**New Technology Foundation -- 1999-2009**

***A Decade of Re-creating Teaching and Learning***

**Susan Schilling**

**Former CEO New Technology Foundation**

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**Executive Summary**

NTF developed a nationally prominent and effective school development organization in four phases.

* In Phase 1 (1999-2000), NTF was forming, determining its purpose and organizational mission and securing funding.
* In Phase 2 (2001-2005), NTF developed the skills and capacity to capture and transfer the best practices and tools from Napa New Technology High School to other communities. It launched new schools in 14 sites in northern California and in scattered singleton sites around the country during this period of time, learning and refining its practices and materials after each school year cycle.
* In Phase 3 (2006-2007), NTF strengthened its capacity to launch and support new schools through staffing up and also refining its planning process, its training and coaching model and its technology tools. This led to 23 new sites with clusters in Los Angeles, North Carolina, Texas and Indiana. Partial funding was secured to web-enable the New Tech Learning System – PeBL™.
* Phase 4 (2008-2010) was projected to be another time of rapid growth with the intention of continuing to add 10-20 schools per year and to transform state and regional clusters into hubs of New Tech schools and classrooms that seriously impacted high school education on a national scale.

**Legal history**

New Technology Foundation (NTF) formed in **November 1999** with the singular purpose of supporting New Technology High School (NTHS) in Napa, CA. This support included: fund raising, external relations with vendors, organization and management of interested parties who wanted to visit the school. A preliminary 501 (c) (3) designation was given by the IRS in **August 2000**.

NTF wrote for and received funding from the Bill & Melinda Gates Foundation in 2000 and again in 2004 for the express purpose of helping other communities create a NTHS for their students and families. The purpose of NTF became twofold – support NTHS and support the replication of the model to other communities across the country.

Because funding to NTF was coming nearly exclusively from the Gates Foundation, it became necessary to create a different legal entity in order to avoid ‘tipping’ into a private foundation status.

In **November 2004**, the New Technology Fund was formed and granted an advance ruling status of 501 (c) (3) by the IRS with the New Technology Foundation then moving to a supporting organization status – 509 (a) (3). The IRS final determination letter making all needed changes to the non-profit status of both organizations was final as of **May 2007** for New Technology Foundation and **January 2008** for New Technology Fund.

**Financial and Planning Reporting periods**

Prior to 2007, NTF planned and executed its work on a January-December calendar. In 2007, the fiscal year was changed to July 1 – June 30 in order to better match the School Year. NTF did a short tax year for 1-1-07 to 6-30-07 and then an eighteen month period from 1-1-07 to 6-30-08. Most of this report is organized by School Year. Note is made when the annual plan reflects calendar vs. fiscal year.

**Early Decisions – Starting at the right place with the right people**

NTF operated as a collaborative, shared decision making organization. The core staff who developed the replication process and trained others on how to create a new Tech High School for their community were experienced, seasoned professionals who had worked in large organizations and had the ability to project future growth and understood the need to anticipate both intended and unintended consequences of decisions. Coaches were hired from within the New Tech schools and represented the very best practitioners of their craft. All staff shared an entrepreneurial spirit and enjoyed the idea of helping others create better teaching and learning opportunities for all teachers and students within their towns and districts. They were passionate about the work and committed to doing whatever was necessary to assure success. Internal care was taken to pause and reflect and modify practice as required. New materials were developed and vetted through an internal process that let all eyes and minds engage in the change. All materials were in a shared space and accessible 24/7. Decisions were made and action was taken on an immediate basis, with a clear articulation of intended outcome. A re-assessment of each tool and practice occurred routinely.

This constant process of reflection and internal informal analysis drove the development of the replication process and materials. This document highlights those pivotal moments when enlightenment occurred and major shifts were made in approach and anticipated outcome.

Leadership for the replication work was provided by Susan Schilling and Paul Curtis, with enormous support from the Napa New Tech High School staff, teachers and students. NTF started by:

1. **Making sure that what NTF was attempting to replicate was something that could be copied and was worth copying**. By the time NTF was formed, NTHS had been in existence for 4 years. It had withstood the test of time and had results to show. Students – the ultimate measure of success – were ready for short term and long term challenges as the progressed through the school and became ready for ‘what comes next’ – be that college or career.
2. **Observation of the original model**. NTF staff spent months directly observing the model in action, talking to teachers, talking to students, interviewing front office staff, counselors, administrators, community leaders, all stakeholders present on campus and in the community. They asked questions and gathered information about the culture, the curriculum and the use and role of technology in supporting these changed practices.
3. **Create materials and processes that copy the original model as closely as possible**. Copying a complex organization is possible, but tricky. Each component not only needs to be captured, but how the components intersect and interact with each other is equally important. The replica can only be coherent if the template is. NTF captured the WHAT as well as the WHY and the HOW.
4. **Adapt only after achieving acceptable results**. Napa NTHS had the core functions up and running and fully integrated so that the culture and the teaching and learning experience were woven tightly together. Seeing it work at the 11-12th grade level gave NTF the opportunity to ‘start with the end in mind’ and while even the first few replication schools needed to be full 9-12th grade schools, the core foundational elements for what made the culture and the school work were unchanged, even in an expanded age group environment.
5. **Keep the template in mind, even as you adapt**. For most replication sites, the core foundational elements for what made up a New Tech were held in common. They all followed a pattern of mutual adaptation as they matured with local control of their name, their image, their curriculum, their course integration selection, their partners. But all had the shared components of the model in common. Care was always present to respect the core of what went into creating the original successful enterprise.

By the end of this ten year period, NTF had discovered that the key to long term success and continued sustainability of the innovation resided in laying the foundation correctly. Schools that started strong, continued strong. To start strong, the district, the community and NTF had to make a huge investment of time and resource in planning, in relationship building and in the start-up phase.

This advance planning turned out to be critical since the New Tech approach is a different way of doing school, of being a teacher, of being a student. It requires careful, planned attention to the supporting elements that create and sustain this changed culture and teaching/learning environment. These elements include shifts in everything from resources and operational controls to shifts in expectations, assumptions, attitudes and beliefs. Assuring staff have had adequate time to be trained, to process the shifts in thinking and to assimilate the mere beginning of new ways of teaching meant hiring early, having the right leadership in place, having the right facilities to support the changed practice and a technology infrastructure to help manage the environment.

**A Gem of an Idea – Napa New Technology High School**

The history of NTF is embedded within the history of Napa New Tech High School since the school pre-dated the foundation by nearly 4 years. Understanding how Napa NTHS came into being in critical to understanding how NTF started and what its initial challenges were.

The connection between education and economic development was the impetus for the New Tech model from the very beginning. In the early 1990s, many federal military bases were closed across the county. Mare Island was on the list and over 40,000 jobs were eliminated in the region. The city of Napa was negatively impacted and the Napa Valley Economic Development Corporation (NVEDC) began the process of identifying ideal new businesses it wanted to bring to the valley that would marry well with wine and tourism. Given the explosion in growth of the technology sector and Silicon Valley, the business leaders assembled placed highest priority on attracting technology jobs to Napa. A new business park by the airport was the impetus for the creation of something called the Napa Valley Applied Technology Alliance – a group of roughly 40 business people who used technology in their businesses. Both **Ted Fujimoto** and **Buzz Butler** were key to this formation of this group.

In the **Fall of 1991**, the NVEDC invited the school district in the person of assistant superintendent **Virginia Rue** to come and discuss their needs. They wanted employees were who familiar with standard business software packages, could do minimal computer troubleshooting and fix small things. They wanted creative problem solvers who got along well with others and were flexible and responsible both for their individual work and for their team’s success. They spoke about having some employees that did entry level work, some that went on to additional jobs that required an AA degree and some that required college level training. They felt they needed very few with advanced post graduate degrees.

The school board formed a committee in 1993 to begin a feasibility study for a new kind of high school Virginia appointed **Bob Nolan** as the project coordinator and asked Buzz Butler to serve as chair.

The district was experiencing population growth at the high school level, but a bond measure for facilities failed to pass. Virginia promised to start this new small school to take the pressure off of Napa High and Vintage High. She promised to make sure it did not require any additional funds beyond that allocated for the regular high school program. The school was to be 11th and 12th only and operate as an upper division school. She rejected the idea of creating this as a ‘program’ oriented on one or the other of the two traditional high schools. It was to bleed the lines between college prep and career prep, draw students from the entire region and form a unique and innovative experience for students and staff alike. County Superintendent **Barbara Nemko** was an early and very vocal supporter of the school, saluting its emphasis on skills and career tracks into the technology sector. The county office of education provided staffing support by allocating one of its headcount to the school to lead career tech type of courses. **Diane Carey Woodruff** from Napa Valley Community College became very excited about partnering with NTHS and over 3 years worked to get the college into an official partnership with the school. This partnership allowed for the smallness of the school not to be an impediment since ‘electives’ could now be taken on the community college campus thus allowing NTHS students access to a broad array of courses. The school model required a minimum of 12 college credits to graduate, which meant it was building a strong bridge between high school and college for its students.

