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**Technology Management  
in the  
Effective Implementation of Change**

**Molly B. Kearns**

**Master's Thesis**

**May 2004**

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# **Abstract**

Organizational fitness is often achieved by making changes in business operations. These changes frequently involve the use of a new technology. The effective implementation of change is achieved by examining the benefits and challenges of technology management when making decisions. Important elements for consideration in technology management are technology evaluation, integration, planning, implementation, training, and change. A solution is proposed to combine and encompass all the elements of technology management to allow for the positive aspects and avoid the negative aspects of change implementation. The tool consists of principles to be addressed for each element.

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# **1.0 Formal Problem Statement/Definition**

Organizational fitness is often achieved by making changes in business operations. These changes frequently involve the use of a new technology. The effective implementation of change is achieved by examining the benefits and challenges of technology management when making decisions. This thesis will examine the issues surrounding technology management, which influence the effectiveness of change implementation. This will be achieved through the development of a case study. The goal is to develop a formal methodology for the effective implementation of change. The tool will combine and encompass important aspects of technology management to allow for the positive aspects and avoid the negative aspects of change implementation.

## **2.0 Scope of Work**

This thesis will explore the issues surrounding technology management, focusing on after the technology has been chosen. It will provide a methodology or instrument to properly manage the effective implementation of change, which incorporates each facet of technology management. It will not examine financial justification or investment proposals, but will briefly consider important aspects in terms of evaluation and selection.

## **3.0 Literature Review**

Overall technology management is building an organization that is fit for today as well as tomorrow. It is the linking of “engineering, science, and management disciplines to plan, develop, and implement technological capabilities to shape and accomplish the strategic and operational objectives of an organization” (qtd. in Ettlie 5).

*“Fitness is a fundamental characteristic of technology management that involves innovating and replicating appropriate resources and routines to successfully attain technological capabilities that satisfy strategic objectives and market needs. It is an evolutionary indicator of an organization’s ability to ensure current and future survival in one or more markets by effectively balancing exploration and exploitation”*  
(McCarthy 739).

Organizational fitness is often achieved by making changes in business operations, and this frequently involves the use of new technology. These technologies often include information systems such as Optiva, Peoplesoft, Oracle, SAP and other Enterprise Resource Planning (ERP) systems. Information systems offer the ability to make operations more efficient and cost-effective by reducing redundant work, standardizing operations, and maintaining records for both documentation of past work and references for future opportunities. There are hundreds of thousands of current implementations. Although these systems provide major improvements with many opportunities for future growth, each will need to be upgraded in the next ten years to continue to achieve organizational fitness.

The high cost associated with information systems extends beyond system purchase, and becomes even higher when an implementation is poorly managed or fails. Each system requires between \$10,000 and \$10,000,000 for purchase and implementation. Aside from the investment made in the system, given the capital required, even a small percentage overrun in the schedule or budget can be a large sum of money. There are costs associated with the employees', customers', and vendors' time that is required to make a change to operations. The transition time affects the cost of possibly operating two systems in parallel, as well as having the potential to affect quality and service. Additionally, the frustration from users when encountering system anomalies, incomplete functionality, and learning the new system, causes delays in the realization of project goals. Due to the high expense of implementation, it is essential for an implementation to be as effective and efficient as possible.

Realizing that change is inevitable, building businesses and systems to sustain today's market is not sufficient enough to maintain success. Technology implementation research and studies have been completed in many varying areas including the auto industry, libraries, education, flexible manufacturing systems, ERP and small business. Project success criteria include on time, within budget, and the realization of key performance indicators, such as productivity increases and organizational performance improvements. Technology Evaluation, Product and Process Integration, Planning, Implementation, Training, and Change are six essential areas of Technology Management. Each of these areas brings it's own set of benefits and challenges.

### ***3.1 Technology Evaluation***

Technology Evaluation involves technology selection, as well as implementation and post-implementation evaluations. After the implementation and post-implementation processes are complete, control should be given to the users. Giving end-users control of initiating improvements to processes and to the technology enhances user importance and reduces the resource needs for improvements (Higgins 16). Users will have more experience and a better perspective for where gaps in optimality exist. Continuous improvement is necessary to ensure that the technology is always effective.

#### ***3.1.1 Benefits***

In terms of selection, organizations often choose autonomous groups to perform effective Research and Development. Companies such as Nokia rotate employees to maintain a constant supply of fresh ideas (Wylie 47). These groups and employees have the ability to look at new technologies with different perspectives, which offers a more comprehensive evaluation of technological opportunities. An organizational suggestion includes “the establishment of a semi-autonomous group of well-trained, multi-skilled operators, supported by a multi-functional working group to solve the problems of integration which are encountered” (Boer 17).

A complex adaptive systems approach is a method used to explore technology management and organizational fitness, through classification, selection, adoption, and exploitation of the technologies needed to maintain an organization’s current and future survival (McCarthy 729). The fitness landscape theory, developed in the 1930s, can be used to visually represent the status of a complex adaptive system. Fitness of an organization is defined as a measure of a system’s

adaptability, robustness, durability, popularity, and survival. The KN model is used to link technology classification, selection, adoption, and exploitation in a three-dimensional space, creating peaks and valleys. In other words, it relates N, the number of elements, to K, the amount of interconnectedness, to A, the number of possible states, to C, “the co-evolution of one configuration and its technology strategy with its competitors.” (McCarthy 733) The goal is to be at the peaks, but to move from peak to peak the system must first dip into a valley and climb to the next peak. “Managers should view their organizations as a complex adaptive system consisting of temporary repositories of routines and capabilities” (McCarthy 742.) Operations must be evaluated to determine placement in terms of organizational fitness and quality of output, both in product and information.

Four processes: variation, selection, retention, and struggle, are the basis for the theory that links the fitness landscape theory to strategic management (McCarthy 738). Variation is variety in technology and can be generated intentionally or unintentionally. Selection is choosing to eliminate or develop different configurations brought by variation, based on internal or external factors. Retention is the process of preserving, copying, or imitating the configurations thought to be successful. Struggle is the process of competing for limited resources.

The Dominant Design Theory, Technology S-Curve Theory, Technology and Market Trajectory Theory, and Modularization of Design can all be adapted to relate to organizational fitness. Additional metrics should be used to quantify progress on implementation, and illustrate the success or failure of a new technology.

### **3.1.2 Challenges**

Major roadblocks in technology evaluation in the Kumar, Maheshwari and Kumar study, an investigation of critical management issues in ERP implementation, include incompetent consultants and software glitches (798). Additional roadblocks include software sophistication, limited industry specific versions, and limited reporting capabilities comprise a list of software limitations (Kumar 798). To meet these limitations, companies modify software, develop add-on features, re-engineer processes or live with shortcomings.

The criteria used to select the technology product and vendors are functionality, system reliability, and a fit with a parent or allied organization. Challenges to making the selection include a different business model than the parent or allied organization, and re-engineering processes to fit the software. Expected criteria were ease of use, total cost of ownership, user acceptance and cost escalation (Kumar 797).

Implementation and post-implementation metrics should be created during planning to track not only progress, but process improvements. The challenge for evaluation is determining what metrics can accurately show process improvements and therefore success. Examples of metrics include the percent of functions implemented, number of active users, and number of completed milestones. These metrics show progress but do not show the technology's ultimate success or failure.

### ***3.2 Products & Processes Integration***

An organizational innovation can be defined as a “process that includes the use of Information Technology (IT) systems and technology, and the development of complementary business and human resources” (Kumar 795). IT systems can be existing or new technologies. Technology is “the systems of hardware, human beings, and organizational aspects that are used in operation of the firm” (Drejer 125). The definition of integration is more complicated, due to its popularity today. In terms of this discussion, it can be the making of a whole from two or more separate parts. Several questions can be asked to determine then, what is to be integrated and it is necessary to define ‘what’ before ‘how’. In the context of technology management, product development is on the product/market level, while technology development is at the internal level. Execution of development can occur both with formal plans and emergent decisions. Many have researched varying methods for integration. Three constant dimensions seem to be: “integration of time horizons, aspects, and activities;” (Drejer 129) but there is not just one way to resolve integration issues.

Enterprise Resource Planning (ERP) can be defined as a customized software application capable of integrating many other systems into one streamlined system that minimizes disconnects. It is a common database and can support all functional roles. ERP is a popular technology being implemented in many business units around the world, and it serves as a fine example for technology management. ERP offers many benefits in terms of integration, expansion capabilities, and automation of manual tasks.

### **3.2.1 Benefits**

In terms of new product development versus new technologies, varying strategies exist on which should lead. Predefined business plans spell out development strategy in a top-down approach. The weakness in this approach is that the top-down nature uses technology developments to fuel product developments, rather than trying to develop new products on existing technologies. The question to be asked is whether product development or technology development is the dependent variable in a new undertaking. Neither approach is better than another nor is it constant. A bottom-up approach, examining opportunities, would explore all possibilities.

A second approach focuses on technology's necessity to be consistent with customer demands, and the integration of activities. This firm takes input from many different sources, including process and product technology, to fully develop a concept targeted for three to five years in the future or the next product life cycle. This enables all different functionalities and disciplines to be linked to customer demands and gather buy-in on a new project. A technique employed in this instance is the use of activity chains, to illustrate each areas input and importance. Activity chains are also useful to evaluate necessity and determine other areas in which the new development can be used.

### **3.2.2 Challenges**

Small and medium sized companies often invest in stand-alone technologies, which leave little capital for integrated system purchases. This is especially prevalent in developing nations. Inefficient operations and requiring more skilled labor to manage the varying resources are results of this lack of integration.



If technology development does not occur at the same time as product development, time is spent developing the mechanics (technology) to produce a new product, after the product idea has been fully generated. To overcome this problem, a technology portfolio is produced to maintain visibility of the current state and to maintain the correct amount of technologies to “secure competitive strength in the future” (Drejer 133). This dimension is an “attempt to achieve coherence between the need for readiness of action and the need for commitment” (Drejer 134).

Many methodologies have been developed for achieving integration. However, the methods do not produce solutions, but rather direct toward a solution using questions based on development objectives. Varying objectives require varying methods for forming a solution. Major roadblocks for integration include unclear strategic direction and vision for use, and a lack of support and training from the parent (Kumar 799). Three categories of failure were identified to meet goals: technical problems, changes in the marketplace, and organizational bottlenecks. In one case study, most of the technical problems could be traced back to the fact that these companies were of the firsts to adopt this technology and thus systems support was unavailable at that time (Kumar 799).

Payback was found to be an important concern in new technology implementation, as it is difficult to achieve. Return on investment (ROI) can only be realized partially through traditional measures of quantifying standard cost. If used, these traditional numbers do not paint a full picture of all the improvements brought by the system, such as improved market performance and operational efficiency. Additional payback is achieved over time as new needs and

opportunities arise. Many of the benefits are not attained due to poor planning and lack of involvement, process understanding, and buy-in from all functional groups. For a manufacturing department to participate effectively in technology development, it must “interact with manufacturing strategy, production information systems, quality management and human resource management,” (Matsui 12) as well as to be integrated with planning, maintenance, quality, design, marketing, sales and top management.

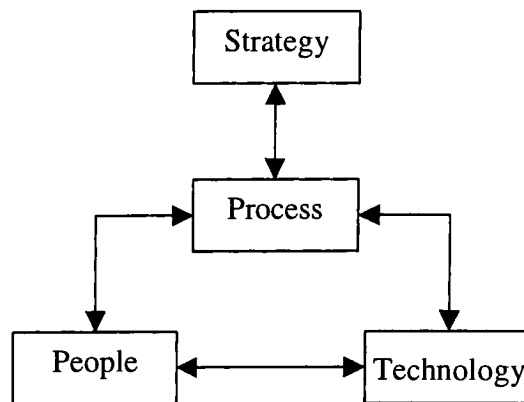
Traditional cost-accounting practices do not accurately measure the types of efficiency and operational savings achieved with technology implementations (Yu-Lee 15). Value-centered technology is a solution to this dilemma. Increased value is realized in reducing costs or increasing revenues. Financial savings can be achieved in two forms, dynamic and static. Static involves ‘fixed’ costs, such as labor, equipment, information technology, and equipment. Dynamic represents output capability and capacity (Yu-Lee 16). Static savings are realized when costs are reduced due to added efficiencies, such as reducing the cost of labor, or reducing the amount of space needed for inventory. Dynamic savings can be achieved by managing capacity. Increased capacity does not increase output, as output is determined by demand. Therefore either demand must increase to meet capacity, or resources can be saved by reducing capacity to meet demand. Value-centered technology focuses on five steps to achieve financial value:

1. Identify strategic or tactical objectives
2. Determine how the technology will help achieve the objectives
3. Calculate how this improvement will be translated into financial benefit
4. Design the implementation to achieve the improvement and the financial benefit

5. Establish, monitor, and manage post-implementation measures

Step One is a typical step for any new project, and thus must be clearly defined for this process. Step Two is necessary to determine the impact of the technology. It is important to note that the technology itself cannot create a savings. Processes need to change to accommodate for the savings. Step Three determines how the financial benefit can be realized. This is accomplished by transferring dynamic capacity to static capacity and realized dynamic capacity (Yu-Lee 17-18). This means, determining proper input to obtain proper output and increasing revenue in the form of increased demand. Step four deals with creating a solution and software configuration that can offer the highest probability of achieving value (Yu-Lee 19). Also during this stage, post-implementation measures must be considered to make improvements before project rollout. It is key to “determine the optimal interaction of the technology and the process improvement and to reflect this interaction in the solution design and configuration. Companies often fail at this step by either using the technology as designed or altering it to model a sub optimal process” (Yu-Lee 19). Step Five is the time to establish post-implementation measures of identifying metrics to measure performance, progress, and value. This is important to make sure the investment is moving forward and to prove the process is beneficial.

Projects often fail due to “Process-Change” barriers (Temkin 34). These barriers are the important links between Strategy and Process, Process and Technology, Process and People, and People and Technology. Figure 2 illustrates the links.



**Figure 1: Process-Change Barrier relationships**

The link between Strategy and Process includes making a clear set of objectives, having measurable metrics, and considering best practices, internal operating constraints and capabilities of existing applications (Temkin 34).

Linking Process and People requires a “blueprint” of changes to responsibilities and performance metrics of everyone involved (Temkin 34). Linking Process and Technology examines process questions in terms of how the technology works with the process.

In terms of linking People and Technology, firms must be concerned with “Driving adoption”. This includes a focus on “post-implementation training, communication, and support” (Temkin 34).

### ***3.3 Planning***

Planning is the most important step in Technology Management. Planning must involve representatives from every group of stakeholders, to develop buy-in and to ensure all needs are met. A planning committee must define a vision, establish goals, and define a strategic plan that

will result in a blueprint for implementation (Valdez 1). It is important to not only define what is to be done, but also why, so that it can be communicated to committee members.

Typical planning stages are Planning, Configuration, Testing and Implementation (Kumar 795). Additionally, the shakedown phase can be described as the period between rollout and return to normal operations. Some steps are done in parallel while others are done sequentially, such as training, configurations, and testing. Precedence is based on individual strategy.

Campisi offers a 9-step process for project management success (34):

1. Complete strategic consulting before vendors are brought in
2. Create a project management requirements document
3. Create a plan and design documents
4. Create a strategy for the system
5. Implementation
6. Deployment and Integration
7. User Training
8. Maintenance and Support
9. Administration and Management

In addition to following the 9-step process, it is important to “never assume, document meetings, be clear on cost, budget funds for the unexpected, expect problems, work the problem, be specific in all areas, work with win/win in mind, and have sign-off meetings on the requirements document” (Campisi 35).

Project teams consist of cross-functional implementation teams with strong Information Technology and higher-level functional responsibilities. Key players include top management, IT personnel, consultants or vendor, parent company employees, and people familiar with hardware. Additionally, key users are brought in and trained to help develop the system and then become internal technology consultants. Throughout the course of technology implementation, different people should control the project. Examples include having a decision-maker purchase, a technology person to install, someone to train, and someone to monitor. It is necessary to have a person in each area of expertise to control each phase (Higgins 16).

Functional experience and project management skills are criteria used for project manager selection. Consultants are chosen based on reputation, process engineering experience and individual knowledge rather than by cost. Leaders who play the roles of broker, coordinator, and innovator are significant personalities found to influence project startup. “Brokers are expected to be politically astute, persuasive, influential, and powerful, with the skills to maintain a power base, negotiate commitments and present ideas. Innovators are expected to be creative and clever dreamers, who see the future, envision innovations and package them in inviting ways, initiate change, and think creatively. Coordinators have the skills to ensure the project is managed systematically across functions” (Hacker 5). If an executive is strong or weak in one of these three skills, it will impact the project, reinforcing the need for leadership development programs in companies.

