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**Sharing the Wealth:
Putting It All Together
in the Corporate Information Factory**

Written by:

Claudia Imhoff
Intelligent Solutions, Inc.
P. O. Box 4587
Boulder, CO 80306
Voice: (303) 444-2411
Fax: (303) 727-5716
CImhoff@Intelsols.com
www.IntelSols.com

One consequence E-business growth has been a swing in emphasis towards the front office and customer-facing applications like CRM and web-based procurement and selling solutions. This has resulted in an extension of the traditional enterprise to increasingly encompass suppliers, customers, intermediaries, etc. Extending the scope and reach of the associated application software has placed a greater burden on IT groups to enhance and integrate these systems.

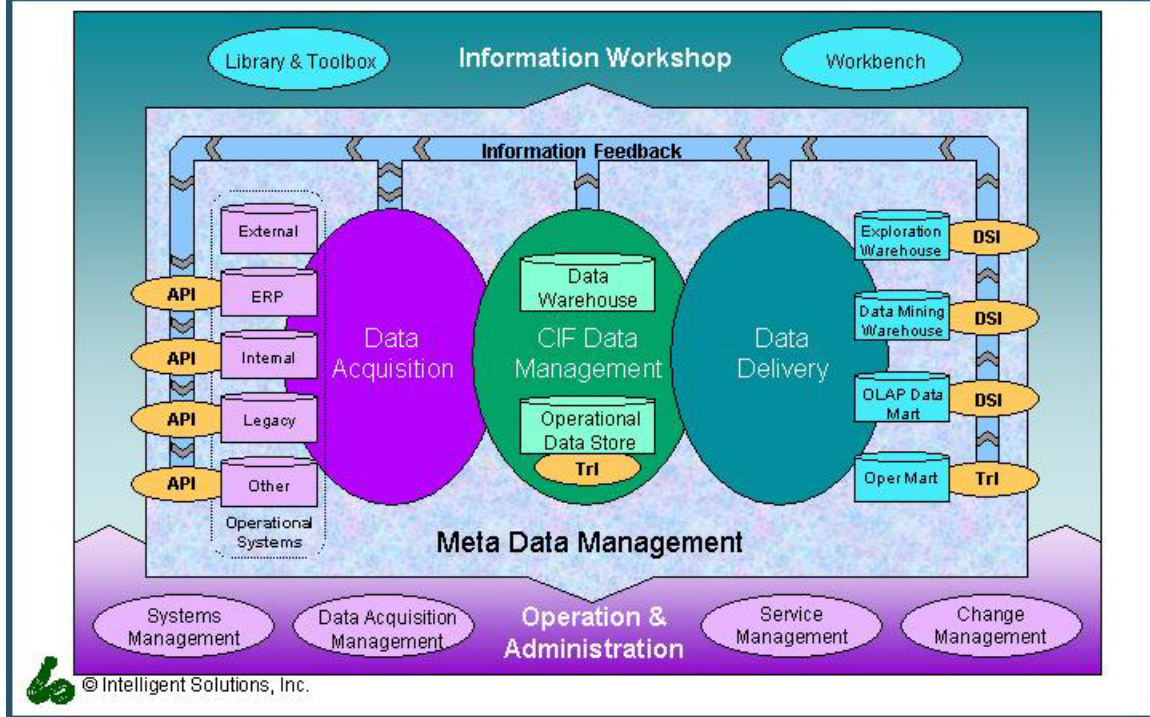
The need for enhancements and integration is growing exponentially. Functionality is becoming more fluid and intricate as the business processes evolve to support new and more dynamic BI and CRM applications. Ultimately, this integration and expansion will encompass the remaining stovepipe systems and business processes.

To successfully facilitate this evolution, organizations need an enterprise wide, coherent infrastructure that brings every producer and consumer of information together in a reliable, accurate and timely manner. Such an infrastructure must embrace and enlist the diverse silos of enterprise information. It must also leverage the vast investment in unstructured data residing in document management systems, internal and external web sites, operational systems, news feeds, groupware, and email, as well as the traditional structured data sources of data warehouses, data marts and operational data stores. All information created, consumed, exchanged, and destroyed within the enterprise should be available throughout the infrastructure.