$850,000 had been set aside to bring portables to the high school campuses to deal with the overcrowding. The plan was to use these monies to bring a mothballed elementary school back into operation. Virginia raised an additional $350,000 to open Napa New Tech. She worked with **Senator Mike Thompson** to get a direct appropriation of $250,000 and then raised $100,000 from the local **Gasser Foundation** and $50,000 from the **Napa Rotary club**. Support was garnered from over 40 national and local business and education partnerships prior to opening day. The list included Autodesk Foundation, (run by **Bob Pearlman**), West Ed, the US Department of Education, CA Department of Education, Hewlett Packard, Tegrity, Lotus Development Corp, Adobe Software, Macromedia Software, Alkar Personnel Services, Nelson Staffing Service, Rotary Club and Napa Valley Community College.

After a broad regional search, teachers were hired in **January 1996** to develop curriculum. No in-district teachers were invited to join the team. **Dave Brown** joined the district as superintendent in 1996 and assured autonomy for NTHS so it could develop without much interference from the district. Bob Nolan opened the school in **SY 1996-97** to incoming 11th graders -- and then left the district. Virginia brought in **Mark Morrison**, then assistant principal at Vintage High to operate the school. In addition to the staff headcount provided by the County Office of Education, the partnership with NVCC for students to take college classes, Alkar Personnel Services funded an internship position that intersected with the Napa business community and provided the internship component of the overall program.

The renovation of the old elementary school created large double wide classrooms that could accommodate the 1:1 computer-to-student ratio as well as the team taught integrated courses that were being developed. The business leaders contributed time and expertise to make sure the network configuration installed was robust and industry standard. Since project-based learning was to be the predominant instructional paradigm in order to impact the goals of producing proficient team work and creativity, a collaborative software program needed to be in place. **Lotus Notes** was the program of choice in the business world and arrangements were made for Lotus Notes to be installed at NTHS.

By the end of its first year of operation, staff was exhausted. Having embraced the principles of transformed teaching and learning, they had run head first into the difficulties of starting everything at once from scratch, in a 1:1 technology rich environment. While the school had gone thru the necessary steps to identify core mission and values, and had taken up the mantra of ‘start small, stay focused’, curriculum, assessment, culture, expectations, teaming all had to be rethought and new standards established concurrently. Ted had offered himself as a coach/mentor to Mark and discussed many of the first year issues with him, offering more entrepreneurial solutions from a business perspective. Mark was a willing partner in this and delighted in asking for district forgiveness rather than permission. Feeling overworked and understaffed, the entire teacher team tendered resignations at the end of year one. Mark convinced staff to recommit to a second year by promising additional support and resources. A new class of 11th graders was recruited and a new team of teachers for the integrated 12th grade classes was hired. This time, existing district employees were integrated into the school. By **SY 1997-98**, both grades were fully staffed and students were beginning to gain the experiences hoped for back in 1991. Word of mouth began to spread and by spring 1998, Mark and the front office were inundated with school personnel from across the country wanting to come and visit – drawn principally by the 1:1 nature of the classrooms. Through a grant from Hewlett Packard, a coordinator position was funded and additional support was brought in to manage the interest.

In **SY 1998-99**, the influx of visitors and the vendors requesting to showcase their product in the school was overwhelming. Mark decided he really wanted to and needed to return to being a fulltime high principal and lose his tour guide moniker. He reached out to Ted and Buzz to help form the New Technology Foundation to deal with those aspects of his job that were outside of this main interest and the school’s need. **Scot Stewart**, a local resident with connections into Chamber of Commerce work, took on the challenge to organize NTF and make it into a non-profit supporting the needs of NTHS. Papers were filed November 1999.

In addition to tapping business leaders to solve this issue, Mark had developed a team approach to internal operations as well. Lead teachers were picking up the responsibility for creating PBL units that were robust and sharable. New templates were being developed on Lotus Notes to store and hold the materials. Front office staff in the persons of **Pam Tuthill** and **Jeannette Cherrington** helped with district reports and compliance issues, student schedules, intersection with college classes, and parent relations. The network administrator had begun tapping talented students to assist in maintaining the robust nature of the network and the number of desktops on campus, with additional support from Ted and **Dean Bowen**. **Paul Curtis**, co-teacher in Political Studies, began experimenting with an assessment system that would give grades on all aspects of student performance – not just academic mastery. Through shared leadership strategies, a staff culture that was totally committed to this new way of doing high school was in place. They owned it in a way most district employees cannot. It was into this environment that NTF was launched.

**New Technology Foundation – 1999-2000**

Almost immediately upon formation, the need to bring additional revenue into the school to supplement district funding formulae was evident. In order to stay ‘industry standard’ the idea was to make sure the technology was refreshed every 2 years, with the older machines being recycled back into the district. At Mark’s suggestion, Scot made a trip down to Silicon Valley to visit **Bob Pearlman**, former CEO of the Autodesk Foundation that had focused on PBL and who had personally taken NTHS under his wing early on to help direct traffic and interest to the site so that it could develop a national reputation. Bob now was involved with Silicon Valley Joint Ventures. He met with Scot and suggested that the best funding to be found was being put in place by the **Bill & Melinda Gates Foundation** and their new director, **Tom VanderArk**. Scot made the call. Tom visited and within a few months NTF was the recipient of a Gates grant to replicate NTHS in Northern California.

The Gates formula suggested that each new school would trigger $600K in funding. Two thirds of that amount needed to go directly to the school ($400K) and one-third could be held by the intermediary to fund operations ($200K). This first grant allowed NTHS to be counted as school #1 for which $400K was now available. Scot negotiated early payment to NTF for most of the $6M grant monies so that staff could be hired and trained. With funds identified and secured, the next task was to answer the question, ‘WHAT is the model that is being replicated and HOW do we help others do it?’ Scot contacted Bob to help identify candidates for the replication director position. Over the next 12 months, two different individuals tried their hand at replication with two very different patterns of failure. After being in place for more than 18 months and having drawn down several millions in Gates monies, by **early 2001**, NTF was behind in their obligations to Gates with no replication model in place and no sites identified or in process. Relations between NTF and Gates were strained. Gates personnel were also not pleased with NTHS leadership and their decision to charge a fee to come and present at major national events. NTHS staff was unsure of NTF and its leadership. There was a measurable lack of trust between the two organizations and parents at the school were asking for clarification for how the Gates money was to be used.

**New Technology Foundation – 2001-2005**

In **July 2001**, Scot, Mark and Ted interviewed yet another Replication Director hopeful – **Susan Schilling**. Susan came from the software industry having successfully developed educational software and having launched a start-up group for the consumer education software industry for George Lucas.

At first glance, there was much that needed to be determined simultaneously. The first order of business was to gain agreement of what NTF was proposing to replicate.

* What was the model?
* How could it be captured in a way to share it?
* What materials were used in the projects? Were the projects free of copyright infringement?
* What role would Napa NTHS play in replication?
* How would a replication site be funded to assure adequate technology infrastructure and 1:1?
* Who would support the technology needs of each school?
* Who would train/support?
* Would each site be set up independent from all others?
* How could sharing across replication sites be accomplished?
* How could you convince other districts to take the money and try to implement something so expensive given its 1:1?

The first proposed statement of purpose melded a fairly broad definition with the beginnings of one that had more specificity. *The New Technology Foundation will replicate ten small, performance based, technology-infused 11th and 12th grade high schools in Northern California, utilizing the model successfully demonstrated in the Napa New Technology High School.*

Work synthesized by Ann McCormick under a grant from the National Diffusion Network, (used with permission, and oriented toward understanding what made for successful replication of over 300 federally funded programs), triggered this first set of explorations. (Attachment A) The road was laid out to better articulate all the aspects of the NTHS experience that in combination produced the different set of expectations and outcomes. As a school now entering its 5th year, the core foundational elements of the model were well established if not well articulated. It was now a matter of observing, finding and documenting so that others could follow.

A second major study was brought into the conversation and summarized. This was the **Apple Classroom of Tomorrow** research – a 10 year longitudinal study Apple maintained that spoke to the transformation that technology can bring to the classroom and how it impacts teachers in particular. Ten core lessons were brought forward as it relates to the role of technology and ten principles of effective professional development programs were also highlighted and discussed. (Attachment B)

The study of these two documents gave foundation to the work ahead.

**Finding the Willing -- First Replication Workshop; Second round invitations**

Scot sent out letters to districts across Northern California asking them to send teams to visit NTHS and to indicate their interest in replicating NTHS in their community. Interested districts were invited to an all day workshop where we discussed who NTF was, what NTHS was, what the replication package consisted of in terms of materials and support and what districts could anticipate receiving should they be successful in their application. 5 districts responded and sent teams to an all day workshop in August 2001. Each team was given 20 minutes per topic oriented around 4 major areas: Infrastructure, facilities, communication/fundraising and curriculum. Time was then given for them to meet as a team and prepare a presentation. NTF staff and board members then listened and rated them against a common selection rubric that was filled out by each NTF staff person participating. Districts that emerged as most interested in starting a NTHS in their district for SY 2002-2003 from this session were: Anderson, Davis and Petaluma. Cotati-Rohnert Park was interested, but had major political battles to fight to secure space at this point in the conversation. Internally, it was determined to start 2 sites for 2002-03 and work with others for 2003-04 start up.

