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IN PURSUIT OF WORKFLOW BREAKTHROUGHS USING "JUST ENOUGH PROCESS MANAGEMENT"

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ABSTRACT

This paper introduces the concept of "Just Enough Process Management" (JEPM). It is the gradual introduction and application of project and process management techniques into "low process maturity" organizations. Such organizations are less likely to have formal initiatives to monitor and manage critical work processes. Significantly, this form of process management is done by individuals at their own behest. Such efforts provide valuable incremental short-term gains and can help pave the way for significant productivity breakthroughs in the long-term. This theory is explored through a case study that describes process management efforts conducted in the WebCampus Division of Stevens Institute of Technology. During the transition of WebCampus from a start-up mode to a more routine operation, essential workflow processes evolved from ad-hoc procedures. The process goal for WebCampus was to leverage and improve existing cross-functional processes where possible, and in doing so make it possible to achieve future productivity breakthroughs.

Keywords: *Business Process Management, Process Improvement, Workflow, Process Charts, Flexible Process, Solo Process Improvement*

Introduction

As defined by Rummler and Brache [1], a business process is simply a series of tasks that produce a product or service. They note that "most processes are cross-functional, spanning the 'white space' between the boxes on the organization chart." From a process analysis perspective, these "white space" areas between functional divisions are the most interesting, since they represent not only the areas where processes are most likely to break down, but also the areas where there are the most opportunities for process improvement to occur. Organizations, they note, are only as good as their business processes. Successfully achieving organizational goals is largely dependent upon having effective business processes in place.

A classic problem for organizations is how to manage operations in such a way that their infrastructure doesn't collapse under new demands that inevitably accompany growth. A typical response to such scale-up pressures is the implementation of sophisticated information systems to make it easier for staff members to handle ever-increasing workloads. But one of the fundamental requirements of the implementing any large information system is that it should not simply automate existing processes, particularly if those processes are inefficient or obsolete. Numerous authors have also stated a fundamental requirement for any quality and/or process improvement movement: senior management buy-in is essential. But what if, for various reasons, an organization is unable to address large process improvement plans? What if a short-term

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focus on getting today's work done today dominates the mindset in your organization? What is a manager in a small but growing organization who and believes in the long-term benefits of process management to do?

The Just Enough Process Management concept borrows from the Just Enough Project Management idea put forth by Curtis Cook [2] in a book by the same name. In the "Just Enough" approach, Cook warns against using more project management practices than a situation calls for, citing examples where complex methodologies were implemented on a scale that were inappropriate to the situation. A simple "initiate/plan/control/close" model of project management, he argues, is enough to get most project managers going.

Similarly, the opening chapter of the *Project Management Book of Knowledge®* [3] notes the fact that practical limitations exist in the application of "good project management practices." Specifically, "good practice does not mean that the knowledge described should always be applied in uniformly on all projects; **the project management team is responsible for determining what is appropriate for any given project**."

As the name suggests, the concept of Just Enough *Process* Management differs from Just Enough *Project* Management in that it deals with a much higher level of repeatability. As such, Just Enough Process Management is more concerned with promoting a proficiency in operations that have (or can be) largely standardized and ongoing. In contrast, Just Enough Project Management deals with becoming proficient in unique undertakings that have definitive starting and ending times.

This case study will explore the concept of JEPM, and the role of individuals who practice it. JEPM concepts will also be illustrated through the experiences of the WebCampus Division at Stevens Institute of Technology. The concept of JEPM maintains that effective process improvement work can be accomplished by individuals (herein referred to as JEPM managers) without the trappings of most company-wide quality improvement programs. It assumes that, along with normal everyday work, line managers may find it useful to perform process improvement activities without a formal process improvement charter from senior management. These line managers may be obliged to ignore conventional wisdom as they make gradual progress in improving the way work in their organizations gets done. Perhaps the most important aspect of the JEPM is that it can help build a foundation for significant breakthroughs in workflow effectiveness and productivity. The flashpoint for such a breakthrough may be the rare project or initiative, such as the implementation of new business plan, a new information system, or in the case of WebCampus the redevelopment of the online learning website.

This case study focuses on the use of a JEPM approach during the transition of the WebCampus division from a "Pioneer Mode," where workflow processes were sometimes implemented in an ad-hoc fashion, to a "Settler Mode," where workflow processes became more institutionalized. Significant efforts were made to have more efficient and better documented business processes that are well-understood by participants and can be more effectively automated without becoming inflexible. The author, having started in this division in 2003, continues to play a central role in this ongoing transition, and the use of JEPM.

Limitations

No claim is made that this study has been verified by statistical empirical evidence. The empirical evidence in this paper comes primarily from a single organization – the WebCampus Division at Stevens Institute of Technology. Further, since the author has himself been the director of operations of this unit for five years, a certain level of bias is inevitable. However, it

is reasonable to argue that rich insights have been made possible by an up-close and personal familiarity with the business processes and workflow of this unit, from the time it was in a start-up mode through a critical period of growth. Prior experiences of the author in other organizations, though not statistically significant, are nonetheless consistent with the conclusions of this study.

Details about the business processes described in this paper were gathered by the author through various informal means over a period of several months. These means ranged from simple "water cooler" conversations with workflow participants, to actually creating and documenting workflow processes in response to organizational needs. Brief questionnaires were given to a few key staff members at Stevens who had the most direct exposure to the business processes and workflow described in this study. The questionnaires asked for input regarding the how well several core processes have been executed over time, and what might be done to improve them. Answers were not gathered in an ordinal or interval scale, but rather in a rich-text manner.

Literature Overview

Obsolete workflow. Enormous backlogs. Angry customers. Overworked staff. Late projects. Unmet objectives.

How big a price does an organization pay when its processes are pushed to their breaking point by the pressure of its own growth? How much scrap and re-work could be avoided? What productivity levels might be possible if things were just done right the first time? These are the types of questions have long been on the minds of managers and executives. A large volume of research has been devoted to the concept of improving core cross-functional business processes and aligning them with organizational goals and objectives. However, relatively little has been written about how workers would go about doing this without a specific mandate from senior management.

The following review of literature goes from a working definition of business process management to some of the contemporary views of large-scale BPM. Studies at more granular and smaller-scale BPM are also cited.

Rosemann, deBruin, and Power [4] summarize business process management as "a holistic organizational management practice that requires top management understanding and involvement, clearly defined roles and decision processes as part of BPM governance, appropriate BPM methodologies, process-aware information systems, educated and well-trained people, and a culture receptive to business processes." They propose a maturity model to help companies assess their BPM proficiency, benchmark their efforts against others, and develop plans for improving their BPM programs. This model is based on both the Software Engineering Institute's CMM framework and a group of six BMP maturity factors: strategic alignment, governance, methods, information technology, people, and culture.

In their landmark publication "Reengineering the Corporation," [5] Hammer and Champy envision companies achieving 70% decreases in cycle time, 40% reductions in costs, 40% increases in customer satisfaction, quality, and revenues, and 25% growth in marketshare resulting from "the fundamental rethinking and radical redesign of business processes to achieve dramatic improvements". Concerned more with "starting over" rather than in "incremental improvement," business process reengineering is a drastic top-down approach to improving organizational performance. It drastically changes the way people do their own work and how people work with each other.

