Technological Innovation via Education: Some Guidelines for Building Partnerships with Tribal Communities

William W. Erdly and Dianne Bissell

Technology is often heralded as the solution to many of the challenges facing underserved populations as they strive to achieve a variety of cultural, educational and economic goals. Unfortunately, without an effective strategy and committed leadership, "technology" often fails. And that apparent failure of technology may be attributed to the wrong technological solution used to solve the problem, feature (or scope) creep resulting in cost over-runs, poor software/hardware selection processes resulting in user-unfriendly applications, failure to recognize and understand the impact of cultural differences, and poor educational planning. These barriers need to be overcome so that access and technology literacy issues may be addressed. In fact, the very process of overcoming these barriers may lead to increased technology literacy and improved access.

Many of the above "lessons learned" from technology implementations served as the inspiration for the development of a partnership between the Tulalip Tribes, Everett Community College (EvCC) and the University of Washington, Bothell (UWB). The Tulalip Tribes desire an integrated information system that serves all tribal members and employees – and to also provide access to services and data important to external entities. After several early attempts by independent contractors and other organizations, the Tulalip Tribes looked toward the educational community for technical guidance and educational support to reach their goal. They felt that this project was first and foremost an incredible learning opportunity that would have long-lasting benefits for the entire region – bridging the digital divide.

Preserving the Past – Building a Future: A Vision for the Tulalip Tribes

The first meeting between EvCC, UWB and the Tulalip Tribes is best described as "unbelievable" in a very positive way. An executive from the tribes arrived at the meeting and identified a short list of tasks that needed some support. These tasks included:

> 1) build a network and telecommunications infrastructure for a 22,000 acre reservation;
> 2) design systems to manage and store a variety of data and multimedia content;
> 3) put information systems in place that will enhance tribal communications;
> 4) foster managed growth in business and economic development;
> 5) enhance educational opportunities for tribal families;
> 6) preserve the culture (customs, art, history and language);
> 7) facilitate the social, health and economic well-being of the Tulalip Tribes;
> 8) develop a technology infrastructure to be managed and owned by tribal members; and

9) provide education and training to ensure a skilled workforce is in place to build and maintain these systems.

The educators' initial response was stunned silence, as we were struck by the complexities involved in this request. We were then asked to propose a way to partner with the Tulalip Tribes to achieve these goals. UWB and EvCC derived a plan that would leverage the combined strengths of the university and community college – and most important – benefit students and tribal members alike. Due to the scope and complexities of the project, expertise in tribal culture, technology (hardware, software, networking), local government, private business, K-20 education and fiscal management were required to address the challenge. Only through a teaming approach – leveraging a wide variety of knowledge domains – would this important project have a chance. This approach resulted in an organization aptly-named *Tulalip Technology Leap* (TTL) – as we were truly leaping into the future.

"Getting There by Being There"

The tribal council chartered the TTL team to complete a detailed needs analysis and strategy for implementing new information technologies.   This included a baseline analysis of the infrastructure requirements and process needs of Tulalip Tribes. Several of the key tasks included mapping out floor plans of shared community building spaces, assessing the existing networking and telecommunications systems, and finding ways to simplify data collection, storage, management and report dissemination.

To complete these initial tasks, the TTL team needed to have a physical presence on site. Staff, students, tribal employees and members needed a place to meet and learn about each other rather than sit in isolation at their campus computers. The TTL Coordinating Center (located on the reservation) was set up to serve as a work and meeting place. Existing computers (and electrical systems) in the facility were upgraded, and additional hardware and software were purchased to meet the project's computing and document management needs. Budget, contracts and operating procedures were established jointly by all partnering organizations in a very timely and efficient manner. The budget and overhead expenses are carefully controlled and kept to a minimum – with the community college serving as the fiscal agent until the project becomes fully managed by the tribes.

The TTL team interviewed and worked directly with over forty tribal representatives of such areas as education, business, government, social/health services, cultural preservation, natural resources and households within the Tulalip community to identify key needs. After the initial interviews were completed, we were amazed to uncover over 170 initial ideas for technology projects – generated by tribal members and the TTL team. We are certain that many more ideas will be generated as we continue to work with tribal members.

Our "longer term" strategy – once the network infrastructure and support services are in place – is to deploy critical technology applications that have direct benefits as identified

by tribal interests. These applications may include e-learning for K-12, enhancing job skills and opportunities for the under- and unemployed, fostering hope in the form of alternatives for economic development, and capturing the richness of the art, language and culture of the past. Several of these projects may be able to build on existing technologies; other projects may require advanced research and education to complete. Ultimately, the networking and technology infrastructure should be owned and managed by members of the Tulalip Tribes -- with continuing partnerships with faculty and students from regional educational institutions.

We believe that the appropriate and selective use of technology will enhance the ability to respond to many of the education, community, cultural preservation, business development and government needs of the Tulalip Tribes. Technology, when not implemented correctly, will only serve as a source of frustration and high costs. The bottom line, however, is to truly understand the needs of end-users, and then – only where appropriate – provide technical solutions that will help people to reach their goals. This can only be achieved via an on-site presence.

