manufacturing enterprise as being comprised of Planning and Execution activities. Often these activities are not well integrated as shown below.



Our emphasis is on real-time data collection and presentation on the factory floor and the sharing of information collected with other systems. We call this vision *factoryInsite*®. A completely integrated manufacturing enterprise system would look like the diagram below.



With the integration of planning and execution systems, real meaning can be given to the data that planners use and the plan that is executed on the shop floor. We have recognized this necessity and developed software systems to fill specific needs within the execution systems. We also integrate existing or new software systems. The current family of *factoryInsite*® systems are shown below.



## **Brief Description of Product Family**

### Currently Available Modules

#### **Labor Productivity Products**

##### **Time & Attendance**

The Time and Attendance application streamlines the payroll process by eliminating multiple human entries. All time spent by employees is allocated to job classifications. Hours approved by Shop supervisors are sent to payroll.

##### **Labor Management**

The Labor Management application provides labor productivity measurements. Labor can be tracked to workcenters and products. Production rate, direct vs. indirect labor, and overhead vs. manufacturing labor comparisons can guide productivity improvements.

##### **Order Execution**

The Order Execution application tracks employees to standards and order progress. It provides electronic work lists to direct work and track the process flow through the manufacturing facility in real-time.

##### **Machine Performance**

The Machine Performance application spots constraints, warns of capacity limits or underutilization, and tracks down time. It allows operators to report malfunctioning manufacturing equipment and tracks their repair.

##### **Absence Scheduling**

The Absence Scheduling application allows supervisors to schedule employee activities such as vacation, personal leave, off-site training, etc. Staffing levels can be checked ahead of time to decide on granting leave. Hours are submitted to payroll at the scheduled time.  
(Windows version available soon.)

##### **Tool Development Costing**

The Tool Development Costing application allows a company to make the best possible estimations for quotes on the development of a die, mold, fixture or other tool.

## Quality & Safety Products

### Voice Warning

The Voice Warning application provides distinctive spoken warnings for worker safety. Signals from machinery are translated to spoken messages and directed to the appropriate location in the shop. (Windows version available soon.)

### Calibration Results

The Calibration Results Tracking application ensures all measuring or calibration devices give correct readings. It tracks the calibration of measuring devices in order to ensure their accuracy.

### SPC

The Statistical Process Control (SPC) application warns of processes trending out of control. It can collect measurements from *factoryInsite*<sup>®</sup> Product Tracking, measurement stations, or manual entry.

### Reject Analysis

The Reject Analysis application allows expertise on reworking failed parts to be shared with all operators. It captures detailed results of product failings from the *factoryInsite*<sup>®</sup> SPC application. Operator actions are suggested based on the failure(s). (Windows version available soon.)

## Material Movement Products

### Tool Check-Out

The Tool Crib Check-Out application shows the location, condition, and responsible employees for all inventories in tool cribs. Expendable items and tool usage can be charged to projects, customers, or other user defined codes. (Windows version available soon.)

### Incoming Material Inventory

The inventory application improves availability while decreasing inventory levels of materials used for production or repair. Visibility is provided by a Vendor Managed Inventory model and real-time updates. Configurable chargeback tracks materials.

### Product Tracking

The automated product tracking application monitors product or lot movement via material handling sensors or worker entry. Product location and production counts are available continuously. Production, test, and SPC measurements can be collected for later analysis.



# Coming Attractions

## **Scrap and Rework Reporting**

Scrap and rework will accept detailed information concerning any parts that are sent to an inspector for evaluation. If the Labor Tracking product is installed, scrap can be reported when a non-zero number of scrap is entered. Information includes defect, cause, product identification, and disposition information.

## **Information Kiosk**

This product will integrate into the time entry stations and allow employees to access information concerning them. Future *factoryInsite*<sup>®</sup> products will add reports that will be available through the Information Kiosk.

## **Information Comments**

This product will integrate into all of the *factoryInsite*<sup>®</sup> applications and allow associating free format text notes with any information available from supervisor displays.



