



**A National Job Analysis Study of the  
Certified Healthcare Technology Specialist  
Clinician/Practitioner Consultant Role  
2016**

**Conducted for:**

**American Health Information Management Association**

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## Executive Summary

The Job Analysis described in this report was conducted in 2016 at the request of the American Health Information Management Association (AHIMA). The purpose of the study was to describe the job activities of the healthcare technology specialist in a Clinician/Practitioner Consultant Role in sufficient detail to provide a basis for the development of a professional, job-related certification examination.

A Job Analysis Advisory Committee (AC) was appointed by AHIMA to conduct the activities necessary to identify job responsibilities and develop the test specifications for the Certified in Healthcare Technology Specialist - Clinician/Practitioner Consultant (CHTS-CP) examination. The AC represented varied national regions and practice settings. All AC members were experts in the duties and activities associated with the profession.

The study involved developing a job task list and survey, distributing the survey, and analyzing the survey responses. Test specifications for the CHTS-CP examination were developed based on survey responses. The AC was responsible for the following functions regarding Job Analysis survey development:

- developing a sampling plan for the survey,
- identifying task statements for the survey instrument,
- determining the survey rating scales,
- determining the relevant demographic variables of interest, and
- integrating tasks, rating scales, and demographics into a survey instrument.

AMP, a PSI business (PSI/AMP) project staff modified and created an online survey for distribution to a sample of healthcare technology specialists. The target professional was defined as follows:

*CHTS Clinician/Practitioner Consultant Role:*

*This role brings to bear the background and experience of a clinical professional in a healthcare setting. Workers in this role will:*

- *Suggest solutions for health IT implementation problems in healthcare settings*
- *Address workflow and data collection issues from a clinical perspective, including quality measurement and improvement*
- *Assist in selection of vendors and software*
- *Advocate for users' needs; acting as a liaison between users, IT staff, and vendors.*

Hyperlinks to a web-based survey were distributed by electronic mail to 1,333 healthcare technology specialists, with 32 survey invitations returned as undeliverable. Three hundred forty nine (349) participants responded and provided usable responses to be included in the analysis, which resulted in an overall return rate of 27%. After a demographic section, respondents were routed to either one or up to all four specialist role surveys, depending on their choice. There were a total of 213 respondents who completed the CHTS Manager Role survey, 109 respondents completed the CHTS Technical Role survey, 105 respondents completed the CHTS Trainer Role survey, and 75 respondents completed the Clinician/Practitioner Consultant Role survey. The

results from the 75 CHTS Clinician/Practitioner Consultant Role respondents are presented in this summary. The results from the three other specialist role surveys are also reported but documented elsewhere. Responses to the demographic questions indicated that there were sufficient numbers from relevant groups for subsequent analyses.

Survey data were presented to the AC at the second job analysis meeting for review and comment. The survey was divided into three parts – Task Inventory, Knowledge/Skill Inventory, and Background Information sections. The Task Inventory consisted of five major areas:

1. Implementation/Optimization of EHR systems
2. EHR policies and procedures
3. Workflow problems
4. Communication and Coordination
5. User interface

The AC developed and used exclusion decision rules to identify tasks appropriate for the examination content outline. Of the 39 tasks on the original survey, no tasks were excluded based on the following exclusion criteria.

- Rule 1 Keep only tasks performed by 71.5% or more of respondents.  
Applying this rule did not eliminate any tasks.*
- Rule 2 Keep only tasks rated at least Significant (2.00) by respondents.  
Applying this rule did not eliminate any additional tasks.*
- Rule 3 Keep only tasks rated at least Significant (1.90) by 3 out of 4 region subgroups (Northeast, Midwest, South, and West).  
Applying this rule did not eliminate any additional tasks.*
- Rule 4 Keep only tasks rated at least Significant (1.90) by 3 out of 3 years of experience in health IT workforce roles subgroups (0-5 years; 6-16 years; and more than 17 years).  
Applying this rule did not eliminate any additional tasks.*
- Rule 5 Keep only tasks rated at least Significant (1.90) by 2 out of 3 levels of education (High school graduate, GED, or associates degree; Bachelor's degree; Master's and above).  
Applying this rule did not eliminate any additional tasks.*
- Rule 6 Keep only tasks rated at least Significant (1.85) by 6 out of 6 certifications held subgroups (CP, IM, IS, PW, TR, and TS).  
Applying this rule did not eliminate any additional tasks.*
- Rule 7 Keep only tasks rated at least Significant (1.85) by 3 out of 4 job title subgroups (Director/Executive; Manager; Technical; and Other).  
Applying this rule did not eliminate any additional tasks.*
- Rule 8 Keep only tasks rated at least Significant (1.85) by 2 out of 3 number of employees subgroups. (Less than 100; Between 101 and 1,000; and More than 1,000).  
Applying this rule did not eliminate any additional tasks.*

