

# Health Information Technology Knowledge and Skills Needed by HIT Employers

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## Keywords

Health information technology, workforce, biomedical and health informatics, clinical informatics

## Summary

**Objective:** To evaluate the health information technology (HIT) workforce knowledge and skills needed by HIT employers.

**Methods:** Statewide face-to-face and online focus groups of identified HIT employer groups in Austin, Brownsville, College Station, Dallas, El Paso, Houston, Lubbock, San Antonio, and webinars for rural health and nursing informatics.

**Results:** HIT employers reported needing an HIT workforce with diverse knowledge and skills ranging from basic to advanced, while covering information technology, privacy and security, clinical practice, needs assessment, contract negotiation, and many other areas. Consistent themes were that employees needed to be able to learn on the job and must possess the ability to think critically and problem solve. Many employers wanted persons with technical skills, yet also the knowledge and understanding of healthcare operations.

**Conclusion:** The HIT employer focus groups provided valuable insight into employee skills needed in this fast-growing field. Additionally, this information will be utilized to develop a statewide HIT workforce needs assessment survey.

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## 1. Introduction

There is an increasing worldwide need to understand how health information technology (HIT) can be most effectively used in today's healthcare delivery systems [1–9]. A competent workforce is required in order for HIT to be effective in a healthcare organization. According to a recent report by the Institute of Medicine (IOM), "We are at a unique time in health care. Technology – which has the potential to improve quality and safety of care as well as reduce costs – is rapidly evolving, changing the way we deliver health care. At the same time, health care reform is reshaping the healthcare landscape [10]. "Meaningful Use" of the electronic health record (EHR), which is funded by the Health Information Technology for Economic and Clinical Health (HITECH) Act of the American Recovery and Reinvestment Act (ARRA), includes investment in workforce development [11]. Due to this act the demand for health information technology professionals is growing, with the U.S. Office of the National Coordinator (ONC) estimating an additional 50,000 workers will be needed [12]. These professionals will help to support the implementation and effective use of EHRs in hospital and provider settings.

Texas has one of the largest physician populations in the nation [13], approximately 600 licensed hospitals [14], four of the nation's largest metropolitan areas for attracting venture capital [15], thirteen state-supported local health information initiatives [15], and a number of private payors and associations offering support to physicians and others who are interested in adopting HIT [15]. The strong healthcare industry, accounting for more than \$100 billion in economic activity for this state, requires a well qualified HIT workforce to support the large and growing Texas population [15].

In response to the HITECH-ARRA legislation the current HIT workforce will need to evolve. HIT workers must possess a wide variety of skills to quickly react and adapt to their current practices to future work surrounding industry and regulatory changes. The Texas HIT Workforce Development project, funded by a Wagner-Peyser grant and supported by the Texas Workforce Commission, was initiated as a direct result of this growing need in the Texas healthcare industry. One of the initial project goals was to conduct a state-wide HIT workforce needs assessment from all industry stakeholders in order to understand the HIT workforce knowledge and skills needed by HIT employers, as well as the numbers of workers needed now and in the future.

Many organizations, such as the American Health Information Management Association, the Health Information Management and Systems Society, the American Medical Informatics Association, and the International Medical Informatics Association, among others, have developed documents describing the skills and knowledge needed by HIT (or health informatics) workers. The research team was able to identify different lists of competencies which had been published for health information managers or health information technicians [16–20]. Several of the competency lists were compiled or created by professional organizations [16,17, 20]. The Huang (2007) framework surveyed the literature and extracted data from journal articles while other researchers included recommendations for defining competencies [19, 21, 22]. These efforts are to be lauded. However, the Texas research team identified a significant gap, a lack of feedback from employers – those who hire health information technology workers. The Texas-based project wished to "start anew" gathering knowledge and skills information from HIT without bias from one group or another or any previous skills or knowledge compilations. This article describes the findings from the HIT employer focus groups.

## 2. Methods

A qualitative research method, or inquiry method, for the initial phase of this project was chosen as no data-based evidence of employer needs was available. That is to say, the previous skills and knowledge documents were compiled by expert consensus; however validation of the content and/or surveys determining actual numbers of employees needed with the different knowledge and skills could not be found. The methods used were approved through Texas State University's Institutional Review Board (IRB) according to federal guidelines.