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## Architecture

### Tailored Software Approach

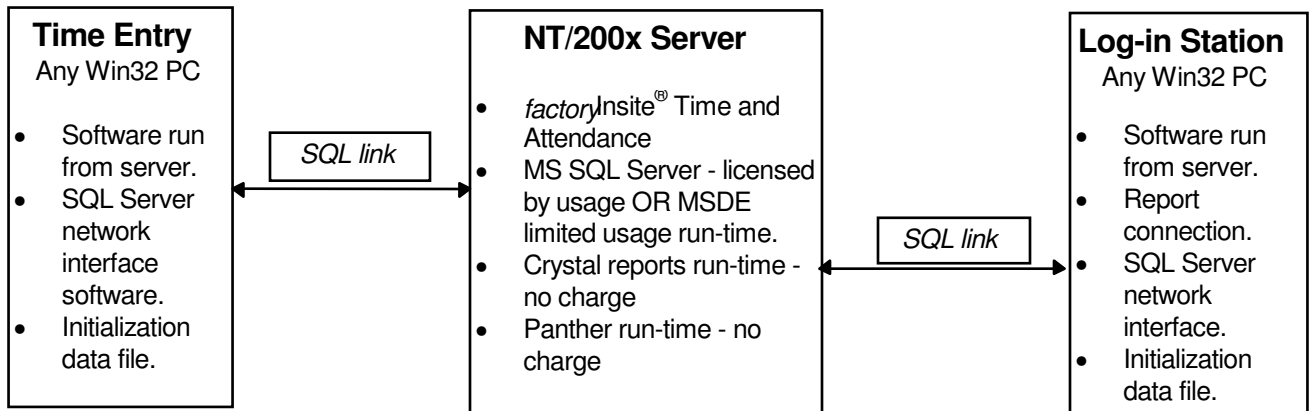
The *factoryInsite*<sup>®</sup> software family is called “tailored” software because it can be easily extended and changed to incorporate unique entry and/or reporting requirements. Yet it is still supported in the same manner as a commercial “canned” package.

Because of the tailored methodology utilized, the *factoryInsite*<sup>®</sup> software:

- **is a global solution.** *factoryInsite*<sup>®</sup> connects to existing systems and grows with your needs.
- **is problem focused.** *factoryInsite*<sup>®</sup> gathers information and presents it in real time for identifying what is happening.
- **is data rich.** *factoryInsite*<sup>®</sup> maintains complete sets of information in context for problem determination or historical analysis.
- **is broad based.** *factoryInsite*<sup>®</sup> modules share data and integrate with other applications to give you views covering all areas of the enterprise.
- utilizes **progressive entry.** You don't have to install all of the *factoryInsite*<sup>®</sup> modules at once. Add them as you need them. Each solution builds on existing capability and incorporates linkages for future solutions.
- **bridges gaps.** Gaps between existing systems or between the information that you need to make good decisions and the information that you currently have available.
- implements **entry by exception.** When human entry is required, only confirmation and changes from the expected results need to be entered.
- **tailors presentation methods.** Information is only useful when it is presented clearly for action. We work with you to make sure this happens.

### Software Requirements for all *factoryInsite*<sup>®</sup> software

The *factoryInsite*<sup>®</sup> software family is implemented utilizing a combination of technologies. This includes Microsoft SQLServer database, Prolifics Panther, and Crystal reports. For small installations, all of these can be utilized in a no-charge run-time version. The diagram below shows the three different configurations of systems that are utilized by the *factoryInsite*<sup>®</sup> software.



## Platform, Client, and Network Architecture

The Windows<sup>®</sup> version of the *factoryInsite*<sup>®</sup> software supports any network architecture that is supported by Windows<sup>®</sup> Servers. This allows a wide variety of off-the-shelf client devices (PCs, NetPCs, X-Windows, Browsers, PC terminals).

The supported user interface is the Windows<sup>®</sup> GUI accessed via a PC or Windows Terminal Server. A web server interface will be available in a future release.