In December 2001, a second round of letters were sent to Northern California communities. They were sent to not just the districts but also to the Chambers of Commerce and EDCs and county superintendents in hopes of sparking a similar wave of community interest as had caused Napa NTHS to form. Letters were sent out in December, with a mid-January deadline for indicating interest and a January all-day session for those districts interested. Applications were due in March 2002 with finalists identified by end of April 2002 for SY 2003-2004 start up. This translated to -at the most- a 6 month start up and planning window for the next cadre of sites. Further, with no relationship established within each community and no NTF personal available to travel and follow-up within each community, letters that went to regional EDCs or Chambers were summarily forwarded on to the district. This meant that when teams did come to visit or respond, they were comprised entirely of educators. There were no partners or businesses included in these early replication sites. Districts responded in traditional RFP style and they were not interested in education reform – they were only chasing money.

**Capturing the model**

To aid in capturing and sharing out the model, contracts were initiated with all NTHS staff whereby they were reimbursed for 2 weekly staff meetings per month. (Union agreements only required teachers to show up for 2 meetings per month.) NTHS needed to meet weekly to aid in establishing and maintaining the collaborative culture and the shared/distributed decision making model. Teachers were also paid for time they spent working with NTF on documenting the model. One of the pivotal sessions was a brainstorming held in September 2001 with **Mark Morrison (principal), Kelly Wheaton (counselor), Jetti Matzke, Mike Smith (team teachers in Political Studies) and Paul Curtis (shared resource between NTF and NTHS).** The topic was to brainstorm *‘What teachers need to know Day One.’* From the very beginning of replication, the focus was on classroom change and therefore centered nearly exclusively on teachers gaining competency with PBL and changing their instructional practice and expectations for student work and behavior. This discussion was captured and synthesized and provided concurrent direction for (1) the order in which to approach both the capturing/creating of materials and (2) the orientation of the professional development sessions.

Major categories identified included:

* Technology
* State standards
* PBL
* Teacher work environment
* History of the model
* Digital portfolio
* Cultural shifts
* Internship
* College relationship and scheduling
* School policies and procedures
* Student handbook
* Staffing and cost issues
* Additional duties of teachers
* Interface with district
* Communication structure
* Staff support and mentoring

The top 5 priorities were established as: PBL, developing Essential School-wide learning outcomes, Technology (Lotus templates, grading, MS office, web/html, peripherals), site based decision making and experiencing the model thru an immersion program of professional development – ‘start with the end in mind.’.

A list of materials that needed to be developed during this planning phase was created. It was agreed that everything could not be delivered at once to a new site without overwhelming the staff. Clearly, a knowledge-based approach to professional development would not work – especially since inquiry based methods were being taught as the basis for the instructional change. The professional development plan needed to find a way to deliver the materials in a ‘just-in-time’ manner that supported topics and practices that teachers needed to know and let them leave each training session with a feeling of success. NTF staff began to scope out what the initial training would need to look like to scaffold the orientation to the model and get them conversant with the tools and the templates. It was determined that “if you are going to sell fish, you need to yell fish” so all teacher training would also need to be project-based. This proved to be another foundational decision. Not only would the replication work:

(1) focus on classroom change and therefore

(2) empower teachers to orient and manage the environment in a totally different manner, but

(3) training would embed the very same teaching and learning practices that they would be employing. And scaffolding of the materials toward the successful outcome meant

(4) starting with the end in mind,

(5) having a clear articulation of common goals and school-wide expectations for what success looked like, and

(6) delivery of this experience would be driven by each individual person and his/her ‘need to know.’

(7) ‘Replication’ would be less prescriptive and more adaptive.

It was clear that a wealth of documentation needed to be produced. But first NTF staff needed to better understand the culture that had been created both for students and for teachers. Most educators who visited Napa New Tech would immediately be overwhelmed by the very adult student behaviors evident. They usually assumed there was a selection process that skimmed the best and brightest from those who applied and that the student body was therefore comprised of high performing students. The culture was so radically different from the traditional high school it actually helped produce competent young adults from the full spectrum of academic ability. It was hard to convince them otherwise. In order to better articulate how the culture impacted student behavior, it was clear that documenting and unpacking the culture needed to happen concurrent with unpacking the processes and procedures that reinforced the academic learning paradigm. Making the visible tangible became the goal.

Commissioned by the Bill & Melinda Gates Foundation, researchers from the American institute for Research and SRI International provided a framework in which to view effective schools. That framework became the base for a series of surveys conducted at NTHS in November 2001. The survey looked at (a) social organization – relationships – both personal and professional, individual and collective (b) academic organization – how the curriculum is divided or integrated, how much is offered and to whom and (c) normative climate – the norms, values and mores that characterize the environment of the school. The interplay of these 3 constructs in any environment makes for the whole since each impacts and relies on the others. (Attachment C) An informal survey using variations on the AIR questions gave structure to the attempt to de-construct the culture and be able to articulate it for others.

By November of 2001, the following had been accomplished:

* Funding secured for first set of replication sites
* An application process and selection process created
* 2-4 districts identified as interested in replication
* Categories for documentation established and prioritized
* Process for engaging and recognizing NTHS staff contributions to documenting the model in place
* Concurrent capturing of (a) the teaching and learning paradigm and (b) the culture of respect and responsibility initiated
* Decision made to use PBL as predominant method for professional development and to carefully scaffold the unpacking of the model

**Changing Organizational Roles while Assuring Continued Value**

The next challenge was to redefine organizational roles and relationships. NTHS was a public school, with teachers under district contract. NVUSD was a public school district. Neither had the mission of helping other schools from across the state form a New Tech. Neither was in a position to support the creation of a network of New Techs. November 2001 was a time for a concerted re-definition of NTF and its relationship with NTHS. An all day session was held with NTF staff (Ester Dungan, Scot Stewart, Jill Hayden, Dale Mead, Norton Perilla), NTHS staff (Mark Morrison, Paul Curtis), NTF board members (Buzz Butler, Ted Fujimoto) and co-facilitated by Susan Schilling and Jon Wagner, a professor from UC Davis. Scot suggested that the original mission was not being replaced but rather enlarged as NTF grows and understands more and more of what is required of us as an organization to do the work of replication. Jon supported the need for mission redefinition as the organization changes and spoke specifically of the challenges inherent in attempting to marry the public and private sectors to a common goal. He talked about shared interests, reciprocal interests and competing interests.

The driving issue for this discussion was the realization that with a 1:1 fully networked infrastructure as the foundational element of the NTHS model, a new set of support decisions needed to be made in order to create additional schools in California. NVUSD was providing a T-1 to NTHS. As NTF added 9 more schools and districts to the network, it was not feasible nor reasonable to assume NVUSD cared to support the communication let alone the infrastructure needs of a network of NTHS sites. Similarly, asking NTHS to act as the main source of technology infrastructure support did not seem to be in keeping it its primary purpose. The school wanted to maintain its innovative edge and status, but was not ready nor able to support the operational needs of a service center concept. Almost by default, this meant NTF needed to be the organizational structure that could support the operational needs of the NTHS Network.

Further, it was clear that over time the role of NTHS in supporting the NTHS Network would change. In this initial phase, curriculum and assessment materials, training, school management materials, school culture materials were all being collected and captured from NTHS, flowing thru NTF to the replication sites. Overtime, the new sites would also be contributing to the body of knowledge and NTHS would be receiving benefit from their expanded sets of curriculum, assessments and management processes. NTF would be the repository for these, much like the hub of a wheel. NTHS then became just one of those points on the hub, albeit ‘first among equals’ given their history and success in building the model. This transition in role needed to be clearly articulated so that reciprocal interests did not devolve into competing interests. NTHS staff, teachers, parents, students needed to understand the evolving nature of the work and the re-defined organizational roles – all the while not de-valuing the role and contributions of NTHS to the growing replication network. While the staff at Napa NTHS needed to help define and articulate the model, they could not be tasked with training and supporting teachers from other districts. NTF needed to become the source for training and professional support as well as technology support.

Much of **January 2002** was dedicated to exploring technology infrastructure options. To foster a collaborative NTHS Network where all work can be shared, it was not feasible for each replication site to be stand-alone and have to invest in the same technology infrastructure Napa NTHS had (7 servers and 2 domain controllers). To grow the network NTF needed to find a solution that could:

1. Reduce the discrepancy in cost of startup and maintenance of technology based schools compared to conventional schools. Only when the difference in cost is minimal will public revenues be justified to make technology-optimized programs a standard feature of public schools. Universal acceptance of this model, demonstrated by routine funding through public education budgets, defined our goal for education reform. Making best use of technology to accomplish this goal was deemed critical to the success of the NTF efforts.
2. Support the need for replication sites to share resources and collaborate creatively on an on-going basis. The NTF replication work was distilling and distributing Napa NTHS’s resources and experiences, but without a shared technology infrastructure, those schools would still be using the materials in relative isolation, limited to meetings, telephone calls, email and web site communication tools.

It was determined that we would use Lotus Notes to capture and store the materials being created, gathered, coerced from NTHS. The resulting work would reside in a series of replication databases that would be accessible on-line through the NTF websites and be password protected.

