

Information

Report to the Field

Getting Beyond Information Technology Basics:

Technology Management to Build Capacity
and Create Sustainability

Prepared for the Community Clinics Initiative

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Resources

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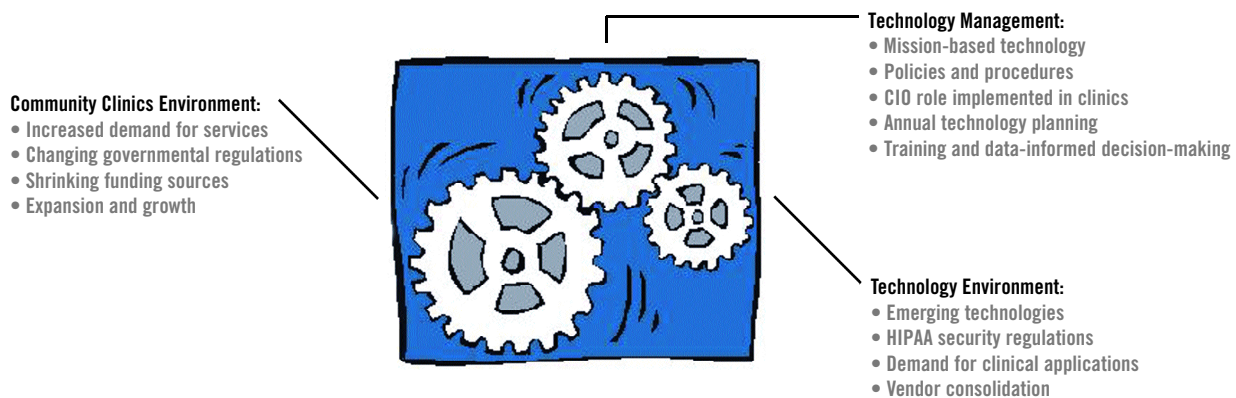
Introduction

It wasn't long ago that computer systems in California community clinics and health centers (CCHCs) were used primarily to replace the typewriter, the old dog-eared appointment book, and the 3-by-5 index cards with patient addresses. Now many clinics operate sophisticated and complex enterprise software solutions, extensive local and wide-area networks, and business-class technology infrastructures. What's more, the systems in place now extend to all aspects of an organization, tied to the tasks that keep the clinics running and, increasingly, improving health outcomes.

The addition of new systems and the ever-changing technology landscape makes technology management a challenge. Clinics find themselves facing a range of ongoing technology issues—from making their system work as vendors promised, to getting the reports necessary for better operations and enabling clinicians to improve the delivery of health care. Some clinics face decisions about whether to keep an existing system, upgrade to their vendor's new system, or select a new vendor and system altogether. Others are living from crisis to crisis, hanging on to outdated systems that no longer adequately support clinic processes.

While the technology has changed, the way in which many CCHCs manage technology has not. Improved technology management is sorely needed to address new issues brought about by the increasing use of, and dependence on, technology. Effective technology management is strategic, proactive, systematic, and thorough and requires the integration of technology and clinic operations. Notably, effective management should not be limited only to clinics of a certain type, budget, or size.

Fig. 1. Technology Management Keeps Two Dynamic Environments in Sync



Del Dawson, deputy director of the Health Disparities Collaborative for the California Primary Care Association, makes the case that because current technology systems are tightly integrated and integral to the organization's well-being, they must be managed at the highest level of the organization. Dawson describes the traditional "three-legged stool" model—with the executive director, the chief financial officer, and the medical director—as too unstable in the current operations landscape. He contends that a fourth leg is required to account for management of information systems and technology.

Community Clinics Initiative (CCI) has commissioned its second study of information technology and community clinics in an ongoing effort to educate the field about how to strengthen the California community health care system through technology. CCI believes that the integration of technology and health care delivery is essential for clinics to become powerful partners in building healthier communities and to meet the current and future economic challenges. CCI will continue to serve as a vital information source by providing examples of best practices.

This report to the field analyzed California community clinics' and health centers' experiences in developing effective technology management and leadership. We identify the characteristics of organizations that have made progress in building technology capacity and maturity, and highlight some of the most effective interventions that increase technology leadership and management effectiveness. Our goal is to provide insight, strategies, and tools that will help your organization use technology to fulfill its mission more effectively.

Sources and Notes

The information presented in this document is drawn largely from the experience and research of Tom Dawson and SA Kushinka, senior program managers in CompuMentor's Healthcare Technology Practice.¹ The findings were developed as a result of direct consulting with clients and through interviews with purposefully selected health care organizations, technology professionals, and clinicians working with the under-served throughout California. Interviews were conducted from June through November 2003.

The authors would like to acknowledge Peg Spak, president of Margaret Spak Associates, for her contributions to the tools found in Appendices A and B.

1. CompuMentor (www.compumentor.org) is one of the country's oldest and largest technology-assistance organizations serving the nonprofit community. Founded in 1987, CompuMentor offers a wide range of programs and services that helps nonprofits and schools use technology to achieve their missions.

Characteristics of Effective Technology Management in Community Clinics and Health Centers

We have seen many ways that community clinics and health centers struggle with technology, and the multitude of problems and challenges they face. Although there are many shared “pain points,” clinics also tend to succeed in similar ways. The organizations that have been successful in managing technology to serve their mission exhibit common characteristics that merit closer examination. While common attributes of success may exist, organizations often achieve their goals in different ways appropriate to their size, culture, and budget.

Many of the common pain points are caused by external circumstances such as a vendor going out of business or new federal or state regulations that impose constraints on using, financing, or adopting technology. It is important to note that while health care organizations are often subject to constraints out of their control, they *can* control how they react to these challenges. Clinics with well-managed technology and information systems are able to react to external changes more quickly, without consuming or diverting their resources from projects that are intended to increase their organizations’ ability to use technology. These clinics tend to spend less time putting out fires and are able to be more deliberate in their day-to-day use of technology.