### **3.3.1 Benefits**

The first task to creating the future, and developing a plan, is “to develop a process for pulling together the collective wisdom within an organization” (Hamel 7). A well-mapped plan is a strategy to meet goals and complete projects successfully. A plan needs to be put into place to establish and maintain visibility of all action items and deadlines, for evaluation of tasks, and to determine personnel and monetary needs. Responsibility and accountability are appointed through plans. A project plan is critical to understanding a project timeline and task relationships, as well as tracking progress. Confusion is reduced, if a project plan is communicated throughout the organization. Unforeseen circumstances can be handled efficiently because consequences can be predicted and risks calculated based on task interactions and involvement with the critical path. The critical path is the combination of tasks that delay the entire project completion if even one task is not completed on time. Additionally a thoroughly documented plan can aid and expedite in acclimating new team members in the event of turnover.

It is necessary to gather people from all levels. Electronic Data Systems (EDS) is a great example of creating the future. Management was concerned with sustaining without growing. A group of managers created the “Corporate Change Team” and eventually gathered the support of the company’s Leadership Council to create a formal and company wide team to develop a plan for future growth. The outcome of these exercises was “a view of its industry and its role that was substantially broader, more creative, and more prescient than it had been 12 months earlier” (Hamel 8). This view was company wide.

Technology of Participation is a method that uses Focused Conversation and Workshop Methods, as well as Action Planning and Participatory Strategic Planning to understand the process, develop goals, and to encourage and gain participant buy-in (Mahon 4-8). All of these aspects of the methodology involve group meetings, surveys or unstructured interviews to discuss the topics, reach decisions and make an action plan. Also involved in this process is continuous feedback on status to participants in the form of summary mailings and follow-up phone calls (Mahon 8).

The use of this planning and organizational method resulted in favorable responses from the participants as well as success in developing a plan. It created a documented consensus and included all parties. Evaluation and feedback of the project indicates that a successful management plan can be implemented (Mahon 8).

### ***3.3.2 Challenges***

Major roadblocks include unavailability of skilled project people, turnover in key project personnel, difficulties in estimating project requirements, in house resource constraints, coordination between functional groups, and lack of commitment from top leadership (Kumar 799). Most changes are made in budget and scheduling, and rarely made in scope. Challenges include the high cost of consultants and training costs due to turnover, the expense of additional hardware capacity and the underestimation of work volume.



### **3.4 Implementation**

Implementation execution is the crucial stage when plans are fulfilled. If a plan was not followed, the changes are observed at this time. A technology needs to be “institutionalized” within an organization (Kumar 802). This institutionalization occurs during implementation.

Business process reengineering (BPR) is a common strategy to balance customer needs and business goals (Childs 6). BRP requires change in a work place. Thomas Childs suggests a “well thought-out BPR implementation plan, an Implementation Support System (ISS)”, and participation from people at every organizational level for success (6).

An ISS is a program management tool that combines automated tools and tailored procedures. The ISS should be “formulated to control the program and ensure adherence to the plan as well as plan for ways to handle change” (Childs 6). Additionally, “program objectives, common definitions and baselines” must be established (Childs 6). Involvement must be secured from top management, program staff, and customers or end-users (Childs 6). Childs notes that companies find success with the use of ISS for the following reasons (6):

- Tighter project control reduces overall costs
- Frequent measuring of progress keeps the focus firmly on goals and results
- A well-planned ISS assures optimum use of available resources
- A mechanism is established for rapid identification and resolution of potential problems
- Involvement and interest at every level facilitates skills transfer, training, and mentoring

- Automated control and analysis tools streamline reporting, tracking, and change management

In terms of choosing a consultant, ensuring effectiveness should be a priority. Two key points to consider for selection are: (1) prior comparable successful experiences and (2) consultant capability to transfer knowledge to entire organization (Turchan 1).

### ***3.4.1 Benefits***

Effective process implementation is “the most influential technology-related measurement scale for competitiveness” (Matsui 12). Additionally, the “involvement of manufacturing departments in technology development activities, smoothes process implementation, which in turn strengthens the competitive position of the plant” (Matsui 12).

Technology Implementation must follow a plan to maintain stakeholder buy-in and increase the opportunity to realize a return on investment. Unforeseen circumstances may arise and must be handled in an efficient manner to keep the project moving along.

Quality assurance activities must take place during implementation to make sure the technology is working as it is intended and planned. Unit testing, integration tests to validate both system integrity and performance, pilot and scale-up testing are all forms of quality assurance activities, typical of technology implementation.

### **3.4.2 Challenges**

Major roadblocks include high cost of implementation and technical difficulties in configuration. Companies in the Kumar, Maheshwari and Kumar study, used manual work-arounds, or ran the new and old systems in parallel, to minimize business disruptions (804). Additionally, frequent communication occurred with the vendor for debugging, software modifications, and acquiring new hardware (Kumar 804). Common implementation difficulties include “Lack of vendor capabilities, incompatibility with employee skills, increased bargaining power of vendors, lack of experience in operation and control of new manufacturing technology (NMT), and over estimation of utilization” (Laosirihongthong 10).

End-users not ready to use the system is the major challenge for shakedown. Reasons for this occurring include “new process not being communicated, inadequate training, lack of user education, lack of support documentation, high user turnover creating confusion, training new hires, and users taking time to adjust to the new system and processes” (Kumar 804).

### **3.5 Training**

While planning is the most important aspect of effective technology management, training is possibly the second most important. In absence of proper training an effectively planned implementation is useless. “Without complete and thorough training, implementation is almost certainly doomed. Training should be perceived as part of the cost of implementation and it must be made clear that the trainer is in charge of this phase” (Higgins 16). “Well trained workers are vital to the success of any IT project” (McGee 141). Typical training costs comprise 10-20% of Enterprise Resource Planning budgets (Stedman 57). “Many IT managers say it’s even more

important for employees to see how the new technologies they're using relate to their job. Likewise, it is pertinent that managers take into consideration that new technologies bring change in the way people do their jobs" (McGee 144).

The Kolb Learning Style Inventory (Kolb LSI) presents learning occurring in four phases: (1) concrete experience, (2) reflective observation, (3) abstract conceptualization, and (4) active experimentation. Additionally, learners have phase preferences, which create four types of learners: (1) convergent (prefer abstract conceptualization and active experimentation), (2) divergent (prefer concrete experience and reflective observation), (3) assimilative (prefer abstract conceptualization and reflective observation), (4) accommodative (prefer concrete experience and active experimentation). Implications of these variations require different training medium and techniques (qtd. in Coppola 174).

Gagne and Medsker provide a theoretical approach for learning that includes five categories for human learned capabilities, each requiring specific internal and external conditions for success (qtd. in Coppola 174) "Verbal information is information that a person can simply recall without having to analyze or modify it. Attitudes are states within an individual that cause a person to behave in a certain fashion. Cognitive Strategies enable individuals to improve and enhance their own thinking and learning processes. Motor Skills are those capabilities that require physical movement(s) on the part of the individual. Intellectual Skills are those that allow a person to interact in an environment using symbols, sounds, or language. The interaction requires analysis which is determined by the four hierarchical levels of intellectual skills: Discriminations, Concepts, Rules, and Higher Order Rules" (qtd. in Coppola 174).

Atkinson and Shiffrin developed an Information-Processing Model. The nine internal processes that comprise a learning event are: (1) reception of stimuli by receptors, (2) registration of information by sensory registers, (3) selective perception for storage in short term memory, (4) rehearsal to maintain information in short-term memory, (5) encoding for storage into long-term memory, (6) retrieval from long-term memory into working memory, (7) response generation to effectors, (8) performance in the learner's environment, and (9) control of processes through executive strategies. "The goal of a training program is to ensure that the information presented is encoded properly and moved into long-term memory" (qtd. in Coppola 175).

"The goal of training is to produce a motivated user who has the basic skills needed to apply what has been learned and then to continue to learn on the job" (Compeau 24). Three phases make up the framework of training: initiation, formal training and learning, and post-training (Compeau 25). Trainee, software, task/job, and organizational characteristics influence key decisions (Compeau 25).

During the initiation phase, a needs assessment is completed. Following initiation, method and trainer are determined in the formal training and learning phase. Evaluation of training and learning occurs during post-training. Gupta and Sadowski provide four steps for successful end user training.

1. Selection of end-user training team members based on "complexity of the computing process, scope of commitment required for end-user training, magnitude of resources

required, management level in the organization, functional area involvement, and willingness of team participants” (212)

2. Develop and clarify the end-user training mission.
3. Establish rules for training activities such as addressing expectations and norms of decision-making
4. Evaluate the training process

The Transformational learning theory explains “learning as a process of critical reflection and self-examination of one’s worldview in light of new knowledge and a fundamental reorganization of one’s perspective or frame of reference” (King 283).

According to K. King, “substantial research has been conducted and literature written about educational technology professional development over the years, and have several good suggestions but fall short of providing a cohesive concept of educators’ learning needs and development” (285). However, the National Staff Development Council (NSDC) did develop a set of guidelines. The NSDC’s standards, listed in Table 1, serve as a goal, as well as a quality indicator.

| NSDC Process Standards |   |
|------------------------|---|
| (3)                    | Provides for the three phases of the change process: initiation, implementation, and institutionalization                                       |
| (6)                    | Provides a framework for integrating innovations and relating those innovations to the mission of the organization                              |
| (7)                    | Uses a variety of staff development approaches to accomplish the goals of improving instruction and student success.                            |
| (8)                    | Provides the follow up necessary to ensure improvement  |
| (10)                   | Requires staff members to learn and apply collaborative skills to conduct meetings, make shared decisions, solve problems and work collectively |

**Table 1: National Staff Development Council Process Standards © 2000**

Brookfield and Cranton provide a framework “to consider faculty development as potentially promoting transformational learning” (King 287). “Transformative learning refers to transforming a problematic frame of reference to make it more dependable in our adult life by generating opinions and interpretations that are more justified. We become critically reflective of those beliefs that become problematic...Frames of reference may be highly individualistic or shared as a paradigm. Transformational learning is a way of problem solving by defining a problem or by redefining or reframing the problem” (King 287).

### ***3.5.1 Benefits***

In order to transition employees, valuable teaching techniques are used. Concepts must relate previous knowledge to new learnings. Specific examples must be used, in real-life situations, to help learners see the practical aspect of the system. All types of learners can provide support within their group (Fidishun 34).

Important implications of a study on training, point out that “it is important for adults to understand how new skills will fit into their daily work lives. They will still come to training with different needs, abilities, and learning styles that the trainer will need to accommodate, but [Information Providers] have an attitude that reflects their understanding of computers as an important tool to assist [patrons]” (Fidishun 33). It is important to ask for input from users to create human situations. “This may be difficult when technology changes rapidly, but for those who do not assume that computers are the answer to all our prayers, it can be an important step” (Fidishun 33).

The Congressional Office of Technology Assessment funds four common methods for training teachers in technology use in the classroom. Coaching and Mentoring, Face-to-Face Training, Train the Trainer, and Web-based training have all shown success in education.

“Training end users has typically been left to high-priced consultants and outside training firms” (King, J 47). To alleviate some of the costs associated with training, Oracle has developed Tutoring modules that can be authored for specific business applications. Rather than having to pay for each user to attend a long training session, implementation teams can create customized courseware, including “non-Oracle” process steps to suit the needs of users not requiring the full training.

A common training option is the “Train the Trainer” approach. This widely used program trains some users who have the ability and desire to help out other users and thus become trainers. Experiences are documented to develop training manuals for the organization. Trainers are often outsourced because they have more experience and patience for training new users who may not be technically savvy. A key point for any training is to make the training fun.

Another option is Web-based training (WBT) which is a commonly chosen option to save training costs. One pharmaceutical company was able to save as much as \$800,000 due to reduction in travel expenses and time (McGee 141). Additionally, web-based training is more flexible allowing users to participate at their own workstations and over a large area, such as at



remote sites. It is important, if economically feasible, to have options for training. Not all training should be web-based, nor should classroom training be the only option.

A corporate case study was completed to answer the questions “Is Web-Based Training as Effective as Instructor-Led Training?” given the same external parameters (Coppola 170). Consumer Network Services, a division of Electronic Data Systems Corporation (EDS), employees were taught to use a web-based application with traditional instructor led training and web-based training (Coppola 171).

The results showed that “WBT can be an effective means for training if designed and developed properly.” Additional points made through the study are:

- “Interaction is crucial to the success of WBT. Participants should be required to respond to questions and receive automatic feedback throughout the lessons
- Attitude toward computers in general and computers in the classroom must be considered
- Effectiveness may depend upon the topic of instruction
- Student skill levels are important to WBT success
- An instrument to establish a baseline of prior knowledge and experience is needed to ensure an equal distribution of students between the WBT and instructor-led groups” (Coppola 183)

### ***3.5.2 Challenges***

Hired consultants are typically exceptional trainers, in terms of systems knowledge, however not all questions related to specific business processes can be answered sufficiently (Stedman 57).

“Insufficient budget, logistics, lack of computer savvy users, getting the right people as trainers, not enough detailed, quality information; and difficulty understanding the impact of downstream activities; geography, high turnover of project team and users; tight timelines, and difficult course content” have all been cited as common challenges (Kumar 801). Additionally, a major roadblock is the knowledge gap between implementers and users.

For a successful ERP implementation, user training must include process training in addition to application training. It is imperative for users to understand the process and connections to use the application effectively (Torode 61).

## ***3.6 Change***

Implementing a new ERP program involves the use of many resources and requires employees and organizations to make great changes. Some changes include standardization of work processes, norms, skills and outputs, and supervision structure (Kumar 795).

### ***3.6.1 Benefits***

Technology is essential in achieving organizational fitness; it is a core competency in terms of competitive strategy. Organizational innovation is an important element to successful technology implementation. Increasing participants understanding of the development process and what the

objectives are will increase willingness to participate and thus create a higher quality solution. To effectively make changes it is important to anticipate, manage and control the change process as well as “allay the fears and discomfort of employees” (Childs 6).

Time is rapidly becoming a great constraint in product and technology development. Thus, the industry to use its time most effectively, gaining the most ground, producing the most new products and effectively implementing the most new technologies will win. The management of change must take into account the three important aspects of change as pointed out by Horsley and Loucks-Horsley (4):

1. Change is a process, not an event
2. Change is a highly personal experience, involving developmental growth in feelings and skills
3. Personal concerns are legitimate

“Vision connotes a dream or an apparition, and there is more to industry foresight than a blinding flash of insight” (Hamel 9). Foresight is essentially vision with a foundation, an insight into technology and industry, based on trends. It is “a synthesis of many people’s vision” (Hamel 9).

The underlying conclusion to foresight thinking, restructuring, reengineering and growth is change. “Given that change is inevitable, the real issue for managers is whether that change will happen belatedly, in a crisis atmosphere, or with foresight, in a calm and considered manner; whether the transformation agenda will be set by a company’s more perceptive competitors or by

its own point of view; whether transformation will be spasmodic and brutal, or continuous and peaceful” (Hamel 9). It is necessary for change to be an ongoing process, rather than one concentrated effort only when reengineering and restructuring fail. “Top managers must recognize that the real focus for their companies is the opportunity to compete for the future” (Hamel 9).

The Influential Model for Organizational Change (IMOC) was used as the basis for a simulation of enterprise change. The IMOC is “a multi-level model that conceptually represents the dynamic links and causalities presented in a complex social system such as an organization” (Zayas-Castro 1). Appropriate performance measures should indicate the need for change in an organization as well as indicate the performance of a change. Change is a cyclic process. Most important in initiating a change is to understand the system to be altered.

Key change management initiatives for institutionalizing a new technology are training, changes in organizational structure, creating new groups and new positions, revisions to roles and responsibilities, counseling and high tolerance for mistakes, and new performance and control measures.

### **3.6.2 Challenges**

Major roadblocks, concerning change, include “difficulties in changing to new from old systems, significant resistance from staff, and significant resistance from managers” (Kumar 799). “Organizations found behavioral problems, such as user acceptance, more challenging than technical issues, such as bugs in the software” (Kumar 804). A major challenge is determining if

custom development is necessary or if it is a situation where users are resisting change (Kumar 804).

The Concerns Based Analysis Method (CBAM) “uses concepts of Innovation Configuration to clarify and communicate the variety of ways the innovation can be implemented successfully”(Jacobs 7). The method has seven stages of concern: Awareness, Information, Personal, Management, Consequence, Collaboration, and Refocusing. Typically used in education, it is a method to guide innovation after the decision to implement has been made. It is a useful tool for keeping key decision-makers informed on project progress, before the impact can be shown. It also creates a common language for discussion among users on how to make the project successful. CBAM details common patterns among human reaction to change. Each user moves through the entire spectrum for each change, from no use to full use over the course of implementation. A similar scale is Levels of Use of Technology (RMC). Table 2 correlates the two scales.