Stoddard and Sirkka [6] classified business process reengineering initiatives into "evolutionary" and "revolutionary" categories. Revolutionary BPR, the type championed by Hammer and Champy, tends to produce adverse and chaotic work environments characterized by secrecy, low employee morale, and resistance to change. Aggressive BPR efforts, rightly or wrongly, became synonymous with cost-cutting through downsizing and layoffs. Conversely, evolutionary BPR efforts, though less likely to produce fast "10x" improvements in performance, can help an organization to "get started with a change program that might otherwise seem insurmountable."

Norton and Kaplan identified business process metrics as one of the four fundamental elements of their "Balanced Scorecard" [7]. Once financial and customer goals have been defined, managers identify their most critical processes in their "process value chain" and continually measure their performance. Specifically, this process value chain has three components:

- Innovation: Identify current/future customer needs, develop new processes for these needs;
- Operations: Build/Deliver the product/service.
- Post-Sale: Offer services after the sale to add to the value a customer receives.

Rather than focusing solely on existing operational processes (which when optimized still won't give distinctive and sustainable competitive advantages), Norton and Kaplan advocate a close examination of the firms innovation and post-sale processes. This helps to ensure that the organization is adding value for their customers.

Ward, Fayad, and Laitinen [8] provide a rare analysis of software process improvement efforts in small organizations. They argue that the successful implementation of software process improvement methods in small companies is likely to be vastly different than at larger companies. By way of example, they cited the approach taken by a new COO of a 100-person software development company: "His most visible decision early on was to take the company from its creaky ad hoc processes to a company-wide process… He was careful to emphasize a limited number of fundamentals, such as making sure various departments shared their plans – marketing, professional services, engineering, and so forth – with each other and ensuring that everyone understood what the company was trying to accomplish." Concluding that software process improvement initiatives should match the needs and circumstances of the organization rather than being dictated by a theoretical model, Ward offers three simple points:

- A process is a tool, not an end. No process can, by itself, transform an ineffective organization into an effective one.
- Processes must be simple. Complex processes that are hard to follow and difficult to update become quickly irrelevant.
- Processes must be easy to apply and easy to change.

Seacord, Plakosh, and Lewis [9] describe the long-term impacts that changing business processes and systems can have on existing IS infrastructure. The fact that information systems tend to expand over time to accommodate new features, workflow, and other changes is a major contributing factor to what they call the "Legacy Crisis." As the amount of code that is maintained by some companies can double every seven years, some experts worry that the pace of an organization's development will exceed its support capacity. This was famously captured in their case study of an effort to modernize a 30-year-old system: "When asked if anyone understood the design of this system, one of the lead engineers quipped: 'Yes, but they are all dead now.'" This state of affairs has striking similarities to situations where new business processes are added to an increasingly difficult to understand infrastructure.

Reijers and Mansar [10] developed a business process redesign model for classifying 29 generic BPR best practices against the dimensions of cost, quality, time, and flexibility (see figure 1). They noted that any given best practice could improve performance in one dimension but lead to a deterioration of performance in another. Some best practices in BPR actually work against each other. For example, "adding more process controls" to check for completeness is essentially the opposite of removing tasks – particularly redundant tasks. Because of the trade-offs involved in the implementation of any BPR best practice, the authors note that "…BPR is not just about the processes themselves, but about organizational structures, personnel, technology, and communications. Focusing on the processes themselves to the exclusion of this other important factors can lead to missed BRP opportunities."

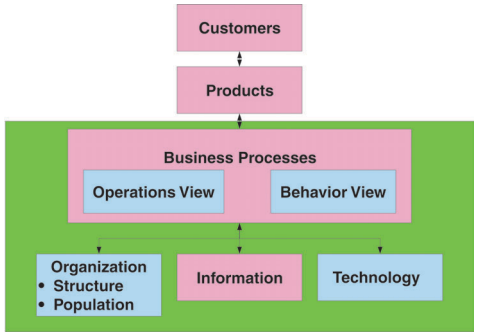


Figure 1: BPR Framework for Evaluating BRP Best Practices

There appears to be universal agreement in management literature that process improvement involves a certain degree of culture change in organizations – which normally requires the launch of a company-wide initiative. There are numerous studies that deal with the difficulties in implementing the kinds of culture changes that are needed in order to implement process improvement models and techniques in large organizations. (For example, Sikkha and Stoddard describe at length the reengineering efforts that took place at CIGNA during the early 1990s.) Some attention has even been given to implementing modified process improvement models in smaller organizations. However, little or no attention has been given to how process improvement can be implemented in small organizations that simply don't have a process improvement culture.

In some organizations and even entire industries, the commitment to quality improvement programs such as six sigma are now a part of their culture. But the reaction to such movements by managers and employees in other organizations might be characterized as a collective shrug. Some of their comments might include: "That wouldn't work here," "Our business is different," or even "We tried this once and it bombed miserably." Scores of productivity enhancement plans that could not overcome implementation difficulties have been documented. Whether these initiatives fall victim to a lack of executive support or mid-level buy-in, impractical expectations, lack of follow-through, or incompatibility with the established organizational culture, the fundamental questions about lost productivity remain. If the organization can not or will not change its culture from the top down to focus on improving the way work gets done, what else is left? Reorganization? Downsizing? Unrealistic demands for better results? Lowering expectations?

The Theory of Just Enough Process Management

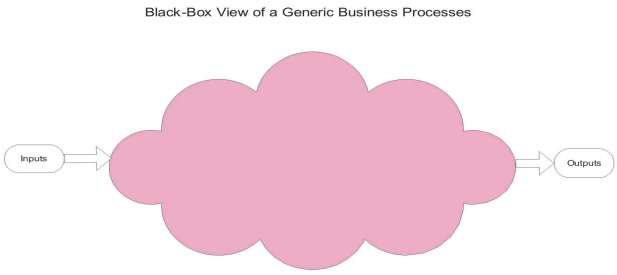
It might not have to be this way. For those who are convinced that the work processes that they are involved in can be made better, and who feel empowered enough to make such

improvements without a management decree, there remains an option. An approach of "Just Enough Process Improvement," or the gradual adoption of basic process management techniques by individuals, could have both short-term and long-term benefits. This does not call for large implementation efforts that disrupt an already-stressed work environment. It does not call for big budgets. It does not even require senior level managers to declare their support for the effort. Why? Because "Just Enough Process Improvement" can be thought of as a grass-roots approach to improving the way work gets done in organizations. It can start with just one person (as a sort of "solo process improvement" program), but will generate enthusiasm in others as time goes on. As processes become better managed (or at least better understood), difficult work becomes more predictable, efficient, and measurable. Even if this is as far as an individual can push things, it still represents a significant improvement. Being able to peer inside the "black box" of a legacy processes enables organizational learning. This is essential not only for keeping operations running smoothly during personnel turnovers, but for having a better chance at automating and optimizing the process when the opportunity presents itself at some later date. The long-term goal of JEPM is to make itself irresistible for all concerned.

To illustrate how JEPM can be applied, consider the natural tension that exists when a new division is formed inside of a larger organization. New business processes and infrastructure need to be implemented in order to get this division moving. Among other things, this necessitates a certain amount of adjustment by other divisions. As the new division begins to grow, the business processes that were first implemented to support it quickly become obsolete. In order for the new division to achieve its potential, more staff, more resources, and more scalable business processes are needed. This calls for more mutual adjustments to be made by both the new division and the rest of the organization. This evolution is discussed at length by Geoffrey Moore [11] in his research about the dangers that new high-tech organizations face as they begin to mature.