**Replication defined**

In **February 2002**, further definition was brought to what NTF meant by ‘replication.’ Five items were identified as ‘must have.’ These included: small school, project/problem-based learning, integrated subjects, use of technology and a culture of trust and responsibility. Additionally, a list of characteristics was generated. Any successful applicant must commit to meeting 80% of these characteristics. (Attachment D). Which 80% they chose gave them the ability to work within their organizational constraints and to ‘flavor’ the New Tech in a way that gave it community ownership. NTF had determined that rather than franchising a standard creation, the work would only be sustainable if it was owned by each local community. The ability to build from a common base, but name the school and orient its theme was thought to be key to local ownership and therefore sustainability of the school long after NTF had ridden off into the sunset. This was the first true attempt to articulate all the component parts that in concert make the music. These criteria were tightened each year as we gained experience and built a reputation where we could demand certain things from a district. This document eventually grew from 5 to 7 core principals and by 2005 had become a set of commitments that were all non-negotiable. (Attachment E) In hindsight, NTF stepped carefully into requiring too many things of a district before they signed up. Early on, we needed to sell a district not only on the model, but on the fact that the extra cost of develop a New Tech was warranted. And this was during the time when we were *giving* money as part of the process! As an example of how gingerly the process of defining commitments was approached, at this point, districts were not even required to commit to 1:1!

February also saw the addition of **Bob Pearlman** to the group - on retainer for 2 weeks a month - as the Director of Strategic Planning. His initial task was to help NTF prepare for a visit from **Kyle Miller, the Gates Program Officer**, and to help scope out a proposal to present to the **William and Flora Hewlett Foundation** after an initial meeting with Mike Smith. This was the point where NTF first began to think of the Lotus Notes templates and all accompanying materials as a **learning ‘system**.’ The Hewlett proposal focused on the further build out of this system – both from a supportable technology infrastructure perspective and looking toward national scalability of the learning system. It proposed a business plan with two approaches – a low-cost fee-for-service subscription model and a free-open courseware Internet service. The proposal was submitted in May 2002 and asked for $5M. Hewlett declined to participate.

By April, the first pass at documenting the model was 90% complete and the project archive had been designed. Projects were starting to be compiled by NTHS staff and added to this resource. Paul was working on a Curriculum Resource Library and designing the first teacher professional development event – shadowing in May for teachers from Anderson and Cotati-Rohnert Park – the first two sites ready to begin. The technology section, however, remained a mystery.

**First replication sites – SY 2002-2003**

By **May 2002**, three sites were ready to be considered 2002 start up sites: **Anderson New Tech, Cotati-Rohnert Park Tech High and Mare Island Technology Academy in Vallejo**. Adding three schools at once was deemed necessary since it was felt that NTF needed to make up for lost time with Gates Foundation and lack of progress since receipt of the grant in 2000. All 3 sites shared a desire to infuse technology into a PBL environment. Anderson was a true new school and planned to replicate Napa to a T. They opened as an 11-12th school only. Tech High had been in existence as a program but was being reconceived as a small high school by the district. It, too, was initially upper division only. MIT had also already been in operation in a series of church basements across Vallejo, focused on middle school. 2002 marked the year they were going to become a real school, move into the high school program and move to a common campus on raw land designated by the district. From the outset they were 9-12 at the high school level.

**SY 2003-2004 start ups** were also identified by this point: Sacramento New Tech, Marin School of Art and Technology - a charter school in Novato - and Davis were on the list for the following year. These 3 were all planning to be 9-12 schools and needed to be convinced that taking on the task of starting the school with 9th or 9th and 10th grade with no existing projects from Napa New Tech was something teachers could manage.

At this point in time, NTF had defined its work as falling broadly into 4 categories:

1. Selection (application, NTF assessment of application, announcement, letter of invitation and press release)
2. Planning and training (access to Replication Guidelines, providing a planning calendar, preparing contract, support for staff orientation, facilities upgrades, shadowing and training, student recruitment support, flexible technology plan)
3. Implementation (walk through check list prior to opening, support for first day of school start-up)
4. Ongoing Support and Refinements for 3 years.

**Getting a handle on technology – finally**

A new Director of Technology was hired in August 2002 – **Art Pufford** – a national expert on establishing Lotus systems that communicated across distance and shared common templates and data. Art immediately proposed a new network configuration. He also configured each site’s Lotus Domino server and oversaw the training and installation at each local site. He pre-loaded each with all the templates, tools and materials that had been developed/organized/captured in the prior 8 months. This included local versions of Filemaker Pro for the Gradebook, the Collaboration database, the Presentation database, learning logs and bulletin boards. All projects were stored in the Foundation folder as a permanent copy. The Project Library had short descriptions of each of the projects so that a teacher at a replication site could quickly scan the descriptions from the NTF website and find a project they might like to implement. Art developed a background agent running on the NTHS server that would allow a teacher to request a project and have it published to the requesting instructor’s server.

In order to protect the intellectual property, a decision was made to have a Replication Guidelines database that would house materials in support of application, planning and initial understanding of the model and the mission. These were materials that guided the application and selection process, but pre-dated a firm commitment either by the district or by NTF to proceed. A second database, School Management Resources, housed detailed processes, practices and documents that were not released to a site until the contract was signed. Both were password protected and available through the NTF website only. It became necessary to also create Word versions of all documents so they could individually be attached to emails when specific questions were asked and common response was needed.

**First collaborative NTHS Network events**

As part of the on-going support and training, it had been determined that principals also needed to be oriented to the model and supported as they learned how to lead differently and share decision making with staff. A series of sessions were established specific to their needs and called **Directors’ Dialogue**. The first Dialogue was held **September 2002** and attended by Cotati-Rohnert Park, MIT, Anderson and Napa. Jon Wagner from UC Davis was present as an observer. Paul Curtis, Susan Schilling and Jill Hayden represented NTF. The session began with the good news effecting 2 of our 3 new sites. Originally, California had passed a bill – AB620 - to fund 5 high schools across the state that would demonstrate new innovative approaches. Two of the New Tech sites – MIT and Anderson – had successfully applied for California AB620 monies and both were awarded $1,000,000. This was seen as real validation for the model and for the site selection.

The major content for this first session was for each site to update the others as to their successes and challenges. All gave verbal updates of their progress toward opening school on time. All had issues with technology. Tech High could not gain agreement with the college as to where the server room could be built. MIT was still working on getting their portables signed off so they could move from the fairgrounds. These two sites thought perhaps they could get technology and the Lotus servers operating 2nd semester. Anderson did much better, but ran into district issues in ordering software. It was very evident that NTF needed to better guide the timeline and the decisions made around technology for future sites. This meant engaging earlier and more deliberately with the district IT department. Purchases needed to be made earlier so that equipment could be received and configured in time. This meant NTF needed to have contracts and agreement signed earlier as well so that monies could be tapped. The Gates money could be used for equipment, but not for facilities, so these distinctions had to be made early on as well since most sites were not building new facilities, but renovating old ones.

**Learning from Experience**

NTF developed a defined set of Products and Services that made up the Replication Package for 2003. It included the Learning System as a product, as well as the Lotus database templates and the web-enabled Lotus documentation of the NTHS model. Services included a set of Start-up Services around facilities, staff and student recruitment as well as shadowing and summer training at Napa NTHS for staff. On-site staff support was determined to be necessary and capped at 5 days per site/year. Technology Planning was added as a major category of Service and included network, hardware and software planning, assistance with purchasing decisions, consultation on installation and deployment, Lotus Domino server configuration assistance and Lotus database installation support. At this point, the Project Library consisted of 38 11th and 12th grade projects gathered from Napa.

**Choice point – Intersection with Bill & Melinda Gates Foundation**

Discussions continued over the Fall about NTF’s future path. Having been turned down by New Schools Venture Fund and the Hewlett Foundation, the future seemed to hinge on making the Gates Foundation happy enough with the speed and success of replication work to continue funding NTF. NTF was invited to apply for a second round of replication funding. In the meantime, NTF continued to determine the necessity and timing of moving to either a charter management organization or a full-blown school development organization that operated on a fee-for-service basis. Internal sentiment ran high that if the New Tech model was to transform high school education, NTF had to stay in the public sector and NOT move to a CMO. This decision ran counter to the direction Bill & Melinda Gates Foundation was moving as they embraced more and more CMOs given their ability to be tighter models with tighter internal controls managed by the CMO rather than negotiated with a district.

At the annual Gates convening in **October 2002**, Susan and Bob were asked to share best practices with the 70 assembled fellow grantees, representing 30 organizations. The NTH Learning System was presented to those assembled with the intent of positioning it as a potential tool for many of the new schools that will be started under the Gates initiative and focused on PBL. Interest was shown by 3 of the groups – Alaska Quality Schools Coalition, Vicki Phillips – superintendent in Lancaster, PA and BayCES from Oakland.

**Migrating databases and setting up servers**

Organizationally, NTF purchased a new server and began migrating all foundation related materials and replication materials and databases from NTHS to NTF. A work-around had been orchestrated for Cotati-Rohnert Park in that their server was up and running albeit still located at Napa. MITs server was configured and in place, awaiting applications to be loaded and teachers to be trained. The NTF domain was up and running and connecting to all other domain servers in a hub-and-spoke topology.

