

Managing for Success: The Insider's Guide to NSF Project Management

Best Practice
2003



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The accomplishments in this report reflect the cooperative efforts of:



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Section 1

Sharing the Context

Today, the pressure for success is so strong that for the most part, we are motivated to operate on the premise of best-case scenarios. These presume all the people, processes and technologies will function smoothly, events will be tackled in the order and method planned, and the results will be as good or better than expected.

*If you're not falling down,
you're not learning.*

*William Smithburg, Chairman
Quaker Oats*

When it comes time to document what we did, how we did it and the outcomes produced, we're inclined to focus almost exclusively on what worked — those tasks and challenges that were completed in a smooth, timely, efficient manner. At the same time, we may ignore, soft pedal or reframe the most daunting problems to paint a picture of total, unqualified success.

This case study, on the other hand, describes the challenges, setbacks and successes of one National Science Foundation (NSF) project and the strategies and lessons learned by one project manager. It has been constructed with the specific goal of revealing the inside scoop and behind-the-scenes realities of managing the NSF project known as IT@Sinclair.

By definition, successful project management means dealing with the unplanned and unexpected. People, processes and technologies rarely work flawlessly. Successful project managers recognize this. They also recognize that somewhere in this journey, they will need to confront the “f” word — failure. It's a word we've come to expect, but we've learned it's not permanent, it simply means that we've not yet succeeded. Plans exist not to be met, they exist to be managed as more information becomes available.

For the most part, this document shares the perspectives, limitations, insights and lessons I learned as the IT@Sinclair project director. New to the NSF project management scene, I had worked since the 1970s in a variety of environments, including the private sector, the high-pressure

environment of high-tech business mergers, acquisitions and mission management, and in astronautics and aeronautics. Eventually, these experiences proved useful to our project, but my early days as project manager were consumed with the need to get familiar with the established team, master specific NSF requirements, learn the intricacies of the college budgeting and management systems, and transition from the role of team peer to manager.

This case study shares what I learned, in the hope that it will alleviate your concerns and fears and provide a useful frame of reference for successfully managing your project. It also shares what our team did, why and how we did it, along with the results and outcomes. I've tried to carefully distinguish between the choices and actions I took as project manager and those diligently pursued by the team. I've included tools and technologies that in the end helped us accomplish our ultimate objective. I've also shared some of the insights gained and changes made to our overall strategy as a result of the lessons we learned, along with recommendations and observations from team members.

The bottom line is this. How we have come to think is as important — or perhaps even more important — than what we've done. Certainly, it's cleaner, easier and less painful to cite straightforward facts and paint everything in rosy shades of success. Overall, however, our greatest contribution may be the willingness to share an unvarnished look at some of the day-to-day challenges of managing an NSF project and surviving to tell about it.

*How we think is as important — or
perhaps even more important —
than what we've done.*

*David Siefert, Director
IT@Sinclair Project*

Section 2

Establishing a Baseline

In 1999, the IT Initiative was funded by the Advanced Technological Education division of the National Science Foundation. The project was housed at Sinclair Community College in Dayton, Ohio, and it was funded at \$856,000 for a three-year duration (July 1999 through June 2002). In 2002, a fourth year of effort was authorized as a no-cost extension, which pushed the project completion date to July 31, 2003.

PEGGING THE PARAMETERS

The original proposal was designed to create a NSF center for IT, called the IT Academy. NSF center grants tackle and solve a problem that has strategic implications on a broad scale, and they provide solutions and support to institutions throughout the country with similar problems.

Through a series of iterations, our IT center grant was transformed into a project grant, and the funding was reduced accordingly. The scope of work was refined but not substantially reduced, which left us with a project that included this complex and challenging array of project objectives:

- Goal 1: Re-engineer the CIS curriculum and develop options within the curriculum framework.
- Goal 2: Establish partnerships with employers of IT professionals.
- Goal 3: Create formal relationships with pre-college programs.
- Goal 4: Offer development programs for faculty.
- Goal 5: Employ an “adopt and adapt” strategy to take advantage of existing best practices for both education and IT technology.
- Goal 6: Explore ways to work with underserved populations.

Sinclair Community College is a two-year associate degree college that also provides extensive certification options. As a result, the primary project focus was to create a seamless pathway that connected high school programs to two-year associate degrees, viable careers and eventually four-year degrees.

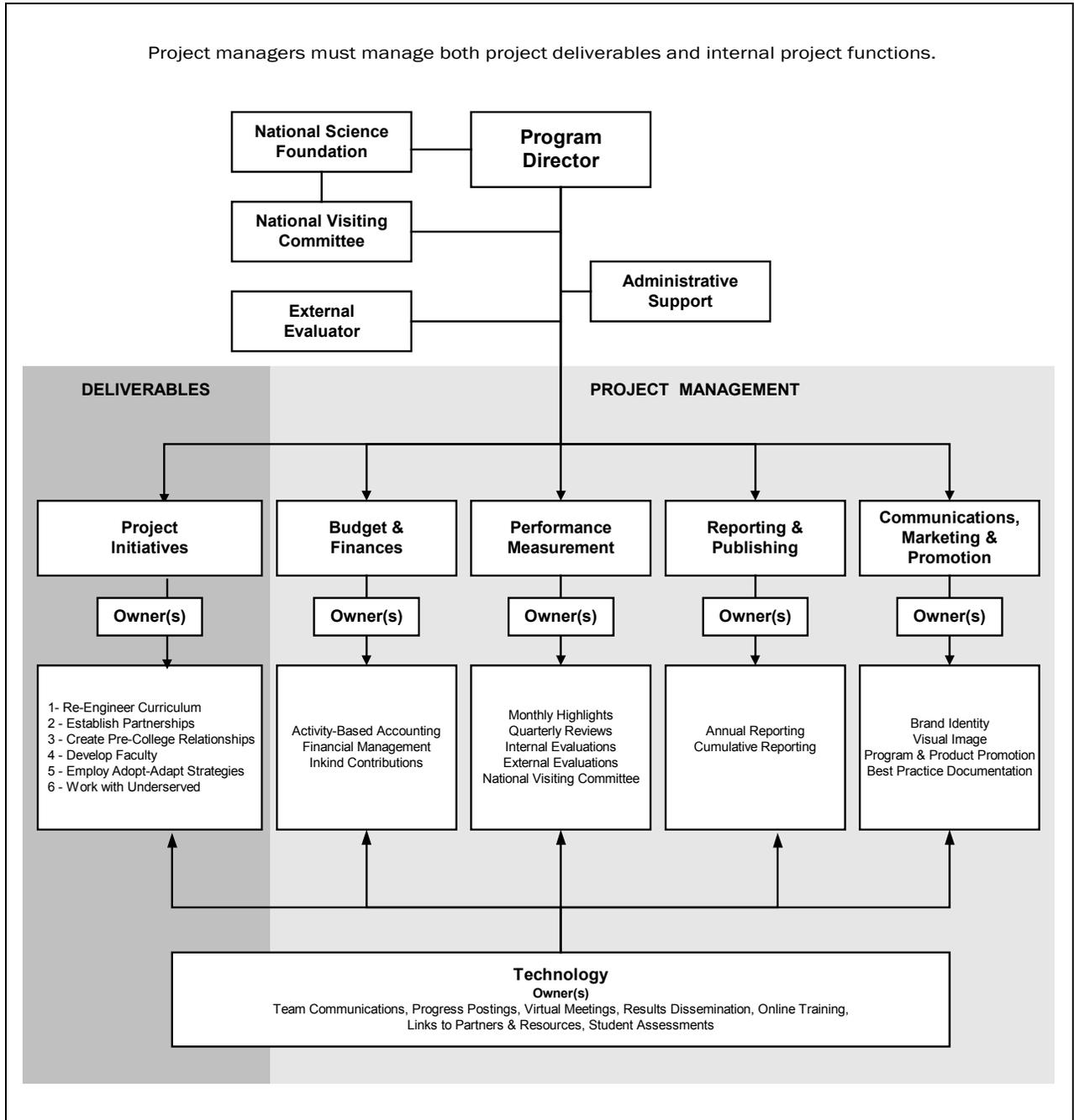
To support this comprehensive effort, we committed to establishing partnerships with diverse IT employers; building a formal, ongoing relationship with technology-based pre-college programs (including the establishment of Cisco network-based programs in high schools); providing extensive skills and technology training and development to high school and college faculty; using adopt-and-adapt strategies to leverage best practices in education and the IT arena; and exploring ways to work with underserved populations. The development of custom Fast Track programs and the creation of formal best practices emerged as valuable deliverables as the project evolved.

The IT initiative was a complex project. My challenge was to reduce these complexities to an actionable level, so I focused on the fact that all projects operate in two arenas. One involves the specifics of project deliverables associated with the goals, objectives and outputs defined as the minimum expectation for the endeavor. The second involves the project infrastructure, the underlying systems and tools that support deliverables.

Hence, in addition to the primary project initiatives, there are also requirements for budget and finance; performance measurement; reporting and publishing; communications, marketing and promotion; and technology. As the following organizational chart illustrates, the concepts can be translated into a high-level model, and this model became one of my central project management tools for this project. It captures the primary challenges every project manager faces, and at a high level, it illustrates how this document is organized.

As you study the model, notice that technology is illustrated as a separate item, one that underlies the other key functions. In reality, technology isn't a distinct function, it's a central tool for enabling other crucial business functions to be performed more efficiently and effectively. Later, I'll explain some of the ways we used technology to support the project, but for now, the most important caveat is that technology can be a valuable tool that supports effective project management, it's not an end goal in itself.

Project managers must manage both project deliverables and internal project functions.



CONFRONTING CHANGE

Whoever said “change is a constant, and constant change is a given” was probably a project manager. That adage certainly describes our project, although such revelations only come with hindsight.

*Change is a constant, and
constant change is a given.*

Anonymous

Technically, the IT project started July 1, 1999. For a variety of reasons, however, the project started late. At the urging of NSF, the original proposal was revised, and as a result, the first-year funds weren't released until October 1999, almost four months after the planned start date. A handful of people had been identified as Co-principal Investigators (or Co-PIs), and they comprised the core project team. Qualified, motivated and enthusiastic, most were carrying full- or nearly full-time teaching loads in addition to their project participation.

At the start of 2000, when I joined the IT Initiative as a Co-PI, work was underway, but because of the delayed funding, a cohesive central effort and formal project plan had not yet emerged. I'd been hired as the director of strategic programs with the mission of helping to develop next-generation programs for Sinclair Community College. I was invited to join the IT project under a plan that allocated half my time to next-generation programs and half to the IT Initiative. My background in the IT arena and experience with technology-centered learning systems were certainly aligned with the project's primary goals.

As a project team, we were struggling to get up to speed and on schedule when another setback occurred. The project director, who was the dean of a major college division, announced he was resigning to accept an excellent opportunity with another community college. He then asked me to step into the project leadership role as Principal Investigator (PI) and project director.

In February 2000, we met with the NSF Lead Program Director to obtain support for the change in project leadership. The change was approved, but

now I was facing a series of real challenges. Even though I was the newest member of the team, somehow, I had to find a way to move into the primary project leadership role and gain acceptance from the team for this change. At the same time, I needed to learn about Sinclair and NSF grant management.

BENCHMARKING REALITY

Everyone on the project team recognized that the project was behind schedule. Work was being done, but it was not well documented, and once the departing project director left, his insights and NSF experience would leave as well. To mine for essential details and benchmark the actual state of progress against goals, I called an emergency planning session.

This session involved the core project team and crucial subject-matter experts, such as the Sinclair grants director and a budget specialist experienced with NSF fund management. Our objectives were to:

- Verify the central project goals.
- Identify primary project deliverables and define immediate priorities.
- Develop a well-defined plan of action aligned to clear success measures.
- Delineate broad budget allocations by major goal or deliverable.
- Identify key knowledge, skills and competencies needed.
- Identify chief owners or champions for each targeted goal.
- Map and confirm progress against plan.

The brainstorming session succeeded. By June 2000, a central project plan was fleshed out and refined, and the team had a comprehensive project map in hand that focused on central deliverables and their relative weight in respect to the whole project.

Each goal (deliverable) had at least one assigned owner, and the owners had a plan of action for their deliverable, an understanding of their budget allocation, and clear-cut success measures for their deliverables. Owners were assigned based on natural alignment, meaning that the deliverable

required core skill sets they already possessed and the work aligned with their primary job responsibilities.

Every goal had an assigned owner.

