



ActionManager Architecture & Technology Overview

Revolutionary Solution for Today's Business Needs

Park City Group®

Copyright 1992 - 2001 Park City Group, Inc.
All rights reserved.

Information in this document is subject to change without notice. The software described in this document is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of the agreement. It is against the law to copy the software on any medium except as specifically allowed in the license or nondisclosure agreement.

Neither this document nor portions thereof may be reproduced without written permission from Park City Group, Inc.

Requests may be submitted to:
Park City Group, Inc.
333 Main Street
Post Office Box 5000
Park City, Utah 84060

All Park City Group documentation is printed on recycled paper.

Labor Scheduler is patented under U.S. Patent No. 5,111,391.
Product Demand System and Method is patented under U.S. Patent No. 5,299,115.
FormMail is patented under U.S. Patent No. 5,410,646.
Agent-based Multithreading Application Programming Interface is patented under U.S. Patent No. 5,421,013.
Data Management Using Nested Records and Code Points is patented under U.S. Patent No. 5,634,123.
SQLWindows® licensed from Centura Corporation, Copyright © 1988-1995 Centura Corporation. All rights reserved.

Action Gatekeeper, ActionBase, ActionFlow, ActionFocus, ActionForce, ActionForm, ActionInfo, ActionList, ActionMail, Checkup, ClientBook, HRAction, InteractiveTutor, LaborManager, MarginManager, Operations Expert, PaperLess Management System, Park City ActionManager, PeopleBoard, PlannerBoard, ReadyReference, ReportBuilder, ScoreTracker, SmartHire, StoreMail, Surveyor, TimeMeter, and WorkForce are trademarks of Park City Group, Inc.

ActionBoard, FormMail, PaperLess Management, and Park City Group are registered trademarks licensed to Park City Group, Inc.

AIX, Application System/400 (AS/400), AT, IBM, IBM Operating System/2 (OS/2), IBM Operating System/400 (OS/400), OS/2 Communications Manager, OS/2 Database Manager, RISC System/6000 (RS/6000) and SNA are trademarks and DB2 is a registered trademark of International Business Machines Corp.

Advanced Communications Manager (ACM), MLINK, and MLINK APPC Communication System (MACS) are trademarks of Computer Associates.

Microsoft, the Microsoft logo, MS, MS-DOS, Microsoft Mail, Microsoft Excel, GW-BASIC, and XENIX are registered trademarks and *Making it all make sense*, QBasic, Windows, Windows NT, and Windows/386 are trademarks of Microsoft Corporation.

cc:Mail is a trademark of cc:Mail, a subsidiary of Lotus Development Corporation.

c-tree and c-tree Plus are trademarks of FairCom Corp.

Centura is a registered trademark of Centura Corporation.

SQLWindows is a registered trademark exclusively licensed to Centura Corporation.

HP-UX is a registered trademark of Hewlett-Packard Co.

INFORMIX is a registered trademark of Informix Software, Inc.

Motif is a trademark of Open Software Foundation, Inc.

ORACLE is a registered trademark of Oracle Corporation.

SCO is a registered trademark of The Santa Cruz Operation, Inc.

UNIX is a registered trademark in the United States and other countries, licensed exclusively through X/Open Co., Ltd.

XcelleNet is a registered trademark of XcelleNet, Inc.

Contents

- Overview 3**
- Executive Summary 3**
- ActionManager Software’s Technology Breakthrough..... 5**
 - Automating Business Processes.....5
 - Innovative Technology for Innovative Functionality5
- Contrasting ActionManager to Traditional Applications 8**
 - The Legacy of Traditional Applications8
 - ActionManager Redistributes Program Constructs..... 10
 - Visual Business Objects (VBOs)..... 11
- Rapid Deployment of ActionManager Applications 14**
 - Multi-Deployment Strategy 15
- ActionManager Software’s Foundation..... 16**
 - Business Organization Structure..... 16
 - Message Distribution 17
 - Alerts 19
 - Security 20
 - Tailoring Tools 20
- Technology Infrastructure 22**
 - ActionManager Architecture 22
 - Open Systems Portability..... 24
 - ActionServer 24
 - Message Server 24
 - User Interface Services 25
- Park City Group’s Secret Weapon: PaperLess Management® 26**
- About Park City Group..... 26**

Overview

This ActionManager Concepts & Facilities document outlines Park City Group's ActionManager Version 4 software solutions from the architectural perspective. This document, which provides summary-level system information, is designed to serve the need for information between high-level marketing literature and detailed technical documentation.

The Architecture & Technology Overview examines ActionManager software's unique architecture and technology and the ways it generates revolutionary business results. It will be of interest to business and Information Technology (IT) management and staff.

The ActionManager system is a cross-industry application—it serves the operational management needs of businesses in every industry. This Concepts & Facilities document covers ActionManager applications at a high level as they apply to all industry implementations.

While every attempt has been made to ensure the accuracy of the information provided, only system documentation definitively presents up-to-date system information.

Executive Summary

Today's computer industry has demonstrated incredible capabilities in creating and dispensing new technologies. Companies have made PCs so simplified a commodity that they can even be purchased at mass merchandise discount stores. Every child learns how to use a computer in school and even firm believers in the pen and paper paradigm have given in to the lure of computer technology.

Almost all industries have been attempting to keep up with the aggressively active computer industry. The computer industry is breaking new ground in speed and functionality available to the market. New products, new operating systems and new methodologies have been assaulting the market at a breakneck pace and fearing the thought of "being left behind" almost all industries, have tried to revise their strategies to benefit from the technology boom.

Historically, retailers have always wanted the "best of breed" solutions. While this strategy provides strong individual offerings, the integration and interfacing of the products becomes more complex as new products are included in the mix. Add into this equation, the upgrades and new versions that each vendor supplies and the company's IT staff is overwhelmed just trying to keep up with maintaining the systems, no less looking for new solutions to include. As hardware becomes more commodity-like, it is not uncommon for companies to adopt the idea of more powerful and less expensive equipment. While an individual can easily consider replacing older and less powerful equipment with the simple purchase of a new, faster and less expensive machine, replacing existing equipment becomes daunting to a retailer. Unlike many businesses, retailers have consistently found themselves with the awesome prospect of deploying hundreds of computer systems to support their geographically-disbursed locations with the associated costs and disruptions to the standard operations of their businesses. To make matters more confusing, along comes the Internet with promises of inexpensive communication, worldwide access to information and an offer to make even a regional

player a national contender. The Internet/World-Wide-Web assault is uniquely characterized by the technology industry approaching not only business as their traditional focus, but the personal communication (PC) market of the average consumer as well. The blazing speed at which the average consumer has embraced the WEB may have caught the industry pundits by surprise, but the speed at which e-businesses have become a reality demonstrates how truly agile business can be.

But what does this new technology paradigm mean to the established retailers? While certainly not caught unaware, established businesses with brick and mortar investments have been unable to quickly re-tool the operations of large, well-established, committed to existing customer relationships, business models.

It is imperative then, to implement a solution that can:

- Leverage the customer's investment in its existing operating environment and existing hardware.
- Support the addition of new systems and have them co-exist with legacy systems.
- Offer customers the choice to selectively deploy the appropriate technology based on the requirements of the systems.
- Deliver this flexibility at a cost and at a speed that is acceptable to established businesses.