Given the size, scope, and complexity of the infrastructure, it must conform to a sound architecture or it will become chaotic and costly. The architecture must be flexible enough to accommodate rapidly changing technologies, yet be consistent and stable enough to provide a solid pathway for implementations.

The Corporate Information Factory (CIF) architecture is a proven plan for building and sustaining a successful enterprise data infrastructure (see Figure 1).

Fig 1: The Corporate Information Factory



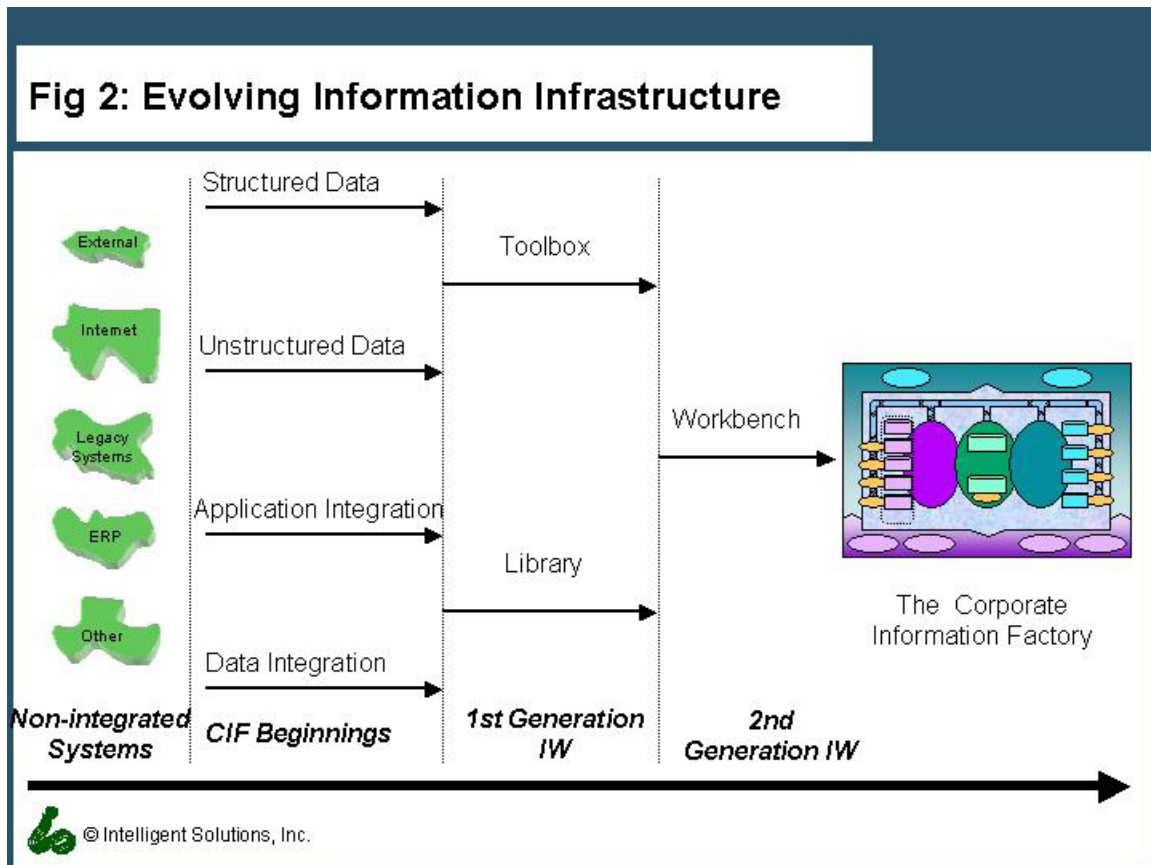
It consists of the following components:

- The CIF roadmap – a logical representation depicting the interaction and usage of the technological components of the CIF.
- Administrative Processes – processes used to update, maintain and evolve the infrastructure as business utilization evolves.
- Information Feedback – the sharing mechanism that allows intelligence and knowledge gathered through the user of the CIF to be shared with other data stores thus making BI “actionable”.
- Information Workshop – the mechanisms (often web-based) to acquire, manage, and present customized information to the users of this environment.

