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Enterprise Architecture and Disaster Recovery Planning
On the way to an effective Business Continuity Planning Philosophy

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Abstract

Enterprise architecture (EA) and IT Disaster Recovery Planning (DRP) are seldom combined in the same sentence much less integrated activities within a company. In this paper, a case will be made for the integration of these two critical business activities as well as promoting a unique business recovery planning philosophy. This paper outlines a logical approach to understanding a company as a system comprised of processes and tasks and then extends this to an approach to creating a comprehensive enterprise architecture. With this approach, a company can create a much more concise IT disaster recovery plan that is closely coupled with both the business and IT, thus maximizing the potential for a successful recovery from disaster or business interruption. This, in turn, provides the greatest probability of the company's long term survival. An additional benefit to such an approach is a leveraged capability for business process re-engineering to further improve the performance of the company.

Introduction

One way to approach the conceptualization of a business enterprise is as a system comprised of a set of processes that collect, create, modify and transport information and material to produce products or provide services. People and machines perform these processes independently, or together. Over time, businesses have evolved from performing almost all processes manually to orienting most processes with information technology equipment and software. Thinking about a business as a system in terms of processes in this manner is relatively new, spawning terms like business process re-engineering to explain altering how a business operates by working through changes in the business processes.

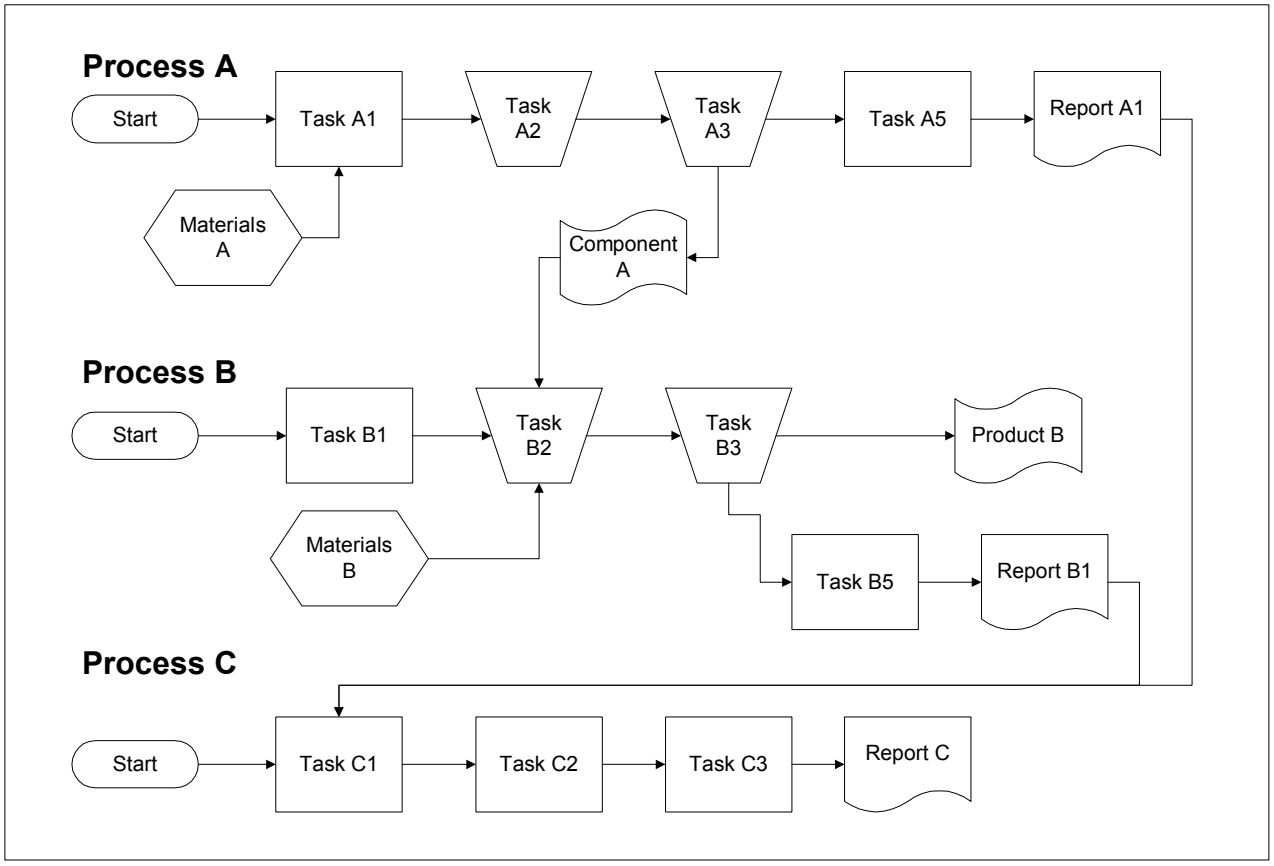

Figure 1 - Example process view of business

Figure 1 is a simple example for RSE company (Really Small Enterprise) that we will use as an example throughout this paper. Our example process view of RSE shows three processes that define this business[1]. Process A creates a subcomponent, Process B takes this subcomponent and some more materials to produce Product B. These processes produce some reports that are consolidated in Process C to create Report C. A "real" business may have hundreds or thousands of processes with that many times more tasks, inputs and outputs.

[1] An efficient business would have the most minimal set of processes, each interacting with the other in well defined and non-duplicative ways to create the "products" of the business. As efficiency decreases, the number of processes being performed compared to the number needed would increase as well as non-value added and/or duplicative or redundant steps in the processes. Note that our example, RSE is portrayed as small to facilitate understanding rather than efficiency.

Enterprise Architecture Ties Business Processes to Information Technology

A major concept in enterprise architecture is that it is critical aspect to tightly couple the business's information technology[2] (IT) to the business functions through the processes that comprise the business. Few companies at the start of their enterprise architecture project, will have done much to document their business processes at even a very high level. Thus, this coupling will be very poorly documented and, therefore, very immature. It will be difficult to understand as the necessary information to make such an assessment will be poor, limited and hard to locate and obtain. Of course, as the EA effort progresses, the information becomes better developed and the identification and documentation of the processes becomes more complete. For the purposes of this discussion, we are going to assume the RSE has an EA mature enough to have this information available.