ActionManager applications and the associated architecture and technology offer what today's and tomorrow's technology deployments need.

ActionManager applications yield dramatic results because their construction differs from traditional applications. ActionManager modules are rules-based, with separation of technical business rules from program executables. Operating functions are governed by the externally-specified business rules—rules that you can easily change to conform to your unique requirements. Thus, with ActionManager software, a change in business operations is quickly accommodated by a change in corresponding technical rules.

ActionManager applications gather data quickly and effectively, providing information that is timely and actionable while eliminating the need for extensive layers of middle management and clerical workers. The ActionManager suite of products addresses the dilemma of conventional business practices using the latest technology. Using a multi-deployment strategy, ActionManager resolves the frustrations of web-based retailers who cannot deal with interrupted operations, as well as addressing the bandwidth issues that may keep some retail operations in a self-contained independent operating mode.

ActionManager software is a comprehensive solution set that automates the day-to-day process of managing business operations. The software is distinguished by the speed in which customers can achieve breakthrough benefits.

Business experts claim that even the largest and most complex organizational processes can be reduced to a set of business rules that govern every aspect of operations, including:

- Hiring, training, and promoting employees
- Scheduling staff and tracking attendance
- Building, stocking, and merchandising product
- Serving customers

The ActionManager system is unique in the business solution it provides, as well as in the architecture and technology it uses to deliver business functionality. This Concepts & Facilities document presents the business function differences at a conceptual level. It also provides an in-depth summary of ActionManager architecture and technology.

ActionManager Software's Technology Breakthrough

Automating Business Processes

ActionManager applications automate total business processes; traditional software merely automates routine clerical tasks. For example, automated word processing replaced manual typing, while scanners that read bar codes replaced the task of manually keying prices on cash registers.

Traditional systems yield marginal return on investment because they are limited to streamlining clerical tasks. This focus represents lower value and labor costs. If a \$9-an-hour clerical activity is automated to realize a 20% improvement in productivity, the resulting gross savings is \$1.80 an hour. The costs of developing, deploying, operating, and maintaining the information technology responsible for the productivity improvement must be subtracted from these gross savings—leaving, at best, marginal net savings.

Rather than focusing on task automation, ActionManager software automates and upgrades total operational processes. For example, the ActionManager system impacts the labor management process as follows:

- Forecasting based on previous business influences
- Labor scheduling based on forecasts and budgets
- More efficient employee training and direction
- Streamlined ongoing assessment of employee knowledge and skills

Improvements in the labor management processes listed above can dramatically reduce labor costs and turnover, while significantly increasing productivity. Similar results are possible in all operations areas. The result is a dramatic return on information systems investments. However, effective automation of business processes requires a different application architecture and technology, as discussed more fully below.

Innovative Technology for Innovative Functionality

The ActionManager system's underlying application architecture and technology is critical to delivering breakthrough benefits. It provides these key capabilities:

- **Integration**—Integrating cross-application functionality geometrically increases system value by enabling a shift from task automation to process optimization. The ActionManager system sets the standard for total, seamless integration, featuring:
 - ◆ A fully-integrated database—data entered once is immediately available across all applications and to all authorized users.
 - ◆ A consistent user interface.
 - ◆ Seamless navigation across applications—once a user learns one application, mastering subsequent ones is intuitive.

Most importantly, ActionManager software integrates all of the tasks that comprise a complete business process.

- **Tailorability**—ActionManager applications are quickly and easily tailored to meet each customer's unique business requirements, including changes in nomenclature, changes in the formatting of screens and changes in business rules and operating parameters.

Application tailoring requires only basic skills for initial system implementation and ongoing changes (learned during initial product education)—most technical or operations analysts can perform the tailoring function without requiring a technical or programming background. Rule specification and maintenance is made even easier with visual editing facilities. The following key concepts are fundamental to the ActionManager architecture:

- ◆ No Change to Code—Tailoring does not require prior examination of, or changes to, existing program code.
 - ◆ Fully Supported Systems—Tailoring does not affect Park City Group's support of the system or the upgrade process.
- **Low Cost**—Cost is critical in multi-unit business operations where computing expenditures are multiplied by hundreds or thousands of units. ActionManager software addresses every organization's need to contain computing costs by running efficiently on low-cost workstation platforms at the remote locations and cost effective open servers for consolidated network operations at the district, region, or corporate level. A complete installation of ActionManager applications will operate on computing platforms that cost a fraction of those required by alternative systems.
 - **Ease of Use**—Systems improve business operations only if they can be quickly deployed, easily learned, and widely used. ActionManager software sets the standard for ease of use, operating in the Microsoft Windows environments familiar to most modern offices.
 - **Open/Portability**—ActionManager systems are open, accommodating many databases, and provide portability across many platforms. This ensures system longevity and significant return on investment, while eliminating the need to make costly, disruptive changes in the near future.

The ActionManager Version 4 applications comply with the following industry standards:

- ◆ ODBC/JDBC (Open Database Connectivity)
 - ◆ SQL (Structured Query Language)
 - ◆ HTML (Hypertext Markup Language)
 - ◆ SMTP (Simple Mail Transfer Protocol)
 - ◆ XML (Extended Markup Language)
 - ◆ JNDI (Java Naming and Directory Interface)
 - ◆ JMS (Publish/Subscribe Delivery)
 - ◆ EJB (Enterprise Java Beans)
 - ◆ Java Bean (Java Component Architecture)
- **Interoperability**—ActionManager applications can be easily interfaced with established commercial applications, such as general ledger, human resource, and point-of-sale systems, as well as with systems developed in-house. By concentrating integration points in a single functional area, the ActionManager system provides a single interface source for all applications. This vastly reduces the time and effort required to construct bridges between ActionManager applications and legacy applications.
 - **Flexible Deployment**—Geographically-dispersed organizations can deploy ActionManager applications in a variety of ways depending upon the availability and criticality of a persistent network connection. Deployment can consist of Web browser clients using the Internet or WAN, thin clients using a dedicated connection, or thick clients using a periodic connection.
 - **Uniquely Configured for International Deployment**—Most commercial software support for internationalization forces a customer company to commit to a single language representation. This limitation would be inadequate for a location with multiple language requirements (for example, a location in Ottawa, Canada, has both English and French speaking employees). To address this problem, Park City Group developed a patent-pending invention, “Language Hot Swapping,” and incorporated it into the ActionManager applications. The innovation has solved the multi-language dilemma by having the application query the host setting and load a matching “resource bundle” for the languages indicated by the setting. A special button object residing on the screen status bar allows a user to display a list of the available languages, and upon selection, displays not only the screen literals, but all the data in the appropriate language.
 - **Rapid Implementation**—With Park City Group’s Professional Services, you gain "best practice" knowledge, which accelerates implementation. This is a critical success factor for the following reasons:
 - ◆ High Return on Investment—Rapid implementation generates faster payback and, typically, a higher total return.
 - ◆ Increased Odds for Project Success—Project failure (the application failing to meet requirements) increases in direct proportion to the length and complexity of the implementation.

- ◆ **Management of Changing Requirements**—Every business has constantly changing requirements. The longer the implementation cycle, the greater the number of changes from original design to beginning of production. When completed, projects with inordinately long implementation phases are often hopelessly out-of-sync with current business needs.