As Moore puts it, the classic growth challenge for these new organizations hinges on their ability to successfully transition from "pioneer mode" to "settler mode." Pioneers like to do new things, develop new products, and live in very dynamic environments. They trail-blaze new territories, move fast, and travel light. Although their accomplishments are often the basis of an organization's future growth, they tend to not spend the majority of their time building scalable business processes that will support long-term growth. In contrast, workers with more of a settler mentality (and who usually arrive after the pioneers) are more concerned with making new and/or current operations as efficient as possible. Innovation does not disappear with the appearance of the settlers, but there is clearly a shift in emphasis. Essentially, this means building an infrastructure with more repeatable business processes and working to bring order to chaos.

Both the pioneers and the settlers perform essential functions. However, they have very different perspectives. This is reminiscent of the differences that Kotter [12] observed between what managers and leaders do. In the classic sense, leaders concern themselves more with strategic changes. The ever-present challenge for managers is dealing with the complexities that are largely the result of these changes. In the context of business processes, leaders may view business processes as a black box that generates the appropriate outputs when given the appropriate inputs (see figure 2).



Compare this view with that of the typical manager, who often sees the interaction of different business processes at a much more detailed level (see figure 3). In some cases, a business process may need to navigate a complex and even treacherous route of activities, many of which may not be aligned, or worse, may be in conflict with each other (see figure 4).

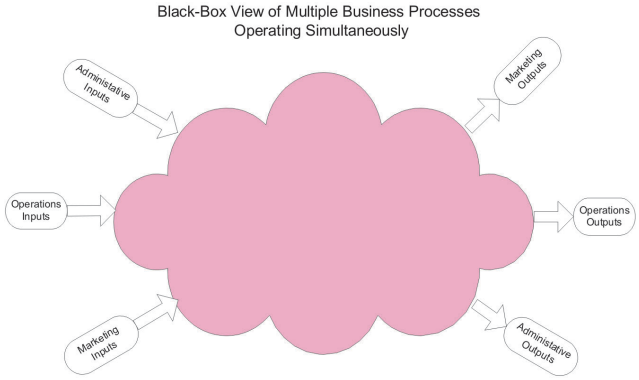


Figure 3: When processes interact, complexities multiply. The black box between inputs and outputs is harder to understand.

The situation can be likened to a heated container of gas, where the molecules bounce off each other as they move faster and faster and in all directions. In bridging the morass between input and output points, the people who perform the work need to navigate through a labyrinth of red tape. Under such conditions, the wonder is that existing business processes manage to get the required work done at all.

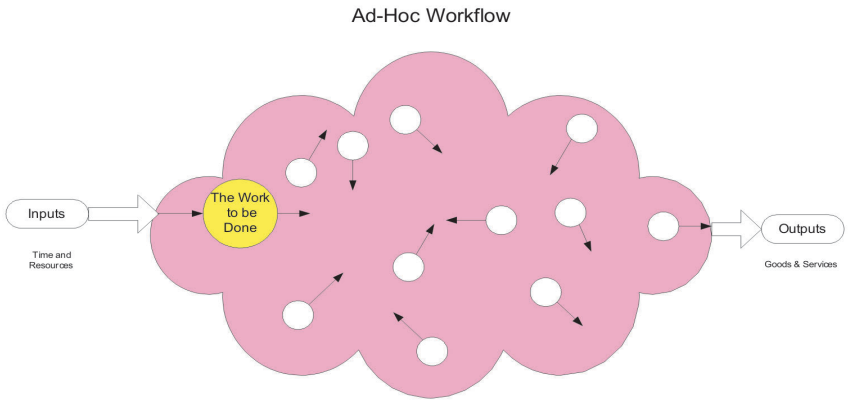


Figure 4: Ad-hoc work flows make use of pre-existing procedures that are sometimes in conflict with eachother.

At this point, those with a settler mentality might feel a strong urge to remedy the situation by advocating company-wide business process improvement efforts. But in the world of JEPM, the organization either can not or will not consider such efforts. At this critical juncture, the initiative falls to individuals who deal most closely with the business process to make whatever improvements that they can. This involves several steps that are neither unique nor revolutionary in and of themselves. The individuals who perform these steps must be prepared to step outside of their comfort zone and look inside of several functional silos. These steps, which can be viewed as the first stage of JEPM, are:

1. Determine the most critical business issues and associated processes;
2. Learn about how these processes currently work and how they address business needs;
3. Determine who all the stakeholders are, and what they know (or don't know) about these key business processes;
4. Define a path through the existing processes and infrastructure that makes the most sense to take under the circumstances (see figure 5);
5. Seek opportunities to utilize existing infrastructure to increase the efficiency and performance of these key processes;

This "tunneling" through the business process landscape involves turning the spotlight on all the things that must happen in order for work to get done. It makes the path between inputs and outputs more visible. Documenting the existing path with a process chart (see figure 6) may give many people their first opportunity to see in a wholistic manner how the work they do affects others. This tunneling also involves asking the stakeholders if the process in question, whether it is a good one or a bad one, is properly depicted. Finally, feedback about what can be improved can be gathered. Opportunities for incremental improvements should become less challenging to recognize – especially in the "white space" between divisions that Rummler and Brache refer to.

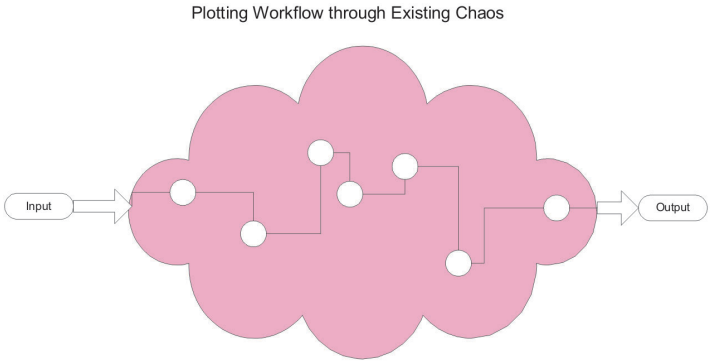


Figure 5: Implementing new workflow involves tunneling through pre-existing procedures to find the best possible path from input to output.

The solitary manager who gets through this stage already has plenty to show for his or her efforts. Work that was ill-defined can now be better understood – especially by new employees who no longer need to learn the hard way about processes that involve them. Process problems can be pinpointed much quicker and dealt with much sooner. Discussing the process at length and in detail over a reasonable period of time with other stakeholders may not eliminate organizational silos, but it should make them less deep. As the results of this kind of analysis are shared, there will be fewer cases where the only people with a deep understanding of

critical business processes "are all dead now."

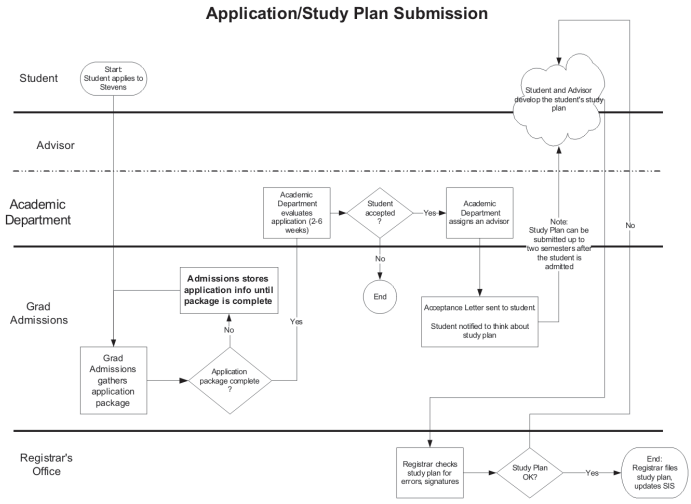


Figure 6: Process chart depicting the order in which tasks are performed, and by whom.