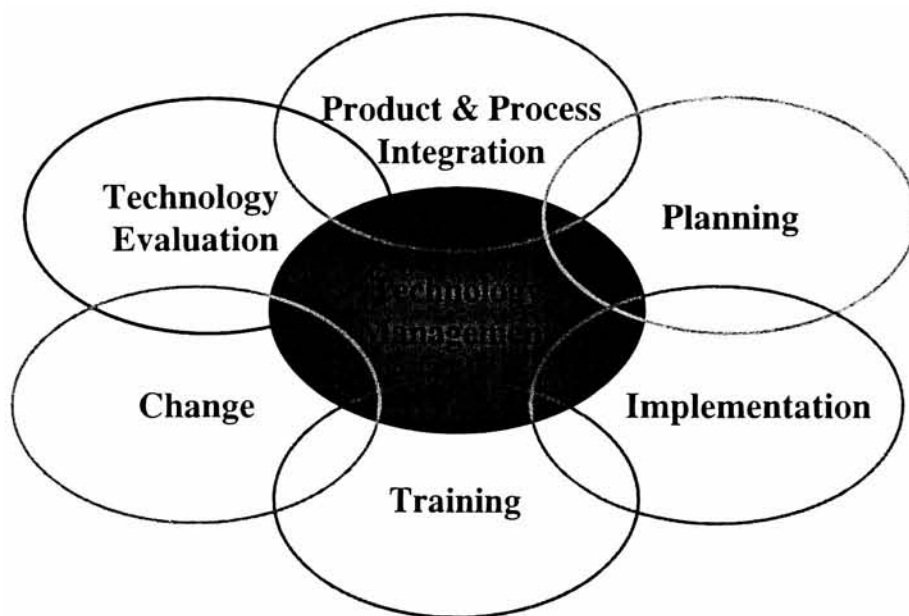
One CBAM tool, the Stages of Concern Questionnaire (SoCQ), is used to evaluate and break down user concerns during innovation in a quantitative form. Furthermore, Levels of Use of Technology is a tool that combines “Levels of Technology Implementation” (RMC) information and the “Levels of Use,” from CBAM, to assess progress in terms of new technology use. By understanding the current state, one is then able to guide users toward the established goal.

| Level                        | CBAM Level     | CBAM Description   | LoTi Category            | LoTi Description  |
|------------------------------|----------------|--|--------------------------|---|
| CBAM and LoTi: 0             | Nonuse         | User has little or no knowledge of the innovation, no involvement and is doing nothing toward becoming involved.   | Nonuse                   | A perceived lack of access to technology-based tools or a lack of time to pursue electronic technology implementation   |
| CBAM and LoTi: 1             | Orientation    | User has recently acquired information about the innovation and is exploring its value demands upon user and user system.  | Awareness                | Computer use is generally one step removed from the classroom. Computer-based applications have little or no relevance to the individual teacher's instructional program.   |
| CBAM: 2; LoTi: 2             | Preparation    | User is preparing for the first use of the innovation.   | Exploration              | Technology-based tools serve as a supplement to the existing program  |
| CBAM: no equivalent; LoTi: 3 |                |  | Infusion                 | Technology-based tools augment selected events.   |
| CBAM: 3; LoTi: 4a            | Mechanical Use | User focuses most effort on the short-term, day-to day use of the innovation with little time for reflection. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use. | Integration (mechanical) | Technology-based tools are mechanically integrated. Heavy reliance is placed on pre-packaged materials and sequential charts that aid in the daily operation of the curriculum. Technology is perceived as a tool to identify and solve authentic problems. |
| CBAM: 4a; LoTi: 4b           | Routine Use    | Use of the innovation is stabilized. Few if any changes are being made in ongoing use. Little preparation or thought is being given to improving innovation use or its consequences.   | Integration (routine)    | Users can readily create integrated units with little intervention from outside resources. Technology-based tools are easily and routinely integrated. Technology is perceived as a tool to identify and solve authentic problems.                          |
| CBAM: 4b; LoTi: 5            | Refinement     | User varies the use of the innovation to increase the impact on clients within immediate sphere of influence. Variations are based on knowledge of both short- and long-term consequences for clients.   | Expansion                | Technology is extended beyond the classroom. Classroom teachers actively elicit technology applications and networking to expand student experiences directed at problem solving, issues resolution, and student activism.                                  |
| CBAM: 5; LoTi: 6             | Integration    | User is combining own efforts to use the innovation with related activities of colleagues to achieve a collective impact on clients within their common sphere of influence.   | Refinement               | Technology is perceived as a process, product, and tool for students to use in solving authentic problems. Technology provides a seamless medium for information queries, problem solving, and product development.   |
| CBAM: 6; LoTi: no equivalent | Renewal        | User re-evaluates the quality of use of the innovation, seeks major modifications of or alternatives to present innovation to achieve increased impact on clients, examines new developments in the field, and explores new goals for self and the system.               |                          |   |

**Table 2: Correlation of CBAM and Levels of Use of Technology stages**

## 4.0 The 6 Facets Model

Technology Evaluation, Product and Process Integration, Planning, Implementation, Training, and Change are six important facets of Technology Management. These facets are all important areas of technology management, as evident by the extensive literature available for each subject. From a systems perspective, it is clear that these facets are also interrelated toward the common goal of effective implementation of change. Figure 2 below illustrates the facets of technology management. Note that each facet is connected to both technology management and the other facets. Each facet is related to each other facet, not just the neighboring facet.



**Figure 2: The facets of Technology Management**

Managing the effective implementation of change requires careful consideration of key principles. Each point is essential in avoiding the difficulties of as well as promoting and allowing for a successful implementation. Points can be broken down into the six facets of Technology Management.

Principles have been derived based on literature, and case studies presented in this thesis. The six facets tool is a summarization of the most important elements from each facet, which should not be overlooked when attempting to effectively implement change in an organization. The tool should be used to aid in the entire process of technology management, from selection to implementation. Each facet is reviewed throughout the process, as well as during post-implementation to ensure all principles are accounted for. Change is a continuous process, thus the model should also be used to aid in continuous improvement and re-evaluation of the current state. The model is applicable and should be used for the implementation of most changes. Appendix B is a one-page reference sheet, which documents the principles.

#### ***4.1 Technology Evaluation***

- *Progress Metrics:* During an implementation, progress should be measured with metrics to illustrate and quantify achievement of milestones, to aid team members in understanding what work is to be done, and to easily show successes and weaknesses in the project.
- *History:* It is desirable to gather input from organizations that have experience implementing the same or a similar system both within the company and outside. Input from current users would also be helpful in understanding system limitations and strengths.
- *Dedicated evaluators:* A team of users and decision makers should be enlisted to evaluate different systems and choose the appropriate alternative. A dedicated technology team will have the experience, authority, and interest in choosing the application that best suits the company's needs.
- *Fitness, Quality and Value:* Potential applications should be capable of meeting anticipated growth in the business, as well as various future opportunities for integration and improving processes. The system should improve organizational fitness, deliver a quality product, and



provide value to the company. The system shall produce a quality product, when given quality information or inputs. For example, if accurate information is entered, accurate information should be populated. Value can be determined using the value-centered technology method, creating a strong case for system implementation.

- *Human Factors:* If possible, applications should be created with human factors and ergonomics inherent in the designs. The methodology for performing operations should be intuitive, and the system should be user friendly. Some shortcomings can be overcome with training.

## ***4.2 Product & Process Integration***

- *Change process or system:* When integrating systems with business operations, it is important to consider the implications of changing a method or customizing an application to avoid changing a method. Costs must be considered, as well as the effectiveness of the current method and configuration. For example, a current practice could be employed to fit with the current operating system, while the new systems configuration would be more effective. Changes should be made with respect to future operations, and potential uses.
- *Document and communicate changes:* Any changes to operations and reasons for decisions must be documented. Having decision history can be instrumental in the event of turnover as well as in the future when architecture is questioned. Sometimes, without understanding the reasoning behind a change, accepting the new way is not possible.
- *Integrate legacy systems:* In most cases, choosing integrated over stand-alone systems allows for greater process improvements, and creates a more efficient system. Integrated systems also provide an effective way for eliminating and upgrading legacy systems. Integrated

systems reduce the number of operations, amount of manual input, and allow for seamless transfer of information. Be certain that the integration will provide value.

- *Determine needs:* It is essential to determine the needs of an organization, as well as the capabilities of the system. Activity chains can be helpful in mapping out current processes. These maps can locate process gaps and identify areas where the technology can be used to gain efficiency. Maps are also valuable in determining what the system must do and how it interfaces with other groups of people and other systems.
- *Maintain Links:* The links between Strategy and Process, Process and Technology, Process and People, and People and Technology must be maintained to develop the most effective system.

### **4.3 Planning**

- *Scope definition:* During the planning stages, it is essential to have a clear definition of scope. Scope prevents resources from being used for extraneous projects, and helps the project stay on budget. When projects are planned for a given scope, milestones can be defined and the specific details of a project can be determined. The scope also helps maintain the projects integrity and purpose.
- *Strong centralized leadership:* A strong central leader is necessary to keep a project on track. This is especially important if a change involves many functional groups, or even multiple brands. Having one leader to represent each group is often not enough to maintain authority and responsibility for a project.
- *Technology experience:* Team members should have experience with technology to better understand the projects needs. If vendor consultants are used, the consultant should have

demonstrated experience implementing technology as well as significant knowledge of the system to provide necessary support.

- *Cross-functional teams:* Planning teams should include users, representatives from all stakeholder groups, as well as members from all functional groups and levels. To gather needs, to better understand the goals for the system, to gather support, and to facilitate change, stakeholders and users must be involved in planning and developing how the new technology will be implemented and used. Additionally, cross-functional teams bring new perspectives to the project. Technology of Participation is a methodology that is helpful in illustrating the benefits of involving users and stakeholders during planning. The team should also consider ways to gather buy-in from their respective groups and serve as leaders to motivate and communicate the need for change.
- *Be specific:* Project plans should be as specific as possible, to accurately determine budget, time and resource needs. Examples of specifics include assigning resources to milestones through a work breakdown structure, budgeting for logistics of bringing in outside consultants and team members from satellite locations, and having detailed requirements for each milestone. More time spent during planning relates to fewer surprises and easier implementation.
- *Project Management Skills:* Having effective project management skills is essential in leading a change. Campisi offers a 9-step method for effective project management, and many other resources exist to learn proper management techniques. Some methodology should be employed by the project team to master each phase of the project, and carefully examine each aspect to not lose sight of the goals.

## **4.4 Implementation**

- *Test!:* When implementing a new technology, it must be sufficiently tested and evaluated to be released with the fewest glitches or bugs possible. Prototype, pilots, beta-tests, and test scripts are all proven methods of determining application functionality and system integrity. User satisfaction is greater when a quality system is delivered. Additionally, the vendor must deliver on promises and the details of vendor offerings should be determined prior to implementation, so all aspects of the system can be tested.
- *Human Factors:* In addition to choosing a system built and designed taking into account human factors, any additional changes, customizations, or configurations to the application should also consider human factors. Make the system intuitive and user friendly.
- *Contingency Plans:* Some contingency plans should be developed if errors occur in the system, or if some aspects cannot be implemented in the timeframe and budget allotted. Oftentimes manual workarounds are put in place until the system functioning properly. Old systems and new systems should be run in parallel until the new application's integrity is validated or the problems are fixed.
- *Communicate:* Frequent communication must occur between team members regarding status, obstacles, progress, limitations, and successes. Companies should invest in a robust process to facilitate such communication. It is important for all team members to understand what is occurring with the project, as well as to transfer status information to the business. Communication becomes especially important if problems arise which could affect the budget or schedule. In these cases, it is important to be honest about the project to gather support for any changes that must be made to the plan. Building trust and honesty about the project gives the project legitimacy and helps foster a change environment.

- *Evaluate Custom Developments:* Before attempting to customize the system based on user needs, investigate whether the change is requested due to an error or shortcoming of the system, or the users' resistance to change and lack of understanding of the process. In some cases the frustration with a system may be due to the user rather than the application.

## **4.5 Training**

- *Budget significant time and money:* Training is essential for making a system work and to reap its rewards. Each technology should be evaluated according to ease of use, changes from current practices, and level of importance. With increasing difficulty, change, and importance, more resources must be allocated to effectively transfer information to users. Even the most effectively planned and launched system is useless if no one knows how to operate it. Training logistics should also be spelled out to accurately budget resources for expenses such as training rooms, training computers and software, travel for trainers and trainees. Additional resources may be required to overcome system shortcomings by teaching users to deal with the difficulties or if the user community is not technically oriented, more time may be required for those users to adapt.
- *Provide documentation:* Documentation must be provided for users to reference during training and after. Reference materials are essential for users to help themselves, and relieve the burden of trainers. Users can learn more effectively by making notations to documents rather than attempting to absorb and write down information.
- *Schedule appropriately:* Training should be scheduled near the time when applications will be available for use. Users cannot be expected to retain all of the information for weeks or months before applying their knowledge. Timing should allow for training's three phases.

Initiation of a plan includes selecting a team of trainers and users, clarifying the mission of training, and establishing rules for training. Formal training and learning are the main focus of training and should be mapped out. The training session should be evaluated following training. Additionally, training does not end at a training session, users will continue to need assistance until they become acclimated with the system and feel comfortable using it.

- *Choose and communicate method:* Decide on the form of training: CBT, WBT, train the trainer, or a combination of those three. Then communicate to users how they will be trained. For example, if the train the trainer method will be used, make sure users understand their role and appreciate the responsibility. Offer options to suit learning styles, such as CBT and mentor sessions. Using adult learning methods, such as Transformational Learning, to relate information to the importance of use, benefits, and fit with daily activities. Training should be broken down for different levels and speeds of learning. Realize that learning will take time and be accepting of mistakes as users become acclimated with the methods.
- *Involve trainers early:* Trainers should be involved as early in the planning and implementation processes as possible, to begin preparing materials and to understand and learn the system. Trainers should be prepared to answer questions about specific applications and procedures as well as how the new activities fit into other tasks. When outsourcing training, it is often noted that trainers were very knowledgeable about the system, but were limited in their ability to answer business specific questions.
- *Power-users:* Power-users should be assigned and developed, as they are valuable resources for any technology change. These users are very knowledgeable with the system and can offer assistance to other users and provide a voice among functional groups to advocate improvements and needs. These users can help ease the burden of trainers and systems

administrators by decentralizing control of a system. Power users should also be involved early in the planning process or be planning team members. A power user can present valuable perspectives from the user community and obtain advanced system knowledge to be retained for assisting users later.

- *Make it Fun!:* To engage learners, training should be fun, to help hold interest and attention, as well as build enthusiasm and desire to learn and use the new application effectively.

## ***4.6 Change***

- *Corporate Support:* Corporate support is essential in changing the way operations are performed. With adequate direction, any change can be made. It is necessary to have support for integration to ensure that the system is used to the best of its abilities and properly integrated into the daily activities it was designed for. A clear strategic direction and vision allows changes to more easily occur, as users are guided and encouraged by the organization. In addition, corporate and project leadership must follow through with promises to help and lead a change.
- *Acquire buy-in:* If the team agrees to the change, it will occur in a smoother manner. For the team to agree to a change, the need must be realized. All stakeholders should buy into the idea to assist with bringing the project to fruition, and to make the change successfully. This can be aided by communicating goals, progress, and reasons for why the change is occurring. Emphasis on growth and foresight thinking can help promote enthusiasm.
- *Out with the Old:* To force a change to occur, disable the old technology. Users will resort to their old habits in emergency situations and be less likely to adapt to the change if the option

of not changing remains. Systems can be run in parallel until the new is completely ready, however, until they are disabled, progress in the new system is hindered.

- *Change is a process*: Acknowledge that change process and work through the CBAM steps to acclimate all stakeholders to the new methods. CBAM can also help gather buy-in, as users understand the company cares about their concerns. Realize that change is also an on-going process; it does not only happen for one new technology but evolves from that technology and from other sources. However it is a process that can be anticipated, managed, and controlled.
- *Respect*: Respect that change is a highly personal experience and that personal concerns are legitimate in dealing with situations arising from the implementation of change.



## **5.0 Methodology**

An empirical survey was conducted to obtain information regarding the Optiva implementation process at Bath and Body Works (BBW) and its relationship to the six facets model. Optiva is a database and program management software used to manage product development from concept to in-store.

A survey was chosen as a method for gathering information in a structured manner, to maintain consistency in acquiring data. The survey consisted of twenty-six free response, qualitative questions to gather background details and insight into the process.