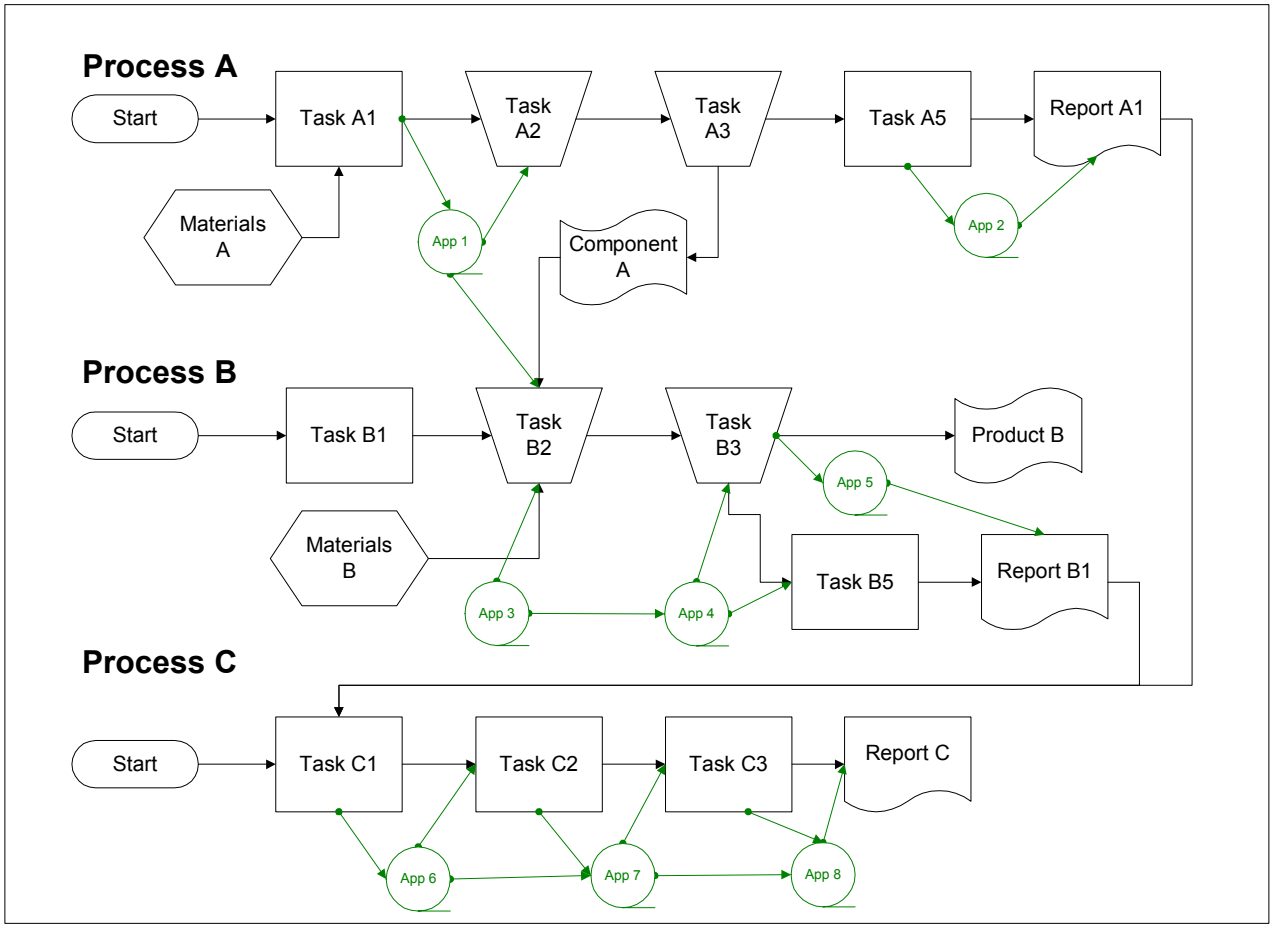

Figure 2 - Applications supporting processes

Figure 2 shows the RSE example with an overlay of the applications that support its business processes. Again, this is a very simplistic example for illustrative purposes. An actual business, even a very simple one, would have many more processes, including processes that did not

[2] In this context, IT is being used to represent a comprehensive view of IT including but not limited to: infrastructure, applications, support, consulting, and management.

directly interact with product production such as human resources processes (like planning the company picnic). It would also have processes that were entirely manual as well as some that were entirely automated by technology. Taken as a whole, a very complex network would result as this information is identified and documented.