Goals (Deliverables)	Owners	Relative Proportion
1. Re-Engineer the CIS Curriculum	CIS Chair	40%
2. Establish Partnerships	CIS Professor & IT Liaison	10%
3. Forge Relationships with Pre-College Programs	CIS Professor & IT Liaison	25%
4. Offer Faculty & Team Development Programs	CIS Chair	20%
5. Employ an Adopt & Adapt Strategy	All Team Members	(Integral to all)
6. Work with Underserved Populations	Program Coordinator for Disability Services	5%

This combination of strategies was crucial. None of the team members was assigned to the IT initiative on a full-time basis, a circumstance that was a challenge throughout the project. Some team members' time was acquired through direct allocation, while others' time was acquired using personal service agreements and release time. Even as project director, only half my time was allocated to the project, so all work associated with building, managing and guiding the project had to be completed within that allocation.

To complicate matters further, when I moved into the project management role, the team lost the equivalent of half a project team member, since my initial team-member slot was never filled. Throughout the project, I functioned as program director, project manager and contributing team member, which is a common but taxing situation. There are two cautions here. One is that when you split people's time into fixed percentages with strict allocations, it's difficult for both you and the team to manage these fixed splits. The second is that it's smart to acquire the essential personnel, so that you don't end up wearing quite so many hats.

In addition, the IT team was comprised of contributors from different functions, departments and outside organizations, and none of them reported to me through the normal organizational structure. As a result, effective communications became critical for conveying and reinforcing ownership, establishing a common ground, sharing milestones, and sharing results and outcomes.

The original project director, as the dean of the division, had been able to provide top-level support to the project. With his departure, this direct, executive support was gone. I operated at the director level and reported to the new acting dean, and neither of us had been involved in the initial conceptualization of the IT effort. By the end of the first year, new leadership and a detailed plan were in place, but the airplane had already left the runway — and nearly one-third of the time planned for this journey had elapsed.

PLANNING FOR ACTION

Clearly, as the project moved into its second year, we were faced with an assortment of obstacles. The project lacked top-level ownership, full-time project personnel and administrative support. A plan was in place, but it was new and untested. Team members represented a range of functions, none of which reported to the project director. The challenge was to build both the systems and organizational support necessary if this project was to succeed.

The new acting dean solved one problem by authorizing the addition of a part-time administrative support person funded by the college and designated as a shared resource for the project and the college. This single action helped improve the project outlook enormously. The administrative support person made substantial contributions to the project, managing logistics for travel, preparing materials for meetings, coordinating invoicing and billing, and maintaining central administrative files. She also helped in the development of the initial IT@Sinclair web site.

The brainstorming session had identified clear-cut owners by specific goals, so that each major project deliverable had an owner committed to completing the required components. In addition to project deliverables,

however, there will always be an assortment of administrative and management functions common to all projects, regardless of the project's purpose and outputs.

In keeping with the principle that primary project activities required clear-cut, natural owners, each major administrative function was also assigned an owner or co-owners to ensure ongoing attention to the day-to-day business of project administration. In our project, the owners were allocated as illustrated.

Project management functions were also aligned with natural owners.	
Project Management	Owners
Budget & Finances	Project manager & finance/budget expert
Performance Measurement	Project manager & internal auditor/evaluator
Reporting & Publishing	Project manager & documentation expert
Communications, Marketing & Promotion	Project manager & marketing/communications expert
Technology	Project manager & Information Systems support

Because of the streamlined nature of our team, and because each team member was literally over- rather than under-allocated, we used both internal and outside experts to support some critical functions. The specifics of these arrangements are detailed in the following sections. One point, however, is important: for all management and administrative functions, the project manager was designated as a co-owner, which ensured ongoing involvement in all central administrative functions and provided a faster, clearer decision-making path.

LESSONS LEARNED

1. **Choose the Right People** – In terms of project staffing, I learned that it was important to identify key competencies required by the project, and then to look for people inside and outside the organization who offered these skills and competencies. Once the competencies were identified, I could contract with the individuals in question for a specific deliverable

or cluster of deliverables. This approach allowed me to expand the capacity of the team and use the appropriate core team members in their areas of genuine strength and expertise.

I learned that in projects of this nature, where the team members are assigned part-time and each participant has many other demands on their time and talent, it's important to align project-based work with their overall job objectives. This allows project contributors to create results that are meaningful to the project and related to their primary job priorities. This also serves as an ongoing motivator, since in our instance, none of the project team members were within my span of control or reported to me in an official organizational capacity.

- 2. Expand the Concept of Team** — For us, the concept of “team” grew to include everyone involved with the project and all those who have a stake in the outcome. This includes the host college, the National Science Foundation, and other partners and collaborators. With IT@Sinclair, I often chose to use external support to do the heavy lifting. Each key deliverable had an internal owner, but the actual task execution was often more effectively completed by an external resource. All successful projects (and project managers) actively seek out and manage both internal and external partnerships to ensure that the focus remains firmly on the ultimate desired outcome.

- 3. Seek and Use Pre-Existing Solutions** — In retrospect, I arrived with a fundamental perspective that shaped how I managed this project, and that is this: most identified problems have already been solved. Your mission is to find the existing solution and then leverage it. This connects directly to the NSF principle that the most successful projects incorporate a conscious component of adopting and adapting pre-existing tools, techniques and strategies, and this concept is addressed throughout this case study.

TOOLS TO USE

Project management begins with a clear, precise statement of the problem, accompanied by clear definitions of what constitutes success and the careful alignment of resources (including competencies and people, time,

effort, money, and quality expectations). Project management tools provide a disciplined method for collecting, analyzing and reporting project data. They provide the structure and consistency that enables and reinforces efficiency. The acronym SMART serves as a useful tool for creating targeted problem/solution statements.

At some point in the future, I hope to share detailed descriptions of the full range of tools I created, adopted, adapted or poached, along with their uses in respect to project management. For now, however, I'll simply refer to key tools and provide streamlined examples in *Section 9 – References & Resources*. In general, all of these tools are self-explanatory.

SMART Project Strategy	
S	Specific
M	Measurable
A	Actionable
R	Relevant
T	Timely

In terms of establishing basic project benchmarks that can also be used for tracking and monitoring, the most valuable tools were the:

- NSF Scorecard — A one-page overview of project deliverables and progress to date.
- Project Plan Template — An Excel-based template for documenting, projecting and tracking major deliverables associated with the project.
- Project Deliverable Plan Template — An Excel-based template for documenting, projecting and tracking major tasks associated with each key deliverable.
- Project Action Items List — A simple listing of new action items, identifying the source of the action item and status.
- Decision Support Technology — An Excel-based methodology for systematically evaluating strengths, weaknesses, opportunities, risks and rewards.

Once our project plan was fully detailed, I captured the central concepts in a custom tool I call the NSF Scorecard. This tool functions like the dashboard of a car: all the crucial dials and indicators are visible at a glance, and these indicators reveal the time, speed, distance traveled and amount of energy consumed. Created in Microsoft Excel, the Scorecard accomplishes the same objectives from a project management perspective,

and it's compact, visual and easy to understand. In short, it's an "all in one" management tool. It also helped the team see more than just their area of responsibility, it helped them see and understand the concept of progress against goals and risks associated with each deliverable. The basic scorecard is illustrated in *Section 9 – References & Resources*.

Several Excel-based templates were created to document, project and then track key outcomes required by the project, and to supplement management information from the Scorecard. These include the Project Plan and Project Deliverables Plan templates. An adjunct to these tools is the Action Item List, which identifies additional action items not detailed as part of the project plan. This tool simply tracks new items, and it identifies the source of the activity (e.g., many of the action items in the example were identified by the National Visiting Committee or external evaluators) and the current status (pending, underway, completed, etc.) Examples of these tools are illustrated in *Section 9 – References & Resources*.

During the course of the project, the NSF Scorecard morphed into another more sophisticated, highly integrated tool, called the Decision Support Technology. This technology allowed me to fully assess the full business case associated with each new opportunity. It's designed to support informed decision-making, not replace it, and it includes a series of embedded, automatic analytical models. Due to space constraints, an example of this tool has not been included.

Section 3

Managing the Money

Every NSF project manager faces the same challenges. The first is that when you developed your project proposal, you evaluated multiple options and projected events into the future. Reality rarely matches these projections, however, and every project manager is forced to face the fact that some things cost more than anticipated and others cost less. This changing nature of projects has a direct effect on your budgeting and financial management strategy.

The second challenge is that all NSF projects must be managed down to net zero. This is a painstaking (and painful) task, and we all have the same goal. We want to *productively* use every allocated dollar available, and at the same time, avoid returning unused funds or risk running over budget.

Project budgeting and financial management was a challenge from the very beginning. Not only were the initial project funds delayed, the fiscal cycles of our financial agent, Sinclair Community College, and the National Science Foundation were out of sync. To accommodate this divergence, special tools and strategies were needed, and these included:

- Aligning the project deliverable schedule to the fiscal cycle of the college.
- Developing an activity-based cost accounting system.
- Creating a routine financial review process.
- Tracking and measuring the impact of inkind contributions.

Since part of the NSF credo is to adopt and adapt, I adopted the concept that the project was fundamentally equivalent to a business start-up unit, and adapted business-unit management strategies to support the project effort. To accomplish this, I scouted internal resources to locate key people who were open to the fundamental business-unit concept and who had the experience and knowledge to help manage the financial aspects of the project.

Sinclair was the site of the National Center of Excellence for Advanced Manufacturing Education (NCE/AME). As a result, a number of people were experienced with NSF fund management within the college framework. I recruited the NCE/AME financial manager, and he agreed to lend his talents — at no cost to the project — during the initial budget development phases. His familiarity with the financial policies and procedures of both Sinclair and the NSF was invaluable. His contributions benefited us, and before our project was completed, he had advanced to a new position in the college.

To ensure the project remained on track, I formed a financial management team that included the volunteer financial manager, the Grants Payroll Manager, the acting dean and me. This team helped me monitor periodic budget statements, assess payroll allocations, and respond to ongoing issues and questions. None of these contributors was funded through the project, but the time they invested was tracked as part of the overall in-kind contributions that leveraged the scope and capacity of IT@Sinclair.

ALIGNING FISCAL CYCLES

There were three important but conflicting schedules that ruled this project. First, Sinclair's fiscal year runs from July 1 through June 30. Second, the NSF grant year began August 1. Third, IT@Sinclair didn't officially receive funding until October, which made it logical to adopt a deliverables schedule starting on October 1 and continuing through September 30 of each grant year.

The team wrestled with these conflicting schedules, and ultimately decided to adopt Sinclair's fiscal cycle and use it to as the master schedule for planning, budgeting and reporting project deliverables and financial benchmarks. This decision ensured that both results and financial reporting were synchronized, and that these aspects meshed with the budget cycle of Sinclair Community College, the fiscal agent.

CREATING BUDGETS & CONDUCTING FINANCIAL REVIEWS

A budget is simply a financial plan of action, one that details what portions of the funding will be allocated to what portions of the project. An activity-

based cost accounting approach (sometimes called activity-based budgeting) takes the financial plan one step further. It links specific dollar amounts to specific activities and outputs (the budget) and tracks expenses and costs against the planned allocation. Success is measured by creating the desired output and remaining within the budgeted allocation. Activity-based cost accounting is common in business environments but relatively unheard of in academic circles.

To ensure the project had a business-like posture, activity-based cost accounting techniques were used to create a financial plan tied to the grant's objectives, goals and program areas. Specific funds were allocated by defined deliverable, rather than by finite task or expended effort.

This approach allowed me, as project manager, and the team to make conscious decisions about which deliverables required larger allocations. Each key owner, therefore, knew what monies were available for their area of responsibility, and their challenge was to complete their deliverable and remain within the allocation.

These strategies provided a meaningful bridge between the project, NSF and the college. They also supported forward planning, linked expenditures to project outcomes, and prevented budget over-runs and conflicts.

Regular finance reviews are crucial for any type of budgeting process to work properly. To ensure the process was well understood, effectively implemented and meaningful, we adopted a series of regularly scheduled budget reviews that ensured ongoing attention was devoted to the issue of performance and output compared to planned versus actual expenditures. The basic financial review schedule is highlighted in the table. (Additional details about project performance reviews are discussed in *Section 3 – Mastering Performance Measurement*.)

Initially, the financial manager and I monitored the budget on a monthly basis, and the financial management and project teams conducted quarterly reviews. By the project mid-point, however, the budget process was fully implemented and monthly reviews were no longer necessary.

The financial manager continued to create monthly financial updates, and we diligently monitored the budget and shared periodic updates with those

involved, including external evaluators and the National Visiting Committee. This approach allowed the team and other stakeholders to stay focused on outcomes and deliverables, because the financial management function had become institutionalized.