**Keep collaborating**

The second Directors’ Dialogue was held in **December 2002** Bob Lenz - MSAT, Adam Littlefield - Tech High, Howard Mahoney - Sac New Tech, Mark Morrison - Napa NTHS, Louise Santiago - MIT and Brian Swagerty - Anderson New Tech participated. Paul, Jill, Susan and Jon Wagner were also in attendance. It was determined that the focus of Directors Dialogue was ‘forced reflection’ and constructive conversation around common topics and issues. It was a safe place to share everything with administrators who are putting similar schools in place and having similar issues to resolve. Participants left feeling supported and with a bagful of new ideas and tactics to use to move their school forward. The support received was timely and the content of the sessions was dictated by their needs. The directors found the sessions so useful, they endorsed establishing a similar series of collaborative sessions for teachers where they, too, would come together and share curriculum and classroom management challenges and successes. These eventually became known as Meeting of the Minds and drew like-subject teachers from the network together for common professional development events.

By the end of 2002, NTF had:

* Rebuilt its relationship and reputation with the Bill & Melinda Gates Foundation – successfully launched 3 replication sites, with 4 in planning
* Rebuilt its relationship with NVUSD and invited incoming superintendent John Glaser to join the NTF Board
* Identified the value of the NTH Learning System and had begun looking for funding to enhance and continue its growth.
* NTF organizational changes – new CEO – Susan Schilling, new CFO – Fred Patton, new Director of IT – Art Pufford and new position for Strategy and Funds Development – Bob Pearlman

**Reflect and refine**

During the first quarter of calendar 2003, NTF tracked with each new site and captured issues and concerns as a way to redefine both services and educate itself on changes to the application and selection process for the next round of replications. Two challenges were shared universally among all sites. In a time of recession, one key topic was not just teacher recruitment, but teacher retention. Many of those attracted to the model are newer to the education system and district. They often are hit by the ‘last in first out’ rule. Tech High lost all but one of their teachers to layoffs in SY 2002-2003. Lack of autonomy means some of the replacement teachers have to be picked from the existing pool rather than recruiting for the right set of attitudes and beliefs. The other ever-present topic was technology – remote network management services, investigations into cheaper 1:1 solutions (i.e. thin client), continued refinement of existing Lotus templates and tools (GradeBook and internship database) and addition of new features and templates (parent database, alumni database) . Art worked extensively to make web access of the Lotus tools available from the NTHS website so that parents and students could see the same view from home as at school.

**Internal reassessment of organizational purpose**

Looking forward, NTF prepared the 2nd Gates proposal to continue replication work. In assessing its internal posture toward replication work, it seemed clear that the lack of multiple streams of revenue and resources made a ‘loose’ replication philosophy the only option. In order to do a tight or hard federation, NTF would need to have more capacity and partners. It would need to articulate the parameters upfront and spend time in the community helping to establish the business partnerships that could carry the day. Clear benchmarks, clear commitments, clear upfront one-year-out plans, resources to build the correct facility and equip it, etc, would all need to be in place before NTF would agree to engage. This type of organization would be in a very different kind of business than the type of replication NTF was currently providing. Given that NTFs existence was totally based on the Gates source of funding, no internal or external entity was dictating its future. It could chose to declare victory and fold up shop after the end of the Gates monies or it could chose to try to become a different kind of organization. Unlike other non-profit organizations where the Board assures consistency and adherence to vision and mission, NTFs future was uncertain at best and totally in the hands of those working in the organization. It was clear that 2003 marked the end of one phase of growth for NTF and a future path needed to be articulated and vetted for organizational viability.

**Napa as flagship**

The long term commitment to Napa NTHS came in many forms. NTF provided a very basic service to the school by capturing and managing the influx of visitors. Conversely, NTF was generating many of those visitors so while it was managing the tours, it was also in many ways creating the need to manage the tours. It provided funds to NTHS from each Gates replication and agreements with the district established ownership and support levels. NTF used both Napa and Sac schools for the Executive Visits and found the combination outstanding. Seeing the first school and then seeing a school developed from the ground up gave interested communities a clear idea of what to expect. NTF needed Napa NTHS to continue to operate as a flagship school and demonstrate by its very existence that a small public school delivering innovative practices and consistent results could be sustained within the confines of a public school district with state funding.

In **August 2003**, NVUSD Superintendent Glaser convened a feasibility task force to study expanding Napa NTHS to a 9-12 high school. The study was orchestrated by Mark with direct input and guidance from Bob Pearlman. In November 2003, the NVUSD School Board unanimously adopted the plan to make the transition, to maintain the 1:1 computer to student ratio, to continue to operate as a New Tech, to cap enrollment at 400 students, to continue integrated, team taught, block schedule, and to locate at the current site in portables until such time as the bond measure passes and new facilities might be constructed. Student recruitment for the upcoming 9th grade was to begin immediately, with a 9, 11, 12 school in place for 2004-05 and a full 9-12 in operation by 2005-06. Maintaining the vibrancy of Napa New Tech as the first and most sustained school in the network was important to the work of NTF. It gave clear message to all concerned that a mid-level, moderately funded public school district could indeed sustain innovation with fairly consistent results over time.

**CA finances and grade level expansions**

**School Year 2003-04** also saw Anderson New Tech transition from an 11-12th grade school to a full 9-12. Financial pressures made it imperative to have student enrollment at or close to 400. In fact, Sac New Tech’s financial analysis concluded that 500 students were needed to create financial sustainability given current funding formulae. Tech High had fulltime 9th and 10th graders and was transitioning out the 11-12th graders that came for just part of the day.

All members of the CA NTHS Network attended the **September 2003** Directors’ Dialogue. Upgrades from IBM to Lotus Notes were discussed and agreement was reached from each Director to allow access control changes that would permit teachers from across the NTHS Network to access curriculum from their individual schools. By **December 2003**, there was a concerted effort to capture and refine any and all 9th grade PBL units since all schools (with the exception of Davis) would have 9th graders in SY 2004-05. A Lotus developer – Nicola Quinn – had been hired to upgrade all templates and make the tools more intuitive and user friendly. A common briefcase had been designed to facilitate the collection of PBL units teachers across the network were developing. Now a method needed to be created to allow sharing of that work. A stipend was offered to incent teachers to go the next step and publish their units to a common library that could be shared. All sites were urged to work thru the technology issues that remained in this school year so everyone could be on the same page when school opened in 2004.

In addition to the omnipresent topics of teacher retention/district policy and technology, schools struggled with (a) math instruction/results, (b) with lack of 9th grade PBL units and with (c) PE and sports in 2003. Districts routinely set and reset their firewalls which made access from NTF to the school servers sporadic and frustrating for one and all. District policy likewise was at issue with PE and sports. Many schools found they were unable to use the community college as a way for students to meet their PE requirement due to misuse of the option by some districts in the state. Some districts were able to get district approved multi-campus clearances so their kids could play sports. Others were not so lucky and had to initiate their own sports programs for students. While NTF could identify these policy issues, it had no staff, forum or venue to address them individually within each district or collectively at the state level for state-wide policy change.

By **January 2004**, NTF had:

* Secured a second round of Bill & Melinda Gates Foundation monies
* Gained agreement to expand Napa NTHS to 9-12
* Started Sac New Tech and MSAT bringing the total replication sites to 6
* Accepted Davis and Oakland for 2003-04
* Begun national cultivation
* Standardized a set of 12 tools that comprised the NTF Learning System™

The addition of Castlemont Business and Information Technology High School (CBIT) and Davis bought new challenges. They represented polar opposites of the public education spectrum and stretched NTFs ‘solution set.’ CBITs CA API score was 1 whereas Davis was at 10. The experience of supporting a low performing student population in a high poverty community and a high performing student population in a low poverty community reinforced the internal belief that it was impossible to suggest a one-size-fits-all solution to high school reform. Each site needed to have special solutions to meet their community and demographic challenges – all the while staying true to some foundational elements that made them unmistakably a New Tech. These two sites generated a nearly constant rethinking of the commitment criteria and who NTF would engage with as we began the national work.

With CBIT, NTF was following up on the interest generated within BayCES – a fellow Gates grantee in the Bay Area. BayCES was working specifically within Oakland and had targeted a number of ‘big bad’ high schools for full school conversion into 4 small high schools. Castlemont had been divided into small learning communities and now was ready to take the next step and become small autonomous high schools. Each school was to begin with a full complement of 9-12 students, and with existing staff reassigned based on interest. 60% of CBIT was African American; 38% Hispanic. Gang activity was omnipresent. CA API score was 1. It was hoped that the New Tech set of tools and techniques could jump start the school and that a doubling up on BayCES and NTF coaching support would be adequate to create the necessary support for staff during this transition. None of this proved to be true for CBIT and the school eventually dropped from the NTHS Network.

**First High School Conversion Site**

In working with CBIT, NTF learned that it was not possible to establish the right student or staff culture when taking over an existing staff and student body, and starting with all 4 grade levels at once. A separate set of ‘conversion commitments’ seemed necessary if NTF was to engage in conversion work, since it was clear that nationally much of the work would be located in existing facilities with districts that were attempting to convert rather than start new schools. These criteria were developed with conscious emphasis on de-culturizing the school. Since the size of rooms, the ability to team teach, have 1:1 adequately installed and enough physical autonomy all needed to be accommodated in a conversion, more time would likely be needed to negotiate the needed changes. Nationally, investments in new facilities were rare. The largest public school districts had an existing inventory of facilities and the most that could be hoped for would be modest capital improvements rather than commitments to fund new buildings. Facilities would be a major challenge in the national work, and starting a new school within an existing facility had to be limited to 9-10th or just 9th in order to establish the culture.