From Incremental Improvement to Workflow Breakthrough

JEPM helps to make clear how work currently gets done and paves the way for incremental improvements to be made. Even though JEPM activities are likely to be performed by an individual (often without a mandate from upper management), the results can benefit people in several functional areas. But this is only part of what can be done thru JEPM. Sooner or later, an opportunity to make a bigger difference will present itself. Perhaps the most common type of opportunity can be the deployment of a new information system, such as a web site or a workflow management system. If business processes have been managed and improved over a period of time, there is a greater chance that a major productivity breakthrough will result from the implementation of the new system (see figure 7).

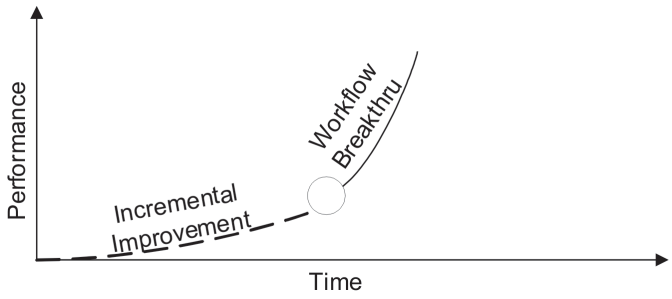


Figure 7: JEPM promotes incremental growth as well as preparedness for a breakthrough in performance

There is one catch in the second stage of the JEPM concept. Owing to the realities of limited time and resources, the JEPM manager realizes that such opportunities will be few and far between. Hence, the JEPM manager may only get one shot at creating a workflow/productivity breakthrough. The race against time has already begun: if an opportunity to achieve breakthrough results does not occur within a reasonable amount of time, normal career progression will take

the JEPM manager to new assignments, and perhaps to a new organization altogether. In such an event, unless a new JEPM manager takes up the cause, the effort falls far short of what can be accomplished.

Another challenge for the JEPM manager is that the call of "regular" work will seldom be such that there will be peace and quiet to conduct uninterrupted process improvement efforts. The JEPM manager needs to find some way to integrate this "extra" work into their already busy schedules.

JEPM at Work

At this point a valid question to ask is: "how does the daily life of someone engaged in JEPM differ from someone who is not?" At first glance, there is not much of a difference at all. Presumably, the JEPM manager still has a shop to run. Normal operations and projects must be the top priority. In order to have any hope of leading a workflow breakthrough or even incremental process improvements, a JEPM manager must demonstrate a solid record of performance.

The main differentiator is that the JEPM manager takes advantage of opportunities to learn as much as possible about "the way things in the organization work." This involves asking a lot of questions of a lot of people in other divisions – not all of whom the JEPM manager crosses paths with on a regular basis. Thus, the JEPM gathers information that includes (but is not limited to):

- Goals and objectives of other divisions;
- Important processes and sub-processes of other divisions;
- Common bottlenecks in the normal operations of other divisions;
- Perspectives of others stakeholders;
- The history of how critical pieces of infrastructure were built, and why;
- Metrics that matter to other stakeholders

When gathering such information from others, it is important to build a non-threatening environment in which to do it in. It may take months to build up informal networks of people who are willing to talk about their work in such detail. Trading non-secret but hard-to-come-by information with stakeholders will help build trust and promote collaborative learning, but information about politically sensitive topics needs to be handled with discretion. As the JEPM manager learns more about the various cross-functional processes that he or she comes in contact with, the information is made available to others as appropriate. Informal discussions about process metrics, procedures, and workflow challenges can lead to incremental changes and lay the groundwork for larger improvements when the right opportunity presents itself.

What is conspicuously absent from this approach are references to company-wide process improvement directives. In the absence of a clear process improvement program backed by senior management, one may rightly wonder how employees can be encouraged to undertake JEPM activities. The answer is often present in employee performance reviews. The kind of skills and behaviors that are commonly assessed in these documents are exactly those that are so important for the JEPM manager. Important skills for the JEPM manger to have include:

- Project management skills
- Presentation skills
- Data collection and analysis skills

- Strategic and tactical planning skills

Additional skills and behaviors that are less commonly found in management performance appraisals but which are important for JEPM managers include:

- Interviewing skills
- Process management and mapping skills
- Works to leverage informal networks (both internal and external) to improve organizational performance;
- Demonstrates willingness to collaborate with others;
- Demonstrates willingness to learn new technologies;
- Takes action to improve inefficient processes rather than just reacting to them.

By definition, early-stage JEPM actions are not drastic in nature. The easiest way to get started is to pick a handful of processes and map out the existing workflow. Get input from those closest to it, and have them verify the analysis. Make others aware of the workflow (whether it is good workflow or bad workflow), and help facilitate process improvements to the extent possible.

The Case: The Evolution of the Online Learning Unit at Stevens

The evolution of operations in the WebCampus Division at Stevens Institute of Technology can be used to illustrate the concepts of Just Enough Process Management. WebCampus, the online learning unit at Stevens that was founded in 1999, is undergoing a fundamental transformation from a start-up operation, where numerous processes were created on an ad-hoc basis, to an operation where processes are better-defined, understood, and are becoming automated to a significant degree.

From 1999 thru 2003, WebCampus was run primarily in Pioneer Mode. New infrastructure had to be created where little or none had previously existed. Faculty needed to be trained to deliver courses in a way in which few were used to doing. Contracts needed to be developed, deals with partnering organizations needed to be negotiated, and many people inside the school needed to be sold on the concept.

As might be expected, WebCampus operations before 2003 had not progressed to a level where process management was the top priority. "There was a general plan to implement the basics," noted WebCampus founder Bob Ubell, "but institutionalization of robust processes would not begin until 2003."[12] Indeed, during this time, the entire WebCampus administrative staff consisted of Ubell, a secretary, and two graduate student assistants. The workflow situation at this time is shown in Figure 8. Business processes that were created for WebCampus didn't always mesh with existing school operations.

During this time, there were other challenges for the WebCampus Division. The concept of conducting fully online graduate courses ran counter to what some considered a good strategy for the school as a whole. More students online meant less students in the classroom, according to this view. In addition, the quality of online courses was an open question to many. Plans were made to implement processes for course assessments, beef up instructor training, execute marketing efforts to attract students outside the school's traditional territory, and provide more quality services to online students. The alignment of WebCampus operations with those of the rest of the school began to improve, but it was clear that in order to grow, more staff would be needed.

From 2004 thru 2006, WebCampus underwent a classic growth-crunch phase. The number of classes that were made available online increased. The number of students enrolling in online classes increased. The number of online instructors increased. The number of projects (many of which were cross-functional in nature) that the WebCampus unit became involved in had dramatically increased. WebCampus classes became more sophisticated in the technologies they used, integrating web conferencing and anti-plagiarism software, among other things. Revenues climbed steadily, and senior management was happy with the unit's performance. (Significantly, between FY2005 thru FY2007, revenues from operations grew between 35-41%.) But during this time, it became clear that the basic workflow processes which were established when the unit was delivering 20-24 classes per semester were inadequate to support the delivery of over 100 classes per semester.