## Security

The list below defines the five classes of privileges allowed in *factoryInsite*<sup>®</sup>.

- System Administrator - Has total control over all computer functions.
- Manager - Can authorize other users, perform software/data updates.
- Supervisor - Can modify operating parameters and data entered by others.
- User - Can enter information and view pre-defined reports.
- Guest - Can view information only as authorized.

System access follows two different authentication models. Administrators and Managers must be authenticated with a username and password before gaining access to any functions. Supervisors and Users may access functions through the time entry station interface. Users are only required to enter their badge identification, which is generally encoded on an ID card using bar code, magnetic strip, or other non-human readable media. Supervisors must additionally enter a Supervisor Access Number (SAN) to perform any function that affects other employees.

Employees are identified by a two level mapping. Information is kept internally by an employee (or clock) number. The employee number is usually assigned by the payroll or Human Resources package. The badge identification is used externally by the employee as an authentication string. Badge identification strings are mapped to employee numbers and can be reassigned periodically for security purposes.

Security is enforced when accessing menu items, navigation using Information Prospector<sup>™</sup>, and individual fields on entry screens.

## Database Support

The software has been developed and tested with Microsoft SQL Server as the back end database. We will support any of the SQL Server configurations that are supported by Microsoft.

The software has been developed with a 2 or 3 tier development method that allows the use of almost any database in common use. If there is sufficient interest in utilizing other than SQL Server, we will test and certify the software on other databases. Native database drivers are available for:

- DB2
- Informix
- Ingres
- Interbase
- Oracle
- Sybase

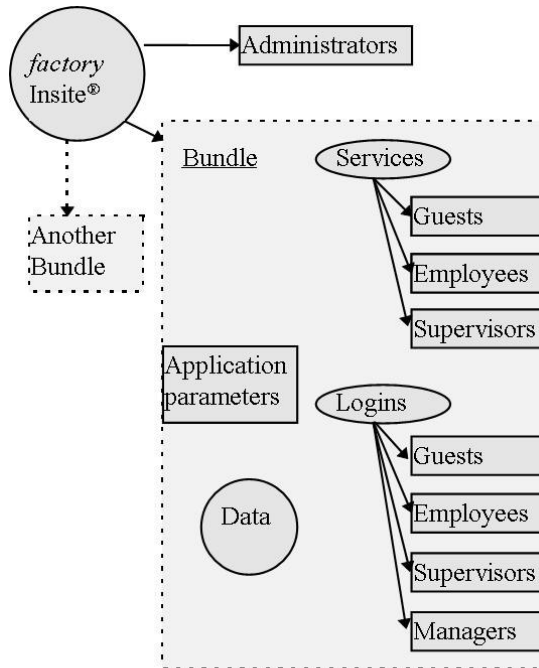
In addition to these databases, most databases with an ODBC driver can be supported.

## Information Architecture

The information architecture reference model for *factoryInsite*<sup>®</sup> is currently being called the "Bundle" architecture. Major goals of this model are:

- Allow services (which are accessed by the entry stations or the login station) on the network that offer any combination of the licensed *factoryInsite*<sup>®</sup> applications.
- Allow different databases to reside on the same computer system.
- Centralize administrative functions and allow administration of all entities from one view.
- Facilitate easy integration of new *factoryInsite*<sup>®</sup> applications and other software.

A "bundle" defines an entry station interface with authorized supervisors, employees, guests and a login interface with authorized managers, supervisors, employees, and guests. The "bundle" also defines various parameters, such as default natural language (English, German, etc.), shift windows, number of workstations allowed, etc. Below is a pictorial representation.



## Reporting Interface

The *factoryInsite*® software incorporates Business Object's Crystal Reports® product. Reports can be modified or additional reports can be created with the optional development package.