Prior to setting up the focus group meetings, a professional focus group facilitator was hired to eliminate any bias from the researchers who work in the HIT field. Conference calls were conducted

to establish the ideal responder characteristics, desired number of participants, and the type of questions that would be utilized in the focus groups. A prepared topic guide, which is shown in ► Table 1, provided the framework for each focus group meeting. The session began with an introduction by the facilitator describing the purpose of the focus groups and a brief explanation regarding the meeting process.

At the beginning of each focus group the facilitator would introduce the purpose and rules of the session informing the participants that her role as an independent moderator was to discover their attitudes, needs, desires, perceptions and interests related to the HIT industry. She explained that their anonymous qualitative responses would provide the background information to build a quantitative survey to distribute across the state. The participants were asked to concentrate on their workforce needs related to employees who were managing or participating in EHR design, implementation, connectivity, security, and data analysis as opposed to doctors, nurses and staff who were using computers as a tool to complete a work function, such as data entry of patient information. HIT workers are employed in a number of settings ranging from providers to public health to EHR vendors to consulting companies. The different types of HIT employers targeted for participation in the focus groups are listed in ► Table 2.

Recruitment of the focus group participants consisted of e-mailed flyers and forms sent to potential respondents who fit the stakeholder requirements. The stakeholders were grouped by HIT employer type, but the stakeholders who responded to the recruitment materials ranged from the Chief Information Officer (CIO), to the Office Manager, to the Nurse Informaticist, or other organization-identified appropriate responsible person. Persons interested in participating in a focus group completed a brief registration form (► Fig. 1) and returned it to the Texas HIT Workforce Development Team via email. Focus group sites were found with assistance from local workforce development boards and universities in the selected cities. They also provided assistance with outreach to qualified responders from the targeted HIT employer organizations.

Before the focus group sessions, participants were asked to complete a form (► Fig. 2) gathering demographic data such as the healthcare market or location, the organization type and size, the size of the community, the types of issues HIT employers are facing currently and/or expect to face in the future, and the status of their organization's EHR implementation. An additional question invited initial feedback on the competencies needed for current and future HIT workforce.

The focus group invitation process was a collaborative effort involving many regional stakeholders from multiple organizations. Initially, grant staff contacted each potential collaborator by email or telephone explaining the purpose of the study and describing the ideal responder. After support was garnered, some collaborators shared their email list for invitations while others preferred to keep their contact lists confidential, sending the invitation and registration form to their internal mailing lists. Because of this, an exact number of those invited to participate is unknown, however, we feel confident that a minimum of 20 stakeholders were invited to each focus group. There were 106 total participants in the focus group population. ► Table 3 provides a detailed breakdown of the participants by their profession. The desired number of participants for the 12 focus groups was 144, or an average of 12 people per focus group. A minimum of 20 people per focus group were invited to participate, for an estimated total of 240 invited. The rate of participation in the focus groups was  $106/144 = 74\%$ .

Focus group methods used included face-to-face and online HIT employer meetings. The face-to-face focus group sessions were held in Brownsville, College Station, Dallas, El Paso, Houston, Lubbock, and San Antonio. Additional focus groups were conducted with rural providers and nursing informatics professionals using the web conferencing software Adobe Connect. The focus groups were conducted in relaxed settings in the afternoon and early evening. Participants were notified that the sessions were being recorded and reassured that the recordings would remain confidential, there were no right or wrong answers. Participants were asked to speak one at a time. The recordings were downloaded into a secure online collaborative tool and transcribed. The data was manually analyzed by the Texas HIT Workforce Development Project team using grounded theory.

### 3. Results

An average of five people attended each face-to-face focus group; while the online focus groups had an average attendance of eight people per session. Trends, themes, and patterns emerged from the data gathered. Initially, it was noted that health care providers (clinics and hospitals) and non-providers (public health, insurance, and so on) had similar, but not identical knowledge and skill needs. Within each of these categories the skills were further divided into basic/entry level skills, intermediate skills, and advanced skills. HIT employers often used these words: basic, intermediate, and advanced; to describe different skills or knowledge needed for their HIT workforce.