Contrasting ActionManager to Traditional Applications

IT professionals are familiar with traditional program construction techniques and architecture—they are the basis of the legacy system problems that plague most organizations. Therefore, we will merely overview key characteristics of traditional applications with the intent of differentiating the ActionManager hallmark technology and architecture from that of other systems.

The Legacy of Traditional Applications

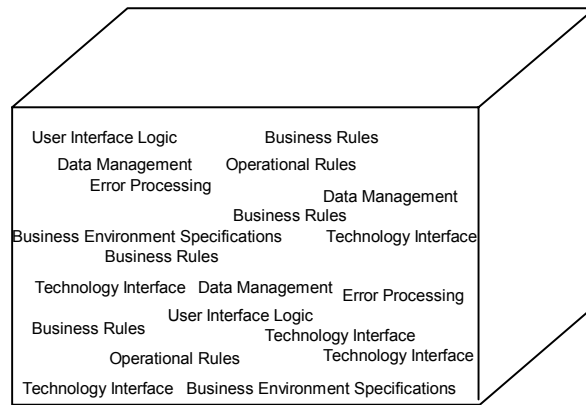
In a traditional business information system, one or more applications are constructed to automate each business task. For example, the typical distribution system contains an excess of programs—one that takes customer orders, another that prints warehouse packing slips, and so on.

Each of these traditional applications requires a variety of programming constructs for successful performance of their task automation functions. These constructs include:

- **Data Management**—Instructions that govern the navigation and use of information maintained in files or database systems.
- **Error Processing**—Specifications of actions to be taken in the event of errors in the technology environment, such as Windows-based errors, errors in data, and user errors.
- **User Interface Logic**—Methods of interaction with the user, including screen displays, user prompts, and navigation.
- **Business Rules**—Codification of how the organization operates, such as when and how to calculate late payments or the terms for extending credit. These business rules are coded in program flow logic (IF, THEN, ELSE, DO, GOTO, etc.), computational logic, and by controlling other processing logic such as data management, user interface, and error processing.
- **Technology Interfaces**—System logic that manages the interface between the programs and the computer technology environment.
- **Operational Rules**—Specifications for operational rules such as security. While computer operating systems technology can provide limited security, such as password-based systems access, applications manage functions such as “who” can set “what data” to “what allowable values” and perform “what specific functions,” such as time card edits and record retention.

- **Business Environment Specifications**—Definition of the way your business is organized and managed, from the chart of accounts to organizational structures for distributing information and making decisions.

The problem with traditional information systems is that all of the above functions, and more, are effectively “fossilized” into the many computer programs that comprise the applications.



Traditional program construction

The specifications and rules are created in mysterious computer languages and intermingled within every program, creating complexity. The rules must be repeated over and over again in every program, resulting in redundancy. Because of functional redundancy, a single change in business practice or technology requires myriad program changes.

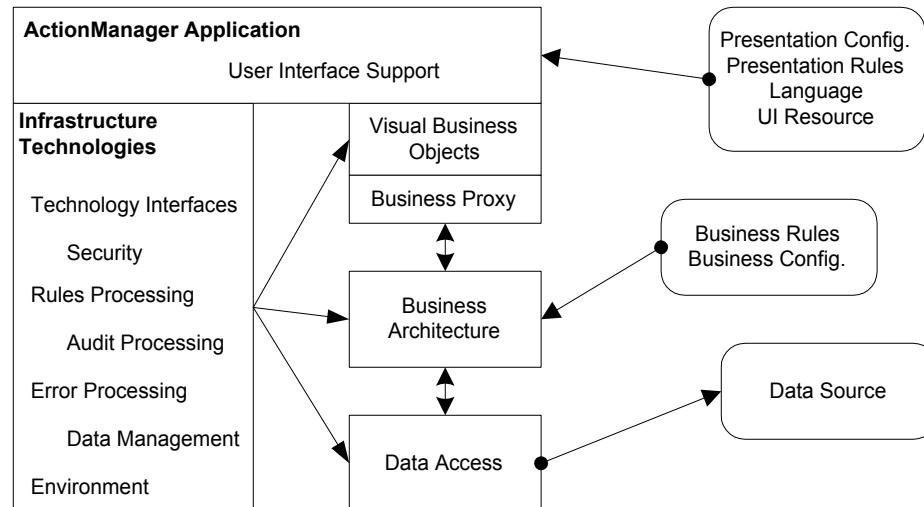
Computer systems with sufficient power to automate a modern business are extraordinarily complex, costly to implement, and difficult to change. Simple changes to rules and specifications, occasionally can be accommodated by changing table values, such as pay rates. More commonly, changes to rules, specifications, or technology environments require coding changes to multiple application programs. This process, called maintenance, is lengthy, error-prone, and unpredictable.

Maintenance problems have an impact on initial system implementation as well as subsequent system change. Because the implementation process is costly, risky and time-consuming, many companies compromise in meeting all of their business and technology requirements.

Requirements change constantly, often as soon as a system is implemented. Just as often, they change during the system implementation process. Problems engendered by program maintenance dramatically reduce your flexibility. They slow the speed of reaction to competitive pressures, or marketplace shifts and increase the costs of making changes. They compound the already significant problems inherent in altering organizational structure and behavior.

ActionManager Redistributes Program Constructs

Unlike traditional applications, ActionManager software separates the logical components of a program into individual, easily manipulated objects. The ActionApplication Framework defines the base components and structure used in building ActionManager products, and provides a common set of services for them. Sharing these components across applications results in reduced development effort and consistency across applications. It also provides a flexible, extensible, and scalable n-tiered approach to application organization, implementation, and installation. It identifies how applications are created in terms of required component layers and service usage.



ActionManager program construction

ActionManager software centralizes technology interfaces in a Technology Infrastructure architecture layer rather than in the individual applications. Because common code provides the technology interface required by all ActionManager programs, interfaces can be specified or changed once for all applications. In addition, the Technology Infrastructure layer is highly modular—an organization need use only those components required by its specific technology environment. This layered approach simplifies coding and maintenance, and simplifies portability.

Once technology interfaces are separated from a traditional program, remaining components can be classified as business rules. Business rules include data management logic, error processing logic (such as user error support), user interface logic, and business function logic. In the ActionManager architecture, business rules are separated into two groups—those that are broadly applicable across many programs and those that are specific to a single program. Broadly applicable rules are centralized in the Business Architecture implementation layer. For example, a set of business rules can be defined to govern the specific operational implications of your organizational structure—such as reporting structures and their information flow, approval considerations, and logical security.

Consolidation of common business rules as an external system element from program code enables single specifications or changes to affect all applications. Technical or business analysts can tailor common business rules, such as organizational specifications, without modifying any programs.

Visual Business Objects (VBOs)

Program-specific business rules are incorporated in Visual Business Objects (VBOs), the building blocks from which ActionManager applications are constructed. VBOs operate on top of the Business Architecture and Technology Infrastructure layers, which provide the common business functions and technology interface services required to support their operations.

Visual Business Objects (VBOs) are a core part of many Park City Group's existing offerings, such as ActionBoard®, ActionMail™, and Scheduler. By providing business analysts with a means to create applications with the rules, validations, and desired appearances, VBOs serve as tools for performing organization-specific business tasks (e.g., a calculator). ActionManager VBO functionality is divided into two distinct pieces: presentation rules and business logic rules. All ActionManager applications are created using a combination of presentation rules and business logic rules.