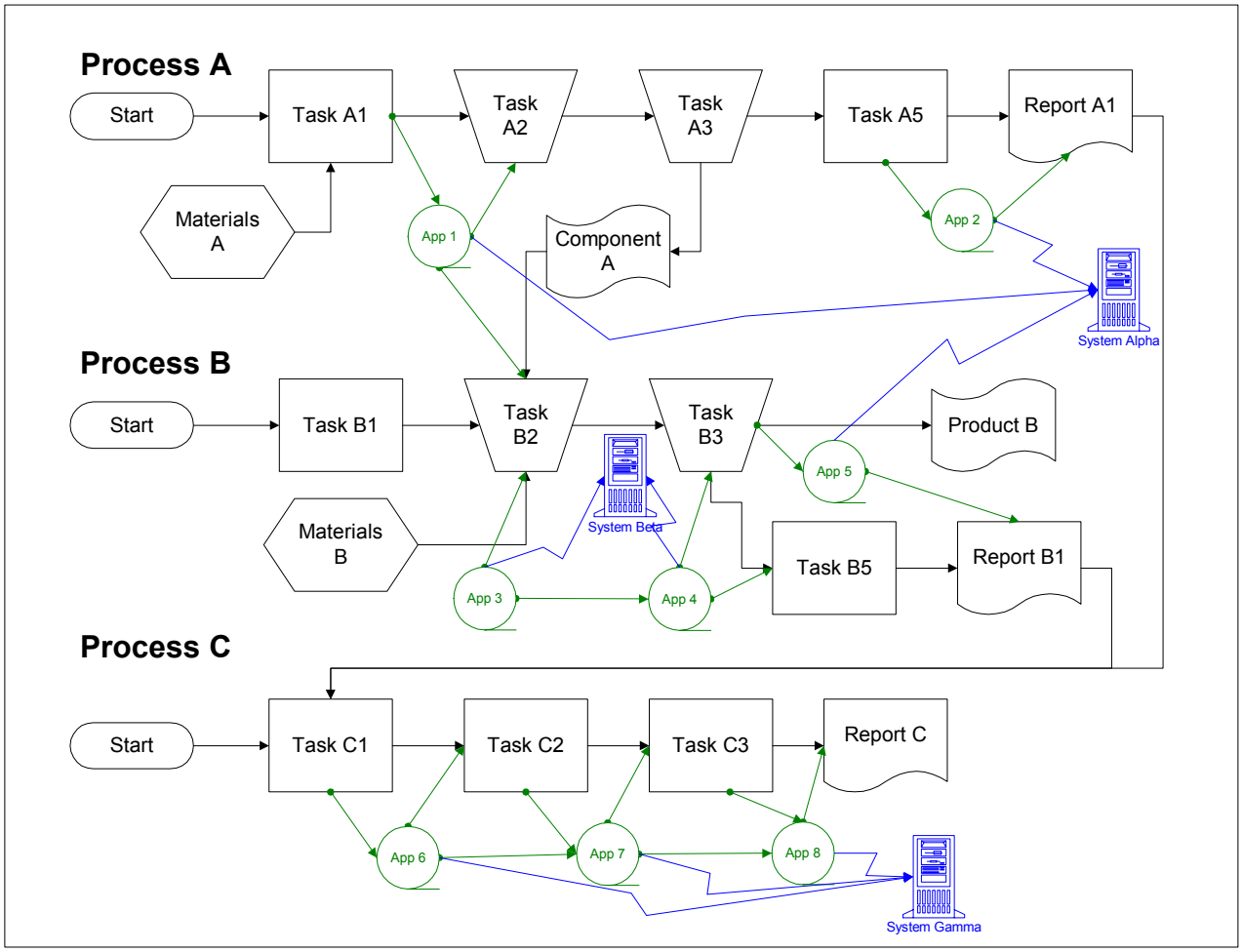

Figure 3 - Server infrastructure

Figure 3 shows our example company, RSE, with the applications and servers that support the applications. This very simple diagram omits other components of RSE's infrastructure such as its network, telephone system, storage systems, desk top computer systems, etc. Even with such a simple example, the addition of that much detail would completely cover the small drawing space being used for the illustrations. In practice, for any reasonably sized company, the only effective way to organize, maintain, communicate and analyze all of the process and IT information is through the use of an EA modeling tool[3]. Tool enabling the EA is critical to extending the enterprise architecture so that it can be used for both its originally intended purposes as well as being leveraged into other critical business planning areas as this paper will discuss.

[3] See also, *Taking Enterprise Architecture to the Next Level*, Jeannine Menefee and David Rudawitz, GoAgile Inc, October 2003

Now we can see that RSE's EA has identified and documented the business processes and IT infrastructure as well as the relationships between all of the various components that comprise the RSE "system." Using the RSE EA, company staff can visualize the coupling between the business functions and the support IT infrastructure. They can trace individual process tasks to the specific applications, data, and IT infrastructure necessary to support each task. This comprehensive view of RSE can also be leveraged for additional value to the enterprise.

Extending EA into Disaster Recovery Planning

Every day, a business executes its processes, transforming and using information to create its products that bring it revenue. When the business suffers from an interruption[4], the normal operation of some or all of its processes is disrupted. In fact, this may be an excellent definition of a disaster in a business process sense. Businesses need to plan how to recover from a disaster as conditions return to normal. Unfortunately, disaster recovery planning[5] (DRP) is not done by as many businesses as it should be, and not done in enough detail in many others. In addition, many businesses, including large companies and those with legislative, regulatory or boards of directors mandates, often do not place enough emphasis[6] on their DRP efforts. As a result of these shortcomings, many of these companies, when put to the acid test of having to actually recover from a disaster, will be unable to do so[7]. This can put them out of business[8] which has been the case for far too many US businesses that have experienced recent natural and manmade disasters[9].