Regular financial reviews ensured that performance and results were compared to the budget and actual expenditures.		
Frequency	Purpose	Participants
Monthly	Review budget	Project Director & Financial Manager
Quarterly	Compare budget to outcomes	Financial Management Team
Quarterly	Review deliverables status (Highlights)	Project Team
Annually	Review performance against budget	National Visiting Committee, External Evaluator & Project Team
Annually	Financial audits	Financial Manager

In this manner, we ensured the project budget was assertively managed, key decision-makers were informed and involved, risks and opportunities were analyzed, and grant activities were aligned with the division's objectives and strategies. This intensive focus on financial issues also helped me learn and grow.

To make certain project finances remained on track, the financial manager also completed internal audits in 2001, 2002 and 2003, and these results were captured in formal reports. Through this process, it became clear project spending was below the allocated funding level.

This occurred for a variety of reasons. The project had started late. When I moved into the project director role, the team lost a participant. Since this position was never filled, funds allocated for this position hadn't been used. The team had a creative ability to acquire in-kind contributions.

The economy experienced a slowdown following the September 11, 2001 terrorist attacks, and there were dramatic changes in the worldwide high-

tech economy. As a result, a number of planned activities and their associated expenditures had been deferred.

With sufficient funds to support a complete year of additional activity, in 2002, IT@Sinclair applied for a fourth-year, no-cost extension to the grant. This bonus year allowed us to polish and refine the primary deliverables. It also allowed us to respond to National Visiting Committee and external evaluator recommendations that we develop a series of best practices and expand faculty development and recruitment to ensure a trained faculty pool for the future.

To prepare for the fourth year, we repeated the cycle described earlier. We created a new plan, pinpointed deliverables, defined a budget with cost projections, identified crucial competencies needed, and identified deliverable owners for the new activities.

TRACKING INKIND CONTRIBUTIONS

Throughout the project, the team tracked inkind contributions to IT@Sinclair. These contributions leveraged the dollars invested by NSF, contributed to effectiveness and increased the ultimate impact of the project.

The value of these contributions was conservatively estimated at more than \$500,000 bringing the effective total project investment to nearly \$1.4 million. Or, viewed from another perspective, inkind contributions increased our project capacity by 60 percent.

The overall effect on project results was exponential. Inkind contributions produced greater cross-organizational investment in measurable outcomes. All inkind estimates were based on conservative, unburdened figures (e.g., straight salary or cost without overhead or benefits). The table illustrates the wide variety of inkind investments that were tracked and tabulated to leverage project results.

Inkind contributions leveraged the project's financial resources and increased the overall impact of IT@Sinclair.

Who	Line Item
National Visiting Committee	Project oversight
The AIM Center	Financial management
CIS Advisory Board	CIS curriculum & program guidance
Cisco	Networking hardware; academy fees waived
Cisco Coordinator	Integrated leadership & implementation for Cisco efforts
Greater Dayton IT Alliance	Fast Track & web page development
IBM	Training & software
LexisNexis	JEDI Fast Track development
Sinclair Community College	JEDI Fast Track development
	CIS curriculum fact sheets & overview
	Display booth
	Web site development & maintenance
	Administrative support
	Faculty: Module Development Workshop
	Faculty development: NETg Course Library & web access
Sinclair Design Student	Logo design
Sinclair Foundation	Mound Street Academy (underserved)

LESSONS LEARNED

- 1. Choose the Right Budget Cycle** – Choosing and committing to the right budget cycle can be a critical success decision. In our case, we chose to align the project with the host school's cycle, which made day-to-day management easier. I chose activity-based cost accounting, so there was a practical bridge between both the Sinclair and NSF systems.

NSF funds are distributed to the host institution, and all ongoing financial issues (payroll, purchase orders, invoices, personal services agreements, etc.) are managed with the assistance of and in compliance with the host school's policies and procedures. Alignment with Sinclair's basic fiscal cycle kept us in sync with our most immediate financial partner, and then periodically, we analyzed expenditures and

results against the NSF fiscal cycle. This decision cost us the equivalent of a month's worth of work time at the end of the project duration, but for the four-year project lifecycle, it made ongoing management issues easier. It was a reasonable trade off.

2. Seek Experienced Financial Management Support – The second major lesson I learned was how vital it is to seek out and obtain experienced financial management support if it's available. Having day-to-day access to someone knowledgeable about not-for-profit finances in general and the host school's policies and procedures specifically was a major benefit. This was particularly true for me, since I was new to the not-for-profit arena. Because of Sinclair's experience with NSF projects, I was lucky enough to find someone who was also experienced with NSF financial policies and procedures.

3. Create a Useful Financial Management System – The budget manager had several insights to share in respect to managing and monitoring budgets and performance by activity. He cautions that project managers need to remember that:

- All team members play an important role in evaluating the project at the appropriate level of detail, and that includes performance against financial targets.
- Special accounting subsystems may need to be created in order to be able to reconcile the typical line-item accounting data with activity-based accounting needs.
- The most effective project budgets are built from the bottom up (deliverable, task, activity, objectives and goals) rather than from the top down. Top-down budgeting tends to create broad categories where data is collected in anonymous and difficult to dissect aggregates.

These are important points. Bite the bullet and create customized tracking systems upfront; it's the better part of valor. Otherwise, at some point down the road, you'll find yourself sifting through reams of accounting records, trying to break project-level expenses into smaller categories that can be clearly matched with key deliverables and activities. It's an onerous thankless task, but it's one you can prevent with forward planning. If you're committed to effective project budget management, it's essential to understand the budget and accounting

systems that exist for both NSF and your host school. Then if necessary, you must be willing to design a third, complementary system that provides you with the data you need to manage finances proactively.

TOOLS TO USE

Budget and financial management statements must meet basic, established standards, plus the unique needs of the project and organization. Thus, our financial management tools are specific to our needs, and don't necessarily work as a universal model. However, one useful financial management tool was the:

- Work Breakdown — A one-page overview of a specific deliverable.

Work Breakdown summaries were created by owners to provide a snapshot of major deliverables. In one compact page, the Work Breakdown captures the deliverable, owner, opportunity or problem, initiatives, audience, outcomes, event dates, cost, resources, success measures, achievement probability, status relative to the plan and budget, next steps, and whether or not a Highlights document was created. (For a discussion on the Highlights document, see *Section 5 – Managing Reports & Publications.*)

Work Breakdowns were also used to identify new opportunities, tasks or deliverables that could be pursued, but which had not been identified as part of the original scope. Work Breakdowns provided the owner with an opportunity to assess the cost impact of the specific deliverable or activity and discuss budget implications if appropriate. An example is included in *Section 9 – References & Resources.*

Section 4

Mastering Performance Measurement

Shortly after I inherited the project, I instituted a carefully orchestrated series of regular team meetings and internal reports, designed to capture critical accomplishments and challenges in real time. All team meetings focused on performance and results measured against goals, but I also used them to share rewards, recognition and reinforce behaviors. These performance measurement, monitoring and reporting meetings and tools included:

- Highlights and Impact documents.
- NSF Scorecard reports.
- Quarterly summaries and newsletters.
- Financial management reviews and internal evaluations.
- External evaluations (assessments conducted by the external evaluator and the National Visiting Committee).

The purpose of the reporting and measurement tools was to help the team understand the whole picture and translate these complexities into discrete elements that could be managed and measured more precisely. These performance measurement tools are discussed below, while annual reports are discussed in *Section 5 – Managing Reports & Publications*.

USING MEETINGS & REPORTS AS PERFORMANCE INDICATORS

During the project-building phase, I held monthly team meetings. Project meetings were structured using Highlights reports, a one-page snapshot of key deliverables. Highlights were generated by deliverable owners and the financial manager, and were used to keep the core team informed of progress across the board. Each owner reported on the accomplishments, results and challenges they had encountered, and provided an updated overview of their budget status and progress against the plan.

Meetings and Highlights focused on a comparison of the planned versus actual performance in terms of deliverables, time and budget. As the

project and team matured and the concept became institutionalized, monthly meetings were replaced by quarterly Highlights reports and formal reviews.

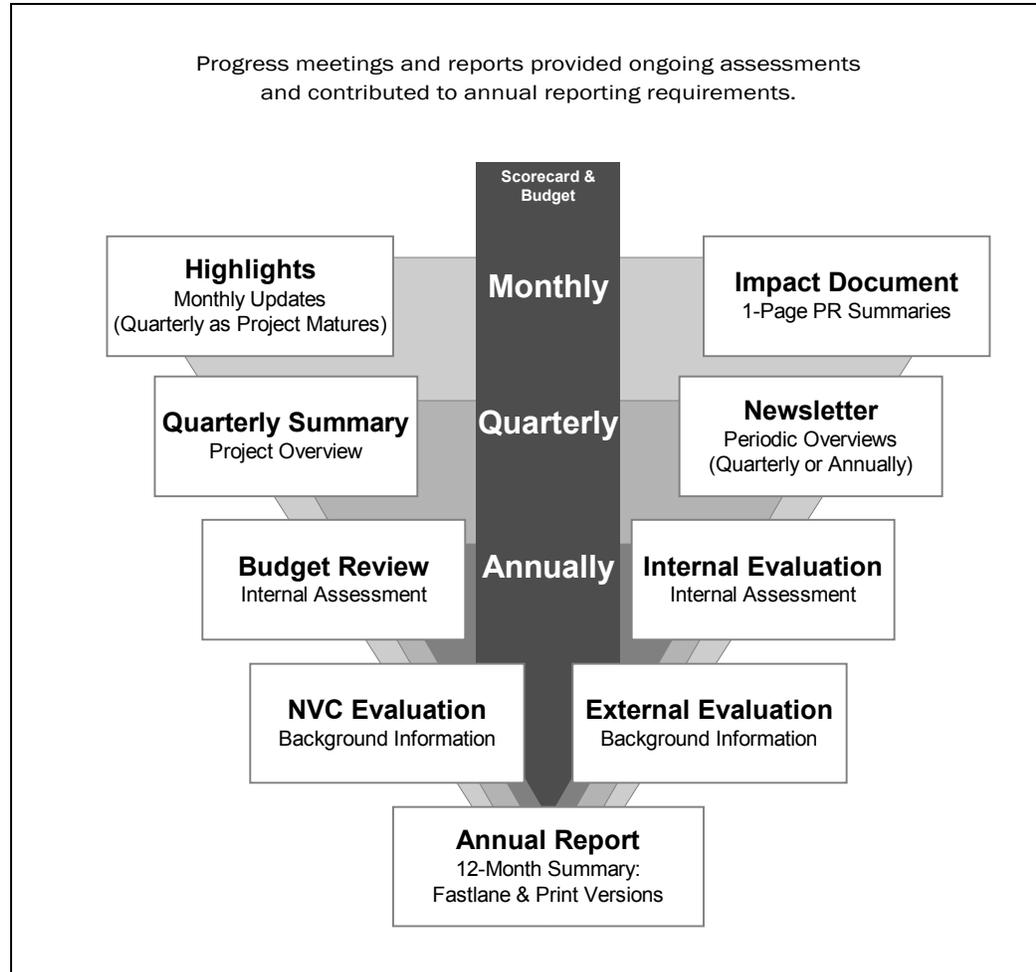
Highlights were also used to share problems, challenges or insights so that other project participants could contribute feedback or recommendations. Each owner posted their Highlights on the IT@Sinclair web site for ready access, instant distribution and meeting preparation.

Team members who identified new deliverables or major activities that were not part of the defined plan recommended these for consideration by completing and submitting the Work Breakdown document. This tool provides a one-page snapshot of the new project or deliverable, and it identifies the timing, cost, and additional resources required. (An example is included in *Section 9 – References & Resources*.) As project manager, I reviewed and approved new project activities nominated by team members.

We used another performance and communications tool, called the Impact document. Similar to internal press releases, these documents captured significant outcomes in a compact format (typically one page) that could readily be shared through e-mail or posted on the web site. Impact documents introduced tools, processes, procedures, best practices and results.

Information from the Highlights and Impact documents created the content for an IT@Sinclair newsletter. Impact documents and Highlights also fed the development of quarterly summaries, which supported the Quarterly Review Meetings held by the project team. Since all reporting and measurement activities focused on comparing specific grant goals and objectives against planned deliverables and activities, the basic Highlights structure was replicated in the monthly, quarterly and annual meetings.

These reporting and meeting structures funneled into the detail prepared for and supplied to the National Visiting Committee (NVC) and external evaluator during the annual review sessions. External evaluations and NVC meetings were simply modeled after quarterly review meetings but targeted to the needs of these audiences. A high-level overview of the reporting and meeting strategy is illustrated below.



CONDUCTING INTERNAL AUDITS

We conducted two types of internal audits: one was a formal financial management review and the other was an internal performance audit. Both were typically conducted at least once a year. Financial management reviews are discussed in *Section 3 – Managing the Money*, but the important internal audit function hasn't been addressed in detail.