Unfortunately, clinics that are reactive in their approach to technology management seek quick workarounds to problems rather than sustainable solutions. Some assume the solution will come with the vendor’s next software update or can be deferred to a later date. As the system begins to lose effectiveness, it becomes harder, costlier, and more time-consuming to address the root of the problem. The clinic’s technology systems and operations grow further out of alignment until a crisis forces the clinic into often expensive and disruptive action.

When taken collectively, the characteristics outlined below paint a picture of successful, well-managed technology and information systems. Community clinics and health centers can use these examples to devise their own management and personnel structure that best fits their specific situation.

Appreciation of the value of data and the cost/benefit ratio for technology investments

Perhaps the most striking characteristic of organizations that effectively manage their technology systems is the value placed on collecting and analyzing data. In many cases this results from an organizational bias toward continuous quality improvement. In others this eagerness for data-informed decision-making was arrived at organically. Reasons why include:

- A data-collection initiative for billing or tracking a grant provided a window into an aspect of clinic operations or health care management that was not previously visible.
- Participation in a disease collaborative produced aggregated patient data in a way that helped the clinic take decisive and focused action to improve the health of these patients.
- The ability to compare reports of no-show rates from one month to another illuminated an opportunity to redesign the appointment process.

However dramatic or subtle, this awareness of the value of data, which we call the “light bulb moment,” has a profound effect on systems and technology management.

When data is seen as a strategic resource, management pays attention to the systems that collect it, preserve its integrity, and analyze it. Management, administrative, and clinical personnel understand what is important and what they should measure. A solid information system supported by information technology effectively takes discrete bits of **data**, correlates this data to provide **information**, and then accumulates a body of information that can be transformed into **knowledge**, leading to **action** for improvement. (See Fig. 2.)

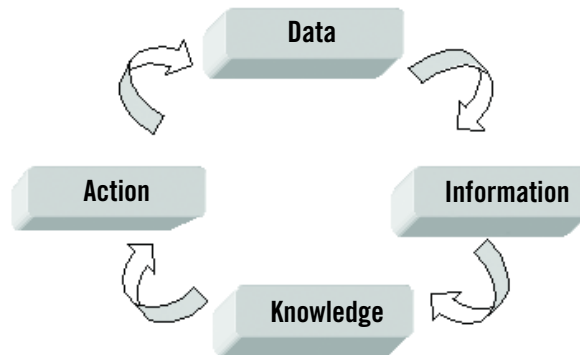


Fig. 2. Using Technology to Inform Clinicians and Improve Patient Care

When a clinic understands the usefulness of data, the importance of capturing it correctly is amplified to avoid costly and time-consuming errors.

Rhonda Tinney, RN of Shasta Community Health Center (SCHC), says, “You can’t make good decisions with bad data. Bad data is worse than no data.” Tinney is part of a continuous process improvement (CPI) team that meets weekly to look for “any process that can be made better.” They evaluate what the system can tell them, as well as what information is missing, in order to design improvement initiatives. Through these efforts, SCHC has nearly eliminated all missing encounter forms and dramatically improved the accuracy of assigning primary care providers to patients.

Understanding that systems are dynamic and need to be constantly aligned with changing conditions

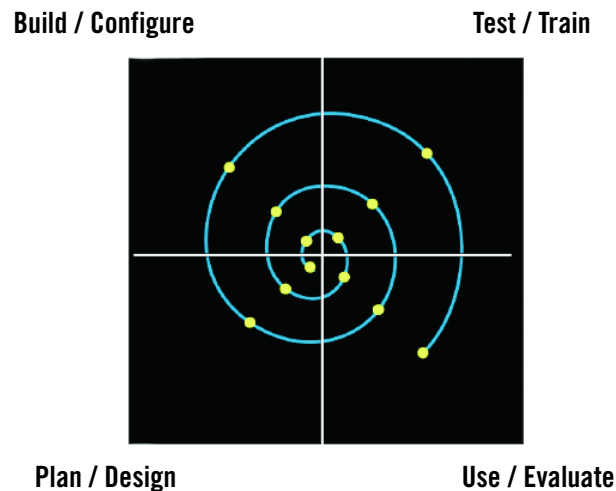
Too often, the implementation of new systems and technology is approached as a linear process: planning, procurement, design, configuration, testing, and go-live. In reality, go-live is just the beginning of the next cycle of implementation and innovation. To some, the thought of a never-ending implementation is horrifying; to others, it provides the opportunity to continually explore the use of their system for operational efficiencies and innovations in providing care.

Implementing new applications and technology provides clinics and health centers with a golden opportunity to examine their existing processes and workflow to streamline processes and enable new programs. Surprisingly, health centers often install a new system to mimic existing, cumbersome processes.

Attempting to automate a dysfunctional workflow only makes bad things happen faster and highlights inefficiencies, lack of communication between departments, and unclear policies. The organization is thrown into chaos with the computer or the vendor inappropriately blamed.

To optimize the use of new systems, CCHCs with well-developed management capabilities will plan for an evolutionary spiral of learning to exploit the features of the application and technology they have purchased. (See Fig. 3.) This learning culture helps these organizations react effectively to externally imposed mandates, the failings of application vendors, and the limits of technology.

Fig. 3. Continuous Cycle of Technology Implementation



Dedication to training all staff to keep technology and operations aligned

As Stacey Dahlin, clinic operations manager at Community Health Clinic Ole, emphatically states, “It’s not about the product, it’s about the people using it.” In accordance with her mantra of “training, training, training,” Stacey believes that clinics need to invest as much in training as they do in their systems.