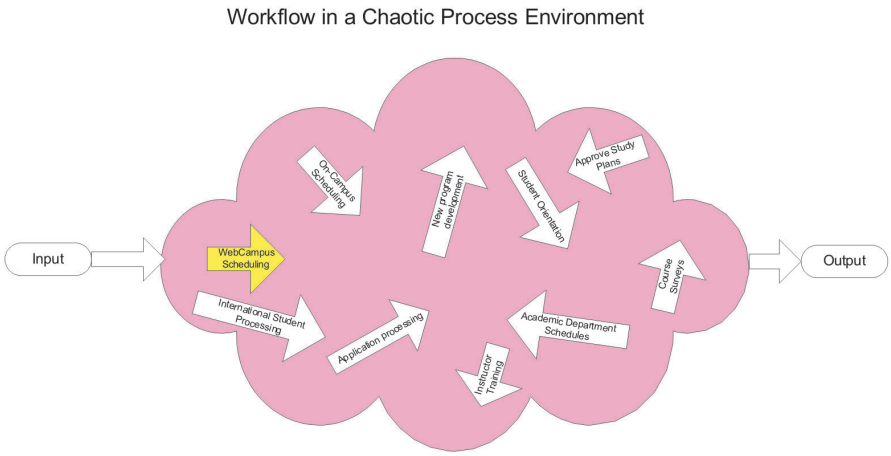


Figure 8: Early WebCampus Workflow. Note the conflicting and unaligned subprocesses.

Using JEPM at WebCampus

The explosive growth during this period stressed several key processes that had previously created on an ad-hoc basis. The staff was able to meet the resulting challenges through a combination of teamwork, collaboration with other divisions, and what might be called low-intensity process management and automation. These key processes were:

1. Managing the semester cycle
2. Attracting and supporting students
3. Supporting and training faculty
4. Supporting the development of new online programs
5. Managing partnerships and client relationships

The proper execution of these essential processes (covered in detail in Appendix 2) largely depended upon the proper alignment between WebCampus and six other groups at Stevens:

1. Registrar's Office
2. Admissions Office
3. Student Services Division
4. Information Technology Division

5. Academic Department Leaders (the Program Directors)
6. Faculty

The first systematic efforts to document these essential workflow processes began in 2003 (see Figure 9).

Proces Chart for Creating WebCampus Schedules

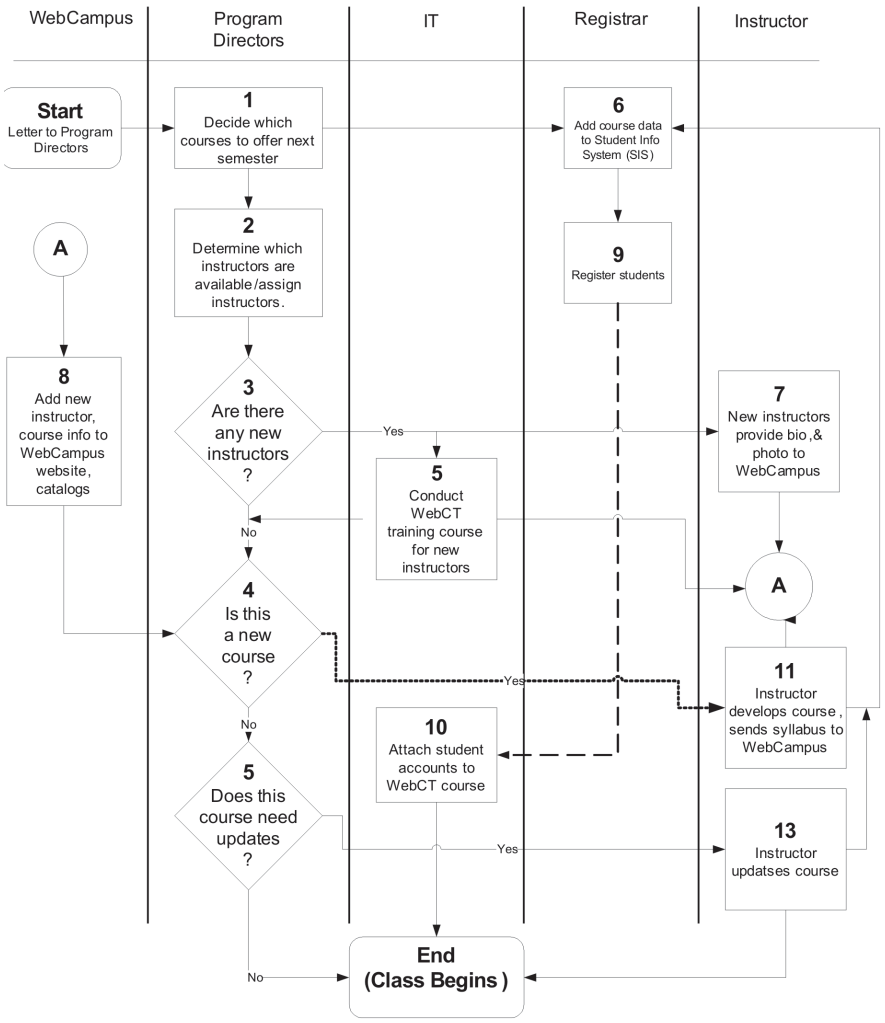


Figure 9: Depiction of Essential WebCampus Workflow (2003)

Since so much about offering classes over the Internet was so new to so many people, the simple act of charting all the players, tasks, and dependencies that were involved proved to be a critical learning experience for both new staff members and existing staff in other divisions. The new Associate Director for WebCampus began this effort through informal interviews with the people that had any exposure to online learning operations. These interviews revealed several themes and issues. For example, which classes should be offered over the Internet? Who decides when they should be offered? Who should conduct these classes? How should

they be conducted? How much support can faculty members count on, and who will provide it? How many students can be placed in an online class? How do students actually get into a WebCampus class and learn how to use the online learning technologies once they get there? The details of these and numerous other issues were examined on an on-going basis. Much was learned through trial and error as operations continued. In order to perform the kind of work that had been pioneered between 2000-2002 on any meaningful scale, it quickly became apparent that a detailed understanding of the way work was accomplished in other divisions was required.

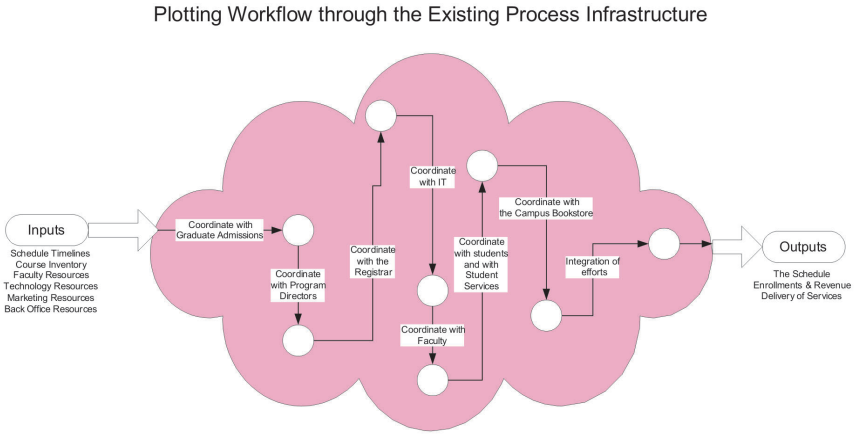


Figure 10: Workflow "tunneling." Analysis of existing cross-unit processes and adapting new workflow accordingly yields the a workable route from input to output.