The Progression to the Complete CIF Environment

There has been a natural progression in enterprises today toward the complete CIF environment. As enterprises mature in their information usage, they go through a series of predictable phases. Figure 2 demonstrates the typical progression:

- At first, there are non-integrated, chaotic operational systems grown organically as the enterprise grows
- The implementation of the data warehouse, data marts, operational data stores with their associated processes is a truly positive step in the evolution to an integrated information infrastructure environment.
- Once the database components of the CIF are in place, the enterprise begins to build the final phase, the information workshop technology, to deliver the right amount of information to the people who need it, when they need it. This is an evolution in which the first set of requirements consist of the development of a Toolbox and Library function, followed by a second requirement, the development of the Workbench.

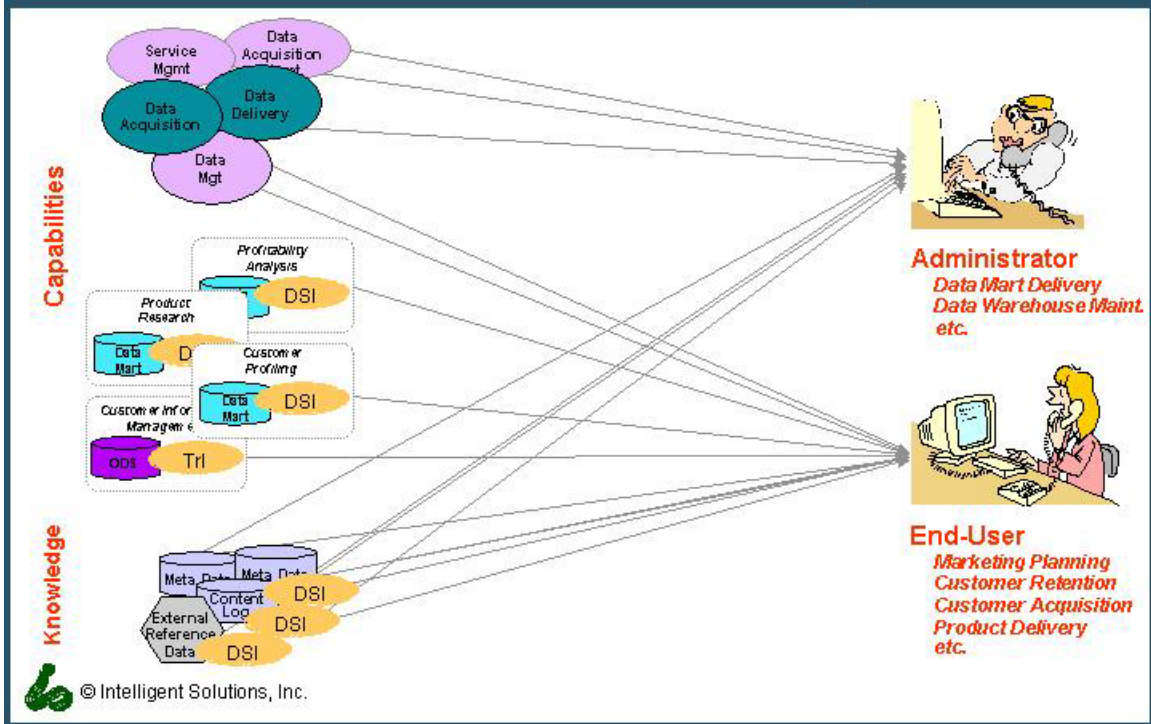


Previous Tech Topics have described the various components of the CIF in detail. This one focuses on the glue that knits the whole concept together – the Information Workshop infrastructure. To understand this concept, it's helpful to describe the components of a mature information workshop environment, and then cover the requirements needed by most enterprises as they go through in their evolution to the complete CIF architecture.