Our Philosophy: Knowledge is Key

In a world crowded with many technical solutions, it is easy to pick a solution that does not truly meet your needs. Most technical projects result in extreme cost overruns, delayed implementations, minimal benefits, dismayed users and, unfortunately, lost opportunities. Corporate leaders and technology managers are often too quick to spend their money on "tangible" capital expenditures such as computer hardware, peripherals and networking solutions without examining the true process and cultural needs of the organization. All too often, vendors and consultants encourage early spending only to leave their client with systems that are expensive (or impossible) to maintain. These cost overruns are directly attributable to lack of knowledge (or interest in the "big picture" beyond technology) about the long-term cultural and organizational needs of their client.

Our approach is much different. The Tulalip Tribes leadership has endorsed the opportunity to build a partnership that has its foundation based on education and cultural understanding. Our team consists of college students, faculty, college administrators, tribal employees and tribal executives. All members are motivated by an inherent interest in learning, interdisciplinary research, computer science and long-term commitment to the needs of tribal members. This unique partnership is focused on determining the core infrastructure requirements. By spending time understanding the requirements, the ability to implement the right solutions for the right problems increases dramatically. Other distinguishing characteristics of our approach include:

Ensuring an unbiased and fair analysis.

Because the TTL team has no specific hardware, software or client services to sell, our findings fairly represent the internal technology needs of the Tribes. Also, students typically perform their best when given the opportunity to put theory into action.

<u>Use effective systems analysis and computer science methods.</u>

The faculty, staff and student teams used many of the latest techniques in systems analysis and design -- enhancing both the educational experience and technical benefits of the research.

<u>Focus on identifying similar and unique needs of the various tribal organizations.</u>

One of the project goals was to determine where organizations might be able to leverage shared data needs – thus reducing the amount of rework, minimize data inaccuracies and provide the ability to share information between different organizations/functions.

<u>Demonstrate the long-term commitment to our community.</u>

The TTL partnership is being designed for the long-run -- a total commitment to the long-term future of the Tulalip Tribes, our students and the education community. Students gain a unique understanding of the Tulalip Tribes customs and culture -- very valuable as they continue their work on real-world technology projects

<u>Complete the project with minimal cost and schedule overruns.</u>

Instead of using very high-priced consulting firms, students and tribal members will complete and manage the projects. The educational experiences are invaluable and the interest in the success of the project is long-term. Future employment opportunities also exist for the participants.

<u>Provide a strategy that will develop job opportunities and technology training for tribal members.</u>

The implementation and management of technology will provide increased opportunities for employment and training for existing and new employees. Extensive education and "hands-on" training provide practical, "real world" experiences that will capture the imagination and interests of all involved. Project teams that consist of students, faculty, tribal employees and end-users will be both enriching and fun.

Some Important First Steps

To even have a chance of completing this project, we found it necessary to develop a core infrastructure and achieve some short-term successes. These core accomplishments set the stage for additional funding and project opportunities, and are listed below:

- Established operating agreement between The Tulalip Tribes, Everett Community College and members of the University of Washington, Bothell.
- Hired faculty consultants, support staff and part-time student workers.
- Provided cultural information and education to faculty, staff and students about the tribes prior to working on their course and/or internship projects.
- Configured computers, printers, network and Internet server for the TTL Coordinating Center located in the Tulalip Education Center.
- Developed TTL Document Management System to store, manage and retrieve all technical documents.
- Managed 23 student group projects (a total of 113 students), one internship, one research project and four UWB volunteers and two Everett Community College volunteers
- Completed baseline hardware, software and networking asset survey for existing tribal facilities (including floor plans).
- Provided technical hardware guidance and implementation strategy for "Computer in Every Tribal Member Home" project.
- Established relationship with key representatives of the Tulalip Tribes.
- Coordinated joint-venture opportunities with industry vendors regarding networking, telecommunications, hardware and software requirements.
- Identified and collected over 1200+ data forms used throughout the Tulalip Reservation
- Built a data dictionary including identification/consolidation of classes and attributes of approximately 90% of data currently collected on the reservation.
- Generated over 6000 pages of technical documentation and specifications to be used during the implementation phase.
- Developed key relationships with tribal members who will provide guidance and support for implementation of new technologies.
- Identified core pilot projects that will demonstrate the appropriate implementation of technology infrastructure.

Implement Core Infrastructure Projects

While much work was completed in establishing the operational infrastructure, the bottom line is to implement. The identification of core tribal infrastructure projects was based on several criteria: providing access to computer hardware/software, developing a high-speed networking infrastructure, creating access to technical support, building communication via the internet, job creation and service learning. Systems such as a geographic information system (for land use and natural resource planning), cultural/language preservation, business development, finance/human resource management, tribal document management, web site development team, case management, on-line medical information systems and a 911 dispatch center are currently being developed. These critical and highly visible projects will serve as a foundation for the future of the Tulalip Tribes.