Shortly after I stepped into the project director's role, I determined that we needed assistance in objectively assessing the overall team performance against identified goals. To accomplish this, I invited a data and evaluation

expert, one experienced with NSF projects, to join the project as the internal evaluator. This evaluator remained involved in but somewhat separate from the day-to-day grant activities to ensure an objective, neutral perspective and meaningful evaluations.

Similar to the classic business model, where an objective internal auditor assesses business activities for a company, the internal evaluator's role was to ensure that the grant remained on target in respect to key goals and objectives. The evaluator collected and compiled interim results and accomplishments, and reported these findings to the team, and developed and managed the grant's external evaluation plan and activities. The evaluator helped the team track their own progress against goals, and ensured that gaps or shortfalls were identified and rectified. In addition to ongoing tracking, the evaluator provided Highlights reports and participated in quarterly reviews, National Visiting Committee meetings and external evaluations.

She conducted an internal audit and produced a summary report in Winter 2002 as one last verification of results against goals before the project end point. The internal evaluator also contributed to project deliverables, helped design and implement the best practice, *Implementing Competency-Based Learning Evaluations*, and led the effort to develop the best practice, *Capturing Competency-Based Employer Feedback*.

WORKING WITH EXTERNAL ADVISORS

Each NSF project is required to have two types of external advisors: one is a single individual who serves as the external evaluator; the other is a group of advisors, known as the National Visiting Committee.

EXTERNAL EVALUATORS

External evaluators are typically experienced with NSF project expectations and criteria, but they must also have expertise related to the core objectives of the project. External evaluators are typically nominated and must be approved by NSF.

Our first external evaluator was officially invited and accepted in summer 2000. He participated in the first National Visiting Committee meeting, held in August 2000, and he conducted his first project evaluation in February 2001. During his involvement, he became an active contributor, not just an evaluator. A gifted asset to our grant, he shared feedback, recommendations and opinions, along with his assessment of strengths, weaknesses, opportunities and threats. Unfortunately, he was forced to resign from the evaluator role due to health reasons, and in 2002, he was replaced.

NSF helped us identify another expert, and the new external evaluator completed the 2002 and 2003 evaluations. She also became a valued contributor to the project, sharing frank assessments of our performance as a team and recommendations for the future outlook of the project. To help reinforce the broad concept of a unified team, we also invited the external evaluator to participate in the National Visiting Committee meetings.

NATIONAL VISITING COMMITTEE

While the external evaluator consists of one individual, the National Visiting Committee (NVC) consists of a group of objective, outside program advisors. Committee members are typically drawn from government, academia and related industries. Every NSF project is required to work with such a monitoring and feedback group, and the committee is expected to meet annually throughout the duration of the project.

The committee is created from individuals nominated by the project team, but each individual's participation is subject to NSF approval. NVC members must also typically receive the authorization and support of their employer, since NVC involvement may require several days' investment each year, plus travel time.

Our National Visiting Committee included experienced, high-ranking leaders from business, industry and government. Because of the high-tech focus of the grant, global companies that were locally based, such as LexisNexis and Scitex, became involved. Again, because of the strong local presence coupled with extreme high-tech needs and applications, technology decision-makers from Wright-Patterson Air Force Base

participated, along with representatives from the Forum Corporation (Massachusetts), Collin County Community College (Texas), Seminole Community College (Florida), and Ohio's IT Alliance.

The various NVC members represented a wide range of specialties, including technology, human resources, professional development and organizational performance. This diversity of involvement helped extend our resources and disseminate project results to new communities.

In constructing the NVC, I made a naive miscalculation. The former project director continued his involvement in the grant as an NVC member and co-chair. The National Science Foundation was opposed to this decision, because they feared a potential conflict of interest. In 2001, before the second NVC meeting, the other co-chair assumed full responsibility as chair.

The National Visiting Committee served as an involved board of directors providing active oversight for IT@Sinclair. As a result, NVC meetings became an extension of the overall project management strategy, and the annual sessions were focused and work oriented, not dog-and-pony shows. Every project team member participated, which increased cross-pollination between the team and the committee, and over time, the NVC representatives were viewed as active partners in our efforts. To increase the effectiveness of our team's interactions with the NVC, I created a standard agenda that was a model for the meetings, plus preparatory and follow-up reports. The agenda and reporting structures focused on performance against plan, including:

- Deliverables, finances (budget, business case analysis, etc.), personnel, resources, issues and challenges.
- Strengths, weaknesses, opportunities and threats.
- Results compared to action items.

Both the NVC and the evaluators were involved in IT@Sinclair throughout the year, which leveraged this resource base beyond the annual meetings, and eventually, the NVC was transformed into an active board. NSF requires one NVC meeting a year; during some years, we scheduled two meetings, however, to ensure the committee was involved and up to date on current activities and accomplishments. They reviewed not only plans and

actions, but results as well and had an active, direct say in subsequent plans and actions.

As observers looking at the project from the outside, they provided crucial insights into what ultimate customers might want and need. They contributed constructive recommendations that were integrated into the project plan as time progressed. They recommended the team identify specific products that had future marketability, and design a strategy for marketing these products to acquire ongoing funding for sustaining the effort. They emphasized the need for faculty recruitment and accelerated development strategies, to meet the expanded enrollment and increasing demand the CIS department was confronting. They highlighted the need for cohesive, effective faculty and student retention programs that would allow CIS and IT@Sinclair to sustain the model that was being built. And, they concluded the overall project needed more marketing and communication on an ongoing basis, which was an issue we struggled with throughout the project.

This outsider's perspective was valuable. As the Computer Information Systems department re-engineered the CIS curriculum, the department also revamped the roles and relationships of the CIS Advisory Boards, adopting a model that emulated the NVC's relationship to IT@Sinclair.

PREPARING FOR NSF PROJECT CONFERENCES

Each fall, the National Science Foundation sponsors an annual conference for NSF Principal Investigators. The purpose of these conferences is to share policy updates, identify future trends, explore funding issues, connect project participants, and provide an opportunity for grant recipients to highlight and disseminate the deliverables, impact and outcomes associated with their project. It's a valuable experience that allows you to network with other NSF project directors and teams, and share project results and impact indicators.

Every NSF project is expected to send one or more representatives to this conference. Furthermore, each project creates a booth or display to showcase results. The type of materials project teams choose to display varies widely, from traditional white papers and print materials to large

format illustrations and digital displays. With this venue in mind, the project manager and team members need to carefully collect and organize representative outputs that describe or illustrate project results — from day one of the project. Otherwise, you and your team will be scrambling to collect appropriate materials and organize them into some kind of cohesive, informative display.

In 2000, we were so consumed with the efforts to create a plan, submit the first annual report and schedule our first external evaluation and NVC meeting, the conference caught us by surprise. At the last minute, we struggled to acquire a booth, collect materials and organize a display. In our case, Sinclair Community College provided the funding for a portable booth display, and the team used this backdrop to display IT@Sinclair graphics, reports and results. In subsequent years, our internal tracking and reporting tools helped us be better prepared.

LESSONS LEARNED

- 1. Document from Day 1** — One of the most important lessons we learned was the need to document activities and results from day 1. According to one team member, her failure to document activities and results in sufficient detail as they occurred was one of the most painful aspects of the project. Preparing for quarterly and annual reviews was a challenge, because she found herself working twice as hard to pull together data and examples, when she could have been compiling these in gradual increments throughout the course of the review period.

We all learned this lesson in one way or another. During the press of day-to-day business, it's difficult to stop and take time to update records, but in the longrun, it's the most effective strategy. By the time the project had entered the fourth year, we had established some useful tables and charts that we knew would be included in the annual reports. An easy interim step is to simply enter relevant data and notes into these master charts as the events occur and the details are fresh. Tools such as the Highlights and Work Breakdown documents are useful ways to capture this data in real time.

A complementary approach is to keep an NSF project box next to your desk. Simply add any relevant results, activities, testimonials, letters of support and outputs to this box as they occur. At the end of each relevant period (month, quarter, year), all you need to do is categorize and compile summaries of these key indicators, and you've created a useful overview of accomplishments to date. Live and learn.

- 2. Create a Master Archive Strategy** — While you're busy setting up systems to capture and record data, keep in mind that every NSF project is required to archive specific types of information related to results, impact assessments, financial records, etc., and to maintain these records for a specified period of time. It's smarter and more efficient to become familiar with these requirements at the beginning of your project, rather than waiting until the end. As specific results accrue or products are finalized, these can be archived in a designated master file while the project is in progress. Even with ongoing attention, there will still be end-of-project results to capture and archive, but the burden of creating final archive files will be greatly reduced.

- 3. Involve Evaluators and Advisors** — Many projects do not incorporate an internal evaluator, but it has been a valuable function for IT@Sinclair. Because the internal evaluator is a neutral contributor and auditor, they can define the evaluation plan and conduct objective, routine gap analyses that prevent last-minute surprises or overstated results.

Choose NVC members based on the relevancy and depth of their experience and competencies in crucial areas, and encourage them to function as a board of directors. We were able to develop a close and productive relationship with both external evaluators, and throughout the course of the project, these outside experts provided valuable insights and recommendations. As part of my philosophy of open-book management, I routinely shared the evaluators' reports with the project and team and our NSF Lead Director. Technically, the external evaluator only reports to the project director, but I found that by sharing the evaluators' reports, all of us benefited from a common understanding of genuine accomplishments and challenges we needed to overcome.

As one team member commented, participating in the meetings with the external evaluators and the National Visiting Committee was enjoyable and productive rather than intimidating. It was fun to candidly share the risks, opportunities, highpoints and achievements, and it was valuable to gain direct feedback from such diverse, successful practitioners. The rigorous reporting and performance measurement schedule did help, because the team stayed on top of results and impact assessments, and the evaluators and NVC took active, constructive roles throughout the year.

NSF site visits were also beneficial to the team. To prepare, we simply relied on the track record documented through Highlights reports, so virtually no additional preparation was required. NSF's goal is to help you be as successful as possible. I used NSF resources and expertise regularly, kept our Lead Program Director informed, and found the assistance and contributions invaluable.

- 4. Involve Stakeholders** — During the last year of the project, external evaluations involved input from and participation of employers and high school and college students, counselors, faculty and administration. I learned that it's very important that both the external evaluator and the National Visiting Committee have direct access to these important constituent groups. In the future, I would include this type of stakeholder involvement on a more regular basis.

- 5. Capture Lessons Learned** — At the end of year four, to close out the project, I scheduled a project postmortem. This meeting was used to evaluate and debrief every aspect of the project, to help consolidate lessons learned and identify practices that support the institutionalization of what we learned and sustainability of IT@Sinclair. Additional best practices were identified, and existing ones were slated for improvement and refinement. This postmortem debrief is a crucial stage of any project dedicated to continuous improvement processes.

TOOLS TO USE

In terms of performance tracking and measurement, the most valuable tools were:

- Highlights — A one-page summary of major activities and accomplishments related to a specific deliverable.
- Work Breakdown — A one-page overview of a specific deliverable, activity or event.
- Impact document — A one-page snapshot of impact and accomplishments, used as an internal press release.
- NSF Scorecard — A one-page overview of project deliverables and progress to date.

The Highlights document has been discussed extensively in this section, and the other tools are referenced in earlier sections. These tools are illustrated in *Section 9 – References & Resources*, along with the financial management tools discussed in *Section 3 – Managing the Money*.

Section 5

Managing Reports & Publications

Naturally, the National Science Foundation requires projects to submit regular progress reports, typically on an annual basis. During this grant's duration, NSF funds could be used for reporting and information dissemination but not for marketing or promotion. In all instances, we worked to align reporting activities, so that all internal interim reports fed directly into the next immediate reporting requirement. Throughout the project we tried to think ahead, create a plan and use one solution to respond to multiple challenges. For example, to offset the limitations on marketing expenditures, we consciously designed required reports to fulfill both the immediate reporting requirement and serve as a general-audience information piece. The NSF reporting requirements are highlighted below.

NSF requires routine progress reports and participation in the annual PI Conference.

Category	Designation	Frequency	Description	Purpose
Site Visit	National Visiting Committee	Once a year (Feb/Mar)	Stakeholder oversight group	Connect the project to stakeholders and elicit end-user feedback
Survey	Western Michigan University	Once a year (Feb/Mar)	Comprehensive survey of grant results and activities	Provide data and summary information to support benchmarking and NSF reporting
Report	FastLane	Once a year (Mar/Apr)	Required online progress report	Project progress data in a standardized format that NSF can access and compile for collective reporting
Report	Annual Report	Once a year (May/June)	Optional hardcopy supplement to the online submission	Additional detail and context to supplement Fastlane and to share with partners, collaborators and the community
Event	PI Conference	Once a year (Oct)	NSF-sponsored annual conference for NSF Principal Investigators	Share policy updates; connect project participants; display results
Site Visit	External Evaluator	Once a year (Oct/Nov)	Onsite visit and assessment from approved neutral expert	Objective assessment of progress against goals from a trained, neutral evaluator along with recommendations; reports only to program director

CREATING ANNUAL REPORTS

Our annual report had to be submitted no later than March 31 of each year. (Other types of projects may have different reporting schedules.) In 1999, NSF launched an online project reporting system, called Fastlane.