Information Workshop

Let's look at how the need for an information workshop came into being. Many organizations started building their CIF environment with the idea that the ultimate end product was a data mart with a nice front-end tool attached to it. From the success of the first mart, it was easy to spin out these "point solution capabilities" with little regard with how they fit into the over business processes. As a result, the interfaces into these capabilities and their associated meta data repositories began to resemble the "spider-web" architecture that we frequently see in the operational systems today (see Figure 3). The users of this environment are given a confusing and complex set of tools, access methods, bits and pieces of knowledge that they must fit together into their process – and are then required to remember all of the nuances. Furthermore, these business people may not even know where the information came from, whether it is reliable, or understand its meaning or relevancy to their business problem. To compound the problem, they may need unstructured data (forecasts, business plans, strategic plans, email messages, etc.) that may be registered in the environment but are not easily accessible or understandable.

Fig 3: Beginning Interface to the CIF



An analogy for this situation is the common garage. If your garage is like mine, there is little order to the location of tools and reference manuals. To perform a task such as building a bookshelf may require a fair bit of preparation. First, you collect the reference manual(s), or meta data – in this case, perhaps it is the pamphlet you picked up at the hardware store on “Easy Bookshelf Making”. After you peruse the instructions, you have to collect the various tools, or capabilities, e.g., hammer, saw, nails, wood, and measuring tape. After you complete the bookshelf, the tools and pamphlet are returned to the garage, but probably not where you found them. So, for the next project, say fixing the leaking sink, you have to start the whole process all over again.

This scenario may sound similar to the business people who want to develop something new, like a sales campaign. They, too, must first determine what tools they need, what meta data they need, and how to fit everything into the process of developing and implementing the new campaign. They will need the capabilities developed of the CIF, including access to the Campaign Analysis data mart, reports from Sales Channel Analysis and Product Profitability mart, as well as a current view of customers from the ODS. They will also need the meta data stating when the reports were run, what the definition of a calculation is, and an explanation of the models used. If they decide to do something else, say developing a new demographic profile for a sales channel, they must start from scratch again – finding the tools and meta data for that process.

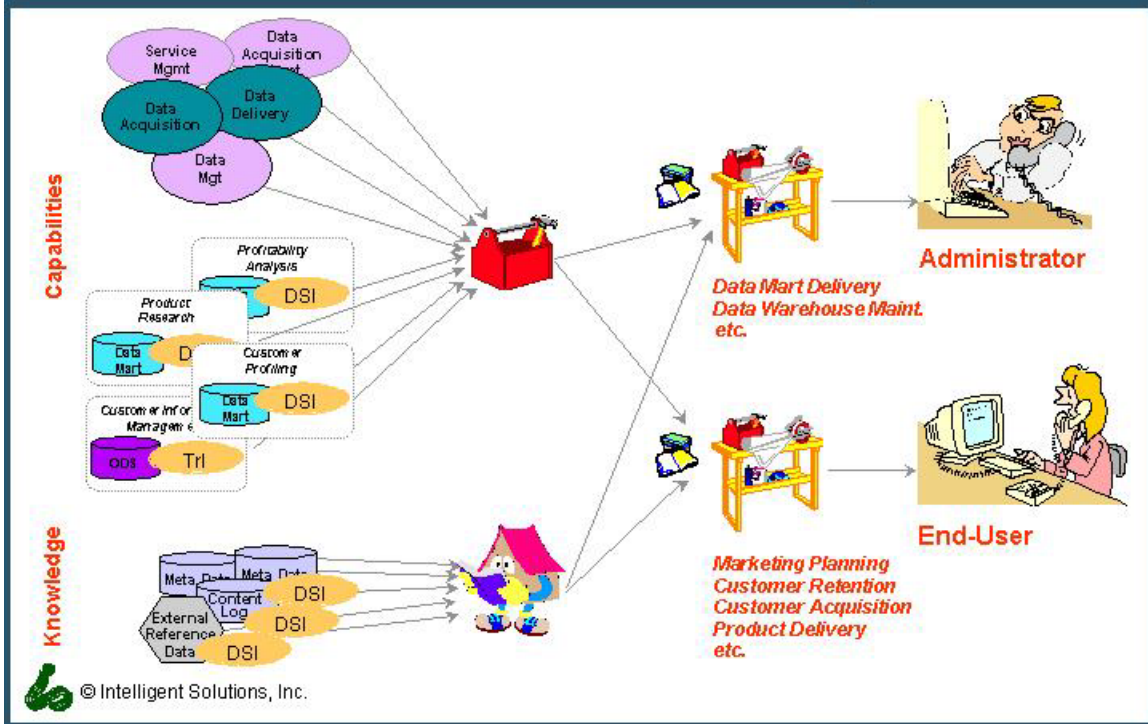
In contrast, the infrastructure of a well-integrated information environment, i.e., Information Workshop, the:

