

Electronic Health Records – Are You Ready?

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This paper will discuss the areas of implementation that need to be reviewed before the transition onto an Electronic Health Records (EHR) system. During the process of evaluating EHR systems, there are several aspects of your current network that must be analyzed.

Many clinics and healthcare systems are surprised by the upgrades that will be required during an EHR implementation. These technology upgrades must be budgeted and planned for in order to have a successful transition to an EHR system. The goal of this paper is to help you identify these needs ahead of time and avoid costly surprises during your implementation.

Is your network ready for an EHR?

Before making a decision about an EHR system, you must ask a number of questions about your organization.

IT Resources

- What technical resources do you have to assist you with your EHR implementation?
- Do you have someone on staff to implement and maintain your EHR or will you need to hire a consultant or advisor?

Equipment and Hardware Needs

- Do you need to upgrade your current computers?
- Do you need to purchase any new hardware or computers?
- Will you need to add computers in clinic locations that don't currently have any?
- Do you need to purchase laptops or tablets for your providers to use when charting patient information?
- Do you need upgrades to your current routers and firewalls?
- Will you implement a wireless network?
- What is your current Internet bandwidth?

Existing Equipment

- Do you have any existing servers in place?
- Do you have a controller that manages user logons and authentication?
- Do you have a file server for central storage of your clinic documents?
- Do you centrally manage Windows updates or does your support staff have to go to each computer to verify updates?
- Do you have a central backup location for data files?
- Do you have printers managed at a server level?
- Do you have a DICOM or PACS server that stores your Ultrasound or CT Images?

Housing Your EHR

- Do you have space for new servers and is there space to grow if more servers are needed in the future?
- Is this space secure?
- Are your heating and air conditioning systems enough to protect a server room?
- Do you have the electrical capacity for additional servers?
- Will you keep your servers in-house or will you have them hosted somewhere else?

Implementation and Ongoing Support

- Does the EHR systems vendor install and support the system on an ongoing basis?
- What part of the support process are you responsible for?

Your IT Advisor

Before moving forward with an EHR implementation, you must have a technical resource that is familiar with your current network. This resource can be an internal IT support professional or an outside consultant, but you will need them available for support during and after your EHR transition. Depending on the size of your organization, this resource may be one person or a complete team of professionals.

Some organizations have chosen to include their advisor as part of their evaluation team to help them decide which EHR system is most appropriate to meet their needs. Including your advisor in the evaluation process will allow them to ask specific questions about how this transition will affect your current network and any hardware changes that will need to be made. The advisor will also be helpful in discussions involving servers, bandwidth requirements, thin client versus full client installations and other hardware issues.

You should begin the review of your IT resources by creating a complete IT asset inventory. This includes all of your existing computers and equipment, including the operating system, speed, memory and service pack level of each piece of hardware. Your IT asset inventory should also include specific information such as the serial number, warranty expiration date, name and location of every computer in your organization. Make sure your inventory includes information about all the printers, scanners and other peripherals on your network. Additionally, include all switches and routers you have on your network, whether or not they are managed, their serial numbers and any existing warranties or support.

Determine what type of communications lines you have between any remote offices and the level of Internet bandwidth. Find out the terms of existing contracts with your communication lines providers. You may need to increase your line speed or change to another type of line to meet the needs of your EHR system, particularly if you have remote sites that require connectivity to your main office for EHR access.

This asset inventory will help you and your advisor plan for the installation of your EHR. Proper planning will help you prepare for any needed changes to your current network and avoid unnecessary expenses later on in the process.

In addition to an IT asset inventory, it's important to have a clear understanding of your organization's patient care workflows. By understanding and mapping the patient workflow from the time they make an appointment to

the time the business office codes and bills, it will be easier to determine what additional equipment will be needed for the implementation of your EHR.

Updating and Replacing Computers

The EHR system you select will have minimum requirements for any computer that is connected. Because of this, you may need to upgrade or replace a number of computers in your organization. Use your IT asset inventory to determine which computers do not meet the minimum requirements.

Understanding the job functions of your employees and how much they are interacting with the EHR system will help you decide who should receive the newest and fastest computers. Employees that use the EHR system frequently should be given the fastest computers to avoid delays or frustration. Many organizations find it helpful to classify their computers into different categories depending on processor speed, memory and age.

You will likely find places in your office that need computers that do not currently have them. This is an excellent time to decide which employees would work best with a desktop computer, laptop computer or tablet. It's a good idea to talk with employees, particularly providers, about which type of computer works best for them. Some organizations chose to have a desktop computer in each examination room while others give each provider a laptop to use exclusively. Work with your advisor to chose the type of computer that best fits your provider preference and meets the requirements of your new EHR.

If your organization needs to purchase additional computers, it is helpful to find a standard desktop or laptop model that meets provider needs and your EHR requirements. This standardization will help limit the amount of set-up and support time required for each computer.