During Fastlane's early years, the online structure left little room for the additional detail that provided a well-rounded context for project data. As a result, IT@Sinclair chose to submit data through the required online system and to supplement this report with a hardcopy version. In keeping with the principle that greater returns come from leveraging the strengths of individuals and groups, I opted to hire an outside expert to develop and help submit the annual report. This strategy allowed project team members to remain primarily focused on working their plan of action and creating deliverables.

In March 2000, the NSF Lead Program Director asked the project team to submit an annual report, even though the project had started late. In the middle of our struggle to implement the refined and expanded project plan, our team had to stop and prepare the required results and impact data. FastLane is distinct from a full-fledged annual report, but we consciously chose to blend the two to fit together as complementary components. The digital version responds specifically to NSF reporting requirements in the prescribed sequence and manner. The print report provides essential supplemental details and was designed to be shared with a range of outside audiences interested in but not directly connected with IT@Sinclair.

Information from interim reports became the basis for the required annual reports. Because of IT@Sinclair's asynchronous project schedule, annual reports either capture the somewhat stale results for the project year completed the preceding June, or they integrate projected results through the upcoming June. Throughout the project, we struggled with this dilemma and in the end, we compiled and created annual reports with results projected through the end of the project year.

Once we moved to this strategy, the reporting process became more valuable. It provided a more complete context for decision-making and helped maintain a sense of currency for the project team and for outside

interested parties. To make this strategy work, however, we carefully distinguished confirmed results from anticipated or projected results.

Each annual report was carefully constructed to fulfill three purposes:

1. Respond to NSF's reporting requirements and incorporate the Fastlane reporting structure.
2. Serve as a print report of accomplishments, results and impact.
3. Serve as a program information dissemination tool for general audiences.

This strategy served us well throughout the course of IT@Sinclair, and I would replicate this philosophy in any future NSF projects I managed.

CREATING CUMULATIVE REPORTS

As the project matured, we began to take a fresh look at the reporting requirements associated with IT@Sinclair. In 2002, we adopted a cumulative results reporting strategy, which accomplished several things. Cumulative reports fulfilled the annual reporting requirement, but they provided a better assessment of the project's overall progress against goals, and anchored results to a clearly identified sequence of achievement. This perspective provided the project team and outside evaluators with a clearer benchmark against overall project goals and better indication of the future vision, needs and directions.

Unfortunately, recent changes in NSF policies require that annual reports focus on results for the identified project year. You can include additional discussion related to the overall perspective, but the focus is the current project year. Only final project reports incorporate cumulative results and impact assessments.

The annual and cumulative reporting process can be awkward and burdensome, but the reports do have great value. They provide a formal, chronological record of performance against plans and goals. They provided recognition to owners for accomplishments, and spotlight areas requiring additional attention. We learned that it was critical the reports be crisp, focused and polished in both content and appearance, because a

large number of people saw these reports. We used them as a major dissemination tool and distributed them to local business and community leaders, internal college executives and decision-makers, NSF project management and monitoring staff, and other interested parties.

DOCUMENTING BEST PRACTICES

One of the goals of our project was to use an adopt-and-adapt strategy that would allow us to identify and leverage existing quality strategies and to customize them to suit our program needs. An adjunct to this goal was to create new strategies that promoted sustainability and that could be leveraged by other organizations and NSF endeavors. With this latter goal in mind, we committed to creating a series of products that took the form of best practices.

Best practices document project deliverables and key processes, and they support the successful transference, implementation and use of the models, tools and procedures. They also capture team members' knowledge and lessons learned, and share these in a manner that helps reduce redundancies, create predictable outcomes and produce high-quality results. All best practices have a similar look and feel. They also have a consistent framework, because all of them are built using the best practice master models we designed. This created an immediate relationship among all best practices and expedited development.

By June 2003, seven best practices were developed, documented and published. The comprehensive best practice, *How to Design & Implement Information Technology Tech Prep Programs*, was championed by the Miami Valley Tech Prep Consortium and developed by a cross-functional team that included IT@Sinclair team members. This best practice has been described as the most comprehensive program implementation guide of its kind, and MVTPC is using the model to create additional guides for other Tech Prep programs.

The remaining best practices were championed by the IT@Sinclair project team, and they included competency-based curriculum development and implementation, competency-based learning assessment, learning opportunity decision support technology, instructor resource guide

development, strategies for capturing valuable employer feedback on student competencies in the workplace, and project management strategies. All best practices are available online, on CD and in print, so they also serve as a valuable program information dissemination component. (To view the documents, visit the IT@Sinclair web site. To order best practices or program reports, contact IT@Sinclair.)

Best practices serve as how-to models
for other programs.

1.	How to Design & Implement IT Tech Prep Programs	2000
2.	Implementing Competency-Based Learning Evaluations	2001
3.	Creating a Seamless IT Curriculum	2002
4.	Using the Learning Opportunity Decision Support Technology	2002
5.	Capturing Competency-Based Employer Feedback	2003
6.	Designing & Implementing Instructor Resource Guides	2003
7.	Managing for Success: The Insider's Guide to NSF Project Management	2003

A number of other tools and internal best practices have been put in place. The IT@Sinclair annual report was adopted as an internal model for project reporting. A new tool, called the Communication Strategy Decision Support Technology, was used to identify penetration strategies for the final program stakeholder report, and it will eventually be captured as a formal best practice.

LESSONS LEARNED

1. **Communicate Constantly** — As our project comes to a close, I've come to recognize that one of my most important roles is that of communicator. Project goals, needs, visions, objectives and outputs must be communicated to a wide range of people all of the time, in as many venues as you can command, including print, digital, audio, video and special layouts, such as large format posters and graphics.

- 2. Leverage and Streamline Reporting Functions** — The second important lesson I learned is that no one on the project team has the time or patience to create reports then create them again for another venue or purpose. As Covey says, start with the end in mind. Think about how things fit together, how one report or update flows into the next reporting requirement downstream, and then plan a system that allows the components to (almost) assemble themselves into the final, ultimate objective. We found that by creating templates for incremental communications, we could improve the caliber, consistency and promptness of ongoing exchanges and periodic, annual and cumulative reports.

Start with the end in mind.

Stephen R. Covey, author

Keep in mind, too, that your web site can be a convenient, integrating environment for reports and updates. However, if your report doesn't read well or isn't effective in print, it isn't likely to become more effective simply because it's posted online.

The value of creating a polished, professional annual report can't be over emphasized, because there will be circumstances when it will be the most powerful marketing tool you have. In our case, Hans Meeder, the US Department of Education assistant deputy secretary of education visited the Sinclair Community College campus in 2002. His primary mission was to learn about the Miami Valley Tech Prep Consortium (MVTPC) and discover both the practical and cutting-edge strategies that make that program so successful.

MVTPC is a partner in our NSF grant, so IT@Sinclair was invited to participate in many of the briefing sessions. Because of our commitment to polished report preparation, when the opportunity arose, we were ready to discuss IT@Sinclair and present an off-the-shelf copy of our most recent cumulative report (1999-2002) to Mr. Meeder. When U.S. Senator Voinovich (R-Ohio) visited the Miami Valley to promote workforce development, we shared our cumulative report with him, too. Time and again the annual and cumulative reports were leveraged in similar ways, with educators, business leaders and community members.

- 3. Keep a Grant Journal** — Finally, start a grant journal to capture ongoing lessons learned, revelations, challenges, impact assessments, discoveries and more. These small pieces of data sometimes seem almost inconsequential on their own, but together, this form of “grant memory” can paint a powerful picture of the full scope of your project and its impact.

TOOLS TO USE

In terms of managing reports and publications, the most valuable tools were the central models we developed to guide both report and publication development. By the end of the project, we had defined and refined master models for the major reporting and publication functions, including Fastlane, the annual and cumulative reports, and the best practices. The models guided report and document development for all versions (print, online PDF documents and digital files burned to CD).

For each type of document, models included standards for:

- The master map or document outline.
- Internal page styles and layouts (including defined fonts, graphics treatments, etc.).
- External art and layouts (front and back cover design standards, copy placement, logo placement, etc.)

Examples of these models are not included in this document, but they may eventually be documented as best practices. However, even without examples, you can define standards and create models to guide your reporting and publication efforts.

Section 6

Making Marketing Work

From the start, IT@Sinclair's central mission was to create a focal point for IT workforce development endeavors in the Miami Valley. As part of this longterm vision, we recognized the need to create distinguishing elements that established a program identity as we disseminated results and impact information. In each of these arenas, however, it was equally important to be consistent with Sinclair's identified standards for print, digital and multimedia communications and images.

CREATING A PROGRAM IDENTITY

This project was originally referred to as the IT Academy Initiative. By the close of the first project year, it became clear that the program was to become a focal point for all IT-related workforce development activities within the community. As a result, it needed a broader program identity characterized by a distinctive name and logo.

BRAND NAME & LOGO

The name, IT@Sinclair, was coined with input from students, business leaders and academic participants. To expedite recognition and anchor the identity, a program logo was developed, and this logo appears in all print, digital and online materials. In keeping with the participative personality of the project and Sinclair's commitment as a learning college, the logo was developed by a Sinclair Community College graphic arts student to fulfill the capstone project requirement for the associate degree.

The brand name and logo were launched in Fall 2000 in our project booth at the NSF/ATE conference, and from this point on, the characteristic name and logo became consistent project identifiers. Both also supported the transition from a project perspective to that of a longterm sustainable effort, by providing a single identity that has become well recognized in the academic and business community. This was particularly important, since IT@Sinclair incorporates credit-based and development components

targeted to students and educators, along with professional development components targeted to regional and national industries.

DISTINCTIVE VISUAL IMAGE

A number of specific graphics were created for the IT@Sinclair program. The graphics evolved as natural corollary to the overall theme-based project management approach. As simple and inconsequential as it sounds, this strategy helped me communicate more effectively with the team so they could see and understand both the immediate and longterm focus for the project. It also guided our communication and thought process throughout, and the images we created supported this management objective.

A theme-based project management approach guided communication efforts.

Phase	Theme	Central Images
Year 1	Building a Foundation	IT@Sinclair Logo Learning Pipeline
Year 2	Developing Deliverables	Molecular Model
Year 3	Refining Deliverables	Project Timeline
Year 4	Disseminating Results	Core Curriculum Lifelong Learning Network

These graphics helped peg the parameters of the project, and they were used in print reports, digital presentations, and booth and online displays. Most pivotal graphics were designed or redesigned by an outside expert, and as a result, the illustrations developed a distinctive IT@Sinclair look that used similar colors, shapes and design elements. Your specific circumstances will be different, but I'll try to describe briefly how these visual concepts emerged.

Sometime during my first year with the project, I began to try to capture a graphic representation of the holistic IT@Sinclair concept. The goal was to illustrate an integrated approach to education, employment, learning, and ongoing training and development.

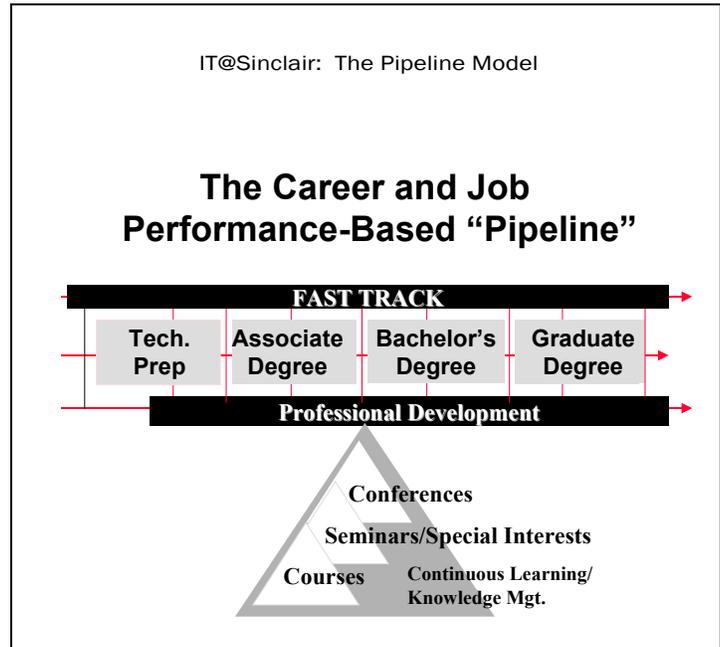
This initial graphic, the Pipeline Model, was created in preparation for the first National Visiting Committee meeting. It attempted to illustrate the seamless flow of learning and education in relationship to employment, training and development. It also targeted the ultimate objective of providing a continuous learning strategy that more closely linked education to employment and learning to success on the job.