Even with the reports provided you can publish reports to a variety of familiar formats, including:

- XML
- PDF
- HTML
- Excel
- RTF
- Word
- Text
- CSV
- ODBC
- Record-style

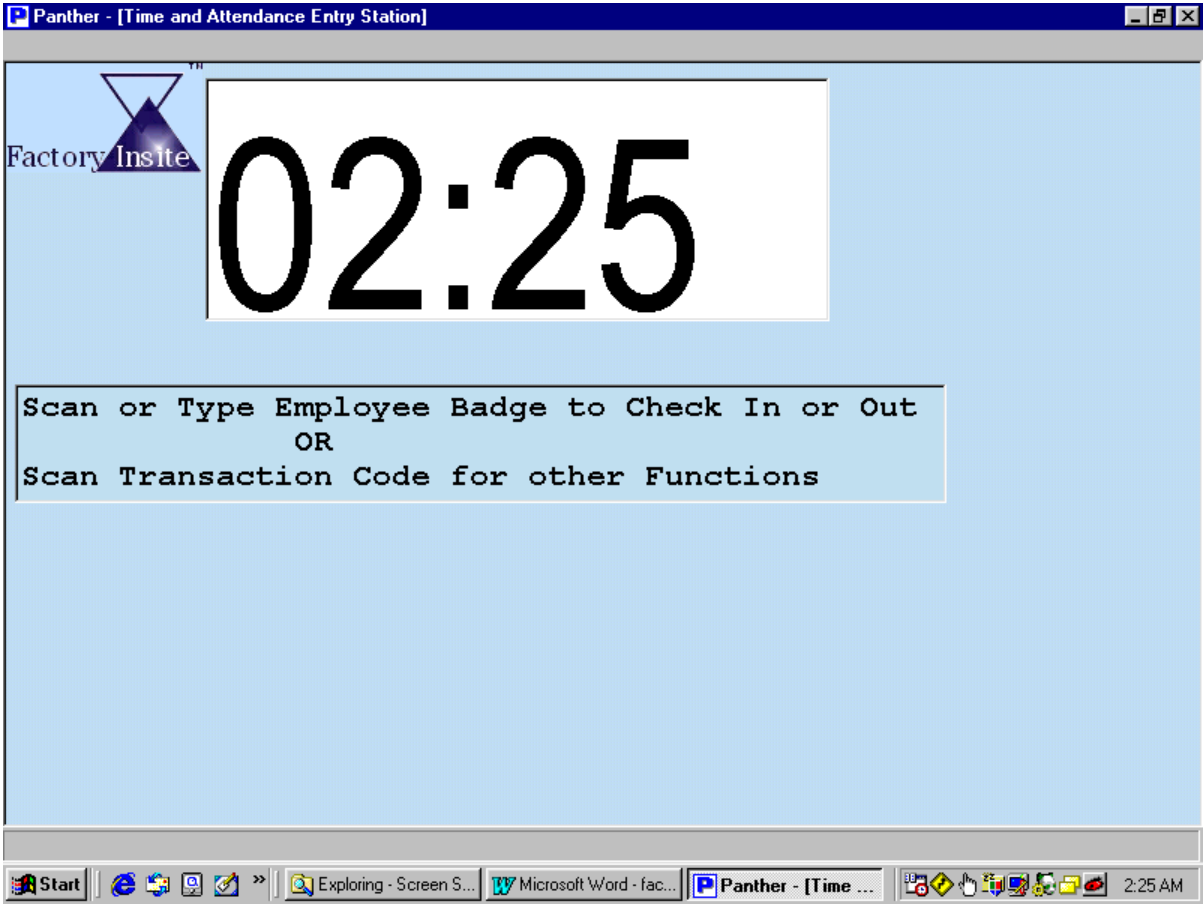
This allows you to use reports as an interface to further process data using such tools as spreadsheets. You select the information of interest and export the report contents to a data file or even another database using the ODBC interface.

# User Interface

There are two main styles of user interfaces to the *factoryInsite*<sup>®</sup> software modules. The entry station interface uses transaction codes and employee badges to invoke entry. This is intended for the main shop floor interface. The menu system requires a username and password login and invokes applications through a menu or the Information Prospector<sup>™</sup>.