Most of the questions were taken from Kumar, Maheshwari and Kumar's Investigation of critical management issues in ERP implementation. This investigation was chosen because of the similarity in technology being implemented and the goals of the survey. Questions 3-5, 9-18, and 21-24 were chosen based on the six facets and the relevance to the Optiva project. The remaining nine: 1, 2, 6, 7, 8, 19, 20, 25, and 26, were developed based on literature and previous knowledge of the project, to help draw out more discussion on key areas of the project. The survey appears in Appendix A.

The twenty-six questions were asked during in-person or phone interviews. One phone interview was a conference call with two team members from the BBW project management group, all others were one-on-one discussions. This method was chosen to ensure response and to afford the opportunity for clarification. Additionally, the live interview allowed for capture of bias. The bias is necessary when deciphering the attitudes toward change.

Interviewees were chosen based on recommendations from the Vice President of Purchasing and Packaging Operations (PPO). His recommendations consisted of twelve key project team members. Of the twelve, ten were surveyed. One additional member of the PPO team was chosen for interviewing based on previous knowledge of relationship to the project. All members suggested were willing participants, but not all were available to interview, therefore only ten were surveyed. Survey respondents held roles and responsibilities of executive steering, determining Information Technology (IT) strategy, project planning, scope administration, budgeting, resource allocation, scheduling, cost estimation, systems architecture and mapping, gathering user needs, training, and testing. All respondents had experience with technology implementations, however this does not affect the bias of the survey, due to the nature of the questions and the goal of understanding the implementation process.

All initial interviews took place during November 2003. On the Optiva timeline, this is the conclusion of the packaging module implementation and midway through the Advanced Program Management (APM) implementation (See case study for further explanation). Due to the timing of the initial surveys and the need for clarification, additional follow-up occurred in February 2004.

It is important to note that some general frustration existed amongst the team, toward the system and the project process. During the time of the interviews, problems were still occurring which allowed the team members to easily share current feelings, but still convey the positive

disposition necessary to see the benefits of the project. Due to the point in time the surveys were administered, capture of all the benefits and overall outcome of the project is not possible.

Techniques from Miles and Huberman, such as descriptive statistics, conceptually clustered matrices, with-in case analysis, and cross-function analysis were used to analyze the survey results (79-150). The survey responses are compiled in Appendix C. The interpretations of these results and tables from the analysis appear throughout the case study, as they relate to the story and the six facets.

## **6.0 Bath & Body Works Case Study**

### ***6.1 Introduction***

Bath and Body Works (BBW), a division of Limited Brands, is a retailer of personal care products for body, face, and hair. Products are sold only in Bath and Body Works' retail locations throughout the United States. Victoria's Secret Beauty (VSB) is a sister company, producing similar products for sale in Victoria's Secret retail stores. The companies recently completed the implementation of a database and product management software system used to maintain component data, specifications, test records, bills of material, formulas, cost sheets and timelines. The system is called Optiva and is produced by Formation Systems. It is a company wide system used by most departments and functional groups for various tasks. It is an integrated system for maintaining product records from development to in-store with a goal of reducing time to market by more efficiently managing product development. Due to the fact that the program is centrally managed, system architecture must match for both businesses to make it economical, and easier to maintain.

BBW has been chosen as a case study because the decision to implement was based on organizational and strategic needs to upgrade and integrate a growing business. The need for this change was felt on both the corporate and user level. These needs and the decisions throughout the case are not uncommon; thus this case study illustrates a valuable example of the necessity for effective implementation of change. Although great planning has been done from a strategic point of view, tactical planning, for execution of implementation, has overlooked some of the keys to successful implementation.

## **6.2 History**

Operations for BBW are located in Reynoldsburg, Ohio; Paramus, New Jersey; and New York City, New York. Product (Formula) Development, Packaging Development, and Purchasing departments are located in New York and New Jersey. All other functions such as regulatory, program management, gift sets, and executive staff are located in Ohio. Organizationally, the enterprise is decentralized with centralized information technology (IT) support. The IT group leads the planning and implementation team.

Optiva was initially implemented as an electronic lab book for formula development and regulatory control in early 2001. The system was purchased in 1999 and was extensively tested, including a three-month beta-test, and implemented in the regulatory and product development departments in New York, New Jersey, and Ohio. Users were trained with a half-day training session, one-on-one sessions, and using Computer Based Training (CBT), which could last from 2 hours to 2 weeks. In addition, users were given mentor support. The system was dually implemented at VSB. The systems were developed with the same architecture, but are used differently. BBW enters data into each required field creating a database while VSB scans documents to retain information for regulatory purposes. Users were trained using automated Computer Based Training (CBT), which ran a series of scripts. Lacking executive support, Regulatory for BBW has taken over the data entry and systems maintenance of Optiva and the product development department does not optimally use the system.

In spring 2002, the Packaging development department began looking for a replacement for their provisional specification management system. The current system, WebPDM, was adapted from the apparel industry and thus did not serve all the needs for package development and was not a true database. The packaging staff began gathering needs and investigating replacements. Optiva's Packaging module was chosen as the system to replace WebPDM. Simultaneously, an in-house team was developing replacement project management software called Launch. In 2002, Launch's progress was slow and the budget was rapidly diminishing, so vendors were brought in to give presentations on other software options. Formation Systems presented their new Advanced Program Management (APM) module. The decision to implement the two modules was the integrated solution to serve both needs. A Project Approval Request (PAR) was put together for the Packaging and APM modules of Optiva, as well as modules for labeling, testing, and sourcing.

### ***6.3 Formation Systems***

"Formation Systems develops Optiva, a suite of product development software for the process industries. Its mission is to ensure a company's best ideas become the world's greatest products" (Formation 1). The company has provided software solutions to companies such as The Coca-Cola Company, Kerry Group plc, Golden State Foods and Rich Products.

### ***6.4 Project New View***

Concurrent to the software searches, BBW underwent massive internal restructuring and operations changes called Project New View (PNV). Limited Brands previously purchased and incorporated product and package development from what was Gryphon Development. Gryphon

Development was a wholly owned subsidiary of Limited Brands with responsibility for managing the new product development and contract manufacturing of cosmetics, fragrances and toiletry products for BBW and VSB stores. In mid-2000, the Gryphon associates were fully integrated into BBW and VSB with most of the Gryphon staff becoming either BBW or VSB employees.

In response to the ever-growing market pressures for continued sales growth, Limited Brands called for a change. PNV began in late spring 2002 with the goals of streamlining speed to market, eliminating unnecessary cost and redundancy in job function, clarifying roles and responsibilities, and realigning departments for better operational efficiency. The most notable changes include bringing in consultants, hiring a new executive staff, and the development of the Innovative New Product Process (INPP).

INPP is the new methodology for project management and product development. It includes detailed project timelines, project tasks, milestones, milestone owners, and project facilitators. For the INPP to be effective, it became increasingly necessary to update the antiquated project management system, PET. INPP creates many new meetings and forces more communication between the different functional groups. It assigns more responsibility and accountability. The outlook and plan projected the amount and frequency of projects to greatly increase, thus producing many more formulas and components, placing higher demands on the software systems.

## ***6.5 Optiva APM, Packaging, and the 6 Facets of Technology Management***

Optiva was implemented on an accelerated schedule to ensure the profitability of the investment, aid in facilitating the new development process and respond to the growing needs of the organization. The system's entire selection, planning, approval, programming, training, and implementation process occurred in a time span of less than two years. Recall investigations began in early 2002 for replacement systems, culminating with PAR approval in mid-2003. The remainder of 2003 accommodated all of the programming and configurations for the system, as well as testing, and training. Rollout occurred in the last quarter of 2003 and first quarter of 2004. The following sections continue to tell the story of the change at BBW as it relates to the six facets of technology management.

### ***6.5.1 Technology Evaluation***

Several questions relate to technology evaluation; criteria for system selection, system strengths, weaknesses and limitations, other systems investigated, as well as project success criteria. The response summarizations that follow further elaborate on Optiva's qualities and potential as an integrated system with extensive capabilities to aid in the product development process. In terms of selecting a system, the team needed to evaluate based on the value of each alternative. For the project to be successful, user needs must be met and time to market must be reduced through the use of a quality system.

The key criterion for system selection was integration. Other criteria include robustness, potential for external vendor access, analytical ability, database capability, and future



functionality. Table 3 is a summary of these criteria, based on functional role. Perceived criteria did vary by functional group, but focused on the same aspects.

| Role                         | User       | Program/Admin | Decision Maker           |
|------------------------------|------------|---------------|--------------------------|
| Perceived selection criteria | Integrated | Database      | Integrated               |
|                              | Database   | Interface     | Database                 |
|                              |            | Experience    | Function for both brands |

**Table 3: Respondent expressed selection criteria, based on functional role**

The major strength of Optiva is the ability to integrate with other modules as well interface with other applications. Table 4 summarizes the strengths of the system, as expressed by the survey respondents. The potential to interface offers the opportunity to link with costing systems and external supplier systems. However, interface links were not part of the scope for this implementation. In addition to the integration, Optiva has tremendous database capabilities, which reduce the amount of work necessary for each new project. Similar materials and dimensions can be used to reduce the creation of completely new system entries and to optimize cost and resources. It offers flexibility and efficiency. The system is configurable to allow it to perform as desired.

| System Strengths     | % Responses |
|----------------------|-------------|
| Integration          | 36%         |
| Powerful             | 21%         |
| Database             | 14%         |
| Configurability      | 14%         |
| Cost Effective       | 7%          |
| Efficiency of Effort | 7%          |

**Table 4: Respondent expressed system strengths (n=14)**

Optiva does have weaknesses. Table 5 summarizes the weaknesses of the system as expressed by the survey respondents. The major weakness is the lack of user friendliness. The user interface and structure is not always intuitive. Programming the system to work as desired requires

significant resources of time, money, and experience. These issues prevent the system from performing as planned. Although the goals are still achievable, the attainment is not immediate. Users must become accustomed to the system and changes, need to be made to allow users to access its full potential, such as creating additional searches and reports.

| <b>System Weaknesses</b>       | <b>% Responses</b> |
|--------------------------------|--------------------|
| Not Intuitive or user friendly | 27%                |
| Formation Systems methods      | 27%                |
| Bugs                           | 18%                |
| Complex                        | 18%                |
| Cost                           | 9%                 |

**Table 5: Respondent expressed system weaknesses (n=11)**

In addition to its weaknesses, Optiva does not have the inherent reporting capabilities desired. Each report function must be individually programmed or interfaced with a database tool to perform. Gathering data from Optiva is a major selling point for the software and has become a major disappointment for users. Some feel misled by Formations, others feel the system is lacking. Table 6 summarizes the limitations of the system, as expressed by the survey respondents.

| <b>System Limitations</b>     | <b>% Responses</b> |
|-------------------------------|--------------------|
| Reporting & Searching         | 42%                |
| Formation Systems             | 25%                |
| Overhead for servers          | 17%                |
| Low level user access control | 17%                |

**Table 6: Respondent expressed system limitations (n=12)**

Other systems were extensively investigated for the packaging specification module, as well as the possibility to build a custom system. While an in-house team attempted to build Launch, Formations presented the Optiva APM module. It became an obvious choice, as it already

existed in the company and met all other criteria. Information was gathered from other Optiva customers to gain a better understanding of the systems capabilities.

Success Criteria tended to vary depending on functional level, but is focused on quality. The question was stated to obtain the respondents individual views of success, allowing for it to vary from the project goal. Table 7 below is a summary of responses, with the percentage of total times each was expressed as a criteria.

| Criteria for Success                            | % Responses |
|---|-------------|
| Meet User Needs                                 | 19%         |
| Quality information in, quality information out | 19%         |
| Data to aid in Metrics & Analysis               | 19%         |
| Less quality issues, returns due to quality     | 14%         |
| Reduce Time to Market                           | 10%         |
| More visibility of information, Ability to      | 10%         |
| On-Time   | 5%          |
| On-Budget                                       | 5%          |

**Table 7: Criteria for Success Responses (n=21)**

### ***6.5.2 Integration***

Integration is a key component to effective technology management and a main goal at BBW. At BBW this integration between systems, by using just one, in combination with the operations changes, makes the product development process smoother with better visibility of resource links and milestones.

The main goal or vision for developing and implementing Optiva was to integrate and streamline product development from concept to in store. This enables the INPP, maximizes efforts, and prepares for future growth. In addition, the system should facilitate a faster method of product development, as well as provide better metrics, visibility, and history. The formula module was

to provide an electronic notebook for better record keeping and history, as well as expediting time to market. The packaging module was to maintain a database of all components and used to expedite the process, and allow for savings in development time and duplication of efforts. Using the system for project management forces involvement from various functional groups, as milestones are approved and bills of material are reviewed. Table 8 is a summary of the goals of Optiva, based on functional role. Perceived goal did vary by functional group, but focused on the same aspects.

| <b>Role</b>           | <b>Users</b>    | <b>Programmers/ Systems Administrators</b> | <b>Decision Makers</b> |
|-----------------------|-----------------|--|------------------------|
| <b>Goal of Optiva</b> | Process enabler | Integrated Product Development             | Process Enabler        |
|                       | Control Process | Infrastructure for Growth                  | Control Process        |
|                       | Manage projects | Automate Process                           |                        |

**Table 8: Goal for implementing Optiva based on functional role**

Optiva is a solution for interfacing timelines with bills of material for formulas and packaging, as well as artwork and testing, creating a complete product history and record. It also has the capability to track cost and interface with external costing systems. Minimizing the gaps in the process creates a smoother process and eliminates duplication of effort and maintains visibility of all pieces of the project.

Choices were required to decide if the system should be changed or the business process. As an example, the decision needed to be made in terms of creating unique items. Some components were ordered and received as mated components, such as a tube with cap. In WebPDM, this was considered one component. Optiva required the tube and cap to be separate entries. Optiva's granularity, allows for components to be separated, which requires a change in procedure.

Creating one entity would suffice for current operations, however to be efficient, in the future, the Optiva configuration was more effective.

Understanding why changes were made from current practices with was not communicated effectively and thus users became frustrated with having to create more entities and did not see the value of such a step. There are hundreds of system nuances similar to the tube/cap scenario that can lead to user frustration.

### ***6.5.3 Planning***

As planning is the most important step in Technology Management, it is crucial to note the constraints placed on these activities. At BBW and in other companies, time and money are scarce. A balance must be reached to properly allocate resources. Planning questions focused on team composition, member selection criteria, experience and involvement, scope, schedule and budget changes and challenges. The responses help illustrate the magnitude of the project and the amount of resources needed to make this great change, likened to turning a battleship around.

BBW did a great job in forming a team representing all involved functional groups. The project team was formed based on an established process at Limited Brands, whereby the appropriate systems personnel and decision makers were involved. The project team included upwards of sixteen key people in BBW, VSB, Limited Technology Services (LTS), and Limited Logistics Services (LLS). The team had a total of four project managers at any time, one from LTS, one from LLS and one each from BBW and VSB. The LTS project manager changed one time over the course of the implementation, because the first manager left on maternity leave. The BBW

segment, of the team, included three systems people, the Brand Relations Executive (BRE), a project manager, and systems administrator, as well as a small team from the packaging user group, and one additional steering committee member. The VSB team was identical, except the systems administrator was also the project manager. Project Managers from LTS were chosen through a well-established process. Other team members include LTS technical support personnel, including programmers, four members from LLS and six from Regulatory. The executive steering committee includes vice presidents and executive vice presidents from each brand. It serves as the higher level decision making team and keeps the project moving along. A consultant from Formations also participated in planning. There was no single or central project manager with interest in making the system work best for all stakeholders; rather the project was managed by committee. No authority was present to keep VSB aligned with BBW. Table 9 below categorizes the team members surveyed based on functional role.

| <b>Functional Role</b>         | <b>Number</b> |
|--------------------------------|---------------|
| Decision Makers                | 4             |
| User                           | 4             |
| System Maintenance/Programming | 3             |

**Table 9: Functional role of team members surveyed**

Initially, the BBW packaging staff led the campaign for a new system and was very involved in planning to gather needs and also help to develop buy-in. The project plan was developed in an aggressive manner, under a tight budget, to help the project remain profitable and recover the investment made in the Launch process. The overall project plan reflected an inclusion of major facets of the project, however it lacked some of the detailed planning necessary to account for all resources and expenses, such as training costs and adequate time for testing.