Throughout the project, the Pipeline was a critical anchor,

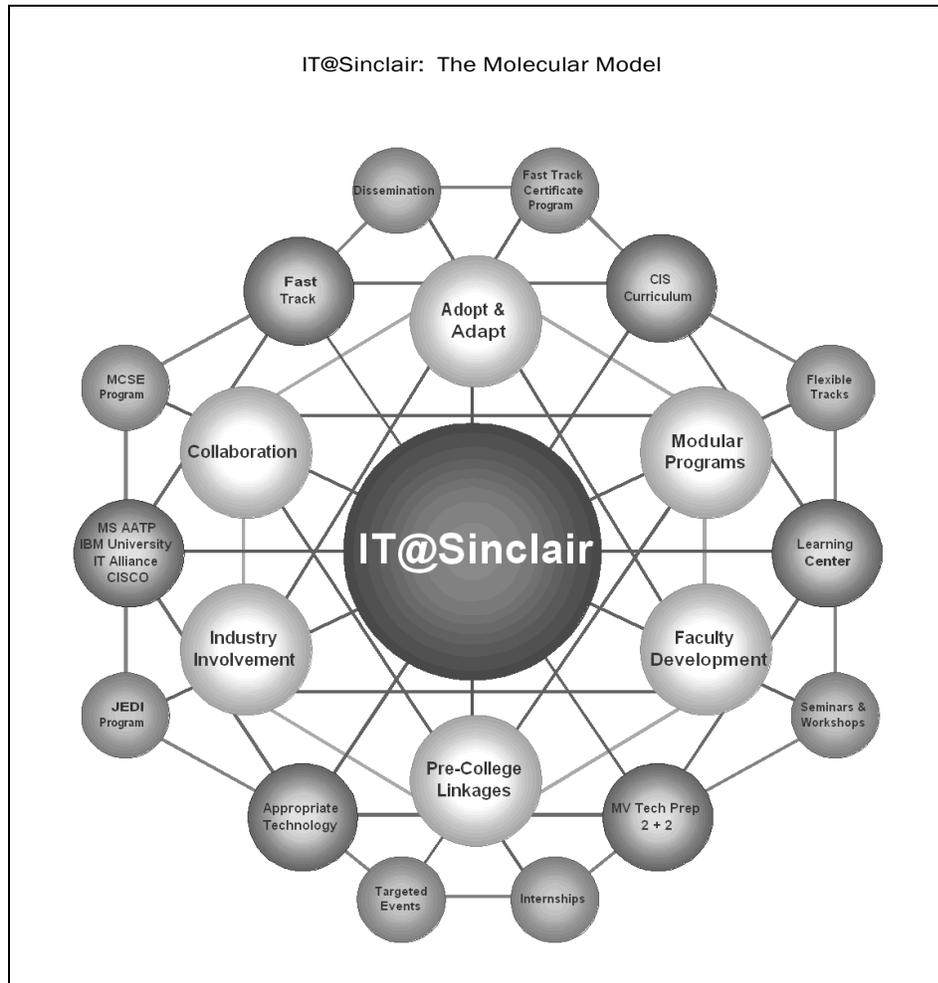
because it captured an overall vision for IT@Sinclair. It's also been widely disseminated and used in PowerPoint presentations, IT@Sinclair annual reports and the National Center of Excellence for Advanced Manufacturing Education (NCE/AME) annual reports.

One of the greatest challenges we faced was describing the intricate relationships and interconnected deliverables associated with our project. As a result, the team evolved a complex, highly networked graphic, called the Molecular Model. This image illustrated relationships among IT@Sinclair, key partners and collaborators, and it identified central project deliverables in relationship to these stakeholders.

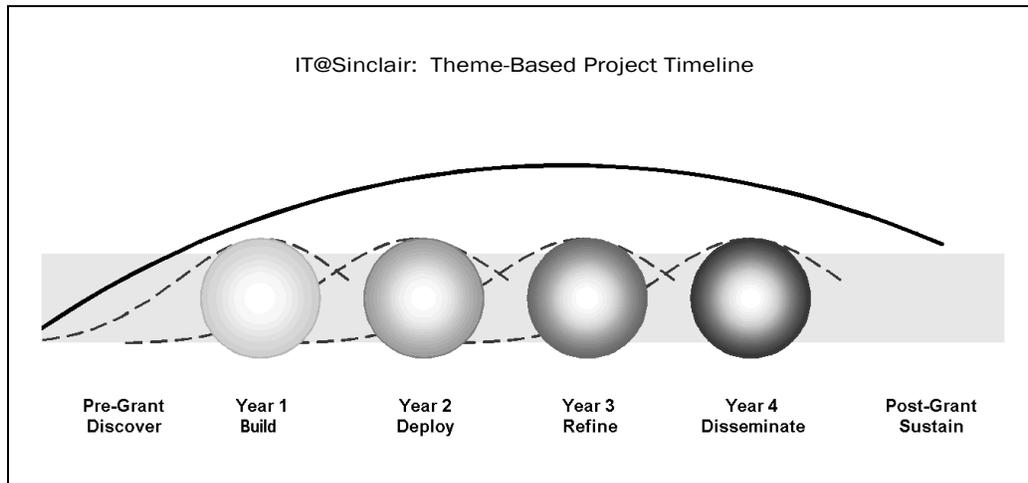
The Molecular Model became the IT@Sinclair signature graphic, and its frequent use made it highly recognizable among project participants and in the community at large. This model has been used as a separate poster, on the cover of the printed annual report (2001), and as an illustration in subsequent annual reports. It has also been modified and adapted for use



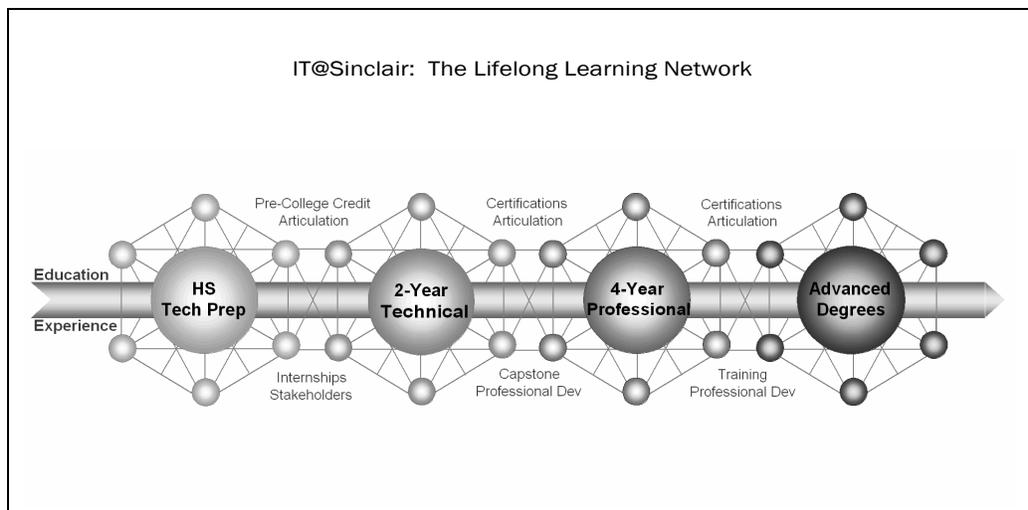
on the web and in other media projects.



The Theme-Based Project Timeline, developed in year three, illustrated the thematic approach to project management and execution. Used on the cover of the 2002 annual report, it was created to identify the distinctive phases of all projects, not just IT@Sinclair. While this graphic is visually related to other IT@Sinclair images, the concept can serve as a model for any project manager that wants to adopt and communicate a disciplined, systematic project strategy.



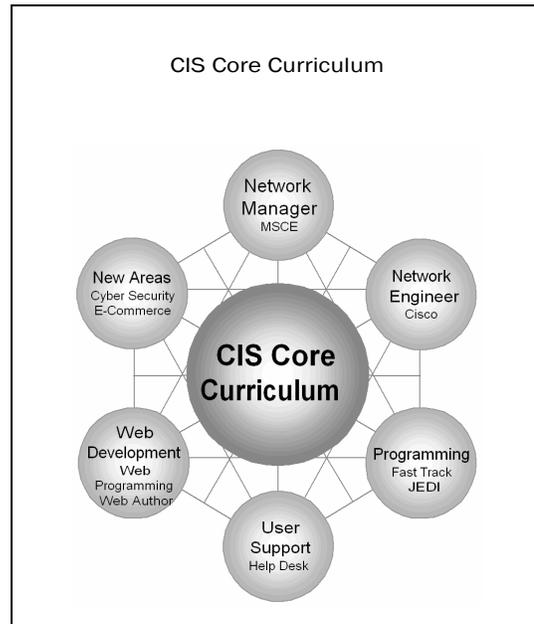
By the fourth year of the project, the Pipeline Model had evolved into the Lifelong Learning Network model. This image not only captured the IT@Sinclair vision, it illustrated a fresh, carefully integrated approach to ongoing education from high school through advanced degrees, and between academia and work-based training and development. This image was used on the cover of the report titled, *IT@Sinclair: Impact & Implications*, which was the project’s final, cumulative results report created in 2003, and it was included in the IT@Sinclair stakeholder summary and overview, *Connect to the Future with IT@Sinclair*.



The re-engineered credit-based CIS curriculum was a substantial, significant outcome of the project. Once the curriculum was defined, this

scope was visually represented in a graphic that illustrated the relationship between the CIS Core Curriculum and the primary Areas of Concentration.

The curriculum strategy is modular, so the Core Curriculum remains relatively constant. Additional concentrations can be added as advancements in IT technology and applications occur or as job requirements, competencies and careers evolve. Like the other custom IT@Sinclair graphics, this image used dimensional spheres arranged in a web-like pattern, and it appeared in the 2003 cumulative report and the stakeholder summary, called *Connect to the Future with IT@Sinclair*.



The decision to work at creating a distinctive visual image produced a family of useful identifiers and illustrations. By the close of the project, IT@Sinclair had a distinctive logo that appeared on everything from printed reports and fact sheets to digital and multimedia venues like the web site and videos. It also had five pivotal images connected to each of the project stages and themes. Developed systematically throughout the project, most were developed in conjunction with the annual reports. All illustrations were also designed to be both independent and complementary, used in a variety of settings, and utilized as the project transitioned to a longterm endeavor.

MANAGING PROMOTION

The National Science Foundation has not, in the past, provided funds for marketing or promoting NSF project products or outcomes. As a result, any funds used for marketing purposes must be provided by the host school or obtained as an inkind contribution from stakeholders.

In our case, Sinclair Community College provided marketing funds, which meant that all IT@Sinclair marketing materials had to also meet the Sinclair standards for materials destined for public distribution and consumption. For example, Sinclair funded the development of a comprehensive fact sheet package to describe the re-engineered CIS program. This package included overviews of IT@Sinclair and the CIS program, along with detailed descriptions of the new Areas of Concentration, industry certifications and technical certificates.

In the spring of 2000, to expedite this collaborative relationship, I identified an internal marketing expert and invited her to join the team as the owner of the marketing and communications strategy. The goal was to have someone linked with and accessible to the project team to develop a cohesive marketing strategy and guide the development of external dissemination pieces that needed to blend with the Sinclair image and standards. Unfortunately, she received an excellent offer at another organization and left during 2002.

While the concept of marketing is a dicey arena, NSF does require each project to disseminate results, findings and products. Every project manager, therefore, needs a plan for disseminating information in a variety of ways. For IT@Sinclair, our dissemination strategy focused on tried-and-true methods using all available venues.

The team used a range of media to support these efforts. After the first year, when it became apparent we had little physical evidence of all the work that had been done, we made some important changes. We began to photograph major events and conduct videotaped sessions to elicit testimonials from students, educators, counselors, administrators, business people, project team members and the NVC. We created a video summarizing IT@Sinclair and the re-engineered CIS curriculum to explain the seamless education-to-career pathway.

A number of pieces were consciously developed for and designed to fulfill multiple purposes. These include the comprehensive annual report created each year to fulfill NSF reporting requirements and a series of best practices that document specific procedures, processes and practices that we believe contributed to our success. All of these documents were targeted to meet both the specific needs of NSF and the general needs of broader

audiences. The best practices and the annual and cumulative reports are addressed in *Section 5 – Managing Reports & Publications*.