**Meeting articulated needs**

During SY 2003-04, NTF attempted to meet what Directors perceived as common challenges that could perhaps have common solutions.

* NTF commissioned a person to help schools create ‘minute movies’ that captured the environment and created buzz within the community.
* NTF paid a consultant to capture the advisory curriculum being offered at MIT so it could be shared across the NTHS Network. NTF also engaged the consultant working with MSAT to capture that material.
* A study was commissioned that researched best options for virtual high school courses that could be added as electives for those schools struggling to get community college agreements in place.
* Common agreements were also negotiated with vendors on behalf of the NTHS Network for special pricing. This included Academic Systems and continued references to technology providers for server support.
* NTF captured areas of interest for potential NTHS Network projects. These included:
  + student exchange,
  + teacher exchange and
  + a common student leadership conference.

Summer training in this time period focused on (a) new sites and (b) new teachers at existing sites, and the ever-present (c) new teachers from any site hired late in the summer. A special summer training was also held for all math teachers across the NTHS Network at Napa and directed by Megan Pacheco.

Refinements to the prior year’s training schedule and approach were implemented for this Summer training (completed by **August 2004**) These included:

1. Using teacher coaches from existing sites to support new teacher training
2. Including a tech support person in teacher training
3. Including the Buck PBL handbook
4. Having School Management Resources available
5. Having teacher laptops available and configured prior to training
6. Using installation packets to configure the servers and install Notes was time effective

At the end of the 2004 summer training, further reflection suggested the following additions for the 2005 summer training.

1. Make the Directors participate in training as well (rename it from teacher training to something more inclusive)
2. Document the NTHS Learning System tools
3. Get district IT sign off on the Strategic Alliance Agreement
4. Expand School Management Resources to include sections on remote access, firewall, client info for student and staff
5. Enforce requirements for server and laptop purchases prior to training
6. Formalize the NTF Mentor program to assist not just in summer trainings but be an on-site go-to person for NTF
7. Test and make sure the district firewall is open prior to remote site training
8. Consider Lotus admin training early in the summer with teacher ‘mop up’ training in August
9. Stick to our commitment criteria. NO MORE 1 month start ups!

**National Expansion**

Expansion into national work began with an emphasis placed on West coast so relatively consistent time zones could be maintained for phone and email support purposes. As NTF attempted to go into new states, a concerted effort was made to find regional partners through the Gates connections. Oregon had a thriving small school project, directed by the Oregon Small Schools Initiative. Much of their work was oriented to conversion work and paramount in that work was a restructuring of some of the worst Portland schools. One school in particular was failing AYP goals established by No Child Left Behind and was being fast-tracked to split into 3 small high schools. Through OSSI and Oregon Public Schools, NTF was approached/pressured to help start BizTech on the Marshall campus. This was NTF’s second ‘conversion’ school and the issues present were remarkably similar to those faced at CBIT. Contrary to our best thinking, NTF agreed to help make the transformation at Marshall and took on BizTech as a replication site.

Highland High Tech in Anchorage, Alaska, was the second non-California school with which NTF engaged. Gates seemed to be active in the state. NTF hoped that and attempting a school there would be seen as ‘being a good partner’ to the work. Highland was second site NTF engaged with that was an independent charter, MSAT being the first. And both highland and MSAT chose to orient their technology to Apple rather than PCs. This proved to be a bigger challenge than anticipated in that the Lotus tools worked nearly exclusively in the PC operating environment.

Prior to this **2004-05** set of schools, NTF had sent coaches on-site for the intensive 5 day training, with an August ‘mop-up’ in Napa to train late hires. Now it became evident a different approach needed to be adopted given the limited number of weeks available in summer. In 2002-03, Paul and Art handled all the training. In October 2003, Nicola Quinn was added to assist Art in training Lotus administrators as well as helping Paul with Lotus development. Two students were hired for summers to help configure the Lotus domino servers and get them ready for training. By 2004-05, additional coaching support was needed and on-site start-up training was no longer a viable option to consider. **Megan Pacheco** – the math teacher at Napa New Tech – and David **Ross**, also a former Napa NTHS teacher – helped on contract.

**Check your assumptions at the door**

By SY 2004-05, two early assumptions had proven false and both impacted the cost of delivery.

1. NTF had assumed that once a school entered its 3rd year, it would have internalized the model and existing school staff would rise to the occasion to take over training and support. This did not occur with the first replication sites. Having started with 9th or 9th and 10th grades, they were not fully formed by the end of the 3rd year of the replication contract. New grades and new teachers were being added. While leadership had remained fairly stable with the early sites, teacher turnover was an issue. Further, the ability to find and train on-site Lotus Admin support from a district’s pool of tech admin talent was proving to be impossible. The quality of worker at that level was low and good ones were snapped up by other organizations.
2. The second assumption that proven naïve was that NTF could engage with a district 3-6 months prior to start-up and be ready to open school with all parts in place. This was not true and staff began spending a greater proportion of its time working with districts prior to contract and between the cultivation and application phases of work to make sure they understood what ‘ready to open’ meant. This was time that was not billable, but deemed necessary in order to successfully prepare a site to open. The more specific NTF was with what was required when, and the more pressure that could be brought to bear within a community to keep the ball moving, the better the outcome.

Time was now also being spent traveling to different states to cultivate potential interest. The cultivation strategy was driven purely by ‘low hanging fruit’ which meant engaging with those that had greatest interest, had spent time doing their homework and had identified the New Tech model as one of high interest to them. NTF staff was invited to come to these communities to make presentations and groups from these communities made visits to Napa and Sac to see firsthand what a fully formed New Tech school looked and felt like. By end of 2004, staff was engaged in Alaska, Oregon, LAUSD, Colorado, North Carolina and Louisiana. To make operational efficiencies work with the limited staff NTF had required a change in practice. NTF could no longer afford to go into a geography where only one New Tech would be formed. There needed to be clusters of New Techs, hopefully within proximity of each other so there would be efficiencies as NTF scaled.

**Formal Business Plan Development – Bridgespan**

During summer **2004**, Gates invited NTF to engage with **Bridgespan** to develop a long term business plan that would guide future work. Bridgespan staff probed deeply into NTF processes and practices. They expressed concern over many aspects of the work. Chief among them were: (a) engaging in two different businesses -- school development and software development concurrently, (b) determining next sites thru an opportunistic rather than strategic marketing approach, (c) determining partnerships within states based on prior professional contact rather than strategic selection process (d) not segmenting opportunities based on governance structures, i.e. working charter schools as well as public schools.

The final plan was completed in November 2004 and presented to program officers at Bill & Melinda Gates Foundation. The plan envisioned growth from 11 sites to 38 (35 net) over a five-year period to 2009 and identified a $9.8M funding gap to meet that goal – including a deficit starting the end of the 2006-07 school year. It was clear at the end of the engagement that Gates was helping its past recipients plan a future for themselves and that future would not contain a 3rd round of replication funding. Gates was once again shifting its strategy. This did not, however, cause undue alarm within NTF since it had been determined that districts were actually more inclined to follow NTF guidelines and commitment criteria if they had more ‘skin in the game.’ Moving to a fee-for-service structure for school development was actually seen by NTF as a better solution. It was receiving much better support from the districts with which it engaged and the resulting schools were starting much stronger with more of the necessary infrastructure in place. Rather than getting money directly from Gates and making grants to districts to create a New Tech, the marketing and sales approach shifted to targeting districts and states that were getting Gates money and ‘selling’ them on a New Tech school, for which they could use their Gates money.

The Bridgespan experience benefitted NTF in multiple ways. It required the organization to rethink and recalibrate its processes and to document more completely its expectations and assumptions. The summer and fall of 2004 saw a huge production of rubrics and documentation for all phases of the work. The plan also clearly pointed out the challenge ahead in terms of bringing in fee-for-service work in order to survive as an organization. The challenge was clear.

**An Alternative Business Model for 2005-09**

In **November 2005**, the NTF Board approved the ‘NTF Sustainability Model 2005-2009’ which was based on the same expansion to 38 sites but envisioned 14 of those sites being fee-for-service replications. This model shoed a positive balance through the end of the 2008-09 school year and a $2M deficit at the end of 2009-2010. Adding an addition al 6 fee-for-service contracts over the five year period would make NTF sustainable.

**Building Capacity to do the work**

**Coaching**

In **March 2005**, it was announced that **Megan Pacheco** and **Tim Presiado** – both existing New Tech teachers par excellence - would be joining NTF. Further, summer training was now going to be held in Napa for all sites – all teachers - new and existing-, Directors and support staff. In SY 2005-06, 15 schools were part of the NTHS Network. They included sites in CA, OR, Alaska, LA, CO, and IL. Directors were very focused on teacher recruitment, retention and evaluation. Teachers were submitting projects to the library with over 73 projects available for sharing. By the end of the school year, most schools were experiencing success with students and with the student culture being firmly entrenched. Where to find the right teachers and how to recruit them to the school was a continuing topic of discussion among Directors.