Over time, the process chart depicted in Figure 9 evolved into a seven foot long by four foot high illustration. It was the product of hundreds of mini "learning events." Most of these learning events tended to be conversations with students, faculty, and administrators who had any connections to the five essential WebCampus business processes. (These conversations took place in a variety of formats: meetings, phone calls, email messages, and even chance encounters in the hallways.) Additional lessons were learned through analyzing the results of operations. Some WebCampus processes that were created during the start-up years had to be taken apart and reconstructed in a manner where they were better "plugged in" to the existing process infrastructure of other divisions. As this "tunneling" through existing infrastructure continued, more WebCampus processes became more institutionalized. As illustrated in Figure 10, this tunneling required coordination with numerous areas in order to establish the standard operating procedures or "process tunnels" that would be needed in to accommodate growth.

Significantly, most of this learning occurred not as a separate activity, but along with day-to-day operations. (At no time was there ever an institute-wide push for each area to analyze and document its critical work processes.) With each conversation about how the flow of work should be conducted, and with each small workflow improvement that was made, the overall operation became more robust.

The value of these JEPM activities was demonstrated on numerous occasions. The process charts that were developed were used as a training tool to quickly help bring new staff members up to speed. They were also used to show other players, ranging from members of the Finance Office to representatives of partner organizations, how work was done at WebCampus. Workflows were devised to better manage procedures such as:

- issuing contracts and signing off on payroll documentation;
- building new course schedules;
- verifying that online course content would be ready and available when needed;
- distributing class rosters to instructors so that they may contact their students;
- maintaining up-to-date content on the WebCampus web site;
- increasing communications with students.

By 2005, a predictable and largely reliable rhythm had developed, involving some 100 faculty members, 16 program directors, 30 administrators, and over 1500 students. Despite these gains, by the end of 2005, it became clear that a significant breakthrough in workflow productivity was needed if the WebCampus staff (now numbering 7) was to keep up with current demands and meet future growth goals. Meeting the challenge for continued growth would hinge not only upon the school's ability for sustaining a larger number of students and clients, but also upon its ability to provide quality support for the ones that it already had.

A major scalability concern for the WebCampus staff was the role that email played in practically all critical workflow tasks. Ironically, the hundreds of email messages that each staff member received each day were the root of several breakdowns in communication. This information overload inevitably led to problems with end-user support, but there were other issues. The creation of the all-important WebCampus schedules depended heavily upon the correspondence between the academic program directors and the Director of WebCampus. In fact, getting most work done at all seemed to involve ever-increasing volumes of multi-threaded email conversations.

An Opportunity to Achieve a Workflow Improvement Breakthrough

In January 2007, development of a new WebCampus web site was authorized. The existing site, built in 1999, contained an impressive amount of useful content: Course schedules, course descriptions, syllabus files, faculty bios and contact information, tuition and fees, admissions forms, newsletters, articles about online learning, and so on. But by 2005 the site was clearly showing its age. In all, there were over 250 individual HTML files, and almost all of them had to be updated manually, one-by-one, each semester. The updates were all done by a single staff member, the web site specialist. As this person was routinely assigned to other projects or otherwise unavailable, the resulting delays in posting up-to-date information was becoming painfully obvious by the 2006-2007 academic year.

Sensing that this project would provide a rare opportunity to vastly improve the operations of the division, the Director of WebCampus spent a considerable amount of time developing a list of business requirements. These requirements, along with all the mission, vision, and goals that were discussed and debated during numerous WebCampus Board of Directors meetings, were poured into a project mission statement and shard with three companies that specialized in web site design. After one of the three firms was selected, and after the obligatory journey through the newly enacted Stevens procurement procedures, the project got under way. Requirements management, the very first of CMM's "key process areas," would prove to be a valuable component of JEPM.

Formally released in March 2008, the goal of the new website project was not only to provide a modern end-user experience, but to provide the last piece that has been missing from a fundamental breakthrough in the way work is done by the WebCampus division. Among other things, the database-driven content management system at the heart of the new website now allows:

- non-web site experts to quickly and easily make updates that cascade to all appropriate parts of the site;
- automation of the generation of numerous reports, including enrollment, rebate, commission, and royalty statements;
- value-added features that will encourage return-traffic from prospective, current, and former students. Such features will include a study-plan builder, an events calendar, and a multimedia section featuring interviews with engineering and management educators and industry leaders.

Figure 11: Illustration of the new WebCampus web site

The new WebCampus web site was deployed in late March of 2008. By the end of the Spring 2008 semester it should become clear whether or not this web site will live up to the expectations expressed in the project mission statement and offer some validation to the theory of JEPM. To the extent that the project expectations are met, the staff will have more flexibility to spend additional time on enhancing the quality of online courses, developing new online course offerings, and reaching out to bigger audiences who might be interested in applying to the school's online graduate programs..

JEPM V2.0 – Making Process Improvement Irresistible to Others

The WebCampus Division shares the 12th floor of the Wesley Howe Center with the school's Graduate Admissions Office. These two units have overlapping responsibilities and have long shared a cordial working relationship. On several occasions, the Graduate Admissions Office was able to make use of the myriad of enrollment and revenue reports that WebCampus staff members maintain. During the Spring 2008 term, members of the Graduate Admissions staff began expressing interest in charting their core processes in the similar manner that had been done at WebCampus. Thus began a joint effort by the two groups to document the many variations in workflow that characterize the process of applying for admission to Stevens. This was followed by plans for charting and improving a variety of other essential procedures, including:

- the ways in which international students were shepherded through the admissions process;
- the ways in which registration could be handled;
- the ways in which letters of credit were handled;
- the ways in which the two offices could better manage relationships with corporate clients.

This development is significant in that, once gain, there was no mandate from senior management to analyze and improve work procedures in this way. The realities of a high workload and limited resources in the Graduate Admissions unit will necessitate a gradual implementation of business process management. However, the assumption of a gradual implementation is a central part of the JEPM concept. Despite this, incremental improvements may be seen as early as the end of the semester. As the turnover rate of part-time student workers is certain to remain high for the foreseeable future, the JEPM approach should be particularly helpful. The next group of temporary workers should be the beneficiaries of better training on better workflow processes.

As the Graduate Admissions Division and perhaps other units throughout the school begin to formalize their work processes through a JEPM approach, they will also be preparing themselves to take advantage of the next workflow breakthrough opportunity. This next opportunity may very well be the implementation of the PeopleSoft enterprise management system. As with the new WebCampus web site, the PeopleSoft implementation can build upon all the JEPM process improvements and vastly improve productivity. But this story will have to wait for another time.