All team members have prior experience with new technology implementation and some specialize in it (Reference appendix table C3). This experience was very helpful in relating user needs to system capabilities as well as understanding the requirements of the team. Involvement on the team began when the functional necessity was realized. Some team members participated in system selection and preparing the PAR, while others were brought on after PAR approval. The final project team could not be determined until funding was approved. Interestingly, only LTS planning team members were involved in all three implementations, Formula, APM, and packaging, while none of the current Formula module users were involved in planning. A few respondents likened it to “happening in a vacuum”, feeling that history was not adequately researched during planning. One belief is that team members expected Formation Systems to make up for previous shortcomings.

In addition to the businesses being located in 3 different states, the project team was also located in three different states. Most systems administrators and programmers were located in New York, while the majority of decision makers were located in Columbus. Although the company operates a twice-daily shuttle from New York to Ohio, no travel was included in the budget. In addition, resources such as system administration were not originally included in the budget because these members are staff employees. However, Limited Finance changed procedures and began counting man-hours into the projects' budget.

Table 10 summarizes the changes made to scope, schedule and budget, as well as the reasons for these changes.

| Plan Changed      | Scope           | Schedule                      | Budget            |
|-------------------|-----------------|-------------------------------|-------------------|
| Reason for Change | Security        | 2 Brands                      | Resource charging |
|                   | Control Process | More complex than anticipated | Scope definition  |
|                   | Configuration   | Scope                         | VSB alignment     |
|                   |                 | No one has used it            |                   |
|                   |                 | Strategy change               |                   |
|                   |                 | Bugs                          |                   |

**Table 10: Reasons for plan changes during project, expressed by respondents**

Two major issues exist in terms of project planning: two brands and a moving target. Both of these issues caused strain on an already tight budget. The two brands, BBW and VSB, have very similar needs but occasionally differing processes, and fewer resources, as the VSB business is smaller. Attempting to get the two autonomous brands aligned to produce a single platform required many meetings. Additionally, BBW had more at stake to make Optiva a success due to Launch's lack of fruition, so more effort was given from the BBW brand to make Optiva work.

The second problem stems from the internal restructuring. The need for Optiva as an integrated system arose from PNV, as the facilitator of the INPP. As INPP was being developed and perfected, so was Optiva's architecture. As changes were made in INPP, equal changes were required in Optiva's programming. Some changes required an expansion of project scope, which was not clearly outlined in the PAR. These issues and "bugs", or programming errors, in Optiva delayed the launch of the APM module from August to October, with it not fully functional until April 2004. The launch in VSB did not occur simultaneously with BBW. It did not begin rolling-out APM until February 2004.

The packaging module was pushed by the packaging department and as such Packaging was rolled-out on time in late August 2003; however use by the majority of users did not occur until mid-October. The packaging module was launched with problems ranging from programming



flaws to minor setup problems. The programming flaws could have been prevented with more resources in the planning stage, while the minor changes could only be realized through system use.

Stemming from the aforementioned issues, the scope of the project was not clearly defined at the start. Some features were not included in the budget, but remained vital aspects of system functionality, such as downloading component costs. In addition, original intentions included the Packaging, APM, Sourcing, Testing, and Labeling modules for implementation. However, due to unforeseen budget and time constraints in implementing Packaging and APM, to avoid limiting the system's capabilities, supplemental PARs were necessary to implement the remaining three modules.

#### ***6.3.4 Implementation***

Implementation is the key time when plans are realized and change begins to become a reality. Again, the challenge is limited time and people. Deciding how much time can be spent during testing and programming to produce an adequate system and determining adequacy are important decisions to be made. Quality, testing, roll-out, and programming were the focus of questions dealing with implementation.

Integrated systems decrease the time necessary to perform tasks and increase quality by reducing disconnects and manual communications. Typically when a new software is implemented at BBW, and in other firms, a pilot program is used to help find programming errors, to understand how the system functions, and to gain a better estimation of what the full implementation will

require. This can occur in up to 3 stages, with an alpha version tested by expert users, a beta version with more users, and the final version for regular use. As part of the PAR, the implementation of Optiva was considered an upgrade, due to the presence of the Formula module, as well as having current systems in place for both packaging specifications and project management. Given the approved budget and timeline, no pilot was tested prior to full system implementation.

However, testing did occur for these modules, as they were in fact quite different from previous applications, as well as the Formula module. The vendor recommends two weeks of testing, while BBW did one week. A testing environment was created for system administrators to perform some basic process steps with users and for training. Systems personnel administered the test scripts with a user present. The goal of testing is to determine if programmed processes performed as desired. The testing is rather ineffective from the user's perspective, as he/she usually has too little knowledge of the actual procedure's goal or is too overwhelmed by the new system, to make observations of its success or failure. No stress testing was done to determine if the system could handle the over 200 users that would need daily access. Project timelines were entered in parallel, to Optiva and PET for accuracy testing. This also kept the projects on track until all users could access the new timelines.

Another frustration, with Formation Systems and Optiva, is that system flaws can only be corrected with upgrades, rather than "patches". Optiva's APM module is fairly new, and as such it experiences occasional errors. However when Formations chooses to fix the errors, the change must be made in the form of an entire system upgrade. This requires more time and effort to

perform rather than just fixing the problem. The number of upgrades during the implementation process slowed progress.

The question was asked, “How much customization was needed?” The answer varied on interpretation. The system is useable when installed, but configurations are needed to make it operate according to the business needs. These configurations include adding databases of vendors and materials, making rules for creating new objects and security features. These changes are all made using programming and do not involve Formations making a change to the system. Very few changes were actually made to the system’s program code, less than 5% on one account.

The staggered method of implementation has eased some of the stress and confusion. The packaging staff experienced the most change with the Optiva implementation, as they are the key users for the packaging module, and use the APM module as well. Having been exposed to the packaging module, packaging users had an easier time adding to their knowledge base when learning APM.

### ***6.3.5 Training***

Training was a major area of concern for users and an area that was greatly overlooked during planning. BBW dealt with problems including turnover and limited resources to adequately train users. Questions focusing on training organization, facilitation and challenges revealed some difficulties and weaknesses in the process.

The major challenge in training was time. The time to identify users and scheduling training was limited. The time to prepare documentation and extensively train was under budgeted. In terms of timing, packaging training occurred before the system was available to all users. For the APM module, training occurred before all timelines were inputted to the new system, so most users did not have the necessity or ability to use the system. The time constraint also made it difficult to transfer all of the system knowledge required to effectively use the system. Table 10 summarizes the training challenges, experienced during the Optiva implementation.

| Training Challenges                       |
|---|
| * No application background               |
| * Optiva-phob                             |
| * Aggressive schedule & Timing            |
| * Availability of users                   |
| * Miscalculation of resource requirements |
| * Scope                                   |
| * Identification of users                 |
| * Number of users to be trained           |

**Table 10: Training challenges as expressed by respondents**

Training was budgeted as an upgrade for packaging and used a train the trainer approach. The approach may have been effective; however all of the original trainees left the company. Subsequently, the system administrators trained packaging users. Administrators were chosen as trainers based on systems knowledge, rather than professional training experience. In BBW, this consisted of two half-day sessions in a test environment. The trainees were not given any documentation, but a member of the LTS Learning Center was present to take notes and prepare documentation. Due to inadequate training, lack of available support personnel and increased workloads, new users did not have the tools necessary to begin using the system, and no power-users were identified for help with the system. Some users were trained on methods and system applications that were not available at the time of training and were not able to practice their

learnings for months, thus rendering their training useless. Most users required refresher training and had many questions. Training closer to go-live would have alleviated these troubles, giving users the opportunity to immediately apply and practice what was just taught. Without crucial documentation, Optiva was not used until late September 2003, when one user created a training manual. The manual enabled the team to use the system. In VSB, training documentation, including a comprehensive, business specific manual and several job aids, were created during testing. Training varied from three half-day sessions to one two-hour session.

For the APM module, the LTS Learning Center was brought in to train all users over a three-week period. However, the Learning Center team was not involved with planning or implementation, and consequently had limited systems knowledge. Trainers had difficulty answering operations questions and some functionality questions of how the system could perform outside the trained procedures because of their late entry into the project. Documentation was created for four training segments and was facilitated by the Learning Center with assistance from the systems administrator. The APM module was new to all users and affected nearly 200 users, thus the training budget was larger, to accommodate the mass.

Table 11 compares the training for APM and Packaging between brands with respect to facilitation, training method, duration, and documentation.

|                             | APM Module  |             | Packaging Module |           |
|-----------------------------|-------------|-------------|------------------|-----------|
|                             | BBW         | VSB         | BBW              | VSB       |
| <b>Training Facilitator</b> | LTS         | LTS         | Admin            | Admin     |
| <b>Method of Training</b>   | Classroom   | Classroom   | Classroom        | Classroom |
| <b>Max Time of Training</b> | .5 day/task | .5 day/task | 1 day            | 1.5 day   |
| <b>Documentation</b>        | Yes         | Yes         | No               | Yes       |

Table 11: Compares training for 2 Optiva modules, APM and Packaging. Compares training for BBW and VSB

### **6.3.6 Change**

In addition to institutionalizing the use of a new software program, BBW underwent many changes including an entire change in business strategy. The need for Optiva was developed before the operations changes occurred, however the changes increased its necessity. Functional involvement and corporate support were key ingredients to the effectiveness of this change. Additional factors in change are the institutionalization of Optiva, shakedown challenges, strengths and weaknesses of the process, infrastructure capabilities, resources, and other obstacles.

The majority of team members felt functional involvement was sufficient, as expressed in table 12 below. A considerable difficulty in functional involvement was turnover in the Packaging Department. At the time of roll-out, only one member of the four-member team remained, so decision history was lost. When the LTS project manager left on maternity leave, her replacement did not have the same understanding of the system or the project. In Packaging, although the team was previously able to express the group's needs, it was unable to capitalize on all of them due to budgetary, organizational and time constraints. Additionally, the team members were not replaced leaving the department with a weakened voice for advocating needs.

| <b>Enough<br/>Functional<br/>Involvement</b> | <b>%<br/>Respondents</b> |
|--|--------------------------|
| Yes  | 73%                      |
| No   | 18%                      |
| Yes & No                                     | 9%                       |

**Table 12: Respondents expressing if there was enough functional support**

PNV, INPP, hiring of a new president and executive staff, and dissolving Gryphon Development mark the beginning of major changes at BBW. All of these changes occurred at relatively the

same time. As previously stated, the direction for Optiva came from the executive staff. Corporate support is vital for project implementation success. Corporate support drives the desire for users to adapt and accept a change. For the current phase of the Optiva project, corporate support was not only sufficient but drove the process. The PAR was approved in less time than usual and the corporate team maintained and accelerated the project's progress. As illustrated in table 13 below, all survey respondents felt corporate support was sufficient for this project.

| <b>Enough<br/>corporate<br/>support</b> | <b>%<br/>Respondents</b> |
|---|--------------------------|
| Yes                                     | 100%                     |
| No                                      | 0%                       |

**Table 13: Respondents expressing if there was enough corporate support**

Aside from overcoming the changes in business strategy, the major challenge in effectively implementing Optiva, has been helping users become acclimated to the system with its imperfections and non-intuitive structure. A common issue is that most users are not computer savvy and thus take longer to learn a new computer tool. Users had a desire to learn and improve the process, but lacked the abilities to adapt quickly to the new system. Due to the accelerated schedule, understaffing, and under-budgeted training, the packaging module was launched in less than perfect condition. It contained some securities flaws, some un-populated databases, and unexplained and overlooked changes to operating procedures. The APM module roll-out has been slow due to the necessity to "back-load" old timelines that have not been completed for in-progress projects. Completion is not expected until April 2004. The lack of populated timelines and unconverted specifications means that the old system and new system must be operated in parallel, delaying the realization of decreased time to market. The staggered module roll-out aids the acclimation and change process, and relieves pressures on both the trainer and the trainee.

Other change challenges noted during shakedown include difficulty getting reports, and lack of interfacing which requires converting. Resource allocation and budget in terms of making improvements or preparing the next module, new packaging staff, and concern whether the implementation will be an improvement are noted obstacles. Struggling with the failure of Launch to justify Optiva, lacking support for Macintosh machines and miscalculation of resource requirements and training documentation development time presented additional difficulties. Table 14 is a summary of shakedown challenges.

| Shakedown Challenges |                                 |
|----------------------|---------------------------------|
| *                    | Turnover                        |
| *                    | Identify gaps between new & old |
| *                    | Paradigm change                 |
| *                    | Conversion of data              |
| *                    | Number of users                 |
| *                    | Lack of reports and access      |
| *                    | Resource allocation             |
| *                    | Unsatisfied needs               |
| *                    | Budget                          |

Table 14: Respondent expressed shakedown challenges

Many steps have been taken to stress the importance of Optiva as a tool to improve business operations. Some of these key change management initiatives undertaken to institutionalize Optiva throughout the organization are summarized in table 15.

| Institutionalization Methods |             |
|------------------------------|-------------|
| Used                         | % Responses |
| INPP Buy-in                  | 40%         |
| Corporate Direction          | 40%         |
| Document issues              | 13%         |
| Remove old system            | 7%          |

Table 15: Respondent expressed institutionalization methods used (n=15)



The technology implementation process at Limited Brands is a well-established process to submit a PAR and assign a project manager from LTS. For most projects, the same core technical personnel are involved for each project, such as the BRE, systems administrators, and most of the Executive Steering Committee. Variables include affected functional group and the experts in each affected group. This project and case study exposed some weaknesses and applauded some strengths of the process, as summarized in tables 16 and 17, respectively.

| <b>Weaknesses of Process</b>      | <b>% Responses</b> |
|-----------------------------------|--------------------|
| Communication between brands      | 27%                |
| Need higher level project manager | 20%                |
| Rushed                            | 20%                |
| Gaps                              | 7%                 |
| Evaluate needs                    | 7%                 |
| Pressure from functional groups   | 7%                 |
| Resource allocation               | 7%                 |
| No LTS accountability             | 7%                 |

**Table 16: Respondent expressed process weaknesses (n=15)**

| <b>Strengths of Process</b> | <b>% Responses</b> |
|-----------------------------|--------------------|
| Predictable & Reusable      | 25%                |
| Teamwork                    | 25%                |
| Ingredients                 | 13%                |
| Rapid Deployment            | 13%                |
| Cost Effective              | 13%                |
| Commitment                  | 13%                |

**Table 17: Respondent expressed process strengths (n=8)**

In terms of outfitting the infrastructure to support the new system, Optiva has not been stress tested to withstand all 500 users. A change in program location is anticipated, from desktop to server applications, as well as a need to increase network capacity, but the need can only be seen as more users become active. No accountability has been set to ensure that issues are addressed should they arise.

Major obstacles in the implementation of Optiva, in Table 18, focus on problems already discusses. Changes focus on problems due to the change process rather than the systems complexity.

| <b>Major Obstacles</b>         | <b>% Responses<br/>(n=13)</b> |
|--------------------------------|-------------------------------|
| Budget                         | 23%                           |
| Scope                          | 23%                           |
| Brands                         | 8%                            |
| Complexity                     | 8%                            |
| Paradigm change/Culture change | 8%                            |
| Understanding role             | 8%                            |
| Compliance                     | 8%                            |
| Reorganization                 | 8%                            |
| Turnover                       | 8%                            |

**Table 18: Major Obstacles in Implementation**

The question was asked of all the survey respondents, “Given the same set of resources (time, staff, budget), what would you do differently?” The responses varied but focused on improving the relationship with VSB to have better alignment and less duplication of effort, and allocating time differently. Repeat suggestions for time allocation include spending more time in the planning phase to enable implementation to go more smoothly and spending more time on testing. Other suggestions include, asking different questions in regards to Formation Systems and what will be delivered, reordering implementation, and defining scope clearly. Table 19 summarizes these suggestions.

| <b>Reallocation of resources</b> |
|----------------------------------|
| * Brand alignment                |
| * Timeline                       |
| * Time in Design                 |
| * Time in Training               |
| * Reorder Implementations        |
| * Time in Testing                |
| * Separate Implementations       |
| * Clear scope                    |

**Table 19: Given the same set of resources, respondent expressed suggestions for how to better allocate resources**

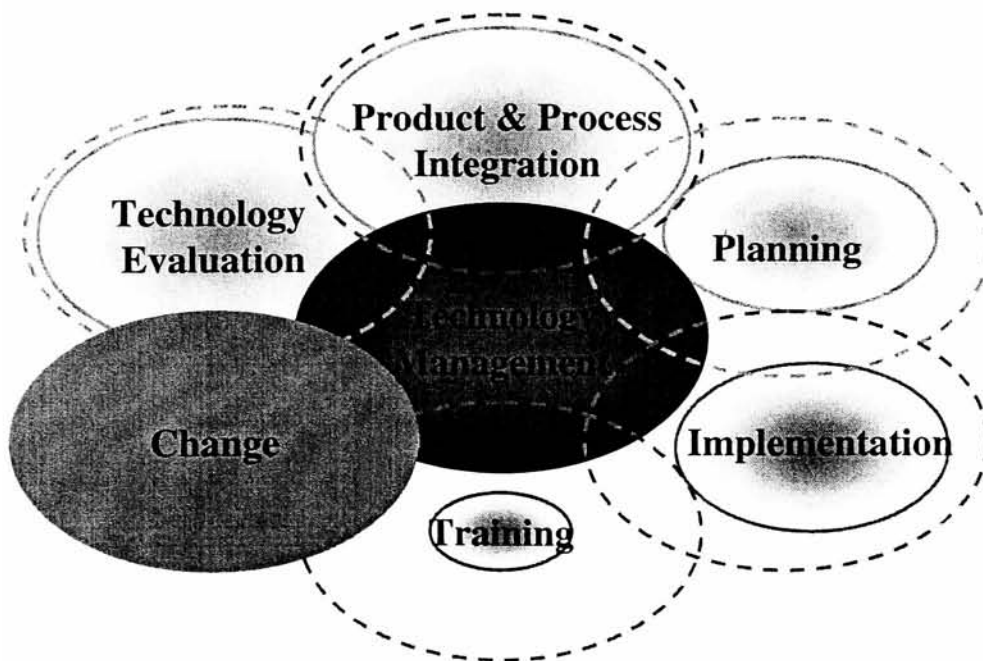
## **6.6 Outcome**

Although the process was not always smooth, the system has been implemented. Users and team member alike have pulled together to make the system work. Throughout the project, users felt the need for Optiva, but were frustrated with the way the project was handled. In response, a SWOT team has been initiated to address the Strengths, Weaknesses, Opportunities, and Threats of Optiva. This team has been instrumental in collaborating common issues and creating a channel for resolution.