Staff training is the cornerstone of using application technology effectively. Because of the relatively high employee turnover rate for CCHCs, the quality of data collected and ongoing optimization of the system are seriously compromised unless consistent and continuing training programs are provided.

Typically, training on a new system or process occurs at the initiation or go-live event. Too often the efforts fade dramatically from that point. Many organizations fall into the trap of taking vendors’ training estimates at face value. While four or eight hours of training may be sufficient to begin using an application, constant reinforcement and deepening of knowledge are necessary in order to benefit fully from the technology

investment. Organizations that require demonstration of proficiency rather than merely a certain number of training hours are much farther along the technology adoption curve. Without a consistent approach to training new hires, the lessons learned from the original training sessions deteriorate into word-of-mouth suggestions, sloppy shortcuts, or organizational folklore.

While resource-constrained organizations lack sufficient time to suspend operations or to pull people out of clinic operations for adequate training, many of the high-functioning CCHCs seem to find a way. Organizations that maximize their use of technology view training as an investment rather than an expense. These organizations also provide their primary system users with at least an end-to-end picture of how data flows through the system. When front-office service representatives understand the financial consequences of inaccurate or missing data—data that is their responsibility to collect or later fill in—they are generally more motivated to get it right the first time whenever possible.

Education and evaluation are part of the organizational culture at SCHC. “We don’t just assume people know something, we test them,” says Beth Greenwood, RN, director of Nursing. Competency in key job skills—whether entering data or giving injections—is evaluated at the time of hiring and reevaluated at least annually, to account for changing requirements.

At SCHC, employees are encouraged to improve their basic skills and technology comfort level through formal and informal access to computers. The IT department provides training twice a week in basic office productivity software. Even before the clinic moved to its new facility where computers are more abundant, a PC with Internet and Intranet access was set up in the employee lunch room. SCHC has a highly developed Intranet that offers on-line provider scheduling and look-up, forms and requisitions, access to policies, and information about benefits.

Establishing an initial comfort level with using technology doesn’t necessarily need to be costly, time-consuming, or even formal.

At Ravenswood Family Health Center, employees who have read and signed the clinic’s “Acceptable Use Policies” may use the clinic’s computers and Internet access for their personal use before and after clinic hours. For many staff members without email access at home, this is a much-appreciated benefit, with the added advantage of familiarizing the staff with Windows navigation conventions, similar to those of their practice management system.

Many directors and managers help to integrate aspects of technology and information systems into everyone's job by consciously hiring staff with a background in using or implementing technology. SCHC's Greenwood exhibits a preference of this sort when hiring. She actively seeks candidates with depth of practice experience foremost, but also looks for individuals who are mission-driven and willing to embrace change. "The rest we can teach them," she says. It is the willingness to embrace change that most often portends successful adoption of technology. As a member of SCHC's IT Steering Committee, Greenwood helped to build the vision for implementing Electronic Medical Records (EMR) and has amassed a team of nurses who are able to integrate and embrace technology in their clinical and administrative duties.

Implementing systems and processes that build an organizational asset from individual silos of knowledge

Organizations that rely on the heroics or knowledge of one or two individuals to attend to their information technology assets are at risk, particularly with turnover so prevalent in CCHCs. Successful organizations make sure that knowledge about systems and technology becomes an asset of the organization itself.

Two years ago Planned Parenthood of Santa Barbara, Ventura, and San Luis Obispo counties (PPSBVSLO) relied almost exclusively on a systems administrator to manage their network, keep computers up-and-running, and pull information out of their practice management system. Yet PPSBVSLO felt vulnerable with all their technology eggs in one basket. When the network administrator left, it took the opportunity to change how the organization managed technology. PPSBVSLO developed policies and procedures, hired a CIO, and introduced a help desk system. Additionally, a technology disaster recovery plan was developed that contains documentation of core systems. These steps have all contributed to making technology an organizational asset.

Training systems and processes are one form of preserving institutional knowledge. Documentation is another and perhaps the most effective safeguard against organizational knowledge walking out the door with an individual or consultant.

Up-to-date documentation is critical to the ability of an organization to train its staff, restore systems after a disaster, or recover from technology staff or consultant turnover. Effective administration-level documentation captures critical architecture and configuration information about servers, networks, applications, telecommunications links, and other technology systems. User-level documentation details the procedures used to accomplish tasks on the clinic's systems. This procedural documentation can be the core of staff training.

Documentation doesn't always mean someone must write volumes of text. Some CCHCs have taken advantage of software that records end-user functions, such as making an appointment or registering a patient, on a computer-readable medium such as a CD. This is, in effect, instant documentation and training on how to use an application in the context of the organization's policies and procedures. Other keys to success include shared files and folders on a common server and a logical directory structure for easy browsing and access. Similarly, maintenance agreements, service contracts, and software license agreements all need to be preserved in a way that provides for easy monitoring and renewal.

Well-managed organizations will have some mechanism for reporting and documenting problems and their resolutions. This becomes part of the organization's knowledge base and can save valuable resources in the future when similar problems arise. These systems can also serve as important supporting documentation to hold vendors to their service level agreements.

Mike Matull, director of Information Technology for the Orange County Coalition of Community Clinics, and his staff use a help desk tool called WebTracker to help manage support calls and build a knowledge base of problem-resolution documentation. Each call is assigned an incident number. As technicians and support staff go to the field to assist their clients, additional information is gathered and filed with that ticket number. Matull notes that his staff hasn't had to refer to this detailed documentation often, but when necessary can often save hours or days in resolving problems. Additionally, it proves valuable in training his staff and keeping knowledge in-house. The outsourcing agents for infrastructure and desktop support are also required to document and itemize their service calls so that Matull can spot trends and deploy staff effectively.