The basic skills were those one might expect of clerks or other entry-level positions, including understanding medical terminology, basic computer and interpersonal communication skills. Intermediate skills ranged from an understand of EHR “meaningful use” to knowledge of privacy and security regulations to knowledge of HIT vendor products to data report writing to project management skills. Advanced skills were very broad and included standard management and strategic planning skills, with contract negotiation, the ability to use data analytics and the interpersonal skills necessary for interactions with senior administration. HIT employer respondents specified that each level subsumed the lower levels. For example, an advanced HIT worker creating a strategic plan would need to have an understanding of privacy and security regulations to ensure the practicality of the plans. The entire breakout of skills resulting from the focus groups can be found in ► Table 4.

### 4. Discussion

The results outlined in ► Table 4 were the main trends found consistently across the focus groups. The breakout of skills was illuminating, especially in the areas of data management and contract negotiation, areas which might not usually be considered HIT-related. This list of knowledge and skills will serve as the foundation of follow-on work, specifically an HIT employer workforce needs assessment survey to quantify the full-time HIT workforce needed by Texas HIT employers. The need is anticipated to be high. One participant stated “today we have 21 or 22 but we have 5 or 6 open positions out of that, and would like to actually probably hire a couple more, I say a couple more, but probably 4 or 5 more to get us over the meaningful use hump. But there is no point you know, we can’t fill the open positions.”

The focus groups were revealing of the differences and similarities, as well as the challenges in health information technology workforce across the state. Overall, HIT employers are interested in people who can think and learn. As one participant stated, “[The HIT Workforce doesn’t] understand the bigger picture in the interface with the doctor’s office and getting the medication reconciliation for the doctor’s office to the ER, they don’t have that picture.” Yet another said, “The most important thing is their ability to learn. I know that sounds stupid, but honestly that is what I look for when I am hiring anybody, is somebody that can come in and pick up and I can teach them.”

As a rule, HIT employers struggle with the mixed nature of health information technology. One stated, “One of the things you need is a survey of career options split between clinical, or within technology, because there is a lot of gray areas in there, a lot of hybrid,” while others said, “Trying to find the right mix of clinicians versus informatics or IT slanted folks as well because you need both in a perfect world. It is just hard to know what the right balance is.” The clinicians themselves had this feedback “...of not taking that time to actually to truly sit down and understand what the needs are so that you are not hurrying up and throwing in a system and then have a major impact on us doing direct patient care.” Yet another, “So, business process analysis background, process improvement background, and then just understanding how a clinic functions or how an inpatient nursing unit functions enough to say that is a good workflow process or that it is not.” Getting the clinical/technical mix will be very important as the country continues to implement health information technology.

Rural HIT employers shared their unique struggles attracting and retaining qualified HIT staff. One participant said, “Within our IT/ HIT Department specifically we have a lot of trouble just attracting IT talent to a rural area and I see that as becoming a more acute need for rural facilities in particular, just attracting IT talent.” Another rural provider in a different focus group shared this

sentiment saying “For us in the rural area, the problem is there is no HIT workforce. I have my own, but that is strictly by virtue of my husband having the background that he does. But as far as the other locations around here being able to hire someone to do their HIT, there isn’t.”

One of the focus group participants seemed to sum it up best with this, “We have a need for somebody who is probably like a unicorn. I could really use somebody who understands the physician practice and the workflow there, I need somebody who understands the politics, policies and technologies of large healthcare systems and then somebody who can understand when a vendor is feeding us a line or is actually telling us something that could happen.”

## Study Limitations

A major limitation of this study is the restriction of the data collection to a single state within the U.S. Additionally, focus groups were chosen to enable the collection of free-form input from HIT employers; however, the focus group participants were volunteers. It is acknowledged that those who volunteered are probably those who are experiencing the most difficulty with HIT workforce recruitment and retention or those who possess an innate interest in the topic. Participant representation is also a limitation as it is not possible to determine whether the roles and titles of those who did participate are in proportion to or include the full breadth of HIT employers in Texas. Finally, the findings of this work are focused on a particular geographical area at a time of great upheaval in HIT and EHR implementation in the healthcare industry. The findings are valid for a limited time as the field and needs of employers continue to evolve as the technology and government regulations change over time.

## 5. Conclusions

The HIT employer focus groups confirmed that they require a skilled and diverse workforce to effectively implement health information technology across the different provider and related organizations, including public health. They also provided the information needed to build a statewide workforce needs assessment. Apparently, the entire healthcare industry is looking for well-trained employees, sometimes in two fields, who can demonstrate critical thinking. The challenge for educational institutions is now to work with employers to meet those needs in a constantly changing, evolutionary field.