In summary, the decision rules resulted in identifying tasks comprising the content domain that were performed by 71.5% of the respondents. Also, the tasks identified were considered at least significant by the respondents. Finally, the tasks were viewed similarly regardless of the location, years of work experience, highest level of education, certifications held, primary job level, and number of employees.

The AC also developed and used exclusion decision rules to identify knowledge/skill statements appropriate as supplemental information on the examination content outline. The Knowledge/Skill Inventory consisted of four major areas:

1. Technical Knowledge: Health Data Management
2. Technical Knowledge: Health Information Technology & Systems
3. Non-Technical Knowledge: Hard Skills
4. Non-Technical Knowledge: Soft Skills

Of the 80 knowledge/skill statements on the original survey, 4 statements were excluded based on the following exclusion criterion.

*Rule 1 Keep only tasks rated at least Significant (1.70) by respondents.*

Applying this rule eliminated four statements (K17: General hardware maintenance; K32: Servers; K45: Ergonomics; K50: Inferential statistics).

One purpose of the knowledge/skill statements is to provide guidance to the item writers/exam committee. As such, the AC assigned priority designations (low, medium, or high) to each knowledge/skill statement to provide some additional detail on the level of emphasis for each statement.

The AC reviewed and considered all respondent comments. No additional tasks or knowledge statements were added or removed. One task and one knowledge statement was slightly edited before final inclusion. The final 39 tasks comprising the content domain were used to construct the detailed content outline, consisting of five major content areas. The AC members assigned cognitive complexity designations to each critical task according to their perceptions of job conduct. Items linked to these tasks should closely align with the complexities of the job. The AC members were confident candidates' scores should reflect critical job content and complexity when tests are developed to the new set of specifications. It was decided that a 100-item examination sufficiently samples the content domain to render a pass or fail decision based on examination scores. The resulting examination matrix and detailed content outline will be used by AHIMA to assemble future examination forms.

## Introduction

The Job Analysis described in this report was conducted in 2016 at the request of the American Health Information Management Association (AHIMA). The purpose of the study was to describe the job activities of the healthcare technology specialist in a Clinician/Practitioner Consultant Role in sufficient detail to provide a basis for the development of a professional, job-related certification examination.

A Job Analysis Advisory Committee (AC) was appointed by AHIMA to conduct the activities necessary to identify job responsibilities and develop the test specifications for the Certified in Healthcare Technology Specialist - Clinician/Practitioner Consultant (CHTS-CP) examination.

The AC developed a comprehensive inventory of activities that the healthcare technology specialist in a Clinician/Practitioner Consultant Role may perform by brainstorming job activities and reviewing both the current detailed content outline and the previous Job Analysis study. In addition, demographic variables were developed, and a rating scale was selected for use on the survey. After pilot testing, the Job Analysis survey was distributed to 1,333 healthcare technology specialists. The returned surveys were analyzed to determine the significance of each task to the healthcare technology specialist in a Clinician/Practitioner Consultant Role.

Job Analysis survey data were evaluated to determine the degree of consensus among professionals on critical aspects of the job. Data were specifically analyzed to answer the following questions:

1. What percentage of professionals performs each job task?
2. Which tasks are more significant to the job?
3. Which knowledge/skill statements are more significant to the job?

These questions helped identify the more significant job activities and knowledge from which the content of the CHTS-CP examination was specified.

## Methodology

### Forming the Job Analysis Advisory Committee

The AC was consulted throughout the survey development stages to ensure that expert judgment was available to AMP staff. The responsibilities of the AC are listed in the following section. The members of the AC were experienced professionals, all thoroughly familiar with the skills and activities of the profession. Listed below are the AC members.