Employing a multi-disciplinary approach to strategic information systems and information technology decision-making

In many CCHCs the luxury of, or necessity for, a multi-disciplinary IT steering committee may seem remote or out-of-scale. Yet even in the smallest clinics, we've seen this approach work to balance competing priorities and garner support and buy-in for technology projects. In health care, processes and information flow are tightly intertwined. Ultimately, strategic technology decisions must be guided by the perspectives of administrators, clinicians, patients, board members, and community members.

Strategic technology decisions belong in the hands of senior organizational leaders. A common mistake is for clinic leaders to delegate strategic technology decision-making authority to a manager who lacks the perspective or position in the organization to negotiate conflicting needs and priorities. Often this is because of senior leaders' "technophobia." Clinics and health centers that most effectively use technology have a mechanism in place for gathering requirements and input from many sources, departments, and functional areas. Decision-making can be informed by consultants with specific domain expertise or other technology experts but is never handled exclusively by these individuals. Tasks such as desktop and network management can be outsourced. Leadership cannot.

Deciding whether to buy more PCs, upgrade a network, expand Internet access, or invest in a clinical application is no different from the decision-making process required for other types of clinic resource allocation or acquisition. What is the cost/benefit of each position? What is the vision for service delivery and where are the greatest opportunities for improvement? Where do the staffing shortages impact patient care or clinic operations most detrimentally? These informed decisions should focus on the health center's business needs and how the technology best serves the mission of the organization and should ultimately improve health outcomes.

Matull, of the Orange County Coalition of Community Clinics, convenes a member-driven IT Steering Committee to help set priorities and give direction to IT projects. Technology contacts from all 19 coalition-supported clinics, plus at least one board member and one clinic ED or COO, attend the bi-monthly meeting. This helps him and his staff separate strategic initiatives from tactical interventions, outsourcing activities where necessary.

Another common mistake occurs when senior leadership fails to differentiate between strategic and tactical technology decision-making. The decision of which development tools to use for the health center's website is a much different decision than articulating the purpose, functionality, evolution, and evaluation of that site. Organizations that understand this can often maximize their use of the "accidental techie"—the person with a keen interest in technology who fills another primary role in the clinic outside of technology. Relieved of the burden of strategic decision-making and informed by the requirements of various constituents, tactical or operational decisions can be framed in a more manageable way for these individuals.

Organizations with clear accountability for technology also seem to maximize their use of consultants by providing a clearly defined objective and a decision-maker for the engagement. While consultants can provide focused support for projects or analysis that informs decision-making, they are no substitute for leadership. Strategic technology decision-making should never be outsourced.

Clear accountability for the multitude of tasks and activities involved in systems and technology management

Successful management and use of technology involves many specific activities and tasks. Not all clinics and health centers require or can afford to hire a CIO, CTO, or full-time network administrator to account for all of the technology leadership and management activities necessary for success. It is important to note that effective technology leadership and management are not necessarily synonymous with using the latest versions of systems and devices. Many technologically successful organizations do not.

Frequently, technology leadership and management reside in several individuals. While management by committee has its drawbacks, it is sometimes the only option for resource-constrained organizations like CCHCs. The key to success is clear accountability for specific tasks and activities and the ability to leverage the technology skills of individuals in the organization. Nurse managers, executive directors, medical directors and operations managers possess strategic leadership skills. These same people plus billing staff, therapists, medical assistants, and the like have tactical or operational skills.

Successful organizations have at least one individual in each functional area accountable for the accuracy of the data and the process for collecting it. This is part of their responsibility as a super user, lead analyst, or data czar/czarina, and time for these system-related activities is accounted for in their workday. Again, there is an awareness of the need to invest, indirectly or directly, in the management of systems and technology and the training required to use them.

Many CCHCs we've worked with have been helped by a tool like the IT Roles and Support Matrix (found in Appendix A) to clearly outline the tasks and activities being done internally, being outsourced, and those that are currently unmet. Using this tool provides a profile of an organization's strategic and operational IT management structure, highlights gaps in the support structure, and serves as a tool to communicate accountability to all participants. These discrete tasks and activities are woven together with IT policies and procedures to make a complete and cohesive plan for implementation of the CIO role.

Community Health Clinic Ole exemplifies how this approach to implementing a "CIO by Committee" can work. Their IT Steering Committee meets every other month and addresses both operational issues and strategic issues. Each participant plays an important role. Medical Director Dr. Robert Moore exhibits the characteristics of an early adopter of technology innovations and moves the clinic forward with his vision. Beatrice Bostic, executive director, balances the future with the competing needs of the present by making sure that current technology assets are used optimally while planning for future projects. As operations manager, Stacy Dahlin is responsible for coordinating the tactical plan that implements the strategic initiatives and manages the tasks and activities of their IT support outsourcing agent. When commenting on her technology knowledge and skills, Dahlin says, "All I need to do is manage it; I don't need to know it." The finance manager and director of development round out the committee.

Roadmap for Increasing Technology Management and Leadership Capacity

Increasing your organization's capacity for technology leadership and management is an attainable goal. While thousands of dollars, expensive consultants, or a magic wand is not required, effort and commitment on the part of the health center's senior management team are. Incremental improvements can often be gained by small but focused interventions that can have an immediate and significant impact on reducing the chaos and anxiety that often surround information technology. Proactive rather than reactive management of technology is the single biggest factor contributing to the sustainability of IS/IT solutions.