### Clinical Relevance

Providers need to recruit and retain skilled HIT workers to support their use of HIT. These findings will assist them in fully describing the skills and knowledge needed in their organizations.

### Conflicts of Interest

The authors declare that they have no conflicts of interest in the research.

### Protection of Human Subjects

The study was performed in compliance with the World Medical Association Declaration of Helsinki on Ethical Principles for Medical Research Involving Human Subjects, and was reviewed by Texas State University’s Institutional Review Board according to Federal guidelines.

### Acknowledgements

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**XXX HIT Workforce  
Focus Group Registration Form  
Address of Focus Group Here  
City and State Here**

Please fill out the following form and save to your computer. Use one form per attendee. Please ensure the form is returned at least one week before the focus group is to be held. It is important that attendees include their correct e-mail address in order for meeting materials to be sent to the attendee before and after the meeting.

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_ Title: \_\_\_\_\_

Name of Organization: \_\_\_\_\_ City: \_\_\_\_\_

E-mail: \_\_\_\_\_ Phone Number: \_\_\_\_\_ Fax Number: \_\_\_\_\_

Please indicate the type of organization you are representing for the focus group: Academic Medical Center \_\_\_\_\_

Please indicate the size of the community your organization serves: Major Urban-metro area w/population 750,000+ \_\_\_\_\_

Please provide the following information regarding the size of your organization:

Number of Employees: \_\_\_\_\_

Activity Measure: # \_\_\_\_\_ Type \_\_\_\_\_

(For Example: # Hospital Beds; # Discharges; # Patient Visits; # Lives Covered; # EHR Installations)

Please indicate which session you will be attending on July XXth:  5:00 – 6:45 PM  7:00 – 8:45 PM

**Please e-mail completed registration form by XXX to [hitworkforce@xxx](mailto:hitworkforce@xxx).**

For questions regarding registration, please contact XXX (xxx@xxx, XXX-XXX-XXXX). If you register but are unable to attend, please inform us and we can cancel your registration. Request for accommodations for individuals with disabilities should also be sent to XXX at least two weeks before the focus group date.

For questions regarding the focus groups, please contact XXX (xxx@xxx, XXX-XXX-XXXX).

*Sponsored by a Wagner-Peyser Grant  
Supported by the XXX Workforce Commission*

**Fig. 1** Focus Group Registration Form

Market: \_\_\_\_\_ Date: \_\_\_\_\_ Time: \_\_\_\_\_

**HEALTH INFORMATION TECHNOLOGY WORKFORCE**

**PARTICIPANT**

**PRE-FOCUS GROUP INFORMATION SHEET**

1. Name: \_\_\_\_\_ (will only be used to ensure comments during focus group are associated with correct organization type, community size, etc.)

2. Below, please find a table adapted from the Health Information Management Systems Society EMR Adoption Model. Please indicate which stage most closely represents your organization in regards to EMR adoption: \_\_\_\_\_

<b>EMR Adoption Stage</b>	Major ancillaries (lab, Rx, radiology) installed	Clinical data repository; with basic conflict checking	Clinical documentation installed with some level of clinical decision support; some medical imaging installed	Computerized physician order entry (CPOE); clinical decision support with evidence-based medicine protocols	Electronic medication administration with bar coding or radio frequency ID integrated with CPOE and pharmacy	Full MD documentation installed; radiology PACS available via network	Clinical information can be readily shared electronically with all entities within a regional health network
<b>0</b>	No	No	No	No	No	No	No
<b>1</b>	Yes	No	No	No	No	No	No
<b>2</b>	Yes	Yes	No	No	No	No	No
<b>3</b>	Yes	Yes	Yes	No	No	No	No
<b>4</b>	Yes	Yes	Yes	Yes	No	No	No
<b>5</b>	Yes	Yes	Yes	Yes	Yes	No	No
<b>6</b>	Yes	Yes	Yes	Yes	Yes	Yes	No
<b>7</b>	Yes	Yes	Yes	Yes	Yes	Yes	Yes

3. Issues facing your organization's HIT Workforce:

Today: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**Fig. 2** Pre-Focus Group Data Collection Form