## Entry Station

The entry station can run on any standard PC and is the window of all *factoryInsite*<sup>®</sup> applications to the factory floor employee. Wandering or entering the employee badge ID checks the employee in or out of their default job. Other software is invoked from this screen to allow functions like job start/stop, rework information, etc.



This screen walks the operator through each operation by displaying instructional messages based on the user entry. Depending on the operation being performed, other screens may be invoked to allow entry of additional information.

For example, wandring in the start direct labor code and then the employee badge will bring up a screen like the following.

Start Direct Labor

Factory Insite

Employee Name: Amy K Johnson

Equipment ID: PB2

Labor Start Time: 19-May-2003 11:14

Labor Stop Time:

Part Number: LK-1287-J-20

F4 - Start

F10 - Cancel

Note that this example shows direct labor time only being assigned to manufacturing equipment and a part number. Depending on the configuration of the *factoryInsite*® software much more information associated with the direct labor time can be stored.

## Menus

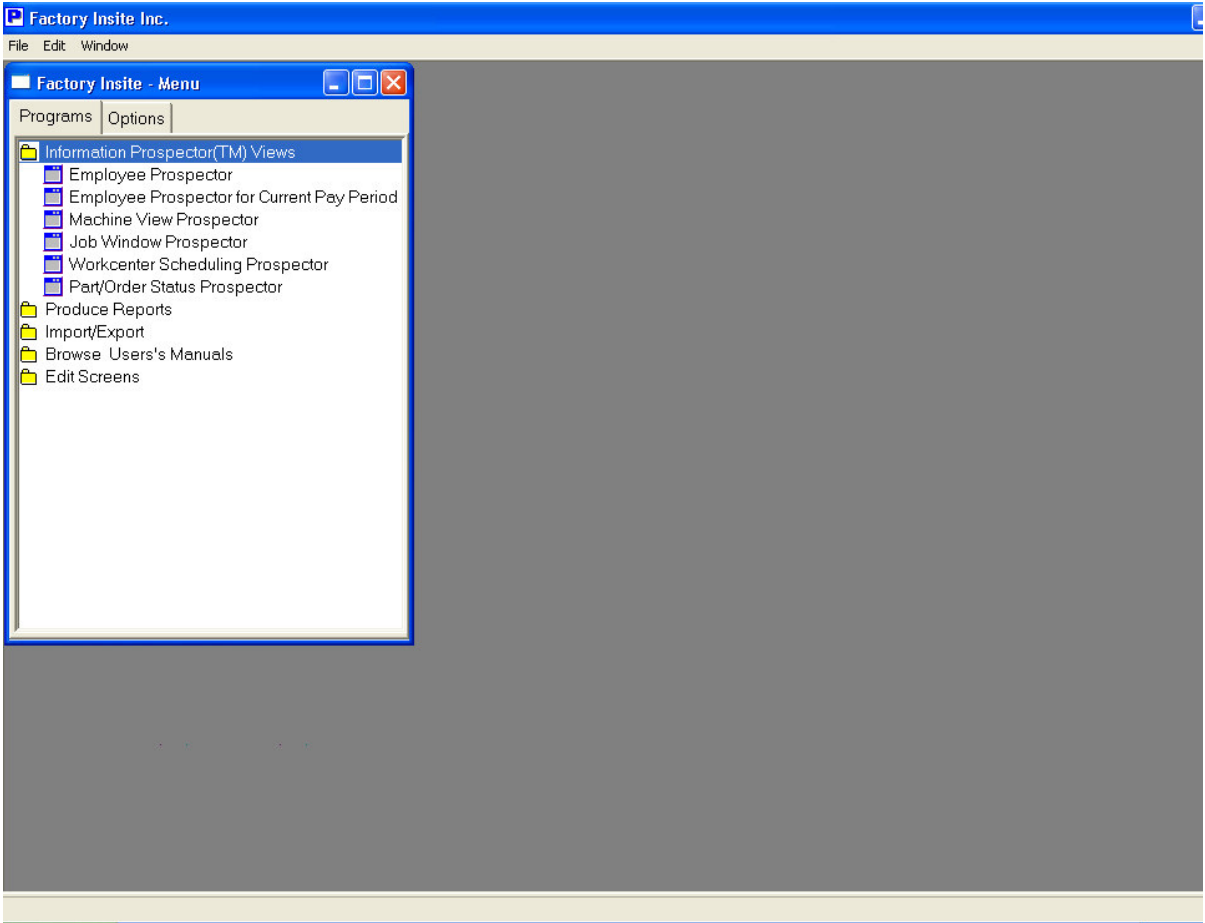
The menu system supports both keyboard navigation and pointing device use. The menu system displays menus in various styles. The styles are selected on a per user basis.