Even when a business is committed to DRP efforts, it can be extremely difficult to identify what should be recovered and the priorities for the recovery in order to keep the business viable while restoring normalcy. Often, only the company's IT staff is involved in the DRP effort due to the myopic belief that recovering the IT infrastructure, alone, assures the full recovery of the business. Why get the business side of the house involved? When the enterprise is not viewed from the perspective of an integrated system of processes involving both business and IT only a very short sighted disaster recovery plan can be the result.

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[4] For a business, an interruption can be any unplanned incident that disruptes the normal operation of the business. This goes beyond disasters resulting from naturally occuring events such as earthquakes, hurricanes, ice storms, etc. An interruption can even be the unplanned results of a planned activity such as a system outage that takes longer than expected.

[5] In this paper, we will be focusing on the recovery of IT to support the business which is generally referred to as "disaster recovery planning." It should be noted that the term "business continuity planning" (BCP) is often used as a synonym for the many disciplines in the field, such as business recovery planning, disaster recovery planning, business continuity planning, and so forth. This is consistent with the definitions provided by the Business Continuity Institute (www.theBCI.org). A common working definition for BCP is: the preparation, implementation, and practice necessary to react in a planned and predictable manner in the event of an unplanned business interruption in order to minimize loss and ensure continuity of the critical business functions of an organization.

[6] Including resources both in terms of staff, equipment and organizational responsibility. In a study by Dynamic Markets Ltd. for VERITAS Software, it was found that for 76% of companies, the decision-making process for disaster recovery is limited to IT staff,

[7] Gartner estimates that two out of five enterprises that experience a disaster will go out of business in five years. Enterprises can improve those odds — but only if they take the necessary measures before and after the disaster. Wheatman, Vic, Aftermath: Disaster Recovery, September 21, 2001, The Gartner Group

[8] The recent blackout that struck the Northeastern U.S. and Canada cost New York City businesses more than $1 billion — or $36 million per hour — according to Steve Kenniston, technology analyst at Enterprise Storage Group. Shread, Paul, *Disaster Recovery Still Just an IT Responsibility*, September 4, 2003, eSecurityPlanet.com

[9] This includes natural disasters such as earthquakes, tornados, hurricanes and man-made disasters such as arson and terrorist acts like the attack on the World Trade Center in New York.

Why is DRP so difficult? To begin, technology is complicated and expensive. It combines physical "stuff" and people in new and unique ways that are constantly changing and growing. DRP efforts are seldom approached from a strict concept of business processes. Often there is no attempt to really understand the business functions being supported by the technology. Which ones are needed for what purpose and which ones are the most critical to keeping the business going and returning it to normal? This is often true even when the business staff is included in the DRP effort. Often these staffers are too focused on their own portion of the enterprise to see the picture from higher up. Thus, as a result of this thinking, it is assumed that all functions of the business must be recovered at the same time. No effort is made to organize and prioritize the various functions and planning is generally along the lines of the enterprise's organizational structure instead of its process structure. Such an approach can lead to a recovery requirement that may not be possible to achieve with any realistic collection of resources and assets after a disaster.

A business that is dependent upon IT for some or all of its critical processes experiences increased difficulty in DRP efforts, as planning for IT recovery is complex and expensive. If the correlation between the business functions and IT is not well understood, it is not really possible to determine what IT resources are actually needed to support specific critical business functions. Since most companies do not have an unlimited budget to support DRP efforts, there needs to be a way to change the parameters of the situation in order to get the costs and effort to a manageable level. It is necessary to pare down and prioritize the recovery requirements to those that are really necessary so that DRP efforts can concentrate on a much smaller business footprint. Business function leaders must take a critical look at their business and produce a prioritized list of business processes and tasks to create the continuity plan.