A VBO is a tailorable element construct that performs a single function. The VBOs operate within an environment called an Application Framework, which includes common functions and support routines. Some VBOs are unique to a specific application while other VBOs can be shared across modules. In addition to flexibility in tailoring software to reflect customer requirements, the reusability of the VBO code increases the overall reliability of the Park City Group technology.

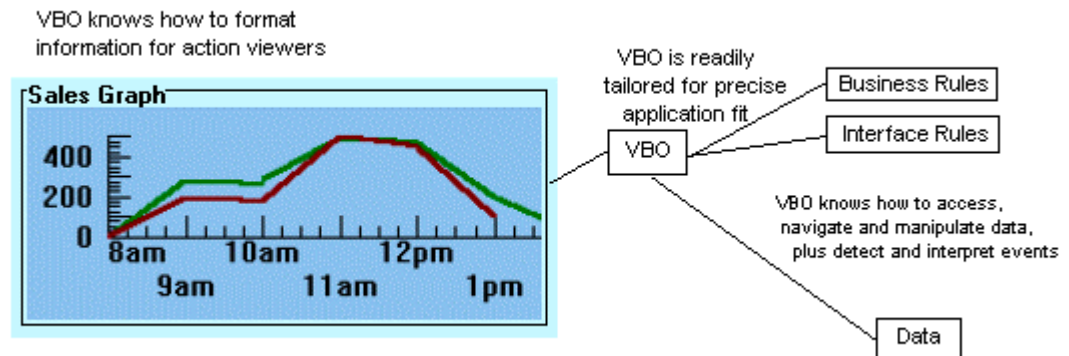
Visual objects, such as lists, graphs or buttons, fulfill specific user-interface and business requirements. For example, VBOMessageList objects display a list of messages, VBOButton object displays a button the user can click for a specific function, and VBOImage objects display an image. There are complex display objects such as graphs, grids like the Scheduler User Interface grid, and drilldown objects like the ScoreTracker™ screens. Other simple objects are buttons, pick lists, list filters, etc.

VBO objects in ActionManager are Java Bean objects. Customers may also add their own Java Beans to the Application Framework. Using Java Bean introspection techniques, the Framework is able to determine Java Bean object properties and add them to the list of available objects.

While other technologies claim to be “business rule based,” they only allow you to determine the “triggers” or “touch points” for pre-coded events. Using ActionManager applications, you tailor the rules, including the trigger, the event that triggers it, and the consequence. Rules are interpreted at run-time rather than being hard-coded in the software; giving you the control over the application.

To further examine VBOs, we will discuss Park City Group's ActionBoard® module. ActionBoard is a focal point (analogous to a dashboard) for day-to-day operations. It is comprised of viewers that provide “windows” into key operational information, such as budget-to-actual comparisons, worker schedules, electronic mail, or other ActionManager modules. ActionBoard software also monitors key business events as they occur, using a task-tracking-and-alert viewer to display information about critical events and suggested activity.

For the purpose of our example, we will construct a new ActionBoard application, as portrayed in the diagram that follows.



Visual Business Objects embed “best practices” via point-and-click tailoring

In the example, a budget-to-actual-sales VBO has been selected from VBOs available for constructing an ActionBoard application. This VBO “knows” how to obtain budget data from other ActionManager applications or an external SQL database, and actual data from real-time POS feeds or updated databases. The VBO also “knows” how to present this information (e.g., coloring a line graph when certain conditions occur). All of the VBO’s “knowledge” is built into the VBO during tailoring.

Applying Business Rules to VBOs

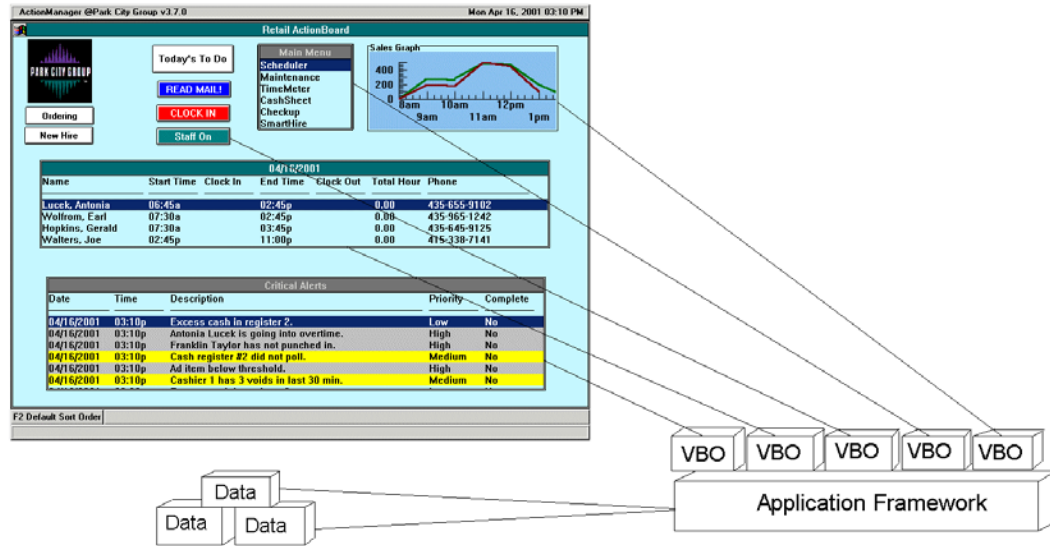
Tailoring is accomplished using visual editing tools that enable rule specification via pointing and clicking on drop-down boxes of available options. “Drag, drop, and size” tailoring of the information enables sizing of the display window that the user sees and modifications to the kinds of information displayed.

Two types of rules apply to VBOs:

- **Interface Rules**—These rules define how the viewer will display. For the example, interface rules include specifying the viewer screen location and size, the graph format, and time periods to be displayed.
- **Business Rules**—These rules define a system or business event and the computational or analytical actions to be taken if it occurs. In the example, events are conditions arising as a result of changing the sales date or receiving an update to sales information, and the recognition of the variances that occur between actual and forecast sales.

For the budget-to-actual VBO, actions dictated by business rules could involve turning the graph line red or green to reflect sales and sending messages to an alert viewer concerning related staffing, inventory, and production issues.

A recommended action in response to low sales might be to send some employees home, reassign staff to other tasks, or initiate activities to stimulate sales. Alerts could include supporting data—e.g., displaying an employee’s home phone number with the message to call him. If any of these events were defined as critical, a pager alert could be sent.



Multiple VBOs build applications

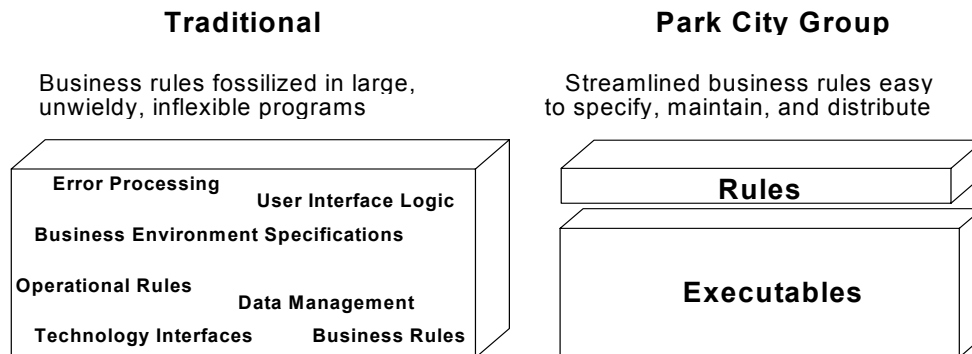
A completed ActionBoard application employing six VBOs is shown above. These multiple VBOs operate within the ActionBoard application framework. Customer tailoring of the interface and business rules creates a complete, unique application. This tailored ActionBoard application provides information, displayed on separate windows, that guide management in effectively running day-to-day operations.