- Menus can be displayed as a full screen list and numbered. These numbers can then be entered to select the desired option. This mode can be used with just a numeric keyboard or BCR.
- Menus can be displayed as a full screen list suitable for touch screen use.
- The explorer style interface in a workspace as shown below is also offered.

The keyboard arrow keys can also be used to navigate in all styles. A pointing device such as a mouse, trackball, or even a touch screen terminal can also be used.



Menu screens are constructed on the fly and what is displayed is based on the preferred language of the user, the *factoryInsite*<sup>®</sup> applications enabled for the bundle, the profile associated with the user and the security access granted to the user.



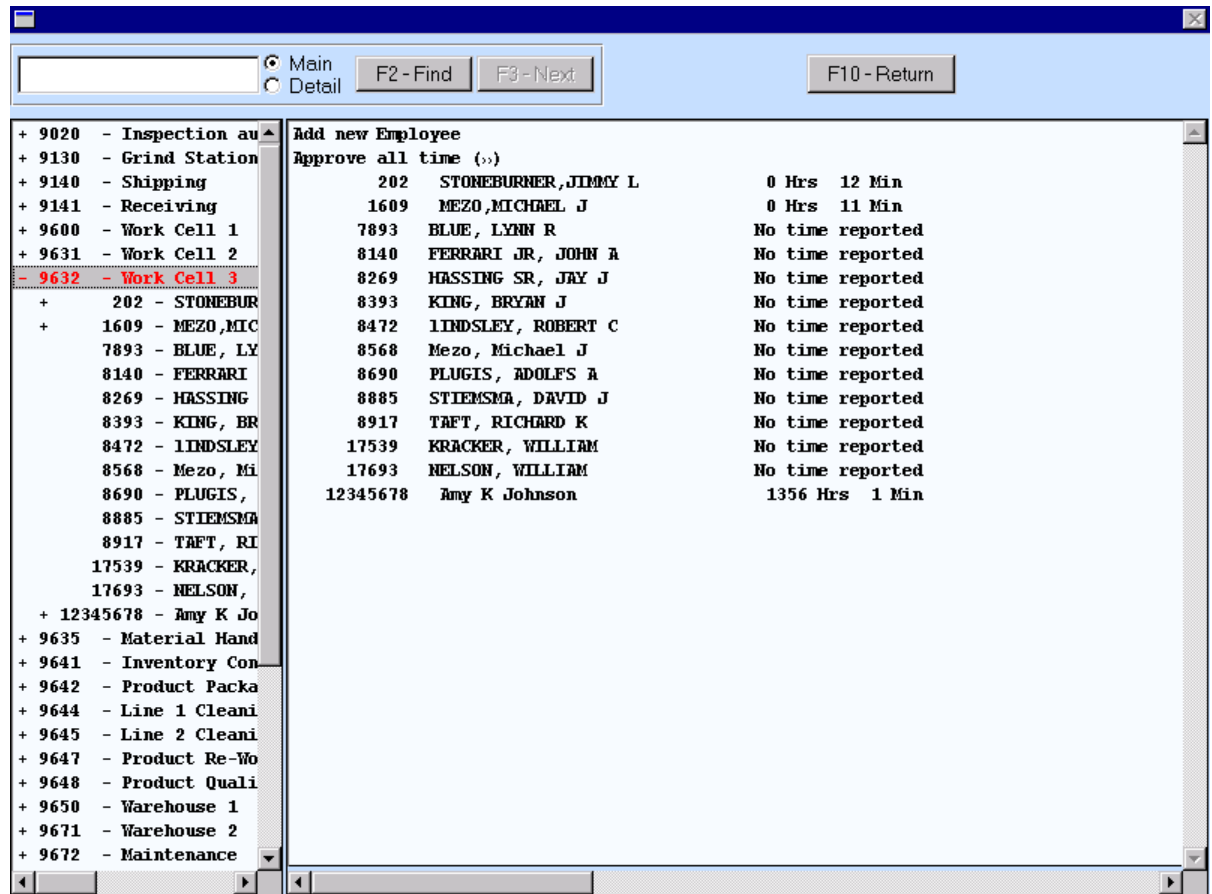
Additional, customer supplied, menu entries can be added easily. Windows executables, commands, and even DLL entry points and ActiveX modules can be invoked from the menu.