- Capabilities and facilities are organized as tools into a Toolbox
- Knowledge and meta data are organized into a Library
- A Workbench is used to bring together the proper tools and knowledge to produce your bookshelf or fix the sink (or create the marketing plans or customer care strategies) by utilizing the Toolbox and Library

The Information Workshop consists of the user interface mechanisms, providing a single point of access for the enterprise user including publication, subscription, and notification of capabilities, single sign-on, query and/or navigational interfaces into the CIF components (e.g., Meta Data, Operational Data Store, Data Marts, and Data Warehouse). Essentially the information workshop gives the user a seamless integration to all of the capabilities and knowledge generated from the CIF in one easy to access mechanism. This interface is characterized by the integration of the business community and business processes with the capabilities and knowledge developed through CIF. The distinguishing characteristic of the information workshop is the assimilation of CIF functionality into the enterprise's business processes. This requires a business model and nomenclature that represents the specific enterprise using it.

It is this degree of integration into the business process that makes the CIF a truly strategic and integral part of the overall CRM business process. Figure 4 illustrates how these information workshop components align CIF capabilities, facilities and knowledge to support the business community and the IT staff.

Fig 4: The Component Parts of the Information Workshop



Toolbox

The Toolbox provides a place to register business intelligence and business management capabilities as they evolve within the CIF. Organization of these capabilities into the Toolbox promotes reuse and so improves end-user productivity. In the garage example, we could simplify the search for tools by organizing them on a pegboard (with those nice white outlines of the tools to let the user know which tool goes where!). In the CIF, we need a form of Business Information Directory that permits the registration of new or improved tools (applications), reports, and capabilities as they are developed and presents these to the users in an easily accessible manner.

Some capabilities are common to most companies and belong in the Toolbox. The following are just a sample of these for both the business community and the CIF administrative staff supporting the environment:

- Profitability Analysis – provides end-users with the ability to measure customer profitability by time, location, market segment, product, demographics, etc.
- Pattern Recognition – provides end-user the ability to recognize trends in the data that may be indicative of market opportunities, fraud, etc.
- Customer View – provides end-users with access to detailed customer information. This information is generally used to support interaction

with the customer and includes customer purchases, addresses, recent contact history, and other pieces of pertinent information.

- Capacity Planning – provides the CIF administrator with information to determine how fast the data files are growing, when new disk space is needed, to accurately determine capacity needs.
- Performance Tuning – provides the CIF administrator with information on the usage of the environment (who is using the data, when they use it, how efficient the queries are) and any performance issues.
- Resource Management – provides the CIF administrator with information on how the environment is being utilized and possible bottlenecks in the technology.

These tools can be organized in a similar fashion to the garage pegboard. For example, you can set up a Publish and Subscribe mechanism to distribute reports to the appropriate personnel. You can organize reports by particular capability (e.g., all Campaign Analysis reports can be bundled under one heading in the Publish and Subscribe mechanism).

Library

The Library provides the business community and CIF administrators with valuable information that guides their use of tools and materials in the CIF. In our garage, we can organize all the reference manuals and booklets into a bookshelf. For your CIF environment, you can begin by integrating business and technical meta data together, collect and make available white papers on tool evaluations, strategic plans, and business cases for the CIF. Again, a mature Business Information Directory will provide the logical categorization of any informational object within a framework that is searchable, can be explored, queried and modified as the business process or practice demands. The Directory must evolve, as new and different pieces of meta data become available.

Most of this information is indigenous to the CIF (e.g., meta data, DSS Results) but may also be foreign as in the case of a company directory or other informal pieces of information. Therefore, the Directory must be able to handle both the structured data found within the classic CIF and the unstructured data such as found in informal data warehouses (emails, notes, and other forms of important but unstructured data).