Future: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

4. Competencies needed for your organization's HIT workforce:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Fig. 2 Pre-Focus Group Data Collection Form (Continued)



**Table 1** Focus group topic guide; Prost Marketing, Inc., May 2011; Health Information Technology (HIT) Focus Groups

<b>Introduction</b>	<b>Background notes</b>	<ul style="list-style-type: none"> <li>● HIT is where the internet was in the 90's (wild, wild west)</li> <li>● Overall want to understand what Texas employer needs are related to HIT workforce</li> <li>● Likely doing a lot within the HIT industry; working your way through</li> <li>● Want to have the right type of workforce (skills) – now and for the future</li> <li>● Want to have the Right type of training so that employers have employees with the right competencies Foundational work – to make all the computer technology work</li> </ul>
	<b>Purpose of Group</b>	<ul style="list-style-type: none"> <li>● The purpose of this discussion is to learn about your attitudes, needs and desires, perceptions and interests relating to Health IT</li> <li>● Main focus on people whose job is totally concerned with the HIT (example would be network security, systems analyst, data analyst, CIO, health information manager, etc.)</li> <li>● Rather than clinical or other staff (such as front-line physicians, nurses and other therapists) who use health IT as a tool.</li> <li>● End Goal: We Will Be Building A Survey From The Focus Group Information.</li> </ul>
	<b>Ground Rules</b>	<ul style="list-style-type: none"> <li>● One at a time, all participate, no cell phones/pagers</li> <li>● Audio-taping, confidentiality, no right or wrong answers</li> <li>● Independent of group sponsor</li> </ul>
<b>Introduction of Participants</b>	<b>Name and Organization</b>	<ul style="list-style-type: none"> <li>● Job title/function</li> <li>● Length of time in this job</li> <li>● Years working in the field</li> <li>● How you got into field</li> <li>● Brief overview of organization/city/size</li> </ul> <p><u>Where Organization is on Adoption Model</u></p>
	<b>Interest in HIT</b>	
<b>Overview of HIT Industry</b>	<b>Current Trends you see in HIT Workforce within your Organization.</b>	<ul style="list-style-type: none"> <li>● Role of Information Technology within healthcare delivery organizations</li> <li>● How large of a priority within organizations (extremely high to not a priority at all)</li> <li>● Why a priority/not a priority?</li> </ul>
	<b>Frustrations/Barriers</b>	
	<b>How important is</b>	<ul style="list-style-type: none"> <li>● A well-trained workforce capable of developing, implementing, and evaluating health information technology (HIT) in your healthcare related facility. (Description from 2010 Hersh article)                         <ul style="list-style-type: none"> <li>– Extremely important (5)</li> <li>– Somewhat Important (4)</li> <li>– Neutral(3)</li> <li>– Not too important(2)</li> <li>– Not important at all(1)</li> </ul> </li> </ul>
	<b>Needs for the future for the HIT Workforce – general Overview; ask open ended First and then Probe</b>	<ul style="list-style-type: none"> <li>● Immediate</li> <li>● 3–5 years</li> <li>● Long term</li> </ul>
	<b>Current Trends/Comply with</b>	<ul style="list-style-type: none"> <li>● Is your workforce ready?</li> <li>● How will you get ready?</li> <li>● What do you need?</li> </ul>