What has this to do with Enterprise Architecture? Let's look at some logical pieces:

- A business can be viewed as a system comprised of a set of processes. Each process is made up of a series of tasks comprising the process.
- IT resources can be matched up with each task in each process as appropriate.
- Company personnel resources can be matched up with the tasks and corresponding IT resources
- The set of essential business processes and tasks would be a subset of the overall company business processes
- A comprehensive EA will document the business processes and tasks with their supporting IT resources.

The company business leaders can then prepare a prioritized set of the critical processes and tasks that are needed to recover the business and return to normal[10] in the event of a disruptive business occurrence. This planning defines the business recovery map for the business. The business's EA, if rigorously researched and prepared, will facilitate the identification of IT and other resources that are specifically needed (and in what priority) to recover the business critical processes and tasks previously identified. This creates a blueprint for IT disaster recovery plan which should fit into an overall integrated business continuity planning effort.

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[10] Normal being defined as all processes running as they were prior to the disaster's occurrence. Preparing this list of processes and tasks is non-trivial and usually requires considerable effort, thought and understanding of the business. The brief coverage of this activity in this document is not intended to demean this effort.

What this means is that when a business has a comprehensive EA and then integrates their EA efforts with their DRP efforts, it is possible to develop a very specific tailored disaster recovery plan where only the required IT infrastructure has to be restored in order to support the identified critical business functions. This can greatly simplify disaster recovery planning and possibly reduce recovery costs. This knowledge helps significantly in negotiating hot site and off site recovery support, acquisition of additional IT assets for self-recovery preparation, recovery simulation and training costs, and so forth. The best possible disaster recovery plan[11] is the result of integrating the disaster recovery planning effort with enterprise architecture.