Wired vs. Wireless

Best practice is to install network cabling to each of the areas you plan to place a computer. Be sure to use a certified cabling company for installation and use only certified cabling for both walled cable and any patch cables to computers and switches.

If your organization selects laptops and/or tablets as part of your EHR transition, you should evaluate the use of wireless connectivity. Wireless connectivity allows providers to move from location to location without having to log in and out of computers. A wireless assessment or survey will help identify any problematic locations you might have within the wireless area.

Wireless connectivity does offer more mobility, but there are a number of considerations that come with going wireless. Firstly, wireless can be slower than wired connections, although new technology is helping to bridge that gap. You will likely have more periods of interference or connection issues with wireless than you would with wired connections. Any interference in the wireless signal can cause a disconnect from the EHR system and possible loss of the information that was being entered at the time of disconnection. This interference can be caused by imaging equipment, other wireless networks in the area or conflicting wireless channels with other networks. Most importantly, there are generally more security issues with wireless networks than with traditional wired connections.

Wireless connectivity certainly has a place in the EHR infrastructure, but do your full diligence in evaluating the complete needs of your environment. Many businesses are choosing to have more wired stations, particularly as a backup to their wireless connectivity. It's recommended to implement a wired connection whenever possible as wired connections are statistically less expensive than wireless.

Your Current Server

It's important to understand your current server set-up. In a domain environment, there would be a server designated as the domain controller, which controls user's access on logons to the network. This environment also allows management of how often users are required to change their passwords, the length of the passwords and the strength of the passwords. From a server, you can manage which operating system critical updates are deployed to the computers on your network.

Switches, Routers and Firewalls

Switches connect all of the equipment within a single location together and allow data to move between the devices. There are many different types of switches. Managed switches allow technical staff to perform troubleshooting involving network issues and to see data being lost through a particular port on a switch. Managed switches often allow you to set the speed of the port to work best with the device that is plugged into it.

Some switches provide power to the devices that are plugged into it. This eliminates the cost and need to have electrical power installed at the wireless access point, which is often in the ceiling.

Routers pass data to various areas of the network. If you have multiple locations, you will need to have routers in place to pass data between each location.

Firewalls protect your network and valuable patient information from intruders outside of your network. A good firewall appliance is required at the point of your Internet access. It reviews all data that travels in and out of your network, to and from the Internet, and makes a determination if this transfer of data should be allowed.

Work with your IT advisor to determine which type of switches, routers and firewalls are the best choice for your organization. Document what you currently have in your inventory as you will need to know what you currently have as part of the implementation of your EHR system.

A Note about Equipment

It's important to invest in professional-level equipment for your network. While these products sometimes cost more than equipment designed for home use, the performance provided by this equipment is necessary for a medical office setting. This equipment is the heartbeat of your network. Make sure you choose equipment that is appropriate for your needs.

It's also important to have a plan of action to take if one of your pieces of equipment should fail. Most network equipment suppliers offer a base warranty and additional replacement coverage after the warranty expires. When a critical piece of equipment fails, you are left with connection problems that can greatly affect your business, so it's important to have coverage. Many equipment suppliers offer a four-hour or next-day business replacement for equipment, but some require sending the faulty piece of equipment to them, which could take days. Talk with your IT advisor and make sure you have a plan to avoid downtime.

Printers, Scanners and Fax Machines

Printers can cause the more frustration than any other piece of equipment on your network. In general, IP or network printers are easier and less costly to maintain than local printers, which are connected directly to one computer, but cost more to purchase.

When choosing a scanner, it's essential to pick a model that has been tested with your EHR system. This will save on support time by minimizing the number of issues that will occur while scanning into the EHR system. Additionally, it's best to connect the scanner to one of the faster computers on your network. Scanning on a slow computer can be very time consuming and greatly increase the amount of time spent scanning information.

Faxing becomes more electronic with the implementation of an EHR system. Most vendors provide a solution for faxing that integrates directly with the EHR system. During

the evaluation process, look into the fax solutions available and ask your vendor about upcoming solutions involving e-prescriptions.

Housing Your New EHR

When selecting where to host your EHR solution you have a variety of options. You may choose to keep your EHR in-house or you may choose to host your EHR off-site at another facility.

When hosting your EHR system in-house, the best location is a LAN room that is secure, away from public traffic, well-ventilated and cooled. It's common to add two to three new servers into the LAN room when implementing an EHR system. Each new server adds to the electrical load and can considerably increase the temperature of the LAN room. You may want to have a dedicated electrical circuit installed specifically for the LAN room. Additionally, keeping the room cool is a critical requirement when housing your own servers. An overheated room can cause damage to the equipment, which could cause the loss of important patient data.

Ask your IT advisor:

- Will the space provide room to grow if more space is needed in the future?
- Is the space well ventilated and air conditioned? If not, can modifications be made to ensure proper ventilation and cooling?
- Is there security to this room such as a door lock, swipe card or key pad?
- Can we provide backup power to the room?
- Are there sprinkler heads in or near the room?
- What is the fire suppression for the room?