Other ActionManager applications are built in much the same manner. Each of these ActionManager applications has its own specific application framework and a set of associated VBOs.

Constructing applications with Visual Business Objects ensures that systems can be quickly and easily tailored to meet business needs at the time of system implementation and as requirements evolve. The VBO construction technique eliminates one of the foremost IT problems: maintaining program code to meet changing business requirements.

Rapid Deployment of ActionManager Applications

ActionManager software also solves the other major problem in the systems change process: managing deployment. As applications change, new versions must be readily available to users. The ActionManager VBO technology dramatically streamlines the software distribution process.



Deployment: Conventional programs versus ActionManager

Customer-specific tailoring for all application VBOs (including both interface and business rules) is stored in a single rule file that accompanies executable and control files. When changing business needs prompt corresponding application changes, only the rule file is changed and redistributed.

ActionManager software provides a unique approach to implementation with products that have been specially engineered for rapid deployment. ActionManager technologies and techniques that facilitate rapid implementation include:

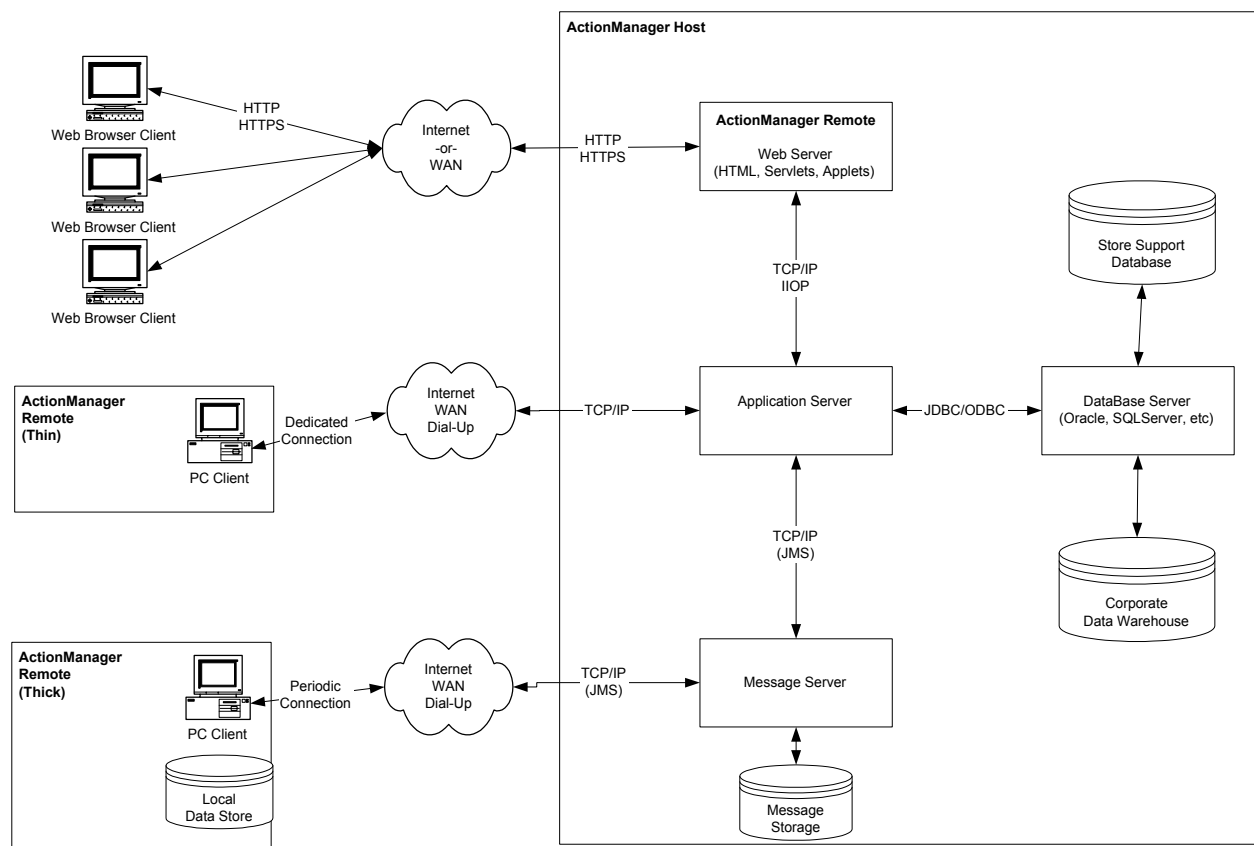
- **Product Selection**—A wide variety of ActionManager applications covering the major functional processes in business operations are specifically designed for fast implementation and rapid investment payback. A customer may select one or many applications and with each additional product, the implementation effort is reduced since new applications will share the same product infrastructures.
- **Services**—ActionManager software is a total solution. Park City Group supports its products with a comprehensive service offering that includes professional services, account managers, documentation, education and product support designed to speed installation, implementation, and rollout.

Multi-Deployment Strategy

ActionManager products can be deployed across your organization in three distinct ways. They are:

1. Web Browser clients using the Internet or WAN to provide access and communications. This leverages the Internet as a delivery mechanism rather than requiring the expense of T-1 phone lines. This strategy is appropriate when interruptions in communications are not critical and minimizing configuration and maintenance at remote locations is important.
2. Thin clients using a dedicated connection to provide communications. Using this strategy, only the UI layer resides on a location computer. This strategy is appropriate when improved UI performance is required and when working in a batch mode.
3. Thick clients, where the software resides on the location computer and uses a periodic connection for transmission and communications. This strategy is appropriate when up time is critical.

You can also use a combination of these options depending upon your network configuration, hardware, and ActionManager solutions. The following diagram illustrates the possibilities:



ActionManager Software's Foundation

The Business Architecture layer contains business functions common across multiple applications. Consolidating these functions dramatically reduces redundant program code, resulting in streamlined new product and release development, and simplified maintenance. The customer receives a system of higher quality and greater consistency.

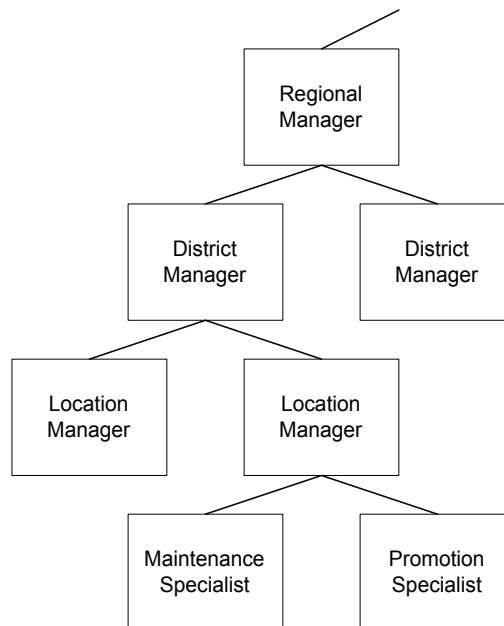
Centralization of common business functions is a hallmark of the ActionManager architecture and technology: specify once, effective everywhere/change once, effective immediately. This single specification approach dramatically reduces the time required to implement an ActionManager system. A system that can be rapidly and dependably tailored accommodates changing business requirements.