For example, in creating a new campaign, the Library or Directory would be used to:

- View the inventory of existing work done in this area (e.g., reports, capabilities, results of previous campaigns)
- Assess existing data for its applicability in creating a new capability
- Catalog new requirements, data and capabilities.

The navigation of the library should be like surfing the Internet. The user enters a string such as “Campaign Analysis” and receives a list of references, reports, data marts to access, and other pieces of pertinent information on campaigns. These reference areas can be classified into:

- Dictionary – provides a definition for “Campaign Analysis”. This definition will include a short and long description, object type (e.g., data, tool, report) and alias references where appropriate. It may also contain references to information outside of the dictionary (e.g., a See Also function) giving functional associations between items.
- Encyclopedia – is a compendium of business knowledge, either general or specialized, that combines all sources of meta data and content into a single repository. From here, users can gain great insight about the content of the CIF before performing any activities. The Encyclopedia is organized into areas such as:
 - Data Quality and Metrics - useful in understanding the quality of data within the CIF and the metrics used to measure it.
 - Data Refreshment and Use - useful in understanding the currency of data in the CIF and the frequency of its use. This information will provide the business community with insights into what they should expect in their analyses (e.g., Should I expect to see January billing data?) and CIF administrators with insights on how they can better tune the environment.
 - Capability Requirements and Use - useful in helping the business community understand what business intelligence and business management capabilities are available, what they are positioned to support, and how to use them.
- Reports - presenting published findings of previous analytical activities and observations on which to build. For example, you may want to publish key performance indicator reports such as the fact that 20% of your customers generated 80% of your revenues last year and who made up those 20%.
- Newsletters and News Flashes – provide tips, techniques and lessons learned so that everyone can work in the CIF environment more effectively – for example, newsletters are effective for this. In addition, this media can be used to quickly alert the CIF public about events that affect their ability to do business – for example, data quality problems or unscheduled down time can be broadcast through New Flashes.

These materials contribute to the education process and promote new discoveries. As these discoveries are made, users can publish their findings through the Internet or perhaps via e-mail thus increasing the base knowledge in the library.

Workbench

The Workbench fulfills a strategic role within a CIF architecture by presenting the library and toolbox in an easy to use fashion tailored to the needs of each business process (e.g., Marketing Planning, Customer Care, Inventory Management, Research). Going back to the garage analogy, life would be wonderful if you only had to tell the garage that today you wanted to perform a wood working task, and presto! The garage would configure itself and present a fully functional workbench containing the right tools and the right reference materials so you could begin working immediately.

Then, once the task was finished, you could tell this “virtual” garage that you now wanted to perform a plumbing task – Voila! A newly configured workbench with the right plumbing tools and materials would appear.

So how might the process of delivering a product from the workbench work in our CIF environment? The first step must be to document what the business process is that will use the CIF capabilities and knowledge. For example, what are the steps to develop a new campaign? The marketing person may identify 20 clearly defined steps in this process. We would document the 20-step process in the Workbench. Second, we would provide links into the relevant tools (operational data store, one of the data marts created, or one of the operational systems) and library references. Third, we would train end-users and deploy the Campaign Development Workbench. It can be that simple. Generally, the implementation of the workbench should be uneventful given the infrastructure is in place and the necessary tools and library references are available. The biggest challenge will be in defining the repeatable business processes and gaining the end-user commitment to follow them.

The Evolution of a Corporate Information Factory

The creation of a mature Corporate Information Factory should be accomplished in a step-wise fashion through an evolution of the infrastructure. Most organizations change their CIF environment as they formalize their business processes and understand when and where the various applications and databases should be brought into play in support of these processes.

The first requirement includes the infrastructure components needed to provide integration and improved navigation of knowledge internal and external to the CIF - the library. In addition, navigation of end-user capabilities and administrator facilities are seen with the introduction of the toolbox. The information workshops provide for registration of tools so that they can be quickly identified and used to support new business opportunities. This is a critical step in the evolution of the CIF as its usage begins to extend across the enterprise and beyond, and the strategic significance is increasingly realized.