Increasing technology management capacity begins with an honest assessment of your organization's abilities and problems. It is important to determine the root cause—not just the symptoms—of IT problems so that their frequency begins to trend downward. The Technology Capability and Maturity Model (found in Appendix B) identifies five dimensions of technology management proficiency, along with an objective characterization of "well-developed," "developing," and "under-developed" organizations within each dimension. This tool is intended to help CCHCs identify their organization's capability profile. In our experience, it is rare to find an organization that is well-developed across all these dimensions. Knowing where your organization fits in each will help identify areas of focus and appropriate interventions.

For example, it's not uncommon to find a health center with all new hardware, yet the medical director is unable to count her chronically ill patients accurately. In this instance, many factors may contribute to the problem, but out-dated equipment is not one of them.

Once the capability profile is established, strengths and weaknesses will be clearly identifiable and next steps can be taken. Unfortunately, there is no one approach to building capacity, and interventions should be designed and scaled appropriately to your organization's special characteristics. Some factors to consider include:

- Mission of the health center
- Services provided
- Organizational culture
- Resources available
- Partners and collaborators

In this section we propose some low- to moderate-cost interventions to provide a possible roadmap of improvements along each dimension of capability.

Technology leadership and vision

- *Encourage data-informed decision-making.* Assign someone the "IS manager" role, and make it part of his or her job to know the reporting capabilities of the system and the sources and uses of data in the organization. With this knowledge, the IS manager can develop and print reports for others within the clinic. Exposure to meaningful information that can be used to improve efficiency or patient services will usually create an appetite for more.
- *Form a multidisciplinary technology advisory committee.* This committee should include representation from every department and level, from managers to line staff of the organization. Membership should not be limited to "techies," but be open to staff with various degrees of computer expertise and comfort. The committee will identify and negotiate organizational needs, a key part of the technology planning process.
- *Implement a technology communications plan.* The technology communications plan identifies the mechanisms used to gather feedback, information, and suggestions about technology from staff throughout the organization and defines how those staff voices will be heard. The communications plan also defines how technology decisions, projects, and issues are communicated to staff. The team facilitates staff buy-in to technology decisions by providing a forum to voice concerns and for the team to communicate the status of technology initiatives.
- *Reward technology leadership at all levels of the organization.* Management that understands the value of technology leadership and rewards it builds an environment in which technology becomes an organizational asset. It is common for staff to contribute to the smooth operation of technology systems, from troubleshooting minor hardware problems to providing "super-user" style application support. The reward can be as minimal as recognition for a job well done. Acknowledging the technology role of staff members in their job descriptions is another effective reward, as many staff members currently do this work without formal sanction.

Technology management

- *Define the central technology management role (the CIO role).* The person holding the CIO role is the senior manager accountable for the strategic and supervisory aspects of technology management in an organization. Even when an organization cannot support a traditional CIO, the senior technology management role should be held by an organizational leader who can draw on resources across departments, convene a multidisciplinary team to inform the technology planning process, and negotiate conflicting needs. An understanding of how technology can benefit the clinic is far more important for this role than are technical certifications.
- *Define technology roles throughout the organization.* While the CIO role is the most important technology role, it is helpful to acknowledge, formalize, and communicate the roles played by all staff members that contribute to effective technology. Including these roles in job descriptions allows supervisors to define the role and the time to be dedicated to it and to evaluate the performance of those duties. It also allows an organization the ability to track the real cost of implementing, operating, supporting, and training for technology systems.
- *Annual technology planning and budgeting process.* The completion of the annual technology planning process is timed to provide the total cost of technology expenditures to the organizational budget. The technology plan should provide detailed information on projects and expenditures planned for the next year and should include high-level information on anticipated projects and expenditures.
- *Technology-related policies and procedures.* The effective use of technology procedures is a major contributor to making technology an organizational asset. The Health Insurance Portability and Accountability Act of 1996 (HIPAA) has clarified the need for technology policies. Policies should articulate senior management's expectations for how technology systems, networks, and assets are to be used, giving the clinic leverage in enforcement. Well-documented procedures will be in place long after any individual staff member has left.

Infrastructure

- *Seek out product philanthropy and technology subsidies.* Many philanthropic resources exist to provide hardware and software to nonprofit health care organizations. Compelling evidence that a gift will be used well include technology planning that details how the donation will be used, identifies its impact on the mission, and demonstrates its sustainability.
- *Develop criteria for accepting or rejecting donated equipment.* Well-meaning individuals and businesses regularly offer equipment donations. Donated equipment can be a valuable way to build a technology infrastructure, but it can also be an expensive and time-consuming distraction. Criteria for determining which donations to accept or reject should be based on your current infrastructure, your needs, and the use of the equipment. Remember to factor in the costs of new equipment and supporting used equipment into the decision-making process.

- *Develop a budget and schedule for annual maintenance of hardware and software.* Computer hardware and software have fairly predictable associated expenses, including the cost of software support and upgrades and the cost of hardware repair, upgrade, and replacement. These expenses should be identified and detailed during the annual technology planning process so they can be included in the organization's budget.

Tech support and operations

- *Develop and adhere to service level agreements.* Service level agreements (SLAs) define the relationship between any service provider and its client. SLAs cover external relationships, such as those between a clinic and consultant or vendor, and internal relationships between the clinic and the IT department. SLAs can be used by technology managers to prioritize the support provided to staff and allocate resources strategically.
- *Initiate a help desk.* A help desk is a mechanism for reporting problems or questions relating to technology systems and tracking them through resolution. When used in conjunction with SLAs, information gathered through the help desk can contribute to a more orderly, prioritized technology support system. Evaluation of help desk data can identify areas where focused training can be used to address technology shortcomings.
- *Maintain current technical and procedural documentation.* Accurate and current documentation of technical systems informs the technology planning process and contributes to making technology an organizational asset. Documentation allows for continuity during staff changes. Administrative passwords, account numbers, and log-ins should be a part of the technical documentation.
- *Evaluate and validate all technology roles, including those filled by consultants and application service providers (ASPs).* In addition to the evaluation of technology roles held by staff members, the roles filled by consultants, volunteers, and application service providers should be documented and evaluated.
- *Keep disaster plans updated.* Disaster plans are a requirement for any organization that uses technology for mission-critical tasks. If your disaster plan is not constantly updated to reflect changes in your technology or data systems, it may not protect you in an emergency.