The Business Architecture layer includes the following major components:

- Business Organization Structure
- Message Distribution
- Alerts
- Security
- Tailoring Tools

Business Organization Structure

By automating business processes, rather than merely the tasks that comprise the processes, ActionManager software supports all workflow situations. For example, ActionManager automates the hiring cycle by electronically routing information about candidates—their completed applications, interview results, test results, etc.—to the managers responsible for review or approval. The ActionManager Business Organization Structure facilitates the process.



The Business Organization Structure is a dynamic model of your organization that is available to all programs. It accommodates multiple organization charts with multiple

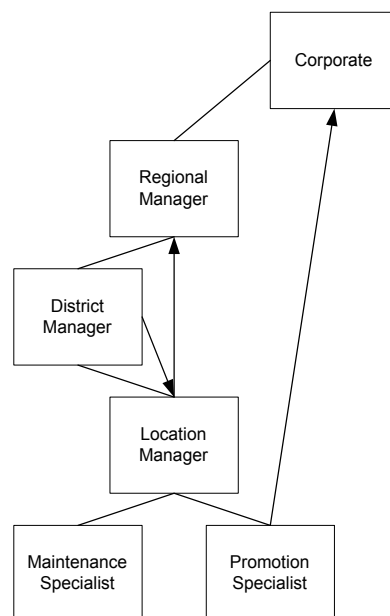
functional views of the organization. The Business Organization Structure is a significant departure from traditional applications' use of organization-specific code.

Understanding and using the structure and operation of the business organization is key to workflow-based, task-integrated process optimization. In addition to the structure, it is essential to know the people, roles, and authorities associated with it. The Business Organization Structure provides a central point for establishing and maintaining organizational information. It tracks functions, responsibilities, authorities, and people.

The Business Organization Structure also provides for decentralized management of this information. For example, corporate personnel might be assigned to manage the lists of people and roles authorized to make specific decisions on issues such as hiring or pay raises. At the same time, local employees could be granted the authority to assign people to roles, to give them temporary authority to change local back-up specifications, such as the designation of the "manager recipient" when the manager is off-duty. This occurs without compromising managerial password protection.

Message Distribution

The ActionManager Message Distribution system consolidates and distributes information throughout the organization. Message Distribution is analogous to physical distribution centers used by large companies. Although the notion of data warehousing is prominent in information technology circles, the physical warehouses it is modeled after have proven ineffective as a distribution mechanism for business. The ActionManager Message Distribution system is not a data warehouse but rather an intelligent communication router. Rather than simply providing organizational routing, it draws upon the most recent business distribution theories, including "just in time" and cross-docking, which focus on minimizing quantities of warehoused goods and quickly repackaging and routing goods to final destinations.



Message Distribution also gets the right information to the right place at the right time. It leverages the Business Organization Structure to determine "where" and relies on tailored business rules to determine "what" and the priorities for "when." It then routes

centralized corporate information to distributed operating locations or routes information from the local operating sites to regional or corporate locations.

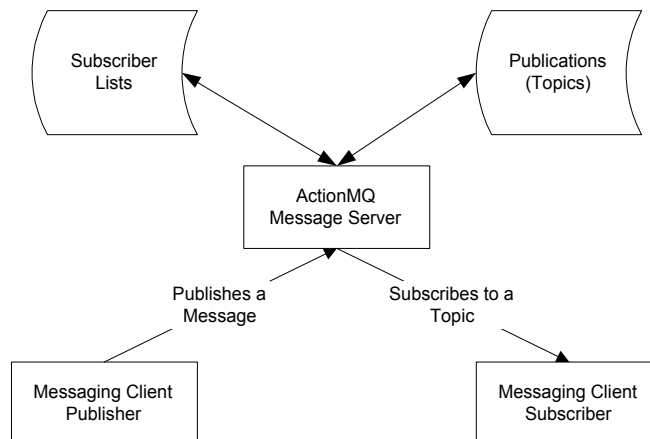
The ActionManager Message Server is central to the software’s ability to deliver the right information to the right individuals when and where needed. The Message Server accommodates all ActionManager applications that require delivery or routing of information. Message Server features include:

- Availability Dates—allows for early distribution of information for network load leveling purposes.
- Retention Dates—prevents premature deletion of information.
- Expiration Dates—automatically deletes information on a specified date.
- Data Compression—optimizes efficiency and reduces cost of transmission connect time.
- Data Encryption—reduces exposure during data transmission over the WAN.
- Gateway—provides an interface to existing electronic mail systems.

The Message Server relies on the Business Organization Structure to resolve specific information routing. This allows messages to be routed to logical destinations, such as “District Manager,” “Benefits Administration,” or “Location Manager #114.” Logical destinations accommodate reorganizations, normal turnover, temporary changes for breaks or vacations, or any other situation that generates the need to reroute information.

The Message Server operates with a broad variety of wide and local area networks (WANs and LANs). It ensures the eventual delivery and confirmed receipt of messages even when communication links between sender and receiver may be only sporadically available, such as dial-up connections.

The ActionManager Messaging System uses the JMS Publish/Subscribe message delivery specification. In the publish/subscribe model, the Message Server serves as *host* to various client applications that wish to *publish* information. The Message Server also acts as *host* to client applications that wish to *subscribe* to the information being published. In this manner, the Message Server acts as a mediator for the publishers and subscribers. This model frees publishers from maintaining information regarding delivery of its publications and allows subscribers to receive publications when and where they choose.



ActionManager can function as a web-centric suite of business solutions. Message and file transfer takes place over an Internet or TCP/IP Intranet WAN communications backbone. The products can also be implemented with a generic WAN file transfer mechanism as the communications backbone. Additional messaging services are:

- The Internet Mail Gateway product, which handles electronic messaging between ActionMail and other systems. The gateway allows ActionManager to interface with common Internet mail applications (e.g., POP3 servers, Exchange servers, etc.).
- The AS/400 Interface product, which establishes communication between the AS/400, the AS/400 Interface post office, and the ActionManager 3.x Communications Controller environment.
- The Action Gatekeeper™ product, which provides message content checking, message flow control, and server-to-server encryption/decryption capabilities. It can be used as a tool for ActionMail or other commercial electronic messaging systems that are independent of ActionMail.

Alerts

Some systems enable companies to collect and analyze large amounts of data to make improvements in how a business is run. Typically, however, data analysis occurs days or weeks after the data is captured. This form of past performance analysis has been helpful in determining what was done in the past, which practices and procedures contributed positively to the success of a business, and which were detrimental. Steps were then attempted to curtail detrimental procedures in the future and to ensure that positive procedures continued.

Today's pro-active industry leaders want a method of discovering damaging situations at the time they occur, so action can be taken right away to put the business back on track. ActionManager includes the concept of alerts as an exception-based, immediate notification mechanism for running a business. The Alert system generates real time or near-real time information that can be used to take action and positively affect the course of a business. Alerts can also be generated due to critical business situations at corporate headquarters or at remote locations.