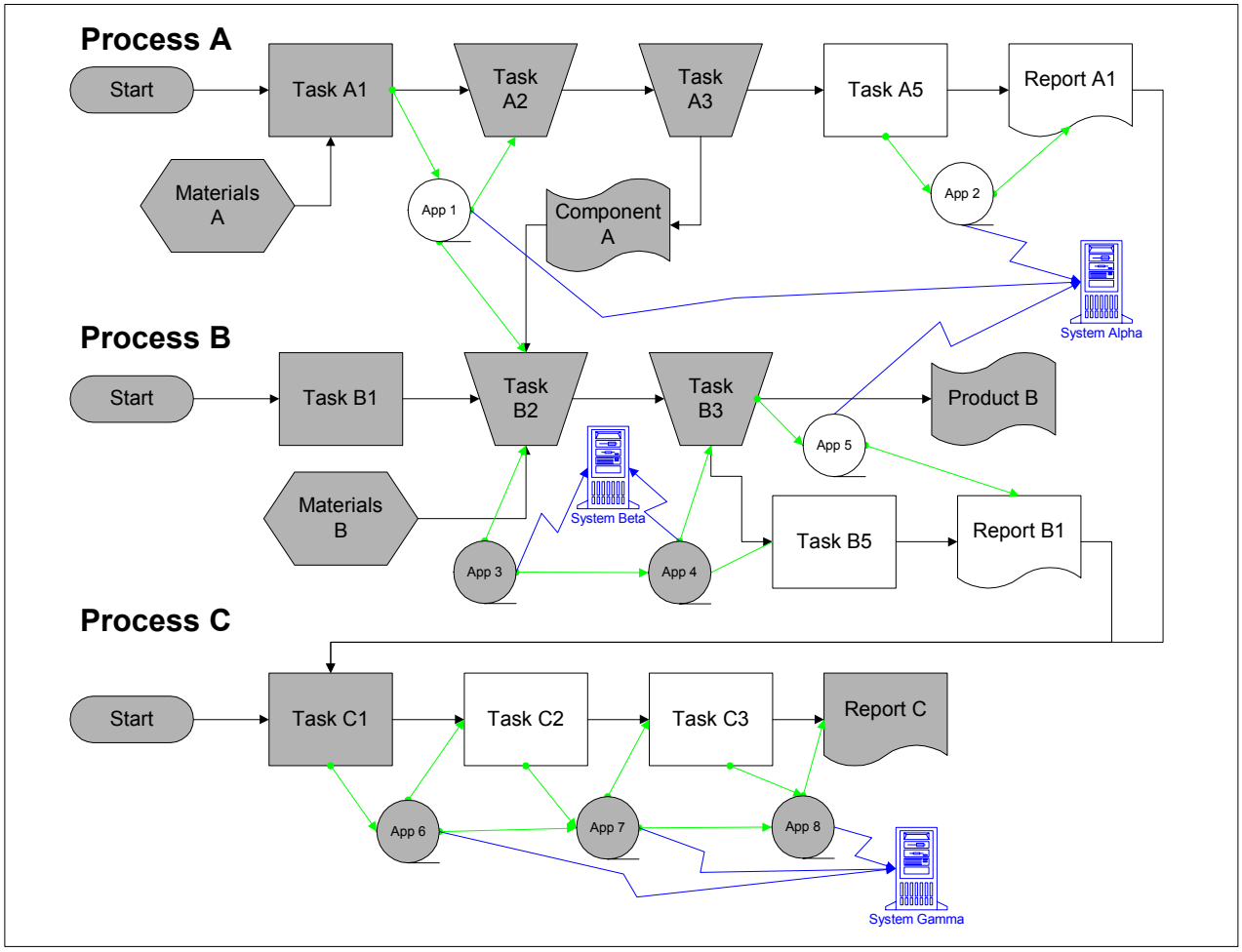

Figure 4 - Critical tasks for business recovery

Figure 4 shows our very simplistic example with the critical business process tasks highlighted based on direction from the business leaders of the company. This shows the components of the IT infrastructure (applications and servers) that must be restored in order to support these tasks. In a real company, there would be hundreds of tasks and corresponding IT infrastructure that would be so identified.

[11] In the context of this discussion, "best possible" means the lowest total cost and highest probability for a success business recovery.

As a company becomes more dependant on complex information services delivered through shared software and technology, the one-to-one type of relationship between technology and business process/tasks breaks down. This means that the required components of the company's IT infrastructure may not be that easy to identify and isolate. This adds a significant new level of complexity to IT disaster recovery planning. It also complicates overall contingency planning when attempting to develop a scaled down infrastructure to phase in the recovery over time.

Coupling enterprise architecture with DRP is the only effective approach to tackle these challenges. Further, only with a tool enabled EA[12], would it really be possible to meet these challenges head-on and leverage this knowledge to build the required comprehensive disaster recovery plan. But with such a tool, this integration is not only possible but almost difficult to avoid. It just requires taking the logical next steps to bring together DRP with EA.

