Human Resources Management System Architecture

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Abstract:

By definition, a Human Resources Management System (HRMS) includes functionality that covers the entire span of an employee's relationship with a company. A partial list of functionality would include applicant tracking, hiring, employee tracking, training, skill inventory, job analysis, career planning, government compliance, benefits, and HR-specific reporting. With the increasing importance of human resources management and its technical applications, a flexible architecture is needed to insure a responsive and dynamic system that will serve the organization successfully. An enterprise-wide HRMS architecture consists of three major components: Operational, Information Database, and Decision Support. This paper will discuss each of these components.

Operational Component:

The operational component is fundamentally the transactional applications of the HRMS. After conducting focus groups, attending human resources trade shows, and talking with many of our customers, the transactional applications need to have the following characteristics: Graphical User Interface (GUI) familiar, client/server enabled, and relational data constructs. The GUI familiar interface. This decade finds many companies reengineering processes, including human resources management. Many of these processes are revamped and automated to improve information flow and increase productivity. Often the systems that are built to facilitate these new processes must be usable by a wider range of users in the organization - executive management, line management, and even employees themselves. The GUI interface allows for occasional users to more easily and intuitively provide the data they are responsible for. The SAS System has the features required to develop these types of interfaces since it is a layered software tool. This layering allows for the construction of virtually any type of interface without sacrificing the data access, management, analysis, and presentation capabilities underneath. Release 6.11 of the SAS® System will allow for a full set of objects, methods, and widgets to satisfy the needs for a GUI interface.

Client/Server enabled. The enterprise is an organization with many different supported platforms. For example, the server could be a mainframe, UNIX, Alpha®, or Windows NT® system; however, the data providers have desktop systems such as Windows® or Macintosh®. This hardware can be leveraged by providing a seamless connection between the desktop system and enterprise server. The SAS® System provides middleware solutions
that meet the widest possible connectivity needs by supporting protocols such as APPC®, TCP/IP®, and Decnet®. The client/server HR software market, according to most respected industry pundits, is the leading area in which organizations are creating continued demand for client/server solutions.

Relational data constructs. For many organizations, the data server of choice for new systems is often a relational database such as DB/2® or Oracle®. Of course, SAS Institute is not unfamiliar with this approach to data storage. Although SAS® Software does not automatically provide things such as rollback & recovery, SAS data sets employ many of the same relational constructs as databases, allowing for efficient storage of data and full SQL access.

The functionality. Currently, research and development from SAS Institute is taking place to provide GUI familiar, client/server enabled, relational database oriented applications for enterprise HR data providers. Some direct reporting mechanisms will be provided with the first module expected to cover general employee and benefits tracking as an add-on to release 6.11.

Information Database:

Often known as Data Warehouse, the information database is considered the link between the needs of the data providers and information seekers. The history of computer technology can be characterized by two dynamic needs - the needs of computer systems to receive and store data efficiently and the needs of people to access and analyze data easily. The SAS® System and its capabilities for enterprise data access provide the tools for control and accessibility.

Data Providers. Great care has gone into building transactional systems that are optimized to the data storage architectures. Without argument from the data providers, these systems were built to optimize data entry as it related to response from the hardware. Therefore, data is stored in many different ways efficient to the computer and the application, but nearly untraceable by people. Another effect of transactional systems, including HR, is that the data stored is only a true picture of things currently. Differing schemes must be applied to determine what things were like, or will be like, at some other point in time. Also, transactional systems store data values in ways efficient for the computer or transactional system, often relating to codes, formats, or calculations that are unknown outside of that system.

Information Seekers. Whereas the watch word for computer efficient systems is 'control,' the watch word for information seekers is 'accessibility.' They need data that is integrated and standardized. The data that is scattered across the organization by individual operational systems can be put into a common data store. They also need data that is historical and enterprise-wide. Complicated historical reporting schemes can be error-prone and data management intensive, often impeding the job the Information Seeker was hired to do.

Data Warehouse. The solution to these
two competing needs is the Data Warehouse. The Data Warehouse is a separate and different data storage that allows transactional systems (hardware and software) to be kept isolated from the computer resource intensive queries of the information seekers. The Data Warehouse concept also allows the information seekers to find an amiable data store to readily access and analyze data. The SAS® System can help in this area by accessing the operational systems, manipulating the data into a standard and integrated form, and storing the data in SAS data sets or some other database. The SAS® System can often be used as the Data Warehouse repository because it is an efficient data structure for queries and, through ODBC®, can surface data to other non-SAS applications. The data warehouse concept is also amiable to client/server, open system environments, as well as, maximizing benefit from legacy systems. Because the Data Warehouse is physically detached from the operational systems, the Data Warehouse can be staged on other hardware platforms. With a Data Warehouse in place, an organization has effectively described the process of data flow within the corporation, allowing for process improvement. For example, legacy systems can be effectively maintained or replaced without harm to upstream applications since the connection is logical rather than physical.

**Decision Support:**

The SAS® System for Information Delivery fits well in the decision support area. From On-Line Analytical Processing (OLAP) tools to its extensive application development toolset, robust solutions can be provided to HR information seekers.

On-Line Analytical Processing. With the reengineering of the SAS® System in the 80s, a whole new layer was developed for delivering interactive analytical applications. The SAS® System provides many organizations today with the features to analyze Human Resources data: English query, SQL query, statistical analysis, report writing, quality improvement, and graphics. More specific to Human Resources, SAS® Software can be used for compensation analysis, grievance weighting, employee satisfaction, skills matching, position control, succession planning, organizational charting, benefits modeling, EEO/AA reporting, etc.

Distributed Processing. Query and Analytical requests may require compute power not available on the user platform or involve a data request too large for the network. The SAS® System provides the connectivity and the opportunity to process the logic on another platform sufficient for the task. This allows other computers on the network to be compute servers and/or data servers. One scenario might involve the need to query a reasonable subset of the data on a server, and then use that data on the client system for analysis. Another scenario might involve the need to submit a summarization request to the server platform. The server platform processes the "detail" information on the server, and returns the results to the client. The results could be in the form of a reports, graphs, or even data for further local processing.

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Application Development. Not all needs can be met "out of the box," unless that box also includes application development tools! The SAS System does just that by providing layers of functionality to deliver a vast array of applications and interfaces. By providing the traditional programming language for low-level development to mid-level code generators to high-level object-oriented programming (OOP) techniques, the SAS® System solves the perplexing problem of extensibility. The need to allow HR analysts (or their internal customers) to be self-serving continues to increase. A flexible application development strategy allows this to be accomplished.

Conclusion:

We have explored the three major components of an enterprise-wide HRMS architecture: Operational, Information Database, and Decision Support. As human resources management continues to be a critical task of our organizational futures, an HRMS architecture will allow us to provide a successfully responsive and dynamic system. SAS Institute's commitment to supporting the Human Resources industry remains strong, with growing dedication to software technology and support services to implement this architecture and help an organization meet its human resources needs.