Alerts are defined and stored on the Enterprise Manager and are generally uniform across ActionManager User environments. Business analysts or clerks performing data maintenance at corporate headquarters can define Alert business rules and triggers that assist a manager in taking the right course of action, based on the company's specific business requirements. Alert definitions are automatically distributed to applicable remote locations when the alerts are activated. Updates to Alert presentation objects can be automatically downloaded to remote locations as they occur.

The Data Mining Agent browses through large amounts of data and uses rules defined by the customer to identify alert situations. The Data Mining Agent can access and evaluate data in ODBC-compliant RDBMS databases. The Data Mining Agent can be configured to recognize alert situations in data for any ActionManager applications as well as non-ActionManager data. When an alert situation is identified, the Data Mining Agent

generates an alert. The Data Mining Agent can be run as a continuous, self-monitoring background process, can be configured to run at specific time intervals, or can be called by other ActionManager programs for on-demand data evaluation.

Security

System security is configured and maintained at the Enterprise (corporate) level. The ActionManager security design employs user profiles with rights and roles. ActionManager takes advantage of security information and capabilities inherent to the target operating systems where possible. Operating system specific security capabilities are extended as necessary for using functionality such as roles. Minor modifications such as password changes and role assignments are permissible at remote locations. Security is elevated to the object level in ActionManager so individuals can have rights to a particular screen but not to all objects on the screen.

The ActionManager Security system can be very specific, allowing independent access control over application features on an individual basis. The cost of this flexibility usually is in increased maintenance requirements. The concept of roles provides a way to consolidate the access control over many individuals within a single group (i.e., the role). A role represents the common characteristics of a grouping and can be used in place of a user in any situation including, log-on, mail, etc. A role is allowed to have no associated users (a grouping of none).

Tailoring Tools

ActionManager applications are precisely matched to business requirements through tailoring. Tailoring tools use visual editing with point-and-click and drag-drop-and-size interfaces. ActionManager software's quick and easy editing functions allow business analysts to initially specify and subsequently maintain systems.

The screenshot displays the 'Retail ActionBoard' interface. It includes a 'Today's To Do' section with buttons for 'HEAD MAIL!', 'CLOCK IN', and 'Start On'. A 'Main Menu' section lists 'Scheduler', 'Maintenance', 'TimeMeter', 'CashSheet', 'Checkup', and 'SmartHire'. A 'Cubes Graph' shows a line chart with data points for 9am, 10am, 11am, and 1pm. Below these are two data tables:

Name	Start Time	Clock In	End Time	Clock Out	Total Hour	Phone
Lucek, Antonia	02:45a		02:45p		0.00	435-555-1102
Williams, Earl	07:30a		02:45p		0.00	435-565-1242
Hopkins, Gerald	07:30a		03:45p		0.00	435-645-9125
Walters, Joe	02:45p		11:00p		0.00	415-338-7141

Date	Time	Description	Priority	Complete
04/16/2001	03:10p	Excess cash in register 2.	Low	No
04/16/2001	03:10p	Antonia Lucek is going into overtime.	High	No
04/16/2001	03:10p	Franklin Taylor has not punched in.	High	No
04/16/2001	03:10p	Cash register #2 did not pull.	Medium	No
04/16/2001	02:10p	Ad Item below threshold.	High	No
04/16/2001	03:10p	Cashier 1 has 3 voids in last 30 min.	Medium	No

Annotations on the screenshot include:

- Tailor:**
 - All Text
 - Nomenclature
 - Help
 - Training
- Tailor Screen Layouts** (pointing to the graph area)
- Tailor:**
 - Event Detection
 - Alert Response
 - Business Rules
 - Business Processes

Tailoring tools allow implementation of "best practice" business rules

Business policy and best practices are initially added and later changed through business rules, causing the application to conform to specific customer requirements.

Modifications can be made to:

- **Text**—All text can be customized. Tailoring help text ensures that help responses incorporate not only program help, but also reinforce business policies, procedures, and culture. Tailoring nomenclature ensures that names such as “sales clerk,” “associate,” or “team member” conform to your business vocabulary.
- **Training**—Fully customized training reduces resource requirements while maximizing the organization-wide learning curve.
- **Business Rules**—Changing business rules changes system operations, including application response to the system and the content of business alerts and events.
- **Workflow**—Tailoring enables specification of the flow of information, activities, actions and approvals.
- **User Interface**—The user interface can be modified, including changes to the size of objects, color schemes, the specific information displayed, the order in which it is displayed, and more.
- **Security**—It is possible to define and control who can view what information and take what actions.

Collectively, the above capabilities support the mapping of your unique business process to the ActionManager technology.

Technology Infrastructure

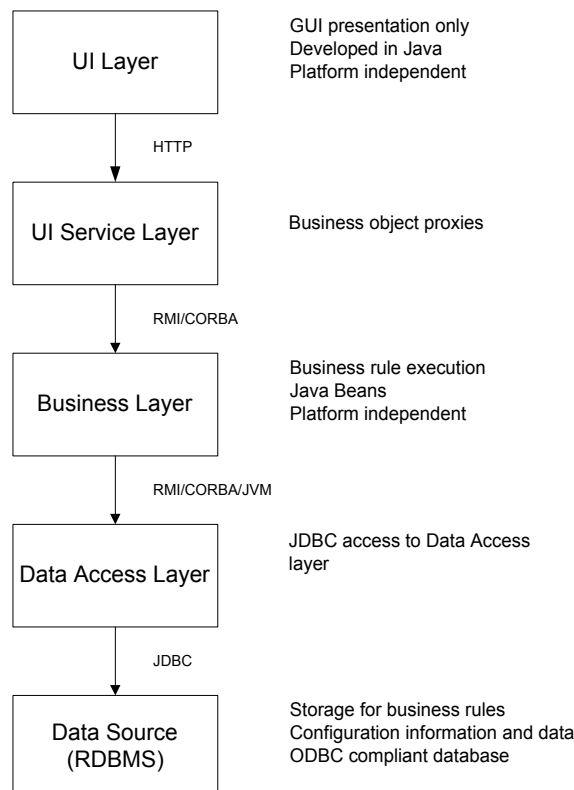
The Technology Infrastructure layer contains all of the technology interfaces and general systems support routines that are commonly shared by ActionManager applications. Centralizing these interfaces streamlines the ActionManager program code and provides breakthrough open systems support and portability.

The Technology Infrastructure layer includes the following major components:

- ActionManager Architecture
- Open Systems Portability
- ActionServer
- Message Server
- Multi-Deployment Strategy
- User Interface Services

ActionManager Architecture

ActionManager applications are based on a multi-tiered architecture consisting of several layers, which include a UI layer, Business layers that execute business rules, and a Data Source layer. The UI Service layer and Data Access layer provide data interaction between business layers. The layers can be in physically separate locations or all layers can exist on the same computer at remote locations, using distributed application technology. CORBA (EJB) handles interaction between the UI and Business layers. Interaction between the Business and Data Source layers is handled by JDBC.



UI Layer

The UI appears in a GUI format developed in Java that enables the GUI to be platform-independent. The UI can be installed on any operating system with a viable Java virtual machine (JVM). Mouse support and screen resolutions of SVGA or higher are required.