Systems and technology training

- *Train staff on your customized systems.* The Practice Management Systems (PMS) and EMR systems used in clinics are highly configurable systems that are often enhanced with custom programming. If training curriculum and materials are not based on the system as it has been implemented in your clinic, training could cause more harm than good. When using training staff provided by a vendor, specify that training be delivered based on the way the system has been implemented in your clinic.
- *Establish baseline levels of technology competency.* Baseline competency requirements allow clinics to write job descriptions that ask for the appropriate level of competency and allow potential staff to be evaluated against this bar.

- *Implement standardized training for all new staff by role and regular ongoing training.* Develop a standardized technology training to be delivered to all new staff members during their orientation period. Schedule technology training for staff during which the technology manager can introduce new or changed procedures, or address specific recurring problems that have been identified during ongoing system evaluation.
- *Devise multiple training methods to account for different learning styles.* Some people prefer individualized training; others learn better in a group setting. Some prefer written directions; others learn better with screen shots and pictures to illustrate procedures. To enhance effectiveness, make sure that your training plan acknowledges the need for different kinds of training.

Use of data and data management

- *Establish super users or data champions in each department.* Formalizing this technology role provides an extra layer of information systems support and problem triage. It also fosters a sense of “ownership” of the accuracy of the data and the efficiency of the data-collection process.
- *Develop a “dashboard” of key performance indicators.* PMS and EMR systems capture a great deal of data that can inform the management and operations of a clinic. A series of reports that measures different aspects of clinic and staff performance should be made available to decision-makers who can analyze them and act appropriately.
- *Take an inventory of standard reports and customize if necessary.* A frequent mistake made during system selections is focusing on data collection without looking at output beyond mandated reports. Standard reports included with systems can be effective tools and should be evaluated during implementation and regularly thereafter. The high level of configuration often necessary in PMS and EMR systems can have a negative effect on these reports, requiring customization. Some will require only small adjustments; others will need to be built from scratch. Customized reports based on a standard report already available will cost far less to develop. Familiarity with what is available “off-the-shelf” is an important first step to data-mining.

Conclusion

Technology System Sustainability

Technology system sustainability could be defined as meeting present needs without compromising the ability to meet future needs. It could also be defined as balancing the amount of functionality provided by technology systems with the resources designated to purchase, operate, and support them. In either case, a tight funding environment and a rising demand for new systems make technology sustainability increasingly important for community clinics and health centers.

To be sustainable, an organization needs to fully understand the costs and benefits of their technology. This includes not only the checks that are written for new equipment, software purchases, and telecommunications fees, but also costs that are often hidden, like staff time to support systems and the cost of system downtime on staff productivity. To yield a true picture of the value of technology, balance these expenses with cost savings from process automation, revenue generated by increased services, and improved quality of care.

Sustainability does not simply mean reducing spending on technology systems. In fact, if the reduction of spending affects the future ability of the system to perform its expected tasks, then it may actually damage the organization's long-term sustainability. Technology spending can only be achieved if the expectations of the system are also realigned.

Technology system sustainability is a manifestation of well-developed technology management and leadership. The criteria that identify an organization with well-developed technology management and leadership are the same that support their ability to operate sustainable technology systems, including annual technology planning, a budget line item for technology, a multidisciplinary technology committee, and a technology communications plan, among others.

A Springboard to Major Technology Initiatives

Effective technology management and leadership help address specific operational problems, but also serve a higher purpose. Investing in technology management and leadership capacity allows an organization to reach more ambitious goals and use technology to create new programs and service offerings, improving health outcomes for the patient and community. The grand technology goals that a clinic chooses to pursue will depend on its mission, vision, and organizational strategic plan.

For many CCHCs, implementing technology that directly impacts the care process—EMRs, for example—is one such goal. These systems are truly mission-critical and many of the functions they support would be too costly, time-consuming, or ineffective to implement without the backbone of technology systems. Mission-critical applications cannot be sustained on a shaky or uneven foundation, and the foundation is as much about leadership and management as it is about hardware, software, and networks.

Community clinics and health centers that invest staff time and resources in building effective technology management and leadership structures will be rewarded with sustainable technology systems and will have a solid foundation from which to pursue major technology initiatives.

Appendix A: Roles and Responsibilities for Information, Systems/Information, Technology Management, and Support