BBW has allocated resources in a manner necessary to produce a system to meet needs while allowing for improvements to be made. It is clear that training was the most significant shortcoming during this process. This shortcoming was caused by under budgeted training and failure to realize its necessity. Most other qualities for an effective change implementation were present including the keys to success for this project:

- Commitment and direction of management
- Need felt by users and commitment to success
- Involving stakeholders in determining needs
- Integration of legacy systems
- Experience with Optiva and other technologies
- Established Implementation process

Figure 3 below is a qualitative representation of the Optiva implementation process at BBW. BBW excelled in the area of change. Technology evaluation was successful except for not utilizing the experience with Optiva within the organization. Integration was very effective, however more communication and documentation would have eased the process. Planning fell short in terms of being specific and identifying scope. The implementation phase accounted for all the principles, but was lacking in terms of testing and communication. Training was by far the most overlooked area and required more emphasis.



**Figure 3: Model to represent the qualitative outcome of the Optiva implementation process**

As with any change, it is not an event, such as turning on a new system, it is a process. At BBW, this process includes the operations changes, as well as the implementation of a new technology. The change has been implemented, and some of goals have already been met. However, due to the newness of the implementation, the extent of its success will not be realized for some time.

## **7.0 Conclusion**

The six facets model is a systems approach to technology management, in terms of making change. Through examining the benefits and challenges of each facet, the six facets incorporate different aspects of technology management linked together to provide the interrelationship of efficiently making change. The goal of the methodology is to provide a checklist for consideration of points necessary to provide the foundation and create the opportunity to allow for an effective change implementation. The model provides a framework to be used in conjunction with project management tools as a means for evaluating the opportunities for use of a current technology, need for a new technology, integration within the organization, and reviewing past experiences. It also incorporates the necessary aspects of training, planning, and implementation. The principles are explicit in incorporating the human factor of change and the personal concerns of making change. The model is applicable to most changes, however is specifically related to the implementation of operations management and information systems.

Although Bath and Body Works did not have the model to plan and effectively implement Optiva, it is clear that the survey validates the model. The results show where addressing the six facets could have prevented delays and reduced opportunities for underestimating the budget. Considering all principles could reduce the difficulties felt by users in having needs met, easing the transition, and making the overall process easier and more efficient. The company feels that the model will be beneficial and plans to present it to Limited Technology Services for future use.

## **8.0 Limitations and Future Research**

All of the data acquired during the case study is qualitative and at this time, no attempts have been made to quantify details and aspects of the case. As previously stated in the scope, analysis in terms of selecting a system based on return on investment is not deeply covered. The focus is on examining key principles of the six facets after a technology has been selected.

Future research opportunities lie in the area of technology selection and determining and quantifying implementation value. Additional research can be done to analyze user reaction to the change and implementation, in a quantifiable manner.

The tool could be re-evaluated as a prescriptive tool. Using a survey and the figure to depict quantitatively the strengths and weaknesses of a particular implementation either prior to embarking on the change or during the process to give the opportunity to improve the current project. This tool could be an online tool used to identify areas where emphasis of a current project is needed to strengthen the change process.

With respect to the case, it would be beneficial to reexamine the project in time, to better understand the outcome. A new survey could gauge the realization of project goals and examine post-implementation discussion. It would also be beneficial to survey the company again to review the effectiveness of the model in future changes, if the model is used. Although BBW was the focus of the survey, more investigation of the VSB change process would be insightful to understand the effect of the slower schedule and advantages of being second to implement. This could identify the benefits and opportunities of increased communication between brands.

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## **Appendix A – Survey question sheet**

### **Questions on Optiva Implementation at Bath & Body Works**

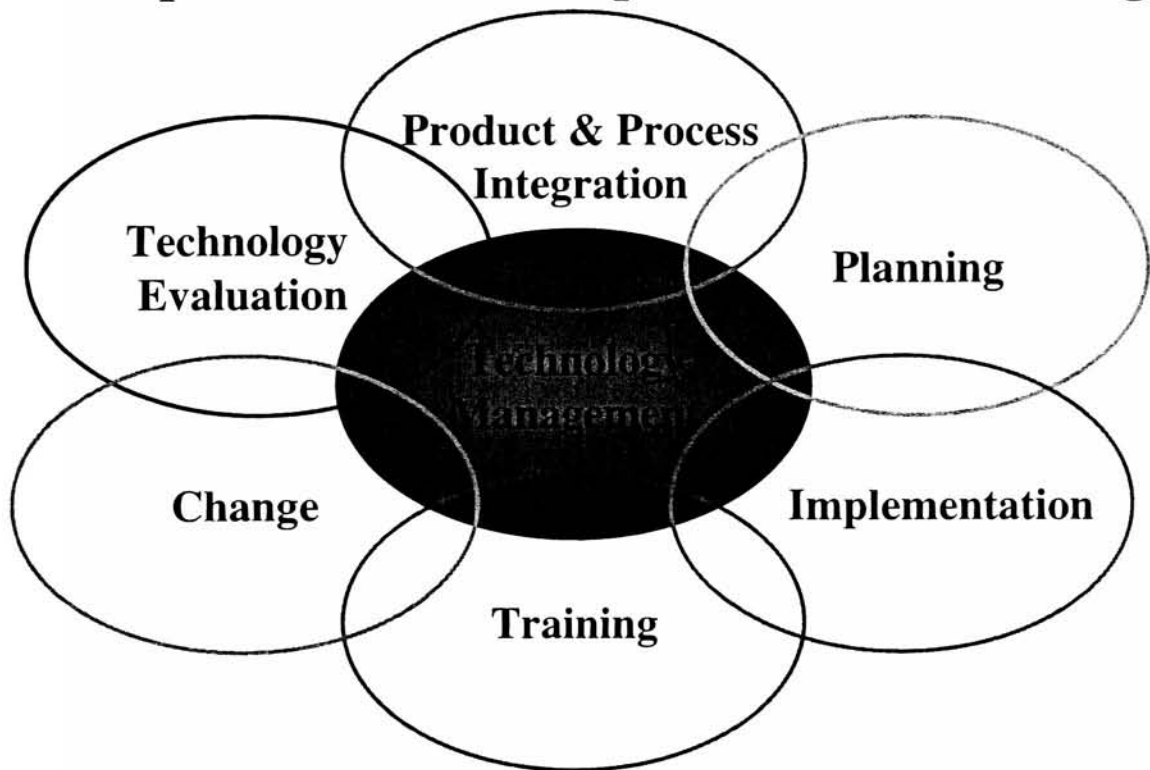
1. Goal/Vision for developing and implementing Optiva?
2. When was your first involvement & your role?
3. Do you have prior experience with technology implementations?
4. Composition of Project Teams?
5. Criteria for System Selection?
6. What other options were investigated?
7. Strengths of the System (Optiva)?
8. Weaknesses of the system?
9. System Limitations?
10. How much customization was needed?
11. What challenges do you anticipate or have you experienced to upgrade infrastructure to support the new system?
12. Typical activities occurring in planning stages, at your functional level?
13. Who planned the training and who facilitated it?
14. What were the main challenges in providing training?
15. What testing was done prior to rollout? During rollout?
16. List major challenges in shakedown (shakedown is the time period after roll-out until the return to normal operations)
17. What were some key change management initiatives undertaken to institutionalize Optiva throughout the organization?
18. Were there any revisions to the project scope, schedule, or budget? And why?
19. Weaknesses of the process?
20. Strengths of the process?
21. Do you feel there was enough functional involvement?
22. Has corporate support for the project been sufficient?
23. Criteria for Success, beyond “on-time, on-budget”?
24. Major obstacles?
25. Given the same set of resources (time, staff, budget), what would you do differently?
26. Additional comments.

Interviewee: \_\_\_\_\_

Date: \_\_\_\_\_

## Appendix B – Reference sheet

### Principles of Effective Implementation of Change



#### **Technology Evaluation**

- Progress Metrics
- History
- Dedicated evaluators
- Fitness, Quality & Value
- Human Factors

#### **Product & Process Integration**

- Change process or system
- Document & Communicate changes
- Integrate legacy systems
- Determine needs
- Maintain Links

#### **Planning**

- Scope definition
- Strong centralized leadership
- Technology experience
- Cross-functional teams
- Be specific
- Project Management Skills

#### **Implementation**

- Test!
- Human Factors
- Contingency Plans
- Communicate
- Evaluate Custom Developments

#### **Training**

- Budget significant time and money
- Provide documentation
- Schedule appropriately
- Choose & communicate method
- Involve trainers early
- Power-users
- Make it Fun!

#### **Change**

- Corporate Support
- Acquire buy-in
- Out with the Old
- Change is a process
- Respect

## Appendix C - Survey Results

### 1. Goal/Vision for developing and implementing Optiva?

- a. Optiva is a technology enabler for INPP, for formula based product, faster, better metrics, visibility to bottlenecks, better history
- b. Originally: Highly responsive electronic formula control to expedite time to market, get early input from safety and regulatory. For the Business, formulate system to facilitate end to end positive release process.
- c. Integrated Product Development tool from concept to in store, utilized by all departments.
- d. Head up Regulatory, used as an electronic notebook, ability to recall information that used to be done through paper.
- e. Implement project management software tool that will integrate product development, timeline, formula control, and packaging. Links it all together in a master database. For example, it shows all vendors for the same product, gives better control.
- f. Integrated Product Development system to maximize efforts and streamline end to end product development process.
- g. Database packaging specs, then it grew to project management, LTS driven. Launch three years ago
- h. Replacement of Legacy systems. Outdated. Develop brand infrastructure for future growth.
- i. Ensure regulatory compliance; ensure safety and quality in product. More Product and efficient. Shorter time to market.
- j. Automate the complete product development life cycle, including packaging, project management, sourcing, formulation, and testing.

| Role           | Users           | Programmers/ Systems Administrators | Decision Makers |
|----------------|-----------------|-------------------------------------|-----------------|
| Goal of Optiva | Process enabler | Integrated Product Development      | Process Enabler |
|                | Control Process | Infrastructure for Growth           | Control Process |
|                | Manage projects | Automate Process                    |                 |

**Table C1: Goals of the project as expressed by respondents in varying roles**

### 2. When was your first involvement & your role?

- a. Formula in 2000 – not involved. 1. Implement Launch – custom --> budget, scope, etc. Summer 2002, floundering. 2. WebPDM for pkg specs for apparel Solution: Integrate and solve! Looking at demos to replace web, one was Optiva, which was in the process of introducing Project Management. Also used at GE Plastics, RMP (Rustoleum)
- b. Year in the project, about 3 years ago, technically, Optiva Documents Manager, overall supervision for information input and tracking, quality and consistency. Optiva ownership, Big Brother.

- c. Responsible for Product Development of Systems in Brand, Team, LTS, and PMO. Began in May 2001, managing Product Development Systems.
- d. Not much until took over regulatory. Make certain to have positive release available. Greg brought in to make sure the information was processed and provided.
- e. NY BBW developing Launch, a customized tool with lots of roadblocks, two to three years ago. Year ago June, Steve Turchan held a technology seminar. Formation Systems was the only company with a formula system. Decide to convert from Launch to Optiva. Kathleen in charge of implementation and user owner testing and converting from PET and Project Management. Meade owns the system. Mary Beth reports to Kathleen, manages timeline for HF and GS. New timelines for GS, new tool for HF. Champion to make one process for all.
- f. Before it was an idea, Web, then develop Launch. Both failed analysis to continue or scrap. Current: Business analyst, familiar with what people do and represent user.
- g. Looking for specs, Kevin and Al. Mike compare and identify systems to fit company and engineering. Looked at 6.
- h. Initial stages looking for new packaging specification systems, Optiva provides all functionalities to ensure application meets brands needs, run implementation, align business process and change to make, training, and system administration.
- i. Lead technology team, first day.
- j. May 2003, program manager for LTS.

| Functional Role                | Number |
|--------------------------------|--------|
| Decision Makers                | 4      |
| User                           | 4      |
| System Maintenance/Programming | 3      |

Table C2: Functional roles of respondents

3. Do you have prior experience with technology implementations?
- a. Yes, since '74
  - b. Yes, background is technology product development. Exposure to implementation of various electronic systems. Selected because working in candles, because has regulatory technical background from product and electronic, had higher than average systems proficiency.
  - c. Yes, software for UK POS, International freight tracking, network, and operations.
  - d. Yes, previous companies, similar databases
  - e. Yes, space management, from user community. At four years, move Express to a new system for merchandise planning, allocation, finance, DC, bring vendors in.
  - f. Yes, web, Launch, and other internal systems.
  - g. Networking issues and JBA
  - h. At Gryphon, IT and technology support, more now.
  - i. Specialty
  - j. Yes, 15 years.

| Technical experience | % Respondents with implementation experience |
|----------------------|--|
| Some                 | 100%   |
| None                 | 0%   |

Table C3: Technology implementation experience of respondents

4. Composition of Project Teams?

- a. BBW – end user team (PKG), VSB team (causes challenges to moving quickly), Advance Program Management (APM) – LLS --> logistics & compliance, MB Tedeschi (program management), Kat & David, LTS PM, & LTS Tech Pooja & Peter
- b. Formation module (not involved w/ APM, sourcing, or packaging, not an active project team) Now in ongoing production, steering committee hasn't met in a few months. Representatives from BBW, VSB, Jennifer Rimpley, LTS Support, Jeniza, and Kat.
- c. Three Project Managers, two Brand Relations Executives to represent brands, Executive steering committee, includes vice presidents and executive vice presidents, Limited Logistics Services, Regulatory, three systems administrators and four technology programmers.
- d. Diversified set of potential users, technology gurus
- e. Varying levels of LTS, Vendor, User Community (Mary Beth's staff), Administration (Ed Riley)
- f. Business analyst, Jayn, admin, Ed (director/leadership), BRE (liaison on all interaction with other Limited organizations), PM, Technical Lead, Formations consultant, Peter (Programmer for reports and system architecture), Jeniza (technical analyst), same at VSB to make a common system architecture.
- g. Packaging, LTS, Kat
- h. Cross functional team, Team size versus effectiveness. VSB and BBW
- i. Each functional group, leader, steering committee, Meade, Sam, Tom, CEO of Formations, Tom McFadden for Technology, BBW, VSB, and Regulatory.
- j. Steering committee, Meade, Sam from VSB, Tom McFadden from LTS, Dan the CEO of Formations, Jason, PM director, Steve Turchan BBW BRE, Tom, Elizabeth, Kathleen, Kathy O'Brien, Jennifer.

5. Criteria for System Selection?

- a. Didn't talk to lots of vendors because already have Optiva. Didn't line up vendors to compare, because designed to be integrated, move away from silo
- b. Selected before on the team
- c. One option was formulator without considering the other modules, or systems integration, and then packaging specifications.
- d. Use database first
- e. Had something more robust, integrated, stop Launch and shift to Optive, more competition, PM to Formula control.
- f. Relational database, requirement to interface to JBA or JDA, Potential for external vendor access, Ability to use for analytical work (time), business specific timelines, gap analysis, to have formations make upgrades.
- g. Looking for specs, Kevin and Al. Mike compare and identify systems to fit company and engineering. Looked at 6.