**Table 1** Continued

HIT Workforce	Description of current Work Force	
	<p><b>Do you currently have HIT Workforce?</b></p>	<ul style="list-style-type: none"> <li>● What types?</li> <li>● How many?</li> <li>● What is their level of competency?</li> <li>● How well have they been trained?</li> <li>● What type of background do they have?</li> </ul> <ul style="list-style-type: none"> <li>● What type of training have they received?                             <ul style="list-style-type: none"> <li>– Training Source:                                     <ul style="list-style-type: none"> <li>Higher Education in HIT</li> <li>Migrate to position within organization</li> <li>Continuing Education</li> <li>On the Job training?</li> </ul> </li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>● What types of HIT workforce (roles or general skill sets) do you need now?                             <ul style="list-style-type: none"> <li>– For each type, how many would you need?</li> <li>– What type of background, either experiential or educational would you expect them to have?</li> <li>– What would be the ideal type of worker instead of a set of skills that would normally require a lot of different workers?</li> </ul> </li> <li>● What can you afford?</li> <li>● Are you experiencing challenges with paying and retaining your HIT workforce?</li> </ul> <ul style="list-style-type: none"> <li>● What types of HIT workforce (roles or general skill sets) do you anticipate needing in 3–5 years?                             <ul style="list-style-type: none"> <li>– For each type, how many would you anticipate needing?</li> </ul> </li> <li>● What type of background, either experiential or educational would you expect them to have?</li> </ul>
	<p><b>Compensation Model</b></p>	<ul style="list-style-type: none"> <li>● How is the compensation model changing?</li> <li>● What is the impact on the use of health information?</li> <li>● Anticipate organizations electronically reporting quality measures or trying to implement population health monitoring would have new HIT workforce needs. From the perspective of their organization.                             <ul style="list-style-type: none"> <li>– Pay for Performance</li> <li>– Use of incentives to be able to perform more (tasks)</li> <li>– Other the Windows</li> </ul> </li> </ul>
<p><b>Target Segments of the Workforce using EHRs – Who are primary Users?</b></p>	<p><b>Clinically focused: Physicians, Nurses, Therapists, Pharmacy, etc.</b></p>	<p>Basic Computer Literacy Skills</p> <ul style="list-style-type: none"> <li>● What types of job titles require these skills?</li> <li>● What are the core competencies needed here?                             <ul style="list-style-type: none"> <li>– Demonstrate basic computer operating procedures such as login the computer and logoff, opening, closure and saving files.</li> <li>– Demonstrate proficiency in operating environment.</li> <li>– Resolve minor technical problems associated with use of computers.</li> <li>– Demonstrate Internet/intranet communication skills.</li> <li>– Access and use a Web browsing application.</li> <li>– Demonstrate use of email, addressing, forwarding, attachments, and netiquette.</li> <li>– Identify and use icons, windows, and menus.</li> </ul> </li> </ul>

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**Table 1** Continued

<p><b>Target Segments of the Workforce using EHRs – Who are primary Users?</b></p>	<p><b>Clinically focused: Physicians, Nurses, Therapists, Pharmacy, etc.</b></p>	<p>Health Informatics skills using EHRs</p> <ul style="list-style-type: none"> <li>● What types of job titles require these skills?</li> <li>● What are the core competencies needed here?                             <ul style="list-style-type: none"> <li>– Create and update documents within the electronic health record (EHR) and the personal health record (PHR).</li> <li>– Locate and retrieve information in the electronic health record for various purposes.</li> <li>– Perform data entry of narrative information.</li> <li>– Locate and retrieve information from a variety of electronic sources.</li> <li>– Know the policies and procedures related to populating and using the health data content within primary and secondary health data sources and databases.</li> <li>– Apply appropriate documentation management principles to ensure data quality and integrity.</li> <li>– Use software applications to generate reports.</li> <li>– Know and apply appropriate methods to ensure the authenticity of health data entries in electronic information systems.</li> <li>– Use electronic tools and applications for scheduling patients.</li> </ul> </li> </ul>
<p><b>Administrative Personnel, Human Resources, Clerical Staff, Data Analysts, Public Health Workers, Emergency Medical Personnel, Medical Assistants, Dietary Workers, Lab or Radiology Techs, Nurse Aids....</b></p>		<p>Basic Computer Literacy Sills</p> <ul style="list-style-type: none"> <li>● What types of job titles require these skills?</li> <li>● What are the core competencies needed here?                             <ul style="list-style-type: none"> <li>– Demonstrate basic computer operating procedures such as login the computer and logoff, opening, closure and saving files.</li> <li>– Demonstrate proficiency in the Windows operating environment.</li> <li>– Resolve minor technical problems associated with use of computers.</li> <li>– Demonstrate Internet/intranet communication skills.</li> <li>– Access and use a Web browsing application.</li> <li>– Demonstrate use of email, addressing, forwarding, attachments, and netiquette.</li> <li>– Identify and use icons, windows, and menus.</li> </ul> </li> </ul> <p>Health Informatics Skills Using EHRs</p> <ul style="list-style-type: none"> <li>● What types of job titles require these skills?</li> <li>● What are the core competencies needed here?                             <ul style="list-style-type: none"> <li>– Create and update documents within the electronic health record (EHR) and the personal health record (PHR).</li> <li>– Locate and retrieve information in the electronic health record for various purposes.</li> <li>– Perform data entry of narrative information.</li> <li>– Locate and retrieve information from a variety of electronic sources.</li> <li>– Know the policies and procedures related to populating and using the health data content within primary and secondary health data sources and databases.</li> <li>– Apply appropriate documentation management principles to ensure data quality and integrity.</li> <li>– Use software applications to generate reports.</li> <li>– Know and apply appropriate methods to ensure the authenticity of health data entries in electronic information systems.</li> <li>– Use electronic tools and applications for scheduling patients.</li> </ul> </li> </ul>