**Technology**

With Kevin Owens help, Art had perfected remote server configuration in the prior year, but had reached a personal maximum with getting 15 servers ready and updated by the time training needed to occur. Relations with district IT staff still caused nearly half of the connectivity issues experienced. Getting fully onto the internet was becoming more and more evident. The NTF tech department had determined that a full migration of the tools to web delivery was necessary to help reduce support costs and to make the tools more accessible for national distribution. This was proposed as a multi-year development plan that would depend on raising external monies. In addition to providing anytime/anywhere access to the tools for teachers, staff, students and parents, web delivery would eliminate the district pass-through which had been such a deterrent. It would reduce the number of servers that sites need to purchase and reduce the hardware costs for student computers since options such as thin clients will be able to be utilized. Mac and PC were also equally supported in the web environment. Further, the move would reduce the amount of on-site support required and would reduce the cost of both training and staffing a Lotus Notes network administrator at each site. A preliminary cost estimate suggested a reduction from an average of $600/student/year for a 400 student high school to $180/student/year.

**From single sites to clusters of New Techs**

By the end of calendar 2005, NTF had determined a cluster strategy was more operationally and strategically efficient. Prior strategy had been to establish a flagship within a geography that would then cause other districts to want to create a New Tech. The new strategy focused on getting multiple sites to start at the same time and support each other. Cluster development was going on in North Carolina, Texas and Los Angeles. Funding had been secured from Gates to plan the migration of the tools and work had begun on web-enabling the toolset. Napa NTHS had been successfully planned and expanded to a full 9-12 school. 14 sites were part of the NTHS Network and 100 projects had been submitted to the common library.

Going into SY 2006-07 required a rethinking of training options once again. With upwards of 6 schools opening concurrently in North Carolina, having multiple weeklong training events would be necessary. The new business plan called for the start-up of up to 14 new sites in 2006 – 6 of which would be Gates funded and 7 fee-for-service replications. Target states were North Carolina, LAUSD, Texas and Oregon. Cultivation work was also beginning in Indiana. Going national on such a large scale required better long term evaluative results. NTF internally funded an alumni study of Napa NTHS. Internally, this was called the ‘hump’ year with the idea that capacity would be in place to handle up to 14 new starts and that would propel NTF to organizational sustainability. The downturn in the economy and the internal investment necessary in the NTH Learning System proved this assumption to be false.

Additional resource was added to NTF in the person of **Mark Morrison** who had resigned as Director at Napa New Tech and to support leadership development at NTF. **Sharon Oldham** joined in May 2006 to take on the task of Replication Director. **Lee Fleming**, a Sac New Tech teacher, joined NTF as the next coach in June 2006. New partners in the form of **North Carolina New Schools Project, the Texas High School Project** and the Louisiana **School to Career** brought hopes of a viable cluster strategy in those states.

In 2006 monies were secured from the Gates Foundation and the **Ruth Epstein Schuler Foundation** to continue moving from Lotus Notes to a more scalable web-hosted solution and an external developer was identified to assist with the specification and design of the system. Support to Napa NTHS and NVUSD also ramped up this year with the need to assist in the hiring of a new Director for Napa New Tech and with support for NVUSD as it prepared to have a bond measure pass that included monies to expand and update the facilities in Napa.

**Recalibrating coaching and support**

2006 was indeed the make or break year for NTF. In **February 2006**, staff met to re-assess replication, status of the sites, reflect on what was working and what needed change. This session was facilitated by **Al Rogers**. Staff determined the core differences between sites that were being successful and those that were struggling. The key factors were:

**Vision**: Sites that struggle haven’t created a common vision for their school and therefore waver with the vagrancies of time, money, support. Having a vision statement that the Director keeps holding up allows for major decisions to be assessed on whether they move the school in the desired direction or not. Staff decided it needs to put increased emphasis in the planning and start up work on the creation of school wide essential learning outcome and the school vision. This move will require schools to develop a culture of inquiry where they reflect on their choices and talk through both the intended and the unintended consequences of a decision and whether it supports the new model or allows them to drift back into traditional ways of behaving.

**Vision as articulated in classroom teaching and learning**: Schools that are being successful ‘got it.’ They understood that project based learning is the best way to engage kids and cause there to be an internally motivated reason to engage and to learn. AND in order to do full-on PBL everywhere, the 1:1 environment with the common tools is core. It is the 1:1 that allows PBL to be done everywhere all the time. Schools that are at 1:1 and using the tools are more successful than those that never made that investment. Staff determined that 1:1 is a non-negotiable going forward.

**How a site starts dictates how they mature**: It was recognized that sites that planned well and allowed for adequate time to create a plan, get buy-in to the plan and time for the mindsets to start to shift started strong. Adequate time needed to be allocated to helping all sites start strong. This is all investment pre-contract and uncompensated in the current model. It was agreed we would move up the date by which districts needed to sign the agreement and monies dedicated to planning would be recovered in the first payment. It was further decided that the commitment criteria need to be more binary – YES or NO. And if NO, then NO GO.

**Calibrating coaches to an inquiry based approach to professional development**: NTF now had the end goals articulated and the materials developed to support the development of those goals. The challenge now was to learn how to ‘drop breadcrumbs’ so that staff asked for what they needed when they needed it. It was agreed that the NTF training approach needed to be even more inquiry based. Coaches needed to resist the need to impose our model at a knowledge level. The goal was to get school staff to dialogue and ask the right question at the right time in order to for them to own the vision and the change. Processes and practices needed to be developed to orient coaching behavior in these early planning/expectation/vision setting meetings with new sites. Early on, a balance needed to be established for when we dictate to them (commitment criteria) and when we lead them to commitments. The coaching challenge was defined as helping them engage around the right topics and decisions at the right time so they can pre-think their options and avoid pitfalls based on our collective experience. NTF redefined the coaches role as being more than just a PBL coach with expertise in the NTH Learning System tools. Coaches needed to have a broader focus which could include engagement with Directors as well as teachers.

The work was reorganized with clear levels of engagement for coaches vs. Mark in his role as leadership development and Sharon with her role as Replication Director. Coaches were urged to ‘bump’ issues up rather than try to be all things to all staff. Coaches were adamant that they needed to continue to be seen as the internal advocate and go-to person rather than the outsider that comes in and reports progress up the chain of command or evaluates who ‘gets it’ and who does not. Bob and Susan’s role also needed to be rethought for the early on discussions where non-negotiables were made clear.

**Expanding Services**

By August 2006, the question of how to staff up to support the national growth was top of mind. Cultivation work in Indiana had brought the challenge of how to do early–on training for sites that were more than 1 year out and were high capacity. A critical path timeline was now routinely sent out to support the need for district commitment up to 12 months in advance. (Attachment F) Analyzing how much time was spent in support and how much support was affordable was an on-going concern. Expanded areas of critical importance had been articulated.

* The engagement with LAUSD had caused a re-casting of the products and services with more specificity as to number of days and schedule of support for the 4 schools starting there.
* The need to support a planning set of activities prior to contract signing and prior to receiveing funding identified.
* Coaches felt it was time to focus more on the Directors and a Principals’ Residency was created for the upcoming IN sties.
* Pre-training sessions were also delivered in IN focused on curriculum mapping, developing of school vision and learning outcomes.
* The number of days committed to a site had morphed from 8 in 2005 to 14 in 2006 for the expanded package of pre-training, shadowing and summer training.

**Technology Migration**

At the end of **SY2006-07**, NTF believed the school development market was strong and would grow over the next 3-4 years. As it worked to get the tools web-enabled, it was less sure of the future of the tools themselves – all the while clearly understanding the critical role that a common set of technology tools represented in being able to develop and sustain the model. It was taking longer and costing more to do the work than anticipated. Additional funds were not forthcoming even as recognition was growing that a market was emerging for tools that supported alternative ways of teaching and learning. NTF had learned that beta test sites did not accurately predict user load or use patterns. Field trials could only happen annually, and use patterns needed to be explored with various configurations in order to determine if the current set of features being converted was sufficient. In addition to being core to the New Tech model, the tools business could perhaps have intersection with the emerging 1:1 movement, with PBL practices and with 21st Century skills, but getting there was proving to be more than a challenge. Originally, when choosing Lotus as the platform, NTF only had to manipulate templates which were overlays to the main base of code. No corollary existed yet on the web that would allow only that level of investment so NTF was forced to take on the task of trying to translate its toolset functionality and major design elements of the Lotus collaborative environment in order to be able to grow and support a national network.

**Increased Costs – Increased Demand for Services**

As NTF sought out additional expertise and service from IBM, it triggered a re-analysis on their part of their relationship with NTF. Having successfully ridden below the radar for years, this re-assessment came at a particularly bad time for NTF. It resulted in IBM removing NTF from the Scholars program whereby NTF had received free Lotus licenses for all users in the network. Even though NTF was remaining a non-profit, because it was no longer receiving funding to do its work but was becoming a fee-for-service organization, different IBM pricing rules were now applied to its work. This re-assessment resulted in IBM presenting a software and hardware license agreement that would bankrupt NTF. **Marykay Michaels** successfully negotiated a multi-year pay off of the software license fees and an overall 80% reducing in the original cost estimate but these unanticipated fees were making the cost of doing business an impediment to staying afloat.