- h. Technology, LTS gave green light that it met technology blueprint. Function, did what wanted it to do, better with looking back. “Too excited to look at company history.”
- i. Experience and penetration, functional for both brands and the future, Financial and quality.
- j. Modern tool to automate and integrate end to end. Interface capability. Formulators then rest of the process. Experience with Formations and the system.

| Role                         | User       | Program/Admin | Decision Maker           |
|------------------------------|------------|---------------|--------------------------|
| Perceived selection criteria | Integrated | Database      | Integrated               |
|                              | Database   | Interface     | Database                 |
|                              |            | Experience    | Function for both brands |

Table C4: Respondent expressed selection criteria, based on functional role

- 6. What other options were investigated?
  - a. Sick w/ Launch, look at less costly options.
  - b. n/a
  - c. Take WebPDM, create unique packaging module, create enhancements, or Mystic, and one other.
  - d. Internal development or other off the shelf
  - e. Stay on track with Launch, other companies soliciting. Many parallels with apparel PM software, but did not service all the needs. Call other users and inquire about system.
  - f. Launch, WebPDM, Mystic Management, and others
  - g. 6 other options.
  - h. Winspec, and 2 others. Learned that Optiva could do both. Integration outweighs history of functionality issues.
  - i. I2, Optimum, Launch (in-house), PET, Fast Turn, Intentia, Open Latait.
  - j. Make a case for Optiva, Launch scratched.
- 7. Strengths of the System (Optiva)?
  - a. Integration, Robust data in new place, new shampoo, like PS, clone & make changes. Appealing productivity curve, leverage information.
  - b. Lots of bells and whistles, powerful relational database, if you know which dials to turn and pull, can do just about anything, specialized access database
  - c. Integration, can see product from formula to package spec to project to artwork; can see everything related to the product. Sequel server fits LTS blueprint.
  - d. Houses all information in organized form, easily accessible, cost effective for materials, formulas, and vendors. Very powerful optimizing costs and resources.
  - e. Integrated, efficiency of effort, Accuracy, Reporting, summarization, helps to support the process.
  - f. Integration, granularity of database
  - g. Could be integrated, true database flexibility; minimize repeats (shippers and packers), if used properly.
  - h. Integration. Configurability, can set up everything, not customizing the application.

- i. Formula control, flexibility in configuration, information sharing, report capability.
- j. Integration, capability to interface.

| <b>System Strengths</b> | <b>Responses</b> | <b>% Respondents<br/>(n = 11)</b> | <b>% Responses<br/>(n=14)</b> |
|-------------------------|------------------|-----------------------------------|-------------------------------|
| Integration             | 5                | 45%                               | 36%                           |
| Powerful                | 3                | 27%                               | 21%                           |
| Database                | 2                | 18%                               | 14%                           |
| Configurability         | 2                | 18%                               | 14%                           |
| Cost Effective          | 1                | 9%                                | 7%                            |
| Efficiency of Effort    | 1                | 9%                                | 7%                            |

Table C5: Respondent expressed system strengths

**8. Weaknesses of the system?**

- a. Challenges: APM is NEW – bugs & shortcomings for first users. Complex system.
- b. Not always intuitive or easy, Formations too light on support to get things were we want
- c. Not as user friendly because of complexity, Optiva does not supply patches, requires upgrades.
- d. Idiosyncrasies, glitches and workarounds.
- e. n/a
- f. Not intuitive to users, takes away tools of granular.
- g. Not delivered what was promised. Could be LTS trying to do too much. Can make it work, weaknesses should disappear. Learning takes time.
- h. More complex than what the average user is used to. No go query and report tool.
- i. New software ahs quality issues. Cost, expensive to implement.
- j. Three tier, overhead maintenance, does not support Mac.

| <b>System Weaknesses</b>       | <b>Responses</b> | <b>% Respondents<br/>(n=10)</b> | <b>% Responses<br/>(n=11)</b> |
|--------------------------------|------------------|---------------------------------|-------------------------------|
| Not Intuitive or user friendly | 3                | 30%                             | 27%                           |
| Formation Systems methods      | 3                | 30%                             | 27%                           |
| Bugs                           | 2                | 20%                             | 18%                           |
| Complex                        | 2                | 20%                             | 18%                           |
| Cost                           | 1                | 10%                             | 9%                            |

Table C6: Respondent expressed system weaknesses

**9. System Limitations?**

- a. Difficult to easily extract, in terms of reports. Parallel or contributing, Formations hasn't released a meta-data resource to pull data.
- b. Some created limitations, lost functionality in search, biggest watch outs are that it is a great system with challenges but Formations over promises and under delivers. For example, almost any report can be generated, "easily to create", but can't actually.
- c. Overhead, as it technically requires bigger, faster servers.
- d. Not well developed wildcard search function. All raw with formulas and what percent. Not as flexible as desired.



- e. More robust than hindsight needed to change and Formations made the change. Only has 5 reports, need money to generate more. Need to use to find limitations and need enhancements. Try to see what everyone needs and then find out what the wish list really is. “Walk before we run”
- f. Milestones are not their own database object, not a separate component, limits security, limits process automation with NF
- g. n/a
- h. Issues with Optiva in the way Formations operates.
- i. User access control and data access control. No good system for low level and detailed security.
- j. No report tool. Three-tier limits the amount of users. Technology is dated, 2 year upgrade to move to a modern platform.

| <b>System Limitations</b>     | <b>Responses</b> | <b>% Respondents (n=10)</b> | <b>% Responses (n=12)</b> |
|-------------------------------|------------------|-----------------------------|---------------------------|
| Reporting & Searching         | 5                | 50%                         | 42%                       |
| Formation Systems             | 3                | 30%                         | 25%                       |
| Overhead for servers          | 2                | 20%                         | 17%                       |
| Low level user access control | 2                | 20%                         | 17%                       |

Table C7: Respondent expressed system limitations

10. How much customization was needed?

- a. Flexible – add data to make fields. Workflow by design. Didn’t modify the program code, more complicated because of.
- b. Initially over customized which caused challenges, Formations frequently questioned customizations.
- c. A lot, because the system is configurable. This is a pro and con as it is possible to make the system fit the business needs, but it needs to be configured. It is not off the shelf.
- d. Formula, less than 50% to iron out the bugs.
- e. 1 change
- f. Out of box, usable, but requires customization to standardize use, create rules, programming basic scripts.
- g. Not much, minor tweaks.
- h. VSB, none. BBW have done and benefited from, have found bugs.
- i. Normal amount, more than they like. Flexible.
- j. Not much, develop reports, function modified. System is configurable. Less than 5% customization.

11. What challenges do you anticipate or have you experienced to upgrade infrastructure to support the new system?

- a. LTS- FF 500 users, can touch 900 users. What is the support requirement? What will it be at full operation? Hasn’t been tried yet.
- b. Originally designed to be working tool to chemists to help. At the time, two different technical groups. Columbus got on board. Non-scientific follow-up, rated the system high with help and ease of use. New Jersey never got on board,

even now, the benefits have not been realized. Optiva instrument for development and the release is not be utilized. Release by process deviation is not following SOPs. Regulatory took over the process to build back approvals called “Optiva positive release”. APM and Packaging are really a sequel. Very technical and new database language.

- c. 30 users on the normal server, What happens when there are 500 users? The wide area network, has lots of communication sizes, information hops to get to servers.
- d. None yet, become accustomed.
- e. “Vanilla”
- f. 4 or 5 upgrades since it started, work with Formations, suppliers automated scripts to generate upgrade configuration and template tools to backload instead of GUI. Upgrade over weekends.
- g. Resources, number of people, system infrastructure for server or changes. No accountability for LTS.
- h. Resistance to change. Lack of planning up front. Not mapped through for budget. Need/want updated infrastructure for brand growth. Cannot do it with Excel. “Lucky in not encountering regulatory or quality issues.”
- i. No insurmountable. To bring on more users, need more capacity on server and network. Need money to achieve.
- j. Budget did not encompass hardware upgrade. Desktop updates. Need to move to a server.

12. Typical activities occurring in planning stages, at your functional level?

- a. IT strategy, look at whole landscape. Center has an idea of spending. Given requirements, what is in the budget? High priorities
- b. Helping design workflows, designing structures. Optiva comes with format, module, structure, and items. Then for users, and customization, header, custom, etc. Decide what information is wanted where. All must be a decision then committee working out what that means. Keeping in mind what workflow reference, have more than one way. Based off basic tenants of good lab practices. Use as a laboratory practice for template and reference. Key: run for a year, then build. Beta-test, pilot did not do first.
- c. Laying out project plan, resources, user communication to get all departments involved, plan training, roll-out, design and configuration decisions
- d. Getting all of the reports and search functions to use immediately. Certain types of additional fields.
- e. Weekly meetings, depending on design stage. Ramifications of design, Executive steering, Executive Team, PM owner, progress and change, shift in resources.
- f. Talk to users, gather requirements, come back again, create documentation of requirements, and technical specifications (Not Kat), quantified analysis. Process now: steps, time, build case for funding, man hours, resources, etc.
- g. Break down Web, include what we needed, and get rid of stuff we do not need. Materials, sizes. Brainstorm how wanted the system to be expectations and needs. See what others like and dislike about WebPDM. Lots of details in beginning.
- h. Running design sessions to map out configurations. Testing and test scripts. Creating and running training.

- i. Requirements definition, scope assessment, design to give cost estimation, resource allocation, schedule, and review plans.
- j. Schedule and budget development, resource allocation, risk administration, scope administration.

**13. Who planned the training and who facilitated it?**

- a. Training by LTS Learning Center for APM Module. Fast Track packaging without LTS learning center.
- b. Computer Based Training (CBT) program from LTS, with the help of Formations. Scripts were used to develop training. Technology planning committee set it up.
- c. LTS, with Kat and Ed doing cost-sheet, cost-sheet approval, packaging, and sourcing because of budget, and supplied users. LTS learning center engaged with Project Management module. Because of the aggressive schedule, LTS was not involved early enough so trainers were unable to answer some questions.
- d. LTS
- e. LTS Learning Center, Documentation. User communities. Four sessions: Milestone Owner, Manager, to-do list, cost sheets, users with Macintosh. 3 week period, register, at VS make up classes, less than 5 left. Continue to train. BBW Administrator, Kay and Jayn.
- f. Not usual. Packaging: project was an upgrade, development project plan used in PAR. Tied hands. Learning center NOT engaged due to choice of project plan. Not enough time to create documentation. Recommended four days of training, business said four days is overkill. Train the trainer approach. Those that were trained, quit. For APM, LTS was engaged. Thinly spread resources were not able to start as early as usual. Usually engaged at the beginning of a project. Seven or Eight types of classes for different roles. Focus on milestones and to-do lists. Continued to have LTS create the documentation.
- g. Kat and LTS
- h. David
- i. Formations and LTS Learning Center. Customize and oversee training.
- j. LTS Learning center budgeted for APM. The rest was internally by Kat and David.

|                             | APM Module  |             | Packaging Module |           |
|-----------------------------|-------------|-------------|------------------|-----------|
|                             | BBW         | VSB         | BBW              | VSB       |
| <b>Training Facilitator</b> | LTS         | LTS         | Admin            | Admin     |
| <b>Method of Training</b>   | Classroom   | Classroom   | Classroom        | Classroom |
| <b>Max Time of Training</b> | .5 day/task | .5 day/task | 1 day            | 1.5 day   |
| <b>Documentation</b>        | Yes         | Yes         | No               | Yes       |

Table C9: Compares training for 2 Optiva modules, APM and Packaging. Compares training for BBW and VSB

**14. What were the main challenges in providing training?**

- a. training w/out application background
- b. Overcoming Optiva-phob. It looks harder than it is, it is not intuitive and then it fits together.
- c. Aggressive schedule, timing, and lots of users requiring training in one month.
- d. Availability, commitment to attend

- e. Getting people to come, to stay, and be attentive. Timing before already loaded or after. Not all timelines are available. Maintain old system. Good trainer, user friendly, not involved with build, needed more training to be able to understand the system more. Maybe someone from brand and someone else too.
- f. Miscalculation of resource requirements and training documentation development time. Personalities, leaders and concerned, but are not computer savvy. Bad taste, relating to other failures, change.
- g. Get everybody to training. Time for trainer to learn the system versus Formations trainer.
- h. Scope in providing what people know, lots of knowledge transfer. Availability of users. Training versus trainer.
- i. Identification of users and scheduling with out impeding in job.
- j. Amount of users, over 200 users at BBW. Developing documentation. Budget for APM, not enough money.

| Training Challenges                       |
|---|
| * No application background               |
| * Optiva-phob                             |
| * Aggressive schedule & Timing            |
| * Availability of users                   |
| * Miscalculation of resource requirements |
| * Scope                                   |
| * Identification of users                 |
| * Number of users to be trained           |

Table C10: List of Training Challenges, as expressed by respondents

15. What testing was done prior to rollout? During rollout?

- a. Unit, system, opportunity to do more. No stress testing in production. APM- PET re-entered to check for parallel package data.
- b. Formations designed the system not to be patched. Alpha- See if it starts, expert test scripts. Beta – multiple testing, see if it functions, open to “regular” users given the number of formulas to enter and launch. Then Rollout- upgraded test scripts.
- c. Typical, regression, administration, and user testing. Missing pilot because of schedule. Vendor standard quality assurance tests two weeks, BBW did one week.
- d. Test server, give to select savvy users. Do not want to lose information and security. Did have some pilot program, three months for roll-out, planning for one year, then the first try with the laboratory.
- e. Lots to lockdown. On test server. Enter timelines, and time for loading. Type scenerios, put in dates ahead, lots of learning. Test found bugs. Funding and time did not allow for a pilot. Additional bugs encountered and understood for time.
- f. After configuration, project team tests prior to user testing. User sign off, function and design. Gap with understanding. Fix what comes up. End to end with Kat and sometimes users. Usually a pilot. No pilot here, commitments to preserving timeline and budget. Cannot test for everything. Then back to Formations to make

changes. Usually a pilot, which can lead to a rebuild. Here, use and fix later.  
Team, user test, stress testing.

- g. Not done properly. Typically try to crash the system.
  - h. Entire system from end to end to document test scripts and create documentation. One user went through test scripts. Involve users in design phase, provide scripts, did not execute. Rigorous process to make sure changes in production environment and well thought out. Better if could look at issues list.
  - i. Module testing, unit testing by Formations. System training, integration tests. Test scripts, test data was carried out. QA form checklist, and compared to.
  - j. Development configuration, Unit Test, develop internal test. Integration, works together. In test environment and debugged. Users acceptance: test develops with users to develop test scripts, to test real scenarios. Clean up, fix, minor changes, minor user acceptance test. Internal testing and performance.
16. List major challenges in shakedown (shakedown is the time period after roll-out until the return to normal operations)
- a. PKG dept experienced high turnover. APM – identify gaps between Optiva & PET delivery. Define component codes then tell JBA later. Identify opportunities based on issues, do we modify Optiva or the process to fit, opportunities to fill gaps because of newness.
  - b. Paradigm change, paper to electronic. Hiccups in program functionality, but the wheels did not fall off. New York and Columbus resisted change, and then Columbus got on board well into 90% on board in and timely utilizing all processes, looking good until restructuring.
  - c. Not complete until April 26. 500 timelines in PET need converting. Project Managers back loaders are the only four users. Getting from four to 216 users.
  - d. Slow, difficulty getting reports.
  - e. Not 100% interfaced, converting. Completion dates. Lack of access, slow, forget not useable for 4 weeks after training. Anticipate 6 weeks for comfort level.
  - f. Resource allocation, make improvements versus making the next module work. Packaging group is new, not around with design. Sign off guy (Al) is gone. INPP makes APM a moving target as they take learnings from INPP because of resource allocation. More focuses on internal service opportunities. Take learnings.
  - g. Things are not there that should have been. Stumbling on broken legs.
  - h. Finish packaging roll-out. APM configuration will be end of January. Three months. Concern about time to do the same job in Optiva versus old, user and usage.
  - i. New software. Some patches have never been implemented before. Supporting Mac users.
  - j. Amount of money in budget. Way the technology is setup.

| Shakedown Challenges |                                 |
|----------------------|---------------------------------|
| *                    | Turnover                        |
| *                    | Identify gaps between new & old |
| *                    | Paradigm change                 |
| *                    | Conversion of data              |
| *                    | Number of users                 |
| *                    | Lack of reports and access      |
| *                    | Resource allocation             |
| *                    | Unsatisfied needs               |
| *                    | Budget                          |

Table C11: Respondent expressed shakedown challenges

17. What were some key change management initiatives undertaken to institutionalize Optiva throughout the organization?
- Development of INPP and training, driver is Optiva as it supports or enables INPP, Behavior changing
  - “Lived in Paramus” to try and train and coax New York. Teach, mentor, acclimate, placate users into Optiva with limited success. Columbus was given no choice and they got on board. New York was not as forceful.
  - Project Managers, only four or five users. Tried to configure Optiva to function like MS Project and PET and Launch, take five Project Managers and meet all needs and finding the middle of the road. Technology going from 1 server for 30 people to 200 users. In terms of process, INPP involves a lot of process changes and going on dealing with application and process changes at the same time. Bring in WBCC plan for needs.
  - Sometimes the system is not working optimally. Maintain a logbook of serious issues, then combine and submit to LTS. “How we ended up with it?” Release under deviations, transition from paper to electronic. Not being maintained. Had to step in and take control.
  - Feel out areas and difficulties then give 1:1 training. Buy-in from executive team on need for this tool. Buy-in from Process. Capability of tool to process. INPP-Milestone owners. Broader audience, Executives and making sure user understand new tasks. High level of acceptance, seeing capability giving more than had before. User Less with converting to complete conversion.
  - Because it is new, understanding of what makes sense. Look at the big picture, user’s focus is user activities. Recognize the key. Make user versus company more efficient. Users may need to do more because of other requirements. PAR approval. INPP and Project New View. New executive leadership, Ken, Neil, and Meade took the role in making it happen. Follow through between leadership and organization.
  - APM linking with New View. Facilitated INPP and now with the system.
  - Resistance to change, lack of quality upfront planning, do once over the system to find frustrations. Mandate, but no official communication, mentioned by the president.