1. Chief Information Officer (Senior Management)

Responsibilities and Skills – CIO	Provided by:	Outsourced to:	Comments/Resource Plan
<ul style="list-style-type: none"> Provides the technology vision and leadership to support the organization's overall strategic vision, mission, and culture. 			
<ul style="list-style-type: none"> Ensures that all information systems and networks operate according to internal standards, external accrediting agency standards, regulatory agencies, and legal requirements. 			
<ul style="list-style-type: none"> Responsible for planning, development, evaluation, coordination and management of the information and technology systems for the organization. This includes voice, data, imaging, practice management systems, and office automation. 			
<ul style="list-style-type: none"> Develops and maintains enterprise IT policies and standards relating to the acquisition, implementation, and operation of information technology and communication systems. 			
<ul style="list-style-type: none"> Develops and enforces policy and procedures to ensure the protection of the organization's IT assets and the integrity, security, and privacy of information entrusted to or maintained by the organization. 			
<ul style="list-style-type: none"> Approves, coordinates, and controls all projects related to selection, acquisition, development and installation of major information systems for the organization. 			
<ul style="list-style-type: none"> Makes final decisions about software and hardware choices within approved budgetary constraints. 			
<ul style="list-style-type: none"> Negotiates all IT acquisition contracts, soliciting involvement and participation of other management team members as appropriate. 			
<ul style="list-style-type: none"> Reviews all hardware and software acquisition and maintenance contracts, soliciting involvement and participation of other management team members as appropriate. Develops, when possible, master purchase or lease agreements for hardware, software, maintenance, and telecommunication services. 			
<ul style="list-style-type: none"> Manages relationships with vendors for sales, service, and support of all information systems and technology. 			
<ul style="list-style-type: none"> Prioritizes IT projects and supervises IT staff and consultants. 			
<ul style="list-style-type: none"> Supervises the development of technical and user documentation. Develops and maintains an enterprise-wide business recovery plan to ensure timely and effective restoration of IT services in the event of a disaster. 			
<ul style="list-style-type: none"> Communicates IS/IT plans, policies, and technology trends throughout the organization, including management, professional, and support staff. 			
<ul style="list-style-type: none"> Oversees the relationships between the organization's IT resources and external entities (e.g., government, vendors, and other health care organizations). 			

1. Chief Information Officer (Senior Management), continued

Responsibilities and Skills – CIO	Provided by:	Outsourced to:	Comments/Resource Plan
<ul style="list-style-type: none"> Works with other senior managers to determine the information they require to make effective business and clinical decisions. Ensures that the gathering, processing, and distribution of this information occur in a timely, accurate, and cost-effective manner through on-going review and education programs at executive, management and user levels. 			
<ul style="list-style-type: none"> Develops and monitors the annual operating and capital budgets for information and technology systems consistent with programmatic plans and established financial guidelines. 			
<ul style="list-style-type: none"> Maintains contact with IT suppliers and maintains knowledge of current technology, equipment, prices, and terms of agreements to minimize the investment required to meet established service levels. Evaluates alternatives, performs appropriate cost-benefit analysis, and recommends solutions that minimize costs commensurate with acceptable risks. 			

2. Systems Administrator

Responsibilities and Skills – Systems Administrator	Provided by:	Outsourced to:	Comments/Resource Plan
<ul style="list-style-type: none"> Responsible for implementing the organization's technology plans and policies and keeping all information/communications systems operational. 			
<ul style="list-style-type: none"> Has ability to triage and solve many user problems, system problems, and network errors independently. 			
<ul style="list-style-type: none"> Ensures that all master files, tables, and system parameters are maintained and up-to-date. 			
<ul style="list-style-type: none"> Implements and monitors security policies, assigning functional groupings for privileges, setting up users and passwords. 			
<ul style="list-style-type: none"> Coordinates user training on all applications. May provide selected training as appropriate. 			
<ul style="list-style-type: none"> Acts as the "help desk"/triage person to document system errors or defects and communicates to vendor. Maintains problem logs and serve as primary contact to software, hardware, and network-related vendors. 			
<ul style="list-style-type: none"> Researches and recommends to CIO new hardware and software procurement, including emerging technologies that can optimize clinic operations and improve productivity. 			
<ul style="list-style-type: none"> Develops, updates, and maintains IS and IT policies and procedures including user documentation. 			
<ul style="list-style-type: none"> Researches new/emerging technologies that can optimize clinic operations and improve productivity and recommends to CIO. 			
<ul style="list-style-type: none"> Implements, monitors, and ensures that security policies are enforced. Monitors HIPAA and other IS security regulations as they apply to the organization. 			
<ul style="list-style-type: none"> Monitors changes in user behavior and needs, making recommendations to the CIO for changes as appropriate. 			

3. Technical Support Staff




Responsibilities and Skills – Tech Support	Provided by:	Outsourced to:	Comments/Resource Plan
<ul style="list-style-type: none"> • Primary point of contact for all technical problems within the organization. 			
<ul style="list-style-type: none"> • Sets up new computers, installs and configures software, and performs hardware upgrades. 			
<ul style="list-style-type: none"> • Troubleshoots users' computer problems and general network problems. 			
<ul style="list-style-type: none"> • Performs basic network administrative functions such as adding users, changing passwords, and adding new email accounts. 			
<ul style="list-style-type: none"> • Guides users in a variety of tasks, including remote connectivity, assistance with office productivity software (such as MS Word and Excel) and email. 			
<ul style="list-style-type: none"> • Performs system maintenance chores according to IS policy such as backup routines or monitoring available space on the server hard drives. 			

4. Special Projects – Highly Specialized Support

Responsibilities and Skills - Special Projects	Provided by:	Outsourced to:	Comments/Resource Plan
<ul style="list-style-type: none"> • Wide Area Network (WAN) <ul style="list-style-type: none"> – Outsource to Frame Relay Provider – Setup and configuration of WAN links. – Ongoing monitoring and maintenance of WAN links and routers. – Troubleshoots Frame Relay links. – Troubleshoots Internet connection. – Evaluates WAN needs and make recommendations to CIO. – Serves as liaison between Frame Relay Network Engineers and CIO. – Provides firewall setup, maintenance, testing, and troubleshooting. 			
<ul style="list-style-type: none"> • Local Area Network <ul style="list-style-type: none"> – Setup, maintain, and troubleshoot network switches. – Evaluates network speed and problems and makes recommendations to CIO. – Provides wiring testing and troubleshooting. 			
<ul style="list-style-type: none"> • Servers <ul style="list-style-type: none"> – Monitors and troubleshoots server backup and restoration. – Monitors and troubleshoots centralized virus protection. – Handles the setup, maintenance and troubleshooting of Microsoft Exchange. – Handles configuration, testing, and repair of network security problems. 			
<ul style="list-style-type: none"> • Project Management / Implementation Management <ul style="list-style-type: none"> – Manages and coordinates vendor and clinic staff activities necessary to implement a new application. – Takes the lead on all project management processes during this time including issue management, schedule management, risk management, and budget management. 			