Strategies for Effective Technology Implementation in Tribal Communities

The Tulalip Technology Leap initiative continues to make progress on many fronts. As with any organization, we face daily challenges and make some mistakes. What is most appreciated by all the staff and students is that each of the mistakes is converted into a learning opportunity for the future.   Through weekly meetings and publishing of project schedules and timelines, students share and discuss challenges and approaches that work (and sometimes don't). The faculty and staff members have found this environment to be a model for learning – truly service learning at its best.

Below is a summary of strategies that have emerged so far from this project that may be useful in other settings. Some may appear obvious -- but the challenge is in the implementation.

Strategy 1: Leadership through Partnering

Leadership that is charismatic, views each team member as an individual and is concerned with providing intellectual growth opportunities is critical in a partnership of this type. Sincere buy-in on the concept and establishment of the community vision is essential. It is also important for each entity in the partnership to have attainable goals that meet the organizational goals of each partner institution.

Strategy 2: Create Service Learning Opportunities for Students (tribal and non-tribal)

Service learning is increasing in importance at all levels of higher education. Perhaps one of the best strategies to span the digital divide is to encourage learning by doing – assuming access to technology. To offer tribal members technology courses with no opportunities to use the skills in the real-world is not an effective approach. Creating the opportunity for mentoring between the tribal members, two-year and four-year students is invaluable. Students teach each other about technical theory and applied application concepts within the context of a unique culture.

Strategy 3: Understand the Culture

To fully understand a culture requires getting beyond the external, visible symbols (more objective) and progressing toward understanding the core values (more subjective). An understanding and experience with the history, knowledge of the founders, cultural rites and ceremonies are but some of the ways to achieve such knowledge. This information appears to be best gained through immersion in the culture. In our project, we encourage students to participate in such diverse events as surveying the shellfish population to attending the closing ceremonies for language camp for tribal children. Students have had the opportunity to learn about the relational nature of the tribes – which is distinctive from traditional corporate America.

Strategy 4: Ensure Technology Is Appropriate for the Process

Successful technology implementation requires a firm understanding of the desired process. It is often easy to automate an existing process without changing it, the result

being frustration and resistance to future attempts to use technology. Using effective listening and systems analysis skills, students have identified effective ways to implement technology where appropriate. Perhaps more important, students develop a personal relationship and mutual trust that ultimately is beneficial to all.

Strategy 5: Demonstrate Short-Term Success within a Long-Term Strategy

The bottom line is the concept of "show me." Native American history provides many examples of failed promises and lack of long-term commitment; this perception is easily generalized (and often warranted) as applied to the promises of technology. It is in the best interest of all to identify and complete projects that work. Building on a series of small, successful projects is an effective method of changing beliefs and overall attitude toward the larger technology strategy.

Strategy 6: Identify and Educate Future Leaders

While finding effective leaders to start an ambitious project is challenging, it is more difficult (and often overlooked) to identify and educate the leaders of the future. Ultimate tribal management of the technology infrastructure is critical and new generations of leaders are essential. Designing effective K-12 programs, job training for young adults and internship opportunities that are interesting and valuable are but some of the methods that need to be implemented immediately. Identifying tribal role models who share their passion and excitement is critical.

Strategy 7: Disseminate Project Information

Project visibility – so often this fundamental concept is the hardest to achieve. Part of building end-user trust and developer accountability is to inform people of the true progress of projects. Web-based project management, newsletters, tribal newspapers, local/regional news coverage and even national publications and conferences help inspire completion of projects. Continued communication between the developers, leaders and tribal members is paramount. The time and effort spent on this activity is often more important than the project itself.

Strategy 8: Establish Core Metrics

As with any modern-day quality management approach, effective metrics are at the core. An established method for identifying the appropriate metrics should be identified and supported by the leaders. Examples of metrics include network bandwidth utilization, database quality, number of education courses completed by tribal members, end-user requests for help or general attitude surveys regarding changes in tribal processes. It is important that resources are allocated to collect and aggregate these metrics for appropriate decision-making.

Conclusion

A project of this scope, nature and significance has truly been a learning opportunity for all. While it is impossible to cite all of the unique learning situations that have occurred so far during this project, it is safe to say that there were many opportunities to examine our own thoughts and perceptions as we mix technology with culture. There are also many general technical benefits that will enable the Tulalip Tribes to access technology through a high-speed network; dramatically increase literacy through training; and provide information services essential to members.

Finally, the TTL team could not have reached its current level of success without the help of the many members of the Tulalip Tribes who have generously provided information, ideas, guidance, support and time to the students and staff of the TTL team.   Their efforts have been critical in building this foundation for the future of the many organizations, members of the Tulalip Tribes and our region. We look forward to our continued partnership as we continue the implementation phase of this important initiative.