At the end of year four, we also created an executive overview for key stakeholders. This overview was extracted from the final cumulative results report, but the information was rewritten to respond to the perspective of new readers. It explained IT@Sinclair and its value to diverse stakeholders, such as students, parents, counselors, educators and business leaders.

Outreach tools supported dissemination efforts and quality results.

Print & Digital

- CIS & IT@Sinclair Informational Brochure
- Stakeholder Overview: What is IT@Sinclair?
- CIS Program Overview
- CIS Areas of Concentration
 - Network Engineer
 - Network Manager
 - Software Development
 - User Support
 - Web Development
- Industry Certifications
 - Cisco Certified Networking Associate (CCNA)
 - Microsoft Certified Systems Administrator (MCSA) & Microsoft Certified Systems Engineer (MCSE) Windows 2000 Track
- Technical Certificates
 - Fast Track Programmer Analyst
 - Help Desk Analyst
 - Java Enterprise Development Implementation (JEDI)
 - Web Authoring
 - Web Programming

Multimedia

- Program Tapes: Student Testimonials (audio, video & CD)
- Video Tapes: Fast Track (A+, JEDI)
- Video Tapes: IT@Sinclair for High School Superintendents
- Video: MVTPC Program Impact (featured at the NTPN 2002 Conference)
- Video Scrapbook (Interviews with students, faculty, employers, the project team, the NVC, etc.)
- Radio Programs: *IT Matters* (ongoing appearances)

PowerPoint Presentations

- Running Training Like a Business
- Catching Fish Without Bait: Recruiting IT Faculty
- Web-CAP: Web-Based Competency Assessment Tool
- Designing & Implementing an Effective Evaluation: Strategies for Reporting Results
- Evidence of Student Outcomes
- E-Learning: What is it Really?
- IT@Sinclair: A Model NSF Project

Examples of outreach pieces are shown in the table. These outreach tools emphasize outputs or products associated with IT@Sinclair, such as curriculum advancements, special certification programs, and the connectivity between high school and college programs.

LESSONS LEARNED

- 1. Identify an Owner for Marketing and Communications** — Early in the project's lifecycle, I identified an internal expert familiar with the college's guidelines to assist in developing and implementing a cohesive marketing and information dissemination campaign. When this individual left Sinclair, I didn't target a replacement to support this critical function. This was a big mistake. Throughout the course of the project, I struggled to manage the marketing and dissemination functions, with only moderate success. The press of deliverables and ongoing project management functions often made it difficult to step back and think about communications and marketing from a strategic perspective.

The best recommendation I can make is this: identify an experienced marketing and communications person to participate in your project and provide cohesive communications planning. They can leverage existing strengths to improve your project's success. The cost implications and the derived impact are enormous. This person can create an effective strategy that includes a logo, tag line, visual identity and dissemination plan, and work with the public relations and communications department(s) to ensure that your project identity and outputs blend with the overall goals of the college.

- 2. Develop a Multimedia Strategy** — Because of the high-tech focus of our grant and our team, we were naturally inclined to seek and use a wide range of media for all aspects of the project, including marketing and dissemination. Think through and design a cohesive approach to using all available media as appropriate, from print to CDs, the web, digital presentations, audio and video tapes, and even radio and TV.
- 3. Promote the Project** — By managing the communications and marketing function, I learned that it was imperative to constantly promote the project and its outputs. We worked hard to establish brand recognition by using our logo prominently and consistently. It's also important that key stakeholders understand how the project is progressing, what has been accomplished and what is planned for the future. Simple and direct strategies are easier to design, create,

implement and sustain, so keep your communications and marketing strategies as easy and focused as possible.

Tangible project outcomes are a valuable way to disseminate project results and promote the project. Some examples from our project are highlighted below, and in each case the core models, systems and tools can be adopted and adapted to solve problems in other environments.

Tangible outcomes can be used to promote the project.		
Category	Item	How To ...
Best Practices	Creating a Seamless IT Curriculum	Design a flexible technology curriculum from high school through college
	Implementing Competency-Based Learning Evaluations	Conduct student-driven competency assessments
	Capturing Competency-Based Employer Feedback	Develop competency-based employer feedback surveys and conduct the survey process
	Designing & Implementing Instructor Resource Guides	Create complete and consistent instructor resource kits for all major courses in the curriculum
	How to Design & Implement IT Tech Prep Programs (MVTPC)	Design, develop and implement IT programs at the high school level
	Using the Learning Opportunity Decision Support Technology	Quantify and systemize risk and opportunity assessments to support informed decision-making
Case Study	Managing for Success: The Insider's Guide to NSF Project Management	Plan for and manage an NSF project
Models	Fast Track	Develop, implement and deliver state-of-the-art technology training and education
	JEDI	Teach the JAVA Enterprise Development Initiative (a Fast Track model program)
	Communication Strategy Decision Support Technology	Define, analyze and implement communication and dissemination strategies

TOOLS TO USE

In terms of marketing and promotion, the most valuable tools were:

- The creation of a custom logo and brand identity.
- The creation of a distinctive visual image through an integrated series of graphics and illustrations.

- The conscious effort to treat significant reports and publications as an extension of our identity and as valuable information dissemination tools.

All of the internal reporting processes, such as the Highlights and Impact documents, supported marketing efforts as well. I'm currently developing a Communication Strategy Decision Support Technology. This tool is in the experimental and pilot-testing phase, and it may be the subject of a future best practice. For now, I'll simply share a high-level checklist of some of our basic marketing and dissemination strategy action items.

IT@Sinclair: Marketing & Dissemination Strategy

- Give speeches, presentations and workshops at conferences and events.
- Participate in related boards, career-night events and campus visits.
- Participate in Greater Dayton IT Alliance events.
- Participate in events with other education and IT-related organizations.
- Communicate and promote IT@Sinclair through the web.
- Communicate and promote IT@Sinclair in print.
- Appear on radio shows, such as *IT Matters*.
- Create custom videos for presentation and informational purposes.

Section 7

Tackling Technology

Considering the fundamental nature of IT@Sinclair, it's appropriate that we leveraged technology to improve efficiency and share results. We used the dedicated IT@Sinclair web site to expedite project activities, track project results, conduct virtual meetings and connect with stakeholders. We leveraged basic online technologies, such as e-mail and interactive capabilities, to support communications, report development and submission, and ongoing data collection.

MAXIMIZING THE WEB SITE

The IT@Sinclair Continuous Learning web site consisted of two basic areas: the front office and the back office. The back office was used to support project activities, while the front office was directed toward stakeholders.

SUPPORTING PROJECT ACTIVITIES

An important aspect of the web site was its role as a central communications hub and virtual back office for the project team. The back office provided password-protected areas reserved exclusively for the team, the National Visiting Committee and the external evaluator. All central project information, including financial reports and progress updates were posted in these protected areas.

For example, all information related to upcoming evaluations or National Visiting Committee site visits was posted on the site, so that all participants could access background information to prepare for the meetings. Agendas were created with hypertext links, so that anyone viewing the agenda could click on the link and immediately view another site, a relevant report or background information. Agendas were used both before meetings to prepare and during virtual meetings to keep things on track.

The site also served as a knowledge management system, since a critical part of the grant was to capture lessons learned, share best practices and record ideas for future use. The team recorded journal entries, designed to capture ongoing lessons learned. As a result, the web site became a digital archive for the primary activities and outcomes associated with the project deliverables, and it was a rich resource for data that could be channeled into the annual and cumulative reports.

CONNECTING WITH STAKEHOLDERS

The IT@Sinclair web site front office served as an access portal for interested stakeholders, and it continues to do so. This area includes typical features, such as an overview of the project and results, and links to related sites, such as The Learning Center at Miami Valley Research Park. It provides direct links to partner and collaborators, such as Sinclair Community College, the Miami Valley Tech Prep Consortium and the Greater Dayton IT Alliance.

Visitors can view or download annual and cumulative reports, the CIS curriculum fact sheets, information about MVTPC programs, IT@Sinclair video clips and other related information. Front office information focuses on IT-related workforce development issues, including knowledge management systems and continuous learning opportunities.

The web site also serves as a central location for providing online training programs to CIS faculty. Part of our project mission was to support faculty skill enhancement and the development of competencies associated with the latest software and hardware advancements. Selected programs are purchased from national vendors and provided online for faculty to access and complete at their convenience. This creates the flexibility and self-guided learning environment many faculty members value, and it helps us deliver quality training in an accessible venue.

LEVERAGING ONLINE TECHNOLOGIES

Everyone involved in IT@Sinclair used online technologies as part of their day-to-day activities. A significant portion of the reports and publications

were developed through e-mailed exchanges, rather than face-to-face meetings. All project participants utilized e-mail and attachments to exchange data, disseminate project results, and share publications, presentations and support materials.

The project leveraged the interactive capacity of online networks for the CIS competency-based self-assessment tool developed as part of the project. The pilot tools were tested in paper-and-pencil form then refined and converted for ongoing online access. At both the start and end of all CIS courses, students log online, access the appropriate competency assessment tool, and rate their competency levels. Students complete these self-assessments at both the start and end of every CIS course. The data from the assessments is captured in a central database and a variety of summary reports are generated, using a custom Cold Fusion program developed by an IT@Sinclair team member. (For additional information about this, see *Implementing Competency-Based Learning Evaluations*.)

LESSONS LEARNED

- 1. Recognize Technology is a Tool** — It's easy to believe that technology makes project management easier. In some cases that's true, but in others it isn't. Technology supports the rapid and consistent dissemination of and access to information, established tools and systems. Technology cannot, however, make a poorly defined system work well. In fact, it often has the opposite effect, serving simply to magnify the flaws and bumps that haven't yet been resolved. Anyone who's ignored this fundamental rule can attest to the chaos that ensues when poor systems are transferred too soon to a computerized environment.

The key to success with technology is to keep it simple. Be practical, and be sure to define and test your processes in manual form first. Once you've managed and refined them in this form, it's possible to transfer them to a technological environment. In the best of worlds, technology is transparent, supporting but not supplanting fundamental good business practices. Technology should enable ready access to information and activities that are intuitive to view and use.

- 2. Use Technology Creatively** — The creation of a front and back office on our web site was a useful device. The front office allowed the public free access to public information and links to additional web sites and documents that might be interesting. It serves as a lasting legacy of the project. The back office provided a safe and protected environment for open, confidential team exchanges about problems, concerns and challenges. If you have access to a web site and the technological capacity to create this type of setup, I recommend it as a useful strategy.

TOOLS TO USE

In terms of technology management, the most valuable tools were the:

- IT@Sinclair Back Office — An online central information and connection point for the project team.
- Linked Documents — An online document with embedded links that connect to relevant background information (for example, the National Visiting Committee Meeting Agenda).

As I've described, we used the project web site as a continuous process management tool. The site served as a virtual office and meeting location, as well as a means of connecting the team, the NVC and evaluators with current project tasks. Central documents, such as meeting agendas, were created and posted online. Embedded links take readers directly to additional material related to the identified topic. Examples of the back office screens and a linked document are included in *Section 9 – References & Resources*.

We've referred elsewhere to additional tools and uses for technology, such as the competency-based evaluations completed online by students. These tools are described in more detail in best practices available from IT@Sinclair.

Section 8

Managing for Impact

The IT@Sinclair endeavor represents an excellent but extreme example of project management challenges. My experiences and those of team members and contributors indicate a fundamental truth. The vision, scope and expectations of any grant evolve as the project matures. To survive, both the project leader and team must flex and adapt to reflect these changing parameters. Your job, as project manager, is to adopt a risk-and-contingency mode of thought, recognize the unexpected will happen and be prepared.

Those who are bold enough to step out and take a risk, who put change into place and execute their plans without guarantees, those are the real leaders.

*Bob Chapman, CEO
Growth Resources of Ohio*

REVISITING THE BASELINE

When the original program director left, the project lost a decision-maker who had vision, experience with NSF projects and the community college organizational structure and politics, and the authority to allocate financial and personnel resources. As the new project manager, I had none of these, and I reported to an acting dean who, like me, had no experience with the IT@Sinclair developmental history.

As the replacement project director, I was unfamiliar with community college dynamics and with NSF project requirements. No one on the project team was full time, and none of the team members was within my organizational span of control. The detailed project plan wasn't fully developed and in place until nearly one project year had elapsed. We had no initial administrative support. When one of the original NVC co-chairs became chair, he had to transition into this new leadership role. The first external evaluator was forced to withdraw due to health problems, so midstream, we had to help bring another evaluator up to speed. The CIS department chair and project Co-PI was promoted to a new position. Her

replacement was talented and enthusiastic, but unfamiliar with the project and Sinclair.