ActionManager user interfaces comply with the standards and inherit the characteristics of each targeted operating system's GUI. For example, a button of a certain size with text on it can be defined in Java. In AIX Motif, the button looks like an AIX Motif button, in NT, it looks like an NT button. User interfaces have the same look and feel across all applications, with a standard main screen template and standard methodology for functions that are common to all applications (e.g., logon, error messages, and help.) National Language Support for all resources (currency, date formats, numerical symbols, etc.) is included for all applications. Many GUI interfaces can be configured to meet an individual company's standards by the corporate user.

The UI layer is a presentation layer only, with little or no business logic or rule execution. (The ActionMail UI layer does allow users to define and process UI layer rules.)

Business Layer

The Business layer houses the business logic used to perform data calculations and summaries, generate alerts, etc. It delivers data to the UI layer for presentation to the user. The Business layer is a set of business event rules that are called by objects in the UI or another event trigger. All business rules are stored in a central repository at the Enterprise Database and can be distributed to remote locations via differential updating. A set of ActionManager configuration applications resides in an Enterprise Processing environment. It is used for business rule tailoring and application configuration. A discreet set of rules and rule capabilities parameters are supplied in ActionManager. The Data Mining Agent and Alert Server are part of the Business layer.

The Business layer is developed in Java. All ActionManager Business layer programs access data via the ActionManager Data Access layer. Business layer objects are implemented as Enterprise Java Beans (EJB).

Data Access Layer

The Data Access layer provides a standard path for the Business layer to access business data. This results in a smaller code base that can access data from different sources.

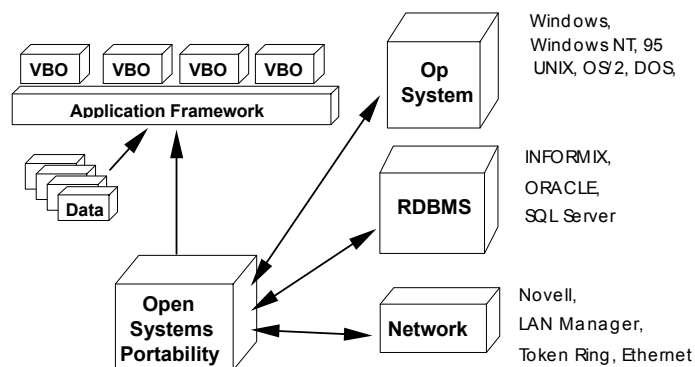
Data Source Layer

The Data Source layer consists of any RDBMS that is ODBC compliant. The full set of database tables for each ActionManager application is located at the Enterprise Database. Database replication between the Enterprise Database and ActionManager Users is supported via differential updating.

Park City Group supplies database table schemas used by ActionManager applications. By default, customers have direct access to the database tables via their DBA tool.

Open Systems Portability

Application platform technology has always been volatile, with continual changes in databases, operating systems, presentation services, hardware platforms, and other technological issues.



Open systems portability

The significant benefit of Open Systems Portability is freedom. Users are freed from technology considerations when tailoring applications to suit business requirements. IT is free to move applications to new technologies—no constraints are imposed by previous tailoring. This capability, with the capability of running on different platforms, preserves the customer's investment in existing hardware and preserves the software investment into the future.

ActionServer

ActionServer is a multi-threaded, server-based process manager used for queues, sockets, and scheduled events (interval or time of day). It is a high performance, extensible, scalable server foundation that allows you to plug in service modules. The Service Module API is available for customers to build service module extensions that take advantage of the ActionServer process manager.

Message Server

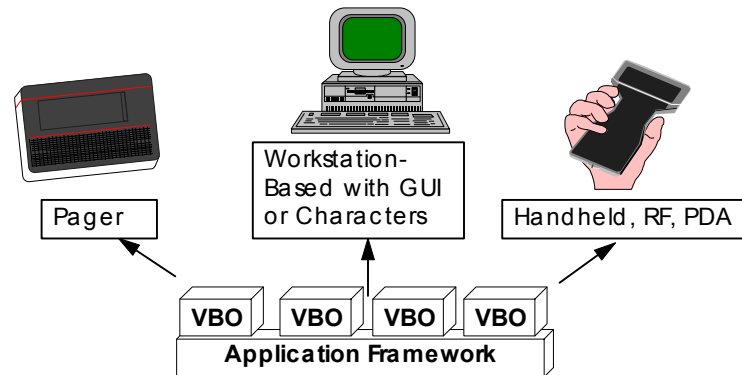
The Message Server is a central management point for message delivery. In this model, a publisher client publishes a message to a specific topic that is held/managed by the Message Server. The Message Server stores the message under the identified topic and then checks to see if there are any active (on-line) subscribers of that topic. The Message Server delivers the message to all active topic subscribers. If there are no active subscribers, the Message Server leaves the message in storage until a subscriber of that topic connects. A client subscriber connects to the Message Server and registers interest in a specific topic. As messages arrive at the Message Server for the given topic, the message is forwarded to the subscriber client. If a client has registered as a *durable* subscriber, all messages previously delivered to the desired topic will be delivered to the subscriber.

The Message Server is implemented as a common Service Module under the ActionManager architecture. As such, the Message Server runs as a daemon or console-style application from within the ActionServer. The Message Server itself does not have a

UI program, but a configuration UI provides a way to handle maintenance. The Message Server is built upon open standards so that customers can develop messaging extensions based on the ActionManager Message Client API.

User Interface Services

Many types of user interfaces are demanded in today's business environment. Moreover, interfaces that are readily accessible and easy to use will become even more important in the future.



User interface services

The ActionManager system provides external user interface facilities to all applications via User Interface Services. Isolating the user interface dramatically reduces the programming requirements that must be contained in a given application. It also enables the same application code to support a variety of alternative user interfaces.

ActionManager software currently supports both Microsoft Windows and character-based interfaces on workstations. Each interface has distinct benefits. For example, Windows is clearly the most popular user interface for corporate management implementations. Alternatively, a simplified view for the less sophisticated user, where a few keys and a simple display screen is the standard, is exemplified by ATM machines and video games.

Isolated User Interface Services simplifies support of new user interfaces, such as the pen-based RF systems that are increasingly popular for warehousing and stocking, and PDA devices.

Park City Group's Secret Weapon: PaperLess Management®

Park City Group uses an innovative architecture and technology, called PaperLess Management, to build the ActionManager applications. PaperLess Management ensures that every Park City Group application uniformly applies our vision for product success: highest quality systems that deliver breakthrough benefits by enabling our customers to achieve flawless consistency in their operations while dramatically lowering costs.

Although PaperLess Management *per se* is not licensed to our customers, its features and benefits are included in every ActionManager application. While customers cannot use PaperLess Management to build their own new applications, we encourage those who seek new applications to talk with us. Many Park City Group applications have been developed in conjunction with customer participation. Such joint development helps the customer achieve a highly cost effective solution, consistent with the ActionManager system, that meets their precise requirements. Joint development also fulfills Park City Group's mission to embed best practices into delivered products.

About Park City Group

Park City Group has more than 20 years of experience building software solutions for the operating problems of multi-location organizations. The need to increase operational consistency without a commensurate increase in operating cost is the foundation principle for the ActionManager family of 20 business operations software products. Based on the framework that "business is just a set of rules," ActionManager software delivers highly functional solutions just in time, just where needed, to produce revolutionary results.