Appendix B: Technology Capability and Maturity Model

Evaluation Criteria	● = Well Developed	◐ = Developing	○ = Under Developed
Technology Vision and Leadership	<ul style="list-style-type: none"> Technology assets are seen as investments rather than expenses. Development and fundraising efforts have focused on technology or accounted for a technology component to support a new program. The organization sees a clear link between technology and achieving its mission. The organization engages in technology-enabled process improvements. 	<ul style="list-style-type: none"> The idea of mission-based technology is not a foreign concept; however, day-to-day issues often overshadow realizing these goals. Some effort has been made to target fundraising efforts toward technology or solicit specific technology donations. Some departments or programs engage in technology-enabled process improvements, but the effort may not be integrated across programs. 	<ul style="list-style-type: none"> The organization does not use technology in support of its mission. Information systems, if any, are used for routine business processes. No development or fundraising has been undertaken specific to technology. The organization does not actively look for ways to use technology to support new service offerings or develop new programs.
Technology Management	<ul style="list-style-type: none"> There is a designated individual or committee to oversee technology issues. Technology is budgeted for in the organization's operating budget. Technology is included in the strategic planning process and acknowledged to be a managed resource of the organization. Comprehensive technology policies and procedures are developed and used. 	<ul style="list-style-type: none"> There is at least one individual in the organization with the capability to assess technology needs. Processes around technology decisions and purchases are informal but have been mostly effective. The organization may have participated in some planning around technology but not on a consistent basis. Policies and procedures are in development. 	<ul style="list-style-type: none"> Technology is generally not regarded as an asset requiring regular attention. The organization does not have a process or forum to examine their technology needs nor is there a technology budget. There is no strategic or technology plan.
Technology Infrastructure	<ul style="list-style-type: none"> Technology infrastructure supports the organization's business and clinical processes fully. There is reliable connectivity between sites and adequate bandwidth for Internet use. Equipment is up-to-date and interoperable. 	<ul style="list-style-type: none"> Technology infrastructure has been pieced together, but most business processes are supported. Connectivity is limited; bandwidth needs to be conserved for priority access to the Internet. Equipment is a mix of older and newer. 	<ul style="list-style-type: none"> Most business processes are not supported by technology. No connectivity between sites or Internet access. Equipment, if existing, is out-dated or the personal property of individual employees.
Technology Support	<ul style="list-style-type: none"> There is a designated individual or team of support specialists available to users. A structured process exists for reporting and tracking problems. Support is reliable, timely, and consistent. 	<ul style="list-style-type: none"> There is generally someone on-site or on-call to respond to technology problems. Processes for reporting are informal but appropriate for the size of the organization. Support is not always timely but users have learned workarounds while awaiting help. 	<ul style="list-style-type: none"> Support is ad hoc or based solely on manufacturer's warranty. Users with computers are responsible for finding their own solutions. Timing of support response is unpredictable.
Technology/Systems Training	<ul style="list-style-type: none"> Super Users for each business or clinical application have been identified, and time is allocated for this function in their job description. IS training needs are assessed on an annual basis and included in the overall technology planning process. Training is an integrated part of a new hire's orientation. 	<ul style="list-style-type: none"> Training is mostly provided by outside vendors, classes, or consultants but is available on an as-needed basis. Training is included as part of a new system implementation; follow-up training is limited to new employees when there is turnover. New-hire training is generally available but not systematic. 	<ul style="list-style-type: none"> Training is provided by observation or "passed down" among volunteers or employees. There are very limited professional training resources available to staff, if any. IS training is not considered part of the organization's planning process.

Evaluation Criteria	 = Well Developed	 = Developing	 = Under Developed
Data Management	<ul style="list-style-type: none"> • The organization has defined and documented its data needs for program management and financial purposes. • All data elements are clearly defined for each report and each clinic program. • Data input documents and report specification documents are well designed with clearly written procedures for data entry. 	<ul style="list-style-type: none"> • Some of the organization's data needs have been clearly defined, but are not uniformly documented. • Some reports are documented as to underlying calculations or algorithms, but not all. • Some data input documents are well defined with some procedures for data entry. 	<ul style="list-style-type: none"> • There are no clear definitions of data needs; only minimal data is collected for billing and reporting purposes. • Clear definition of data elements is lacking throughout the organization. • Data is entered from a variety of sources without defined procedures. Many times reported data is based on an estimate or extrapolation of a small sampling.
Use of Data	<ul style="list-style-type: none"> • The organization values data and prioritizes efforts to manage, collect, and utilize data to promote community and individual health improvement and advocacy. • Reporting requirements for funders, governmental agencies, and internal management are met by mining data from the organization's info systems. • The organization shares data with other CCHCs and state organizations for improvement of the health status in the community and to promote effective advocacy efforts. 	<ul style="list-style-type: none"> • The organization pays attention to data collection mainly for internal financial management. • Reporting requirements for funders, governmental agencies, and internal management are mostly met but with some inconsistencies. • The organization engages in limited collaboration with one or two other organizations or consortia members to examine comparative data. 	<ul style="list-style-type: none"> • Data collection and management are not a high priority for the organization. • Reporting requirements are not well met, data is not easily accessible, and sampling is sometimes used to generate reports. • Only data required for reporting is shared; there are no ongoing collaborative efforts with other organizations.

Action

Resources

Information

Community Clinics Initiative

A Joint Project of Tides and The California Endowment

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