It must also be remembered that during the initial phase of a disaster recovery effort, alternative tasks may be appropriate to replace the normal tasks that would be performed during routine operations. For example, some automated tasks may be replaced with manual tasks, thus changing the IT support required at that point in time. These could range from marketing to billing. An example is the manual creation of invoices. These alternative tasks should also be modeled in the EA so that the true complete set of business processes and tasks to be used during the recovery phase will be available for the planning process.

As a further extension of the added value to this approach, it is also possible that during the planning efforts for disaster recovery and the retrospective analysis, overall process improvements may be identified. In fact, annual DRP reviews can be combined with on-going business process re-engineering efforts to leverage this possibility. This analysis is further facilitated by having a fully integrated tool enabled EA so that alternatives can be quickly and easily analyzed against the current state of the business and its IT support.

Yet another benefit of this approach is the ability to identify when changes in the company's technology or business processes would impact the disaster recovery plan, *before* they are implemented. With the coupling of the company's technology with the disaster recovery plan through the processes and all interlinked in the EA, assessment of the impact of technology changes to the disaster recovery plan is greatly aided. This will allow for the evaluation of these impacts as part of the process to modify the technology. It will also facilitate the necessary modifications of the disaster recovery plan to accommodate the technology changes so that the plan stays fresh and up to date with the actual state of the company.