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**Table 1** Continued

Final Comments	What other Issues or Topics do we need to cover related to HIT Workforce Development?	
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HIT Resources:  
 EHR Meaningful Use (NEJM article):  
<http://healthpolicyandreform.nejm.org/?p=3732>;  
 Accountable Care Organizations:  
<http://www.aha.org/aha/content/2010/pdf/09-26-2010-Res-Synth-Rep.pdf>;  
 Implementation of ICD-10:  
<http://www.cms.gov/apps/media/press/factsheet.asp?Counter=3407&intNumPerPage=10&checkDate=&checkKey=2&srchType=2&numDays=0&srchOpt=0&srchData=icd%2D10&keywordType=All&chkNewsType=6&intPage=&showAll=1&pYear=&year=0&desc=&cboOrder=date>  
 Health information exchange:  
<http://healthit.hhs.gov/portal/server.pt?open=512&objID=1488&mode=2>;  
 Affordable Care Act:  
<http://www.healthcare.gov/law/introduction/index.html>;  
 Patient-Centered Medical Home:  
<http://www.pcpc.net/patient-centered-medical-home>  
 Immediate – next 1–3 years

HIT Employer Populations
Independent and group physician practices
Information technology and software companies
Healthcare consulting companies
Health plans and clearinghouses
State and local government, especially public health
Rural hospitals
Skilled nursing facilities & long term care facilities
Ambulatory clinics
Mid-sized hospitals
Large hospital systems
Clinical laboratories
State & local government
Home health
Nursing Informatics
Military and VA

**Table 2** HIT employer populations targeted

**Table 3** Focus group population categorized by profession

C-Suite	Healthcare Director/ Manager	Coordinator/ Administrator	Clinical	Financial	H/IT	Education	Other
13 (12%)	43 (40.5%)	3 (3%)	3 (3%)	2 (2%)	14 (14%)	26 (24.5%)	2 (2%)

**Table 4** Focus group identified skills necessary for future workforce

Skills	Health Care Provider Core Competencies	Non-Provider Core Competencies
<b>Basic/Entry Level</b>	Operational medical terminology knowledge	Customer service, communication and interpersonal skills, training
	Basic desktop/computer skills, computer/internet navigation	
	Understanding of how patient information should flow in clinical settings	
<b>Intermediate</b>	Knowledge of HIT products, familiarity with vendors, ability to negotiate contracts	Knowledge of HIT products, familiarity with vendors, able to negotiate contracts
	Knowledge of HIPAA, state privacy and security regulations	Knowledge of data management, data mining and data sharing
	Understand "Meaningful Use" and which HIT system can produce the data needed for demonstrating compliance	
	Problem solving and critical thinking skills needed to implement and use HIT systems (such as flowcharting, Root Cause Analysis and examining existing assumptions and evaluating evidence)	
	Advanced clinical knowledge and understanding of uses of HIT for patient management/education needs	
	Data management, data mining/report creation, and data sharing skill	
	Project management (such as initiating, planning, executing, and monitoring EHR/HIT-related projects)	Understand "Meaningful Use" and which HIT system can produce the data needed for demonstrating compliance
<b>Advanced</b>	Management skills to direct technical and non-technical staff re: EHR/HIT systems	Strategic planning and analysis skills Database system and design
	Strategic thinking related to EHR/HIT implementation/management that is supportive of organization goals and mission	HIT systems implementation and management Software/hardware engineering
	Ability to effectively interact with senior management and above in HIT governance	
	Ability to use analytics/data from HIT systems for planning	
	Financial decision-making and negotiating skills: for selecting HIT system purchases and maintenance plans that meet external and internal goals/resources	
	Ability to design HIT databases and systems HIT software/hardware engineering, development and/or system maintenance	

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