## Information Prospector™

The current release of *factoryInsite*<sup>®</sup> modules on Windows introduce a new technology user interface. The name for this technology is **Information Prospector™**.

The Information Prospector™ allows navigation through related information and modification of any information that you can view (as long as you have authorization). The left pane shows a hierarchical view and is used for navigation only. Each line in the right pane has an action associated with it. This action may differ depending on the security level under which the user logged in.

For example, the screen shot below shows department numbers on the left pane with employee numbers indented underneath. The right pane shows employees with the current pay period time summary. This gives a supervisor a quick pay period review and allows approval of all time for the department if everything looks good. If the supervisor has questions, drilling down into detailed attendance records and then into labor distribution can be done from this view.



Clicking on the “Add new Employee” line will allow you to add a new employee to the department. Clicking on the “Approve all time” line will approve all individual reported time for payroll payment. Clicking on any of the employee lines will allow you to modify the characteristics associated with that employee.

As another example, the following screen shows the overall status of each production workcenter. The status with regards to the schedule is summarized and the actual work waiting at the work center is shown along with the schedule estimates of completion.

Again this presents summary information at the top level that can be Key Performance Indicators (KPI) or can predict upcoming problems. The ability is then present to drill down into more detail in order to determine whether some action needs to be taken.

Factory Insite - Work Center Schedule Information Prospector

Main Detail F2 - Find F3 - Next F10 - Return

Work Center ID	Status	Total Hours Scheduled	Work Orders Waiting	Estimated Hours Waiting
1	Behind	21.778	2	17.778
12345	No work Scheduled	0	0	0
2	Behind	15.000	1	1.000
3	Behind	3.750	0	0

This view allows you to look into a work center of interest to see individual orders and their comparison against expected time. Then the orders can then be expanded to see all steps performed so far and steps scheduled in order to determine any problems.

## Reporting

Because of the standards embodied in the design of the *factoryInsite*<sup>®</sup> product, many different reporting tools can be utilized by customers. For example, application information can be accessed directly from Excel using Microsoft Data Query.