It Is Really About The Holistic Enterprise Documented in the EA

The holistic enterprise is the total view of the company where it is understood that the company is a single system comprised of processes and tasks that interact with people and materials, produce and use information, and deliver products or services. Looking at the business from the perspective of enterprise architecture, or the perspective of disaster recovery planning, is just looking at the same things from different views and perspectives. Achieving this realization

[12] A tool enabled enterprise architecture is a graphical, navigable model built on database technology, with interlinks to business and IT documentation. This requires the use of a modeling tools such as Ptech FrameWork® as the underlying core for the technology.

enables the company leadership to leverage its various planning and management efforts to reduce duplication and achieve the benefits that a holistic perspective makes possible. This is a logical extension of the concept of using a centralized shared database for company information that is accessed by all applications that use/create/modify the data.

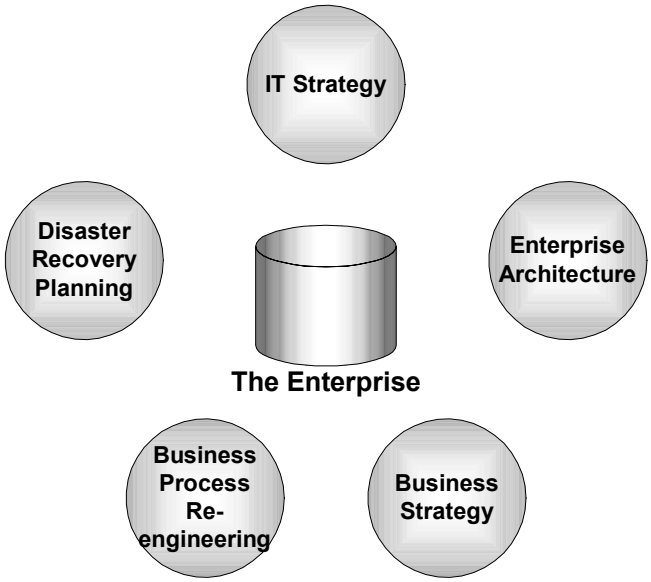

Figure 5 - The enterprise centric view

The tool enabled enterprise architecture repository is the central repository for describing the enterprise and integrating business processes, business strategy, IT strategy, IT configuration and IT planning all together in a single coherent enterprise-wide model. The tool enabled EA communicates this model across the enterprise and facilitates its use for purposes as business continuity planning, strategy, etc.

The Bottom Line – Towards an Effective Business Continuity Planning Philosophy

Although we have been discussing disaster recovery planning in an IT context, what is really possible is the development of a new effective philosophy for business continuity planning (PCP). By integrating business process analysis and business continuity planning through enterprise architecture, it is possible to provide an enterprise with the best possible and most highly achievable business continuity plan. This is achievable by adopting a new philosophy and establishing a tool enabled enterprise architecture process for the company.

Leveraging the understanding of the company's business processes and their coupling with its information technology provides a significant value add to BCP at very little, if any, additional cost. This simplifies the challenge of cost justifying what might appear to be additional effort as it has traditionally been very difficult to develop acceptable cost and benefit analyses for BCP efforts. In the spirit of the legendary Yankee baseball team manager Yogi Bara13, "the real costs are real," but the cost of a business interruption is only a probabilistic estimate that becomes real only should an interruption occur. Businesses can not afford to wish away disasters and other

[13] Yogi Bara is famous for his statements of the obvious such as "It ain't over till its over."

events that may disrupt their normal business activities in an effort to avoid the costs of planning and preparing for business continuity. Nor can they wait unit a business interruption occurs to calculate the value of BCP. However, leading businesses can integrate their business process analysis, enterprise architecture and business continuity planning efforts leveraging them and achieving a combined benefit.

David Rudawitz is Vice President of Antevorte Consulting, LLC and a senior IT management consultant with recognized subject matter expertise in Enterprise Architecture implementation and automation. He has practiced his craft over 30 years with companies such as IBM, Northrop Grumman, Ameron Corp., General Dynamics and Holmes & Narver, Inc. He also has over 33 years of disaster operations and response experience as a Disaster Services supervisory volunteer with the American Red Cross. Mr. Rudawitz is a business partner with EITS, which is an alliance of experienced EA practitioners. He is a member of the IEEE, Computer Society and the Association of Computer Machinery (ACM). Mr. Rudawitz can be contacted at David.Rudawitz@Antevorte.com.

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