To reach this stage of evolution, you must have a substantial business information directory (the corporate “Yellow Pages”) in place. It must be expandable to handle the new and evolving capabilities and knowledge. It must be customizable in terms of user’s views to accommodate the specific needs of

the individuals using this environment. Finally, it must have sufficient security measures while permitting access via multiple methods – Intranet, Internet, extranet, LANs, and WANs.

The second requirement is characterized by the strategic positioning of the various workbenches. This is accomplished when the business processes are defined, automated and the library and toolbox are seamlessly woven into this process via a series of workbenches (e.g., Marketing Planning and Customer Care workbenches).

Unfortunately, there are few technologies available today that support this mature environment. My advice is for you to look into future thinking companies and their portal strategies to find technologies supporting this last step. Look for companies that aspire to be “portal ware” vendors, providing an open business information directory solution that is independent of content source, service component or information workshop user interface. Promising technologies are XML, “digital dashboards”, and maturing portals.

Once you have process integration, then through strong collaboration, workflow and knowledge management for the mass capabilities, you get process automation. In the future, we could imagine the advent of intelligent agent technology that could remove the drudgery of certain tasks, or act as a knowledge helper to provide your business community with context sensitive information. For example, your intelligent agent could perform the following function – “I noticed that you are interested in ABC’s Web site. Do you want me to regularly monitor it for changes? Also, if they announce anything, do you want a copy of their press release and their stock price?” The information workshop here would not only perform the above interaction but would have open and ready for your usage all the windows you would need to act on this news – presentation of stock brokerage account, stock purchase window, stock quote window, and other pertinent information.

Clearly, the driving force behind information workshops is to overcome a number of some old and emerging enterprise computing and information retrieval issues. From a user perspective, the foremost value proposition is delivering the right amount of information to the right people at the right time. Information workshop technology is designed to overcome the overabundance of information sources that a consumer is expected to utilize during any one day. In addition, the information workshop technology enables them to include information in their decision making process that existed, yet was inaccessible due to its infrastructure, such as the corporate Intranet(s), file server(s), or client/server-based applications. Furthermore, the information workshop empowers the user, through personalization, to elect what to see and what not to see.

With suitable customization, these information workshops can be extended to meet the requirements of CRM, such as providing an environment for enhanced customer support. Again from a maintainability standpoint, the requirement of a single point of access promotes the need for a consistent user interface, single sign-on capabilities to all applications, accessibility from any

network device, seamless integration between data, applications and processes, and lastly, to thwart the spread of rogue accessible intranet and internet sites.

Summary

Businesses that want to thrive must be able to dramatically redefine themselves and their approach to their market using technology to become evolutionary enterprises and be successful, long-term viable enterprises. This means that all employees must have access the to right data at the right time.

In the context of providing access to corporate wide information for each employee, the final piece of the Corporate Information Factory – the Information Workshop – is composed of three key components. The first component consists of the data warehouse, data marts, operational data store and the processes for their creation. These are the technological underpinnings of the Corporate Information Factory. The second consists of the Administrative Processes necessary to ensure smooth running of the technology. The Information Workshop makes up the third component of the Corporate Information Factory architecture. This last part of the CIF provides the mechanism to integrate knowledge and tools into an intuitive, easy to use end-user and CIF administrator environment. The components responsible for this are the library and toolbox. Building on these components, the workbench integrates the library and toolbox into the business process to promote efficiency through reuse and repeatability. As each workbench gets used, information is collected and circulated back through the enterprise, thus enriching its information content. Over time, this feedback loop will evolve into a knowledge fabric that enables corporations to better understand themselves and the markets they serve.

Information Workshops are in the early adopter phase of the market; today's technology is not a panacea and many vendors have a slice of the entire picture. Furthermore, the user interface usually may provide an incomplete infrastructure that cannot scale or cope with the size and scope of the business's content requirements. Nevertheless, information workshops show great promise for the future, though they will require several generational iterations before they truly fulfill their promise.

Bio:

Dr. Imhoff is a popular speaker and internationally recognized expert on the Corporate Information Factory, Business Intelligence, and CRM. She has co-authored four books on these topics. Dr. Imhoff is the President of Intelligent Solutions, Inc. (www.IntelSols.com), and may be reached at 303-444-6650 or CImhoff@IntelSols.com.