With all these challenges, the project still had to meet the identified goals and create the promised deliverables, on time and with quality. In the end, we completed all major project goals, plus some additional crucial accomplishments in spite of all the changes and challenges. We redesigned the CIS curriculum, developed core partnerships, built close relationships with pre-college programs, supported nearly 6000 hours of faculty and team development and training, institutionalized adopt and adapt strategies, and built a special program for underserved populations. In addition, we created a range of custom Fast Track programs, installed 12 state-of-the-art Cisco labs in high schools, and developed and published seven best practices. (For detailed descriptions of project outcomes, see *IT@Sinclair: Impact & Implications*, the 2003 cumulative project report.)

CREATING NATURAL ALIGNMENTS

NSF projects typically involve multidisciplinary teams drawn from a variety of areas within the organization. It's best to align the functions and goals of the grant with the natural work of the individuals. This strategy allows the team participants to work in their greatest areas of strength, rather than shift back and forth between conflicting arenas. It contributes to optimized results and longterm sustainability through the gradual institutionalization of work associated with the project.

To accomplish this, however, the project leader must do the upfront work of aligning goals with deliverables and the requisite competencies, skills and knowledge to identify the right contributors, as we did when we assigned owners to each major project deliverable. As part of this process, we also delineated success measures, so these factors were known from the beginning. The payoff for this intensive investment can be tremendous. Work is linked to the natural owners, which provides the right individuals with opportunities for rewards and recognition in areas related to their own career goals. In other words, natural owners were aligned with natural work, which led to natural rewards.

During the course of the IT@Sinclair project, the CIS Chair was appointed to the newly created position of Director of Learning Technologies. The CIS Chair position was filled with a high-energy, extremely experienced IT educator from another institution, who contributed substantially to outcomes achieved during the latter half of the project. One Co-PI advanced from Associate Professor to Professor of CIS. Our financial advisor, who offered his services gratis, advanced from grant-based project budgeting responsibilities to the Budget Analyst position with Sinclair Community College. The Acting Dean of Business Technologies became Dean in 2002.

Not all of these advancements were related to the project, but certainly the contributions these individuals made to IT@Sinclair had a part in adding to their reputations as dedicated, quality achievers. The diligent, disciplined team approach to results documentation and reporting also contributed to these advancements, because achievements were readily demonstrable and highly visible. The project benefited and the careers of team participants benefited as well.

ADOPTING A SYSTEMS VIEWPOINT

Project management skills and the discipline to deal with uncertainty and stay focused were absolutely crucial to this project's success. This strategy incorporated an overall systems view that linked processes with products and performance with results.

Effective people and processes are the two key components of any successful project. Build easy, practical systems that create the desired behaviors, outcomes and deliverables, and invest the time and energy to find the team members and non-team collaborators who will make the right things happen at the right time.

I employed a descending system of refinement and clarification that started with a broad vision, which was then translated into specific objectives, strategies and plans. Throughout the project, I also emphasized sustainability and institutionalization. Institutionalization means that what's being done is accepted within the institution and is beginning to be implemented as a common practice. Sustainability means the work can be used and leveraged by others, and it supports the central NSF premise of

adopt and adapt. These elements were so central to our grant that we formalized the concept as a specific project goal and built deliverables with these strategies in mind.

As a project manager, it's important to demonstrate that principles such as adopt and adapt and "being roughly right but not necessarily perfect" are central premises for success. As you confront each opportunity or challenge, remember that someone else has probably already solved it. Find this solution and adapt it as necessary, so that you're only building new solutions when you have to. If you do develop a new solution, build and document it so that others can use it to produce similar results in a predictable manner.

Buy or build useful models to make repetitive tasks and functions easier to execute accurately and quickly. For example, we developed a common look, feel and structure for everything we built, establishing useful models and templates for core communications and documentation efforts. These supported core activities and project outputs, including:

- Project planning
- Best practices
- Annual and cumulative reports
- FastLane submissions
- Internal interim reports, such as the project Highlights
- National Visiting Committee meeting agendas and follow-up reports
- Digital presentations
- Web site content and displays
- Booth displays

EMPHASIZING COMMUNICATIONS & DISSEMINATION

Throughout the project, the entire team expended considerable effort in maintaining communications and information dissemination, but in retrospect, we should have done even more.

Throughout the project, I adopted a policy of open-book management. Project team members had full access to any administrative records or

documentation that they needed or were interested in. I also shared all evaluation results with both the team and NSF. As noted earlier, NSF doesn't expect to have access to external evaluation reports, but my policy of full disclosure helped build confidence and reinforce the collaborative problem-solving stance that I wanted for our project.

Basic marketing is essential. In this project, we attempted to create a marketing and communication strategy that was rolled out in real time, and as project manager, I did most of the marketing and communications work. These were ongoing weaknesses in the overall project plan. After the fact, we learned there was perhaps more flexibility to support marketing-related materials with NSF funds, so we failed to maximize our opportunities in this arena. In the future, marketing and communications plans and outputs will be integral to any grants we pursue.

Both the National Visiting Committee and the external evaluators consistently recommended more marketing and communications, to ensure that program results and product information reached the eyes and ears of educators, business decision-makers and community leaders. The NVC's rationale was that promotion upfront contributed to longterm transference and sustainability, and in essence, created a market for project products. The NVC also encouraged IT@Sinclair to explore ways to create an ongoing business unit for the purpose of distributing project products.

FOCUSING ON PEOPLE & PARTNERHSIPS

When I took the helm, I had the opportunity to learn from the experiences of others. Sinclair Community College was the home of another substantial NSF grant, the National Center of Excellence for Advanced Manufacturing Education. The leader of the curriculum development and delivery function shared invaluable insights into the intricacies of NSF project management, which helped shorten my learning curve, and the original program director served as a mentor throughout the project. During the project, I also developed close collaborative relationships with key partners and advisors, including the NSF Lead Project Director, the National Visiting Committee chair and the external evaluators.

Effective project managers recognize the value of people and partnerships. Choose your team carefully, using the criteria discussed throughout this document. Encourage productive, mutually rewarding relationships by supporting an open exchange of data, opinions and project-related efforts substantiated by facts. Encourage risk-taking, sharing and a team culture characterized by respect for the capabilities of the individuals involved and the recognition that you will sink or swim as a team. Lead by example and coach rather than command. Create a team journal to capture and transfer results, accomplishments and lessons learned.

Credit your team with the most impressive outcomes, provide direct recognition and support the processes that attract recognition from other critical sectors. This happens by plan not by accident, and it needs to be a conscious goal for you, as the project manager.

Acknowledge your team's successes loudly and clearly, in as many forums as you can. Write letters of endorsement and tout team member's accomplishments to evaluators and the National Visiting Committee. Offer team members opportunities for public exposure through speeches and presentations (something I could have done more of), and solicit testimonials or apply for awards on their behalf.

If you help your team grow and succeed, the team will help you do the same. It's important, therefore, to support team members in their efforts to seek promotions and career advancement opportunities. For example, during the course of the IT@Sinclair project, data indicated that student retention was a major issue. It is costly and time consuming to recruit new students, and we recognized that if we could improve our student retention record, we could also reduce costs and leverage outcomes. In June 2003, we were awarded a new NSF grant to tackle these

The key to a successful project is ...

For the most part, this case study reflects my perspective as project manager. However, as we bring this document to a close, I wanted to share the advice of one our most active and productive team members. I asked her what three things she'd share with new NSF project managers and team members, if she had the opportunity. Her advice was succinct and straightforward, and a good reminder to all of us:

- Compose your team carefully. Whenever possible look for positive chemistry among the team members. It does make a difference.
- The project manager's capabilities can mean the difference between wild success and mild success, so it's important to have a strong, effective leader.
- Document, document, document.

issues. This project, *Improving Student Retention in IT Programs*, is a three-year endeavor funded at approximately \$900,000. The new project manager and several core team members were drawn from the our project team, in part due to the valuable results they produced in our first IT@Sinclair project.

TAKING ACTION

Managing — and surviving — an NSF project means wearing many hats: finance manager, product developer, team leader, marketing manager, communications director and data collector. Project management is a complex and often daunting challenge, and many lengthy books are devoted to the topic. We've only begun to scratch the surface in this compact forum.

One goal of this case study is to help you see some worst-case scenarios and issues that were transformed into successes and valuable lessons learned. Hopefully, this case study will reduce confusion and shorten your learning curve by responding to the most pressing questions you will confront.

The prospect of any major project can be overwhelming, but the key is to create your

Translate ideas into action.

- Clarify goals and expected outcomes.
- Define the core values for your project.
- Create a plan.
- Detail a budget and identify a financial management team.
- Identify key competencies and resource needs for the project.
- Identify a natural owner for each deliverable.
- Pinpoint specific success measures for each deliverable.
- Determine critical due dates and budget-related deliverables.
- Design a team communications plan.
- Define your reporting requirements, tools and timeline.
- Create a marketing and information dissemination plan.
- Work with NSF to identify a suitable National Visiting Committee.
- Work with NSF to identify a suitable external evaluator.
- Create a rewards and recognition plan for your team.
- Identify and implement appropriate technologies.

plan and work it systematically. I've included a high-level checklist along with the assortment of tools in *Section 9 – References & Resources* to help you begin translating ideas into action as you confront the challenge of managing your National Science Foundation project.

Clearly, the people, processes and products associated with IT@Sinclair have created a tangible record of success, and in the end, managing this project has been one of the most challenging and rewarding endeavors of my career. I hope this is also true for you, and in the meantime, enjoy the experience.

Section 9

References & Resources**IT@SINCLAIR**

Call: (937) 512-3125
 Visit: <http://IT.Sinclair.edu>
 E-mail: IT@Sinclair.edu

ADDITIONAL RESOURCES

Greater Dayton IT Alliance: www.daytonitalliance.org
 ITworks: www.itworks-ohio.org
 Miami Valley Tech Prep Consortium: www.mvtechprep.org
 National Science Foundation: www.nsf.gov
 Sinclair Community College: www.sinclair.edu
 The Learning Center at Miami Valley Research Park: <http://IT.Sinclair.edu>

IT@SINCLAIR PROJECT TEAM & KEY PARTNERS

None of the results described in this report would have been possible without the exceptional efforts and creative contributions of this incredible team of people. I respect them professionally for their time, dedication and commitment to service, and most importantly, I have come to view them as friends.

Nancy Thibeault	Director, Learning Technology Support	Sinclair Community College
Charlotte Wharton	Chair, Computer Information Systems	Sinclair Community College
Patty Santoianni	Professor, Computer Information Systems	Sinclair Community College
Robert Sheehan	IT Liaison	Miami Valley Tech Prep Consortium
Dr. Cinda Mize	Evaluation/Assessment	National Center for Manufacturing Education
Jim Horton	Cisco Coordinator	Sinclair Community College
Judy Aldridge	Administrative Assistant	Sinclair Community College
Neil Herbersman	Director, Grants Development & Government Information	Sinclair Community College
Joe Must	Manager, Grants Accounting & Payroll	Sinclair Community College
Michael Barhorst	Budget Analyst	Sinclair Community College
Jeff Miller	Purchasing Manager	Sinclair Community College
Mike Schmid	Assistant Purchasing Manager	Sinclair Community College
Barbara Spencer Hawk	President	Crossbridge Communications

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Dan Brazelton	Dean, Corporate & Community Services	Sinclair Community College
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Ann Gallaher	Director	Greater Dayton IT Alliance
Ann Armstrong	Director, Publications	Sinclair Community College
Jill Oldham	Administrative Assistant	Sinclair Community College
Dr. Tom Atkinson	National Visiting Committee, Chair	NCR/Forum Corporation
Dr. David Harrison	National Visiting Committee	Seminole Community College
Ruth Schneider	National Visiting Committee	Wright-Patterson Air Force Base
Dick Wendling	National Visiting Committee	Lexis-Nexis
John Baltzer	National Visiting Committee	Techcor Training Center
Keith Satterfield	National Visiting Committee	Scitex Digital Printing
Douglas Fleser	National Visiting Committee	Wright-Patterson Air Force Base
Scott Dickinson	National Visiting Committee	Ohio IT Alliance
Dr. Pamela Tate	External Evaluator	CAEL
Dr. James Masi	External Evaluator	(Retired)
Gerhard Salinger	Lead Program Director	National Science Foundation
Dr. Bonnie Coe	Vice President & Dean of Faculty	Central Ohio Technical College

ATTACHMENTS

- NSF Scorecard: IT@Sinclair
- Project Plan Template: IT@Sinclair
- Project Deliverable Plan Template: Curriculum Redesign
- Action Item List: New Activities
- Work Breakdown: Education is Everyone's Business Project
- Highlights: Curriculum Redesign
- Impact Document: The Flexible Competency-Based Associate Degree Program
- Web Site: Back Office & Virtual Meeting links
- Linked Document: NVC Standard Agenda