Summary

To pursue the path of JEPM is to commit to a belief in the value of managing work processes and sharing information. Although there is a fundamental requirement for collaboration with others, the JEPM practitioner may be obliged to go about the bulk of workflow management chores on his or her own accord. To business process improvement purists, this "solo" brand of process improvement may be considered heresy. But in an environment where business process improvement initiatives are simply not a big priority, the best hope for achieving workflow productivity gains will by default fall to those individuals who are the closest to those business processes and have some level of authority to act. Some suggested guidelines for the solitary process management practitioner are presented in Table 1.

A little bit of process management may go a long way. Simply the act of documenting the way work currently gets done in an organization will expose the JEPM practitioners to a wide variety of experiences and give them insights that they would not get inside of functional silos. Work products from JEPM activities (primarily process charts coupled with metrics reports) can be a useful conversation piece that may help open the door for productivity-enhancing projects.

Table 1: Suggested JEPM Guidelines

JEPM Dos	JEPM Don'ts
Get your own house in order	Call for a company-wide BPR efforts with senior management buy-in
Understand how your own processes affect and are affected by other areas	Complain bitterly about people not understanding critical business processes unless you have something constructive to share.
Accumulate knowledge about critical processes over an appropriate amount of time, and from a variety of sources	Demand to know everything there is to know about critical processes immediately.
Organize the information that you have uncovered	Assume that the information you need about important business processes already exists in an easy-to-use format

JEPM Dos	JEPM Don'ts
Confirm what you have learned from others and share what you have learned as appropriate	Rely too much on unconfirmed or uncorroborated information.
Demonstrate the value of what you have learned about critical processes in your day-to-day work	Withhold information to preserve power.
Seek ways to help others improve their business processes in low-key ways	Turn business process improvement into a compliance thing.
Build on process knowledge over time	Expect quick-hit successes
Prepare for the big improvement opportunity when it finally comes along	Simply automate existing processes when the opportunity finally comes along.
(Gently) demonstrate to others the value of your business process improvement activities. Start with small audiences – especially those that are involved in the business processes.	Assume that everyone gets it. Or tell everyone that they should get it.
Move on to other processes as appropriate	Fixate on only 1 business process or issue.

The history of the WebCampus Division at Stevens provides some corroboration for this theory, but to the author's knowledge, it is the only case study that has been analyzed from this angle. In addition, there were some relatively unique factors at work at WebCampus that underscore the need to study JEPM in other contexts. For example, WebCampus was a 21st century start-up division in an educational institution that has been around since the 1800s. WebCampus specializes in a service that, for all intents and purposes, was not an option for the masses until the late 1990s. Finally, the Director of WebCampus and the author of this paper had a fairly free hand to pursue JEPM as long as the day-to-day work was completed in an orderly fashion. (The author also had some experience in organizations that had broad process improvement programs.)

If the maturity of business process improvement practices at WebCampus was plotted on the Rosemann, deBruin, and Power model [4], it would look very much like the illustration in Figure 12. As JEPM is largely a voluntary proposition taken on by individuals in organizations that don't have big process improvement initiatives, it is probably unrealistic to expect BPI coverage or proficiency to rise far beyond the Initial Level. Even crossing the threshold into the Repeatable Level would be considered a significant long-term achievement.

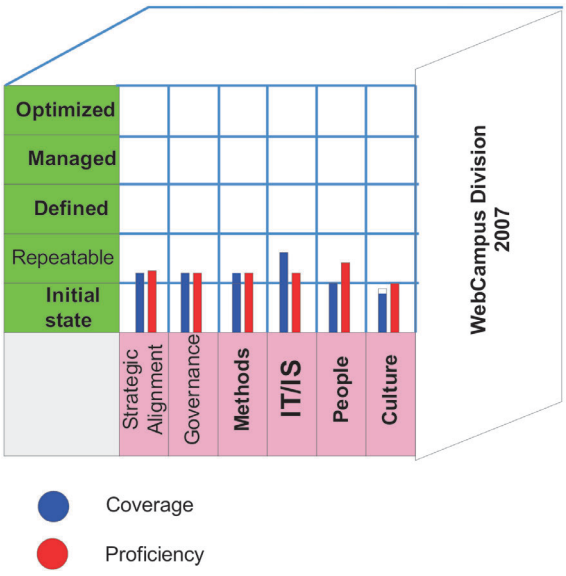


Figure 12: WebCampus Business Process Improvement Maturity

A follow-up study of the WebCampus and Graduate Admissions operations (presumably after the implementation of PeopleSoft and/or after the current staff has moved on) may provide insights about the long-term viability of the theory of JEPM.

Appendix I: Summary of WebCampus Operations

Online Graduate Programs

Through the WebCampus Division, courses for 15 Masters Degrees, 39 Graduate Certificates, and the school's MBA are offered online.

Corporate Campus Programs

Through the WebCampus Division, numerous programs at offsite locations have been initiated and supported. Significantly, the amount of new activity at existing corporate campus sites has dramatically increased.

International Programs

The WebCampus Division has also demonstrated the capability to exploit new international opportunities. Through the WebCampus Division, the school has begun offering classes in Beijing via partnerships with Chinese universities. These partnerships make use of a hybrid and innovative approach in offering programs, with some classes run online and others conducted in conventional classrooms. The first Chinese cohorts started in 2003. The experience gained from this undertaking was instrumental for Stevens when IBM awarded special training contracts for their Chinese employees. The school's second award from the prestigious Sloan Foundation can be traced to these efforts.

Training Programs

Through the WebCampus Division, the school has been able to run a limited number of special training programs for corporate clients. The model involves leveraging current faculty members and existing course content in the development of customized materials based on client needs.

The WebCampus division has also developed a blended PMP Exam Preparation training course. Originally developed for the "retail market," this course has been successfully run for corporate clients.

It has been the experience of the WebCampus division that developing and deploying training programs is very labor-intensive, with low margins. Despite the benefits that a training arm would bring to the WebCampus portfolio, a lack of resources gave the division no choice but to suspend further development of training programs at the beginning of FY08.

Proposed Undergraduate Degrees

Finally, discussions are under way to deploy two online undergraduate degrees. (This is not to be confused with the Euclid program, which consists of 4 online courses designed for incoming Freshmen that WebCampus has offered since 2003.) The online undergraduate degrees under consideration are likely to be targeted towards people who have been in the workforce for several years but have reached a plateau in their careers.

Appendix II: Essential WebCampus Processes

1. *Managing the Semester Cycle:* Managing the schedule of offerings is perhaps the single most important and time-sensitive process that the WebCampus team is involved in. This process has several critical milestones that can not be missed under any circumstances. The schedule of courses and instructors must be built and posted at least two months

before the start of the registration period. Although some aspects of the schedule are somewhat routine, many schedule elements can change radically from semester to semester. Opportunities for automation exist, however a fully automated scheduling process will not practical for the foreseeable future. If the posting of the schedule is delayed for any reason, it would have a cascading effect upon sales and marketing activities, and hence enrollments and revenues.

Apart from scheduling, there is a myriad of sub-processes that are executed each semester: distributing instructor contracts, filling out faculty payroll requisitions, ensuring course content is loaded and ready for Orientation week in all WebCT shells, distributing rosters to instructors, performing web conferencing directory maintenance, calculating co-sponsor commissions and developer royalties, making routine website updates, synchronizing the ACE student survey systems, collecting operational performance metrics, and numerous cases of technical and administrative trouble-shooting that are inevitable in every semester.