Name	Credentials	Organization
Valerie Ball	IS	NC State University College of Veterinary Medicine
Tammie Bolling	TR	Pellissippi State Community College
Cynthia Buege	IM	Michigan Public Health Institute
Tamara Flynn	IM	Pitt Community College
Paula Arceneaux Ivey	IM	Hospital Corporation of America - Gulf Coast Division
Diane Lerch	PW, TR	Tampa General Hospital
Daphnie Mustafa	IM	Inova Health System
Geri Newman	IM	UF Health Shands Hospital
Issac Perkins	IM	Johns Hopkins EPIC Training
Tamara Rodriguez	PW	Tallahassee Memorial Healthcare
Nancy Rosivack	IM, IS, PW, TR	NJ-HITEC
LaShunda Smith	IM, PW, TR	Baptist Health
Tatyana Pashnyak	TR	Bainbridge State College
Shelley Safian		Safian Communications Svs. Inc.
Tanya Scott	CP, PW	Lemont Scott Group
Melinda Teel		Midland College

### Job Analysis Advisory Committee Responsibilities

1. Provide PSI/AMP current information about the job.
2. Develop the Job Analysis survey:
  - a. develop a sampling plan,
  - b. identify tasks for the survey instrument,
  - c. determine the survey rating scales,
  - d. determine the relevant demographic variables of interest, and
  - e. integrate the definition, tasks, rating scales, and demographics into a survey instrument.
3. Review the final form of the survey for completeness, relevance to the profession, appropriate language, and clarity of instructions.

A significant investment of time by the AC members ensured a successful Job Analysis study. We are grateful to each of these professionals for their guidance, expertise, and devotion to this complex project.

## **Developing the Job Analysis Survey**

### ***Developing the Task List***

With the assistance of PSI/AMP project staff, the AC drafted an inventory containing a comprehensive list of job activities. The task list was drafted from various sources, including the previous test specifications and other descriptions of the healthcare technology specialists in a Clinician/Practitioner Consultant Role. The final document consisted of 39 tasks presented in content order.

### ***Selecting Rating Scales***

The AC also assisted in the selection of the rating scale used in the survey. The scale was based on similar scales used by PSI/AMP in previous national job analysis surveys by other professions. A significance scale, including a "not applicable for my role" data point, was selected by the AC to include on the survey for the tasks.

The scale was designed to identify the job activities that are most significant to achieving the healthcare technology specialist in a Clinician/Practitioner Consultant Roles' job objectives. Such information was necessary to demonstrate that the examination measures significant aspects of the job and covers appropriate content. The following scale was used:

**Please use the scale shown below to express your judgment of the significance of each task as it applies to your current role in the health IT workforce.**

- 0 = Not applicable for my role
- 1 = Minimally significant
- 2 = Significant
- 3 = Very significant

### ***Selecting Background Information Questions***

The Background Information section was designed to gather information about the respondents' demographic characteristics. Demographic questions were used to help the AC evaluate potential bias in the respondent group. Therefore, the following information about the survey respondents was available:

- work location
- facility setting
- primary job level category
- years of relevant work experience
- highest level of education
- whether education included healthcare/medicine or IT
- hold the CHTS credential
- years holding the CHTS credential

- which of the CHTS credentials held
- other certifications held
- licenses held
- primary work setting
- number of employees in your organization
- age
- gender

Region, years of work experience, level of education, additional certifications held, primary job level, and number of employees were used to identify subgroups for analyses and to describe the sample.

### ***Integrating the Definition, Tasks, Rating Scales, and Demographics into a Survey***

Following the first AC meeting, survey components were compiled into draft form. The draft survey was reviewed by the AC. The pilot survey was distributed to all AC members and a sample of potential participants for review and comment. The purpose of the pilot study was to determine (1) if the directions were clear, (2) if any important tasks were missing from the survey, (3) if the tasks were clearly worded, and (4) if the rating scale was easy to use and understand. The AC also reviewed comments from the pilot study participants. Any needed modifications to the survey were made prior to distribution. The final survey is shown in Appendix A.

### **Sample Selection**

In an effort to obtain information from respondents who represented professionals throughout the United States and other countries, 1,333 surveys were e-mailed to the certified healthcare technology specialists by PSI/AMP. This group of names was selected by AHIMA, and represented a target sample of the population of the healthcare technology specialists.