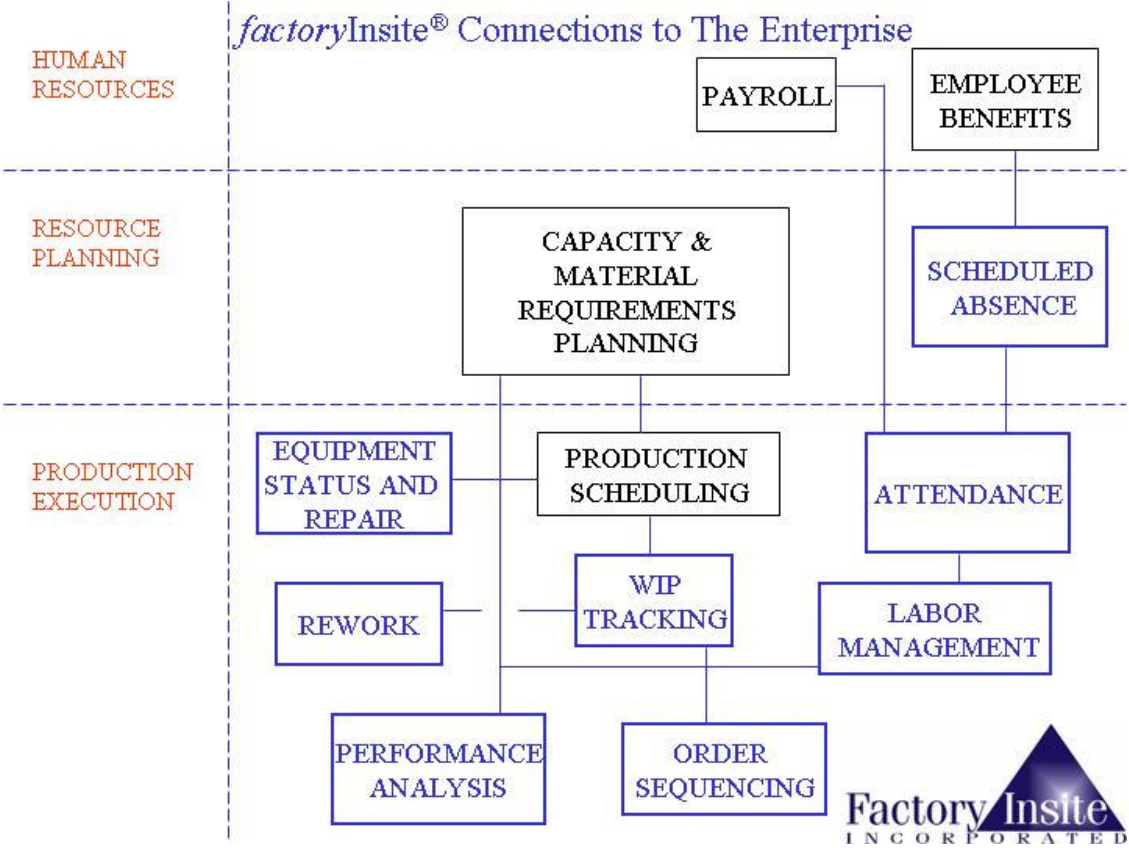
*factoryInsite*<sup>®</sup> includes the Crystal Reports<sup>®</sup> product to deploy the reports. Crystal Reports<sup>®</sup> is capable of graphing and plotting as well as text only reports. This capability is used to provide analysis reports showing historical summaries and trends graphically.

Reports provided can also be used to select information and export them in tabular format to other applications or databases.



# Integration

The chart below shows some of the functional connections to other applications. Components in black are enterprise software modules.



## Connections with other applications and databases

factoryInsite® applications contain connectors for exchanging data with other software applications. These can be program-to-program connections or direct access to other databases. factoryInsite® can simultaneously access multiple manufacturers databases.

The interface utilized by the factoryInsite® labor applications provide native support to over 250 payroll/HR systems utilizing Integrated Design's TimeBank™ technology. This interface is installed at over 13,000 sites. Business rules can be defined to validity check the payroll information before transfer.

A linkage from the payroll/HR employee database is also available to ensure that the shop floor employee data is synchronized with personnel changes.

Linking the *factoryInsite*<sup>®</sup> applications to the scheduling interface can either be done by importing and exporting files of information or by creating a real-time connection between the applications. A typical usage is to use real-time lookup for validating part number and order or lot number information and to report the labor back for scheduling runs during the day.

## Invoking Other Applications From *factoryInsite*<sup>®</sup>

The *factoryInsite*<sup>®</sup> architecture is based on standard connections and can bring up other applications installed on a network from any of the user interfaces.