- i. “Missing info”, more detailed confirmation of details and scope. Schedule availability for acceptance testing. Communication of documents, process and organization change management. Announcements, documents, etc.
- j. Categories, business criteria, functional, cosmetic. Only issue are resolved during fix up in production, most learning, some major changed. Message from steering committee, Old system to be removed, Tools are first automated tools. Consistent view from the top.

| <b>Institutionalization Methods Used</b> | <b>Responses</b> | <b>% Respondents (n=11)</b> | <b>% Responses (n=15)</b> |
|--|------------------|-----------------------------|---------------------------|
| INPP Buy-in                              | 6                | 55%                         | 40%                       |
| Corporate Direction                      | 6                | 55%                         | 40%                       |
| Document issues                          | 2                | 18%                         | 13%                       |
| Remove old system                        | 1                | 9%                          | 7%                        |

Table C12: Respondent expressed institutionalization methods used

18. Were there any revisions to the project scope, schedule, or budget? And why?
  - a. Yes! 1. How much pressure on budget because of 2 tracks, not adequately allowing. 2. TBD concern that any user can get read access to formulas – scope change.
  - b. Way behind schedule when asked to join. The time utilized discussing aspects not relevant. Esoteric utilizations. More complex than anyone realized going in.
  - c. Schedule, multi-brand, supposed to work together with resource constraints, two tracks with the same design parameters, off-base and burning up budget plan revised to meet remaining budget, needed to stick to the original plan.
  - d. Original plan was on budget
  - e. Discussions between Optiva and BBW to get price down, travel for associates left out of PAR, Over budget finding a number of bugs, ask Optiva to come help. Justify money spent on Launch, confidence level use balance from Launch to make this work. LTS to take on cost and Optiva costs. Justify speed to market to justify expenditures. Will give PM updates, detailed documentation of pending, hot, etc. from LTS status. APM supposed to be launched in August. Bugs pushed it back to October.
  - f. Yes. Component cost download, lost from scope without go-live deadline of October 13. PM had baby and left. The new person did not have the same understanding. BBW is small. LTS has four months of effort. Not seeing eye to eye. Budget, the PAR did not have travel and expenses for the consultant and Kat. Center Finance a change in how to budget resources, start to take money out to pay for business resources such as Kat, Ed, Jayne. Packaging, APM, Sourcing, Testing, and labeling, only have enough budget to implement one more.
  - g. Yes.
  - h. Supplemental PARs. Scope, confusion, VSB and copy, not feasible and configurable-ness. Exact custom fields did not make sense, and was not established upfront.
  - i. Numerous. No one at the Limited has used the system.

- j. Yes. Major scope revisions in June, state and budget to have project move out and phase 2. Re-baseline. Schedule re-shaped due to strategy changes. Separate roll-out then unified which causing re-planning. Bugs created a two-month delay.

| Plan Changed      | Scope           | Schedule                      | Budget            |
|-------------------|-----------------|-------------------------------|-------------------|
| Reason for Change | Security        | 2 Brands                      | Resource charging |
|                   | Control Process | More complex than anticipated | Scope definition  |
|                   | Configuration   | Scope                         | VSB alignment     |
|                   |                 | No one has used it            |                   |
|                   |                 | Strategy change               |                   |
|                   |                 | Bugs                          |                   |

Table C13: Reasons for plan changes during project, expressed by respondents

#### 19. Weaknesses of the process?

- a. Gaps – ideally, pick a slice, take it all the way through. get package specs as fast as possible, because packaging was dying in Web, but Project Management was dying in PET. Thorough end to end pilot to cover gaps.
- b. Think- planning process did not have LTS PM. Needed co-manager who had technical background to shut down the theorization.
- c. Lack of communication going down two tracks without someone monitoring brands, lose the big picture. Need higher level PMO from the center.
- d. Cannot satisfy everyone, evaluate what is wanted and what is the system can do. Takes a lot of time. Not many options, develop internally versus off the shelf. Time.
- e. Long time to get PAR to sign, pressure from functional groups.
- f. Resource allocation, must be enough projects to justify headcount. Interaction between businesses in enterprise. Huge corporation, making any major change is like turning a battleship around. Operations most successfully, lost battles and face battles with unsatisfied people, have to have a big picture outlook.
- g. Started as one project, try and do it all at once. LTS process, no accountability. Lots of people. Was not handled properly.
- h. Too many PMs, lack of integration between brands, timing, rushed. Example, only one week for testing.
- i. Setting expectations of planning time, not rushing to get cost estimate.
- j. Development of PAR did not consider components which comprised budget. Training, hardware, talent, new system, size, did not have enough LTS, no detailed scope, huge expectations.



| <b>Weaknesses of Process</b>      | <b>Responses</b> | <b>% Respondents<br/>(n=11)</b> | <b>% Responses<br/>(n=15)</b> |
|-----------------------------------|------------------|---------------------------------|-------------------------------|
| Communication between brands      | 4                | 36%                             | 27%                           |
| Need higher level project manager | 3                | 27%                             | 20%                           |
| Rushed                            | 3                | 27%                             | 20%                           |
| Gaps                              | 1                | 9%                              | 7%                            |
| Evaluate needs                    | 1                | 9%                              | 7%                            |
| Pressure from functional groups   | 1                | 9%                              | 7%                            |
| Resource allocation               | 1                | 9%                              | 7%                            |
| No LTS accountability             | 1                | 9%                              | 7%                            |

Table C14: Respondent expressed process weaknesses

20. Strengths of the process?

- a. Product development delivery process. Have a predictable, reusable process.
- b. All the right ingredients in terms of representation to discuss rather than build the system.
- c. Lower level teams, worked very well together. Tech teams responsible and going above and beyond and user time commitment.
- d. Rapid deployment system
- e. Prove out business case and make sure the best ROI. Benefit from having multiple divisions using the tool.
- f. Great minds, inclusion, lots of background, evolution, leadership have strong vision and commitment. Follow through, regardless of small failures.
- g. Done better, whole enterprise, Function accountability, integration.
- h. User involvement in the design.
- i. Used many times, institutionalized, have finance assistance; BRE's are familiar with it. Fine-tuned.
- j. Strong PM process. Clear communication with stakeholders, commitment from the top.

| <b>Strengths of Process</b> | <b>Response</b> | <b>% Respondents<br/>(n=11)</b> | <b>% Responses<br/>(n=8)</b> |
|-----------------------------|-----------------|---------------------------------|------------------------------|
| Predictable & Reusable      | 2               | 18%                             | 25%                          |
| Teamwork                    | 2               | 18%                             | 25%                          |
| Ingredients                 | 1               | 9%                              | 13%                          |
| Rapid Deployment            | 1               | 9%                              | 13%                          |
| Cost Effective              | 1               | 9%                              | 13%                          |
| Commitment                  | 1               | 9%                              | 13%                          |

Table C15: Respondent expressed process strengths

21. Do you feel there was enough functional involvement?

- a. Good, but can always be better. Turnover, Al's departure – couldn't be helped. Better conditions would make it better.
- b. Enough in executive and design, but have the best idea in strategy.
- c. Yes
- d. Yes
- e. Hiccup, not having VSB aligned from the beginning. VSB came back with more needs, same path, do not need a custom tool.

- f. Lack of time, strong commitment from packaging group, less from PM. Learning experience with Launch, too much user engagement. Evolving set of requirements, never achieve go-live, cannot satisfy all.
- g. No, it was taken away.
- h. Design yes, Quality, no.
- i. Generally acceptable. IT always wants more.
- j. Yes. Beginning floundered between March and May, but overall very good commitment from users.

| Enough Functional Involvement | % Respondents |
|-------------------------------|---------------|
| Yes                           | 73%           |
| No                            | 18%           |
| Yes & No                      | 9%            |

Table C16: Respondents expressing if there was enough functional support

**22. Has corporate support for the project been sufficient?**

- a. Yes – high levels in center very supportive. Usually socialize for 18-24 months, but beat timing. Develop in November and approved in February.
- b. Financial yes. But system use was not enforced.
- c. Yes
- d. Absolutely
- e. More than enough, including Len and VSB Sam G, Elizabeth Elliott, smaller and does not have the same number.
- f. Business, absolutely. LTS, better than normal. Center, less support, more pushing along, manage late success.
- g. Yes, kept the project moving and go ahead.
- h. Yes
- i. Yes, approved funding and project with reservations. More knowledge would help.
- j. Yes

| Enough corporate support | % Respondents |
|--------------------------|---------------|
| Yes                      | 100%          |
| No                       | 0%            |

Table C17: Respondents expressing if there was enough corporate support

**23. Criteria for Success?**

- a. 1. Take time to realize. Reduce time to market. 2. Less quality issues, quality metric. 3. Customer returns due to quality goes down.
- b. Quality information in, Quality information out. Successful, a journey that is sometimes extremely off track. Now, not as designed, we are approaching that.
- c. Application meeting user needs. Long term, speed to market, reduce project management cycle.

- d. Specification comes out with what the system should do, and come back workable. Test module was disappointed, showed lack of benefit.
- e. Tool to give specific facts and more focus in BBW in the beginning. Data to make timely decisions, metrics to pinpoint work gaps or execution gaps. User community embracing, visibility of concept faster. Managers have capability to see what is to come to see resources based on work fluctuations and prioritize.
- f. Ability to use as an analytical tool to continue INPP growth process. Integration of availability of data, such as documents attached to milestones. Alleviate some common issues.
- g. Will not be able to tell for a year. No crying and the process is faster.
- h. People are happy.
- i. Customer satisfaction, process, quality, team. Ability to document results.
- j. 1. Budget. 2. Implement functionally all modules purchased, and quality. 3. Time.

| Criteria for Success                            | Responses | % Respondents<br>(n=11) | % Responses<br>(n=21) |
|---|-----------|-------------------------|-----------------------|
| Meet User Needs                                 | 4         | 36%                     | 19%                   |
| Quality information in, quality information out | 4         | 36%                     | 19%                   |
| Data to aid in Metrics & Analysis               | 4         | 36%                     | 19%                   |
| Less quality issues, returns due to quality     | 3         | 27%                     | 14%                   |
| Reduce Time to Market                           | 2         | 18%                     | 10%                   |
| More visibility of information, Ability to      | 2         | 18%                     | 10%                   |
| On-Time   | 1         | 9%                      | 5%                    |
| On-Budget                                       | 1         | 9%                      | 5%                    |

Table C18: Respondent expressed criteria for success

#### 24. Major obstacles?

- a. 1. Multi-entity- challenge. 2. Complex application. 3. Asking lots of people, all over, to change behavior
- b. Change in paradigm, lack of management support in enforcing it as the tool, having a technically confident chair could help the differing process. No group director. Done out of compromise, one group to move on, outlet to compromise.
- c. Budget, PAR, Travel and expense. Sometimes video conference instead of time constraint.
- d. Have marketer give focus of goal. Have all involved understand what their role is for and get it all captured.
- e. Compliance, behavior, on time entry.
- f. Lay-offs, reorganization, culture change, not an obstacle in the long run. Getting users to understand the culture change. Cannot get everything they want. Go forward and continue to develop the system and legitimize to finance and efforts. Continuous development versus a money pit.
- g. Taken away from packaging, keep it simple, do it right, then move on. APM rushed. Money and support does a change get made?
- h. Budget, and scope problems
- i. Project began with Gryphon, different users. Lots of turnover, then regulatory was added as function. Business changes, caused re-plan.

- j. Budget, insufficient. Scope expectations disproportioned to budget. Technology setup caused hurdles.

| Major Obstacles                | Responses | % Respondents<br>(n=11) | % Responses<br>(n=13) |
|--------------------------------|-----------|-------------------------|-----------------------|
| Budget                         | 3         | 27%                     | 23%                   |
| Scope                          | 3         | 27%                     | 23%                   |
| Brands                         | 1         | 9%                      | 8%                    |
| Complexity                     | 1         | 9%                      | 8%                    |
| Paradigm change/Culture change | 1         | 9%                      | 8%                    |
| Understanding role             | 1         | 9%                      | 8%                    |
| Compliance                     | 1         | 9%                      | 8%                    |
| Reorganization                 | 1         | 9%                      | 8%                    |
| Turnover                       | 1         | 9%                      | 8%                    |

Table C19: Major obstacles toward success

| Change Process                  | System                        |
|---------------------------------|-------------------------------|
| Multiple Entity                 | Complex Application           |
| Required Behavior Change        | Compromise system with budget |
| Underestimated budget for scope |                               |
| Understanding role              |                               |
| Reorganization                  |                               |
| Culture Change                  |                               |

Table C20: Major obstacles in Implementation

25. Given the same set of resources (time, staff, budget), what would you do differently?
1. Look at getting BBW and VSB to work in same room to work at the same time.  
2. End to end pilot.
  - Have a higher-level technical person in charge to co-chair. Project timeline, needed higher level technical to keep special interests at bay.
  - More time in design, this caused a miss, and training. More time upfront, spend less time at the back end.
  - Pressed Formations to itemize and get deeper into capabilities. Ask different questions.
  - Integration with VSB earlier, more focus on testing, live a timeline each week.
  - Reorder, APM first then cost-sheets, then packaging specs. Happened at the same time because of the huge push from packaging.
  - Ideally, break off and do 20% development and 80% Optiva. Pull VS in, people leaving. No force because of lack of representation.
  - Non-brand related resources did not need as many LTS for planning. Shift tasks to allow for more time in testing.
  - Break project into multiple projects. BBW and VSB, re-implement. More time in cost detail determining.
  - Clearly stated before March and May with a clear scope matrix and signed off my steering committee. Deployed in PAR.

| <b>Reallocation of resources</b> |
|----------------------------------|
| * Brand alignment                |
| * Timeline                       |
| * Time in Design                 |
| * Time in Training               |
| * Reorder Implementations        |
| * Time in Testing                |
| * Separate Implementations       |
| * Clear scope                    |

Table C21: Given the same set of resources, respondent expressed suggestions for how to better allocate resources

26. Additional comments.

- a. User driven or feelers } transcended functional dept areas, pushed up. Meade is key.
- b. LTS structure has 3 levels 1. Basic system admin. All done in a vacuum. Not involved in the APM or Packaging modules. Make everyone's life easier, put all in a fishbowl to react in real time in the original design of system earlier when timing has less impact on on-time deliver. VSB uses, but not the exact processes. Project delayed to get uniformity and consistency in the system. Two responsible agreed to not be the same. BBW enters spec electronically, and VSB scans.
- c. New system because so configurable, easier to change, worse if not off the shelf.
- d. Origin of Optiva: Formula system, electronic notebook. Then evolved into large and well-designed tool for getting product information into it. Get all information into a report, focus on sub-process, which now links, and provide information to electronics.
- e. Show Yellow, Green, Red. More ability to find information. Database benefit, attach forms to have a log. Formula in multiple places. Mechanics can be attached, can get from Optiva. Will find more benefits.
- f. n/a
- g. n/a
- h. Done in a vacuum because expected Formations to make up for it.
- i. More time planning equals less overall time.
- j. n/a