The alternative to housing servers on-site is hosting your EHR system at an off-site facility. There are significant differences among the various hosting facilities and it's important to understand the advantages and disadvantages of each.

A *co-location* facility offers the ability to maintain control over your servers while housing them offsite for business continuity purposes. You typically own the servers that are placed in a co-location facility and you provide technical administration, backup strategy and control over upgrades of software and hardware. While hosting is a fixed fee for the life of the contract, you continue to invest in hardware assets and technical resources.

In an *ASP facility* (application service provider), cost and hardware resources are shared between many organizations using a similar system. These servers are typically owned, managed and backed up by the ASP facility.

While this scenario can provide great savings, you may give up control of when you choose to upgrade hardware and software. ASP facilities typically charge fees per user.

Managed server hosting facilities offer the most thorough service. While you have your own dedicated environment and can host more than just your EHR system, the facility owns the hardware, administers the servers, manages back-ups and upgrades with your approval. Costs are comparable to hosting locally, but come with the added advantage of disaster recovery and availability.

The greatest disadvantage of hosting your servers off-site is the sacrifice in performance. While the connection speeds are acceptable to many, reaching data over the Internet will be slower than accessing data that is located on a server inside your office. Those who choose to host externally generally decide that the benefits of increased availability and disaster recovery outweigh the need for greater speed.

Work closely with your providers and IT advisor to thoroughly explore and discuss which option is the best for you.

Bandwidth

If you have remote offices that connect to your main location or a server hosting facility, the speed of your communication lines will be very important. You will need high availability, high bandwidth lines to connect your offices to where the server is located. This can be point-to-point with dedicated lines or a virtual private network (VPN) created using your internet connection and firewall. If you choose to have your server hosted off-site, you'll need to meet these communication line requirements for your main site as well.

By completing your IT assessment, you should have information on your existing communication lines, including the terms of your current contracts and the speed of these lines. You should also know if they are private lines or if they utilize the public Internet.

Many organizations assume they have a T1 connection between their main and remote offices. However, this T1 connection also provides all the phone traffic between the offices and leaves only a portion of the connection to pass data back and forth.

Another misconception is thinking the speed of your Internet line is the same going both directions, to and from, two sites. If you have a 5 MB DSL line, you may have 5 MB of download speed, but only 768 KB of upload speed. Be sure to check the speed of both downloads and uploads.

As with all technology, there are constant changes to the types of communication lines that are, and will be, available. If you have remote locations that need connectivity back to your main office for EHR, or if you are considering hosting your server off-site, make plans to review your communication strategy at least annually. This will be critical in the future and continued success of your EHR system. Whether you are ready to implement an EHR solution in the near future or are several years away from implementation, take the time to know and understand your existing communication lines.

Anytime you need to connect to servers that are at a different location, whether this is your main site or remote server hosting facility, you will likely be using a terminal server or Citrix client. This is often referred to as a thin client. These servers provide a thin client connection which is used to access your applications without requiring the full application to be installed on every computer. This greatly reduces the amount of bandwidth required for each computer at the remote site. Thin clients work fine for most functionality, however there are certain circumstances where you may need to install the full client.

Using a thin client does impact how you scan information at remote locations. Without the use of special software, you may not be able to scan information into your EHR system. Discuss this possibility with your vendors and IT advisor during the evaluation of EHR systems.

Who is Responsible?

Once you have made a decision on which EHR system to implement, it's essential to have a clear understanding of who is responsible for every part of the implementation. Many organizations don't realize that many vendors assume the client organization will be responsible for a large portion of the implementation of their EHR system.

While it's common for the vendor to install your EHR system onto your server, it's also common for you to be responsible for preparing your computers for the implementation. This includes making sure your computers are at proper service pack levels, verifying they all have certain versions of required applications and that they all have Java implemented. Assume that your IT resource will be installing the EHR system on each computer. If you are not prepared to do this, ensure your vendor offers the option of having them perform that work.

You should also have a clear understanding of who is responsible for keeping the server updated with new patches and service packs after the implementation. Additionally, ask your vendor how you will be notified of new patches and service packs for your EHR system and how often updates are generally released.

Know your Network

In closing, the best advice moving forward is to have a clear understanding of your existing network. Document your current equipment and have a plan to maintain this documentation. Plan for growth on your servers including future needs of additional processor speed, memory and disk space that will meet your needs for the next few years. Know who is responsible for what, both during the installation and maintenance afterwards.

Having a clear picture of your existing infrastructure and where you need to go will greatly reduce the need to make quick changes during the EHR implementation process. It will give you time to weigh out your choices and make the best decisions for your organization.

MMIC Health IT has helped many clients through the EHR implementation process. For more information, please contact us at 800-328-5532, or visit our website at MMICHealthIT.com