2. *Attracting and Supporting Students:* Managing the student experience from "inquiry" thru graduation and beyond involves a complex and often changing mixture of sales, marketing, and operations activities. For attracting new students, WebCampus uses a mixture of marketing approaches, which can involve any combination of corporate (B2B) sales and outreach efforts, on-site and online information fairs, email blasts to existing lists of prospective students, and various forms of online advertising. Due to budget constraints, most online advertising approaches such as banner ads, search engine optimization, and paid "lead generation" programs have not been consistently pursued. Some work has been done in Website analytics, though the link between this activity and increased enrollments has not yet been demonstrated at Stevens. Finally, printed catalogs, public relations efforts (such as writing articles and networking at conferences, etc.) also round out the list of marketing activities at Stevens. None of these activities are nearly as routine as the schedule building process. However, there are frequently work products from previous iterations that can be recycled, as is the case of creating catalogs and revising information session presentations.

In contrast, sub-processes for supporting incoming and existing students are more well-established. Naturally, the various student support processes can be quite complex and involve many staff members. For example, application processing starts with the student, who may be "coached" by either faculty or Admissions staff members. Application components (including transcripts and letters of recommendation) are gathered by the Admissions department, logged in the record keeping system, and then sent to the appropriate academic department for evaluation. The academic department renders an admissions decision and forwards the application package back to Admissions. Admissions takes the appropriate admit or reject documentation and enters this additional data into in the school's record keeping system. Students who are accepted are informed of how to logon to their accounts, who their advisors are, and are then required at some point to submit study plans. The study plan process itself ironically has highly structured and non-structured components. Students have a wide time window in which to work with their advisors and get their study plans on file. Some parts of the application process are semi-automated, and some opportunities for further automation exist in study plan processing. Yet these two support processes are still highly prone to error and/or delay.

Most situations where students withdraw from courses are handled in a routine matter. But numerous petitions for Incompletes and full refunds are evaluated on a case-by-case basis. Similarly, handling student complaints about course content, quality, delivery technologies, or

faculty are handled on a case-by-case basis. Often, intervention by other areas, such as the Registrar, Student Services, or the appropriate academic department, is required.

The process of giving course surveys is largely automated – at least from the student perspective. Unfortunately, there is a large amount of non-automated and semi-automated work (primarily data management) that goes into maintaining the ACE survey system. This, in turn, makes the course assessment process prone to errors that require manual intervention to correct.

With the re-development of the WebCampus web site, some services for online students will be vastly improved. More content that is of general interest to both on-campus and off-campus will be made available. Much work has been done in improving Library service for WebCampus students as well. Other services have not been addressed. For example, providing career services specifically for online students is a largely unexplored area. Other than contingency planning mechanisms such as compiling a list of frequently-asked questions, the opportunities for automating many of these tasks are limited.

3 *Supporting and Training Faculty:* Nearly 150 faculty members have taught online courses at Stevens. WebCampus staff members have been available to assist online professors in a wide range of topics, ranging from administrative, technical, and course quality matters.

Since 2000, WebCampus and the IT Division have coordinated WebCT training sessions, and more recently Interwise training sessions. (WebCT is the learning management system where most virtual classroom activities are performed. Interwise is a web conferencing system that is used to supplement the capabilities of WebCT.) In addition to traditional classroom-based or one-on-one sessions, training on the use of these technologies can now be taken in real-time web conferences or through pre-recorded self-paced modules. Promoting student participation in ACE surveys, distribution of student contact information, and even assisting in the uploading of course content are just some of the things that the WebCampus division does to aid instructors.

Perhaps most significantly, WebCampus offers advice to new and current online faculty members regarding matters of pedagogy. WebCampus staff members, some of which have taken online courses, routinely advise instructors on effective methods for conducting various class activities. From grading strategies to advice on how to structure exams and team assignments, the WebCampus staff is constantly sharing knowledge that is gleaned from past experience, current student feedback, and the latest research in the online teaching profession. Instructors are expected to attend WebCampus colloquium meetings every year to discuss best practices. Topics such as effective virtual teaming, fostering active discussions, the effective use of standard course materials and templates, and plagiarism detection are some of the topics that have been covered in previous faculty colloquia.

Finally, the WebCampus staff often intervenes when students are having administrative or technical difficulties that may be related to registering for, logging onto, or sometimes exiting from an instructor's online courses. These interventions are important not only for helping students out of difficult situations, but also to allow faculty members to concentrate on what their mission is: providing top quality instruction for their class. As with many forms of student support, these activities are largely addressed on a case-by-case basis.

4. *Supporting the Development of New Online Programs:* In all, there are over 150 courses in the WebCampus inventory. About 130 of them are given on a regular basis; approximately 105 of them are given each semester. Whenever a course is to be developed, the WebCampus and IT divisions will jointly coordinate the training of the course developer on the appropriate technologies, and offer assistance and advice to the developer regarding

how to course content should be deployed.

For cases where other faculty members teach the course using the developer's materials, a process has been set up for calculating and distributing royalty payments. This process should be largely automated when the new WebCampus web site is released.

5. *Managing Partnerships and Client Relationships:* This is an extremely high-touch set of activities, many of which are not conducive to automation. Examples of these activities include holding frequent discussions about the status of existing agreements, plans for future engagements, providing customer services, and analyzing the effects of various events upon the partnership. Specific tasks might range from the development of client/partner internet landing pages to attending partner/client conferences and education fairs. These activities help to build trust and credibility with the client, which in turn opens the door for additional opportunities such as cross-selling programs and/or recruiting additional students. However, this activity can greatly benefit from process improvements and automation in the reporting of various metrics.

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Metrics reporting is handled as a separate process (or perhaps more accurately described as a sub-process). It entails monitoring, controlling, reporting, and improving upon these five basic processes. It is an activity that has grown in importance with each passing semester. In this regard, WebCampus faced many of the same challenges that other divisions at Stevens did. As in many organizations, the appetite for reports by senior management seemed insatiable. Though the infrastructure at Stevens made broad real-time reporting impractical, there was an ever-present demand to provide the most up-to-date information as possible during weekly departmental meetings. These metrics normally included such things as enrollments new student applications, revenues generated, comparisons with data from the previous year, forecasts for the following year, as so on. With help from the Registrar's Office, WebCampus developed a system of metrics and reports that were able to satisfy the most common inquiries from senior management. The major problem with this activity was that is was enormously time-consuming. The enormous complexity of the raw data in the Registrar's system has led to numerous cases of misinterpretation. Sifting the data and formatting it into easy to understand reports was largely a manual process. (The planned replacement of the Registrar's Sunguard/SCT Student Information System with a PeopleSoft information management system will eventually make this kind of reporting much easier. However, no date has been set for this transition project to begin.)

Results of Operations	FY2004	FY2005	FY2006	FY2007
Total Enrollments	1917	2469	2896	3607
Graduate Enrollment	1391	1853	2310	3138
Sections conducted	178	209	263	315
Students per section	10.77	11.81	10.99	11.45
Graduate Students per section	7.81	8.87	8.77	9.96
Revenues	$3,316,000	$4,467,000	$6,007,000	$8,457,000*
Percent Revenue Increase over previous year		34.7%	34.5%	40.8%**

* New accounting schedule adopted in FY 2007 changed the way Summer-A revenues are booked. Accounting for this change, booked FY 2007 revenues were $9,288,000.

** Allowing for the new Summer-A accounting rules adopted in FY2007, this percentage is actually 54.6%

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