At year’s end, NTF had successfully started an additional 12 schools – half of which were fee-for-service. The challenges for calendar 2007 included doubling the number of high capacity fee-for-service sites, continue to secure financing complete the web portal and move from clusters to hubs in those geographies where suitable partners were in place.

**Going Forward – New Structures**

By **SY 2007-08**, NTF had determined not just a set of non-negotiables but also that some of them were pre-requisite to being able to coach effectively for the instructional change. PBL was core and central to the model, but the model gained its overall effectiveness from the integration of 21st century skills, authentic assessment, school cultural shift, group norms around trust and responsibility, and changed relationship among students and between adults and students. To accommodate all of this, structural changes in ‘school’ needed to be in place and supported by the district. It was deemed necessary for the school to be autonomous, have correct facilities design, have instilled a professional culture, embrace 21st century skills as necessary, have 1:1 student-computer ratio and allow for the different use of time. Those structural supports were considered necessary in order to have success in changing the teaching and learning environment.

The training program that was in place for 2007 new starts was not just expanded in scope but also required certain deliverables. Over time, NTF staff had seen schools struggle with determining how to cover state standards using PBL strategies. Weak leaders were often unable or unwilling to mandate team teaching and often were railroaded by stronger personalities within their schools. NTF now required schools not just to prepare and present a master plan for their school (and present it to their school board) but also required curriculum mapping and identification of integrated subjects early on in the start up process. This resulted in identifying a master schedule early in the life of the school, with an articulation of how the school would grow over time and how they could assure parents that their students would be ready for college. The plan could and would change over the course of the 3 year engagement, but it represented a common starting point and a way to communicate with the community that showed the power of forward thinking and planned action.

By the end of 2007, the bond measure for Napa had passed and architects were engaged to begin planning the re-creation of the Napa NTHS campus. NVUSD had launched its Student Centered 21st Century Initiative into the 2 traditional high schools. The NTHS Network added 11 new schools and a pipeline of interest was building for 2008 and beyond. Flagship schools were identified within the NTHS Network to aid in spreading the word about the model. The web portal development continued to drain resources as external monies became unavailable and the internal safety net was sacrificed to the hoped for completion of the work. In the search for new partners, KnowledgeWorks Foundation rose to the fore and began its support for the New Tech model.

FY 2008-2009 began the hard work of determining a viable future for the enterprise and for the innovation. With support from KnowlegeWorks, the number of sites in the NTHS Network continued to grow. By the end of this period of time NTF was operating in 9 states in 39 high schools. More than 7800 students were being impacted. New Tech changed its name in mid 2009 to New Tech Network and announced it was becoming a subsidiary of KnowledgeWorks Foundation to continue the work and expand its impact in a time of great opportunity brought about by the stimulus monies and the Race to the Top funds. Ten additional schools joined the New Tech Network in SY 2009-2010 and the pipeline of schools ready to start in 2010 grew to over 30. The challenge of being recognized as a viable option had been achieved and now scaling with proper resources was possible. Significant development of the common set of tools continued with an open source focus, all positioned to help decrease costs while increasing effectiveness and student outcomes as measured by both academic measures and authentic assessments that targeted the acquisition of 21st century skills and capabilities for all students.

**Conclusion**

In 2003, education researchers Anthony Carnavale and Donna Desrochers published a study that mapped the economic reasons for education reform. (Carnavale, A. and Desrochers D. (2003). “Standards for What? The Economic Roots for Education Reform” Education Testing Service, Princeton, NJ.) They argued that the American education system is antiquated, obsolete and inadequate in preparing our youth for the demands of the 21st century. The New Tech model was founded expressly to address those issues and the New Tech Network is an example of successful replication of those core foundational principles and practices.

Every region of the country faces different community and demographic dynamics that require specific solutions. NTF’s goal from the very beginning was to build proof points across the country in all geographies and with all demographics. Where other organizations created excellent individual lighthouse charter schools, NTF chose to work within public school districts and transform teaching and learning in full view of the public. The New Tech model has been successfully implemented in urban, suburban and rural communities. It has been successfully implemented with 99% African American and/or Hispanic populations in low socio-economic urban communities; it works in 99% Caucasian high-income communities; it has been adopted by small rural communities that have transformed their one and only high school to a new Tech. The core principles of the model remain unchanged but the specific articulation of those principles take on the local community character and flavor.

The success of New Technology Foundation in school development stems directly from the fact it began with a working model in place. Napa New Tech began as a small school with the big idea of changing the way teaching and learning happens in America. The ‘bones’ of the model were strong and have endured. They include: small school size, curriculum designed around collaboration and project-based learning, integration of technology with a 1:1 student to networked computer ratio, rich and deep and lastly intersection with the local business community, intentional blurring of the lines between high school and what comes next – college and career, with clearly articulated program components to cause students to be out in the community experiencing both.

Having a working model made it possible for communities to come and see it in action. Rather than reading and agreeing to a long list of design principles, the New Tech model was up and running for all to see. Interested communities were invited to come and visit and see for themselves that project-based learning in a 1:1 environment is transformative for both teachers and students.

Assuring that interested parties came to see a New Tech as a community was critical to building support and creating the necessary move-forward pressure points on the educators. If a community was interested, they were given a list of who needed to be on the Executive visit which included local business leaders, local government, local press, higher education and non-profit members of the community in addition to district and school personnel. Building a set of local advocates who got the vision, who sincerely believed that the traditional model is broken and needs to be replaced and who would hold the planning group accountable was key to establishing a culture for success.

NTF gave communities the opportunity to convince themselves that the model was worth copying. NTF let them observe the model directly and put processes in place that helped them copy the original as closely as possible. NTF urged them not to adapt the model until they were achieving acceptable results by copying the original and asked them to keep the template in mind, even as they adapted.

The recipe for success required huge amounts of articulation. All aspects of the school, the culture, the changed instructional practice, the building of staff culture and training support needed to be clear and unambiguous – and continuously refined based on new experiences and new communities. The focus remained at the classroom level. The driving question was always, “What are the desired student outcomes and what needs to be in place to achieve those outcomes?”

The NTF Commitment criteria evolved over the 8 years so that all stakeholders knew precisely what was going to be required of them. A clear articulation of what would happen prior to opening and what could be expected in years 1, 2 and 3 was necessary. Everything had to be changed at once. This was not piecemeal reform. The commitment and capacity needed to be present to deal with all of these interdependent and interconnected change pieces simultaneously, and a plan needed to be built that showed how the community would grow into a New Tech over a 4-year period. While everything had to happen at once, we urged schools to start small and stay focused on getting 9th grade or 9th and 10th established first, growing a class a year at a time until the culture was established, the teacher teams had gained some confidence and they were a full 4 year high school.

The recipe for each site was basically the same. The changed environment was the result of 100 small decisions made daily with solutions to challenges processed through a different lens. Everything emanated from an aligned vision of what the desired final outcome was. Systemic change was key. Each site was led through a process that allowed them to decide what they could change, establish a clear vision and purpose for achieving the change, creating the necessary supports, firewalls and autonomies to allow the change to occur, institute multiple levers of change so that returning to the old ways was problematic for one and all, support the change with all the resources, coaching and connections to others doing the same work.

And finally, after all this time, a word about technology. From the very beginning, the NTHS model had PBL as the core focus of the changed environment. It was PBL that had the power to bring relevance to the work. It was technology that brought a way to support the change. NTF recognized that properly positioned, technology was perhaps the most powerful lever for change in this environment. It supported teachers as they transitioned to a more student centered learning environment. It supported students as they used the tools of today to prepare for tomorrow. Without the web, teachers and students find it nearly impossible to acquire timely resources necessary for PBL. Web access means having adequate bandwidth and 1:1. It also means simple answers to simple questions are no longer the focus of instruction or assessment. Having web access means learning how to access and assess the veracity of information. Technology can provide the framework for teachers to work by providing the common means to store and share their projects, their struggles, their communications. Just like the textbook created a framework for traditional assignments and activities, the right kind of technology can provide a new framework that pushes teachers into the kind of teacher we want to see and students into the kind of lifelong learners they need to be. Making that technology common, simple and reliable was accomplished early on by using established collaborative tools from the business world. As the world of technology continued to innovate and evolve, the technology tools to support the New Tch model had to change as well. They could not remain static.

Key to the success of the New Tech Network was the emphasis placed on supporting every teacher as they learned new skills and changed their practice. NTF mirrored well the 3 key essentials to improving learning and performance detailed by Richard Elmore in his book *School Reform from the Inside Out*.

* Increase the knowledge and skills of teachers
* Change the content of what is taught to students
* Change the relationship of the student to teachers and to content.

NTF started its work at the classroom level where students and teachers live their lives. It learned over time that for the classroom change to be supported, NTF needed to create a full school. In order for the school to survive, districts needed to understand how they had to change. Districts then needed state reform and policy change and States needed federal support. The NTF bottom-up approach to changed teaching and learning meant that the students were the first ones to benefit and in the long run - at the end of the day - the only ones who really matter.