## Results

### Return Rate and Sample Size

Hyperlinks to a web-based survey were distributed by electronic mail to 1,333 healthcare technology specialists, with 32 survey invitations returned as undeliverable and 0 opted out. Three hundred forty-nine (349) participants responded and provided usable responses to be included in the analysis, which resulted in an overall return rate of 26.8%. After a demographic section, respondents were routed to either one or up to all four specialist role surveys, depending on their choice. There were a total of 213 respondents who completed the CHTS Manager Role survey, 109 respondents completed the CHTS Technical Role survey, 105 respondents completed the CHTS Trainer Role survey, and 75 respondents completed the Clinician/Practitioner Consultant Role survey. Table 1 below shows the summary of survey invitations sent and response rate. The results from the 75 CHTS Clinician/Practitioner Consultant Role respondents are presented in this report. The results from the three other specialist role surveys were reported and documented elsewhere. Responses to the demographic questions indicated that there were sufficient numbers from relevant groups for subsequent analyses.

A general approach was incorporated to evaluate the standard error of the ratings. An approximate standard error was used for the rating scale by applying the equation:

$$\text{Standard error} = 1/\sqrt{75}, \text{ where } 75 = \text{sample size}$$

The resulting standard error of the ratings was 0.115. This indicates that ratings were highly stable, and reflective of the population of professionals.

**Table 1. Response Rate Summary**

	Credential	No. Sent
	Clinician/Practitioner (CHTS-CP)	169
	Implementation Manager (CHTS-IM)	292
	Implementation Support Specialist (CHTS-IS)	167
	Practice Workflow and Information Management Redesign Specialist (CHTS-PW)	360
	Trainer (CHTS-TR)	228
	Technical/Software Support Staff (CHTS-TS)	117
	<b>Total Invitations Sent</b>	<b>1,333</b>
	Undeliverable	32
	Opt-out	0
	<b>Valid Overall Response</b>	<b>349</b>
	<b>Overall Response Rate</b>	<b>26.8%</b>
	# who responded to Management Role survey	213
	# who responded to Technical Role survey	109
	# who responded to Trainer Role survey	105
	# who responded to the Clinician/Practitioner Consultant survey	75

## Task and Respondent Rating Reliability Estimates

To find the extent to which *tasks* were consistently rated within each survey section, a statistic known as coefficient alpha (Norusis, 1994, p. 204; Hopkins, Stanley & Hopkins, 1990, p. 133-134) was used. Coefficient alpha is an estimate of the amount of error reflected by the scores associated with the instrument. Higher estimate values (e.g., .90 or higher) reflect smaller amounts of error. To determine the extent to which the *respondents* were consistent in rating inventory activities, a statistic known as the intraclass correlation (Guilford, 1956) was used. Separate reliability estimates were calculated for content areas and are displayed in Table 2. Since the maximum reliability coefficient is represented by a value of 1.00 and the total reliability estimate for the whole task list was 0.97 (alpha) and 0.89 (intraclass), the respondents' task ratings were considered highly reliable. Based on these data, it is very likely that a different sample from the same population would have produced similar task ratings.

**Table 2. Task and Respondent Rating Reliability Estimates**

Survey Section	Reliability (consistency)			
	# of Tasks	Between Tasks (Coefficient Alpha)	Between Respondents (Intraclass Correlation)	Number of Respondents*
1. Implementation/Optimization of EHR systems	13	0.942	0.905	73
2. EHR policies and procedures	6	0.899	0.854	73
3. Workflow problems	8	0.934	0.876	71
4. Communication and Coordination	8	0.871	0.918	73
5. User interface	4	0.908	0.821	74
Total	<b>39</b>	<b>0.972</b>	<b>0.891</b>	<b>68</b>

\*Only those who responded to every task in each section with a rating of 0 to 3 were included for these analyses.

## Demographic Analyses

The following figures and tables present background information collected from the respondents (also see Appendix B). These demographic data helped describe the sample.

A typical respondent is described below:

- Works in the South of the U.S.
- Facility is in an urban setting
- Works in a hospital setting
- Describes their primary job level category as director/officer
- Holds the CP and/or PW certification
- Has 14 years of relevant work experience
- Holds a Baccalaureate or Master's degree
- Education included both healthcare/medicine and information technology
- Has held the CHTS credential for 3 years
- Also holds the RHIA and/or the RHIT credential
- Has between 101 and 1,000 employees in their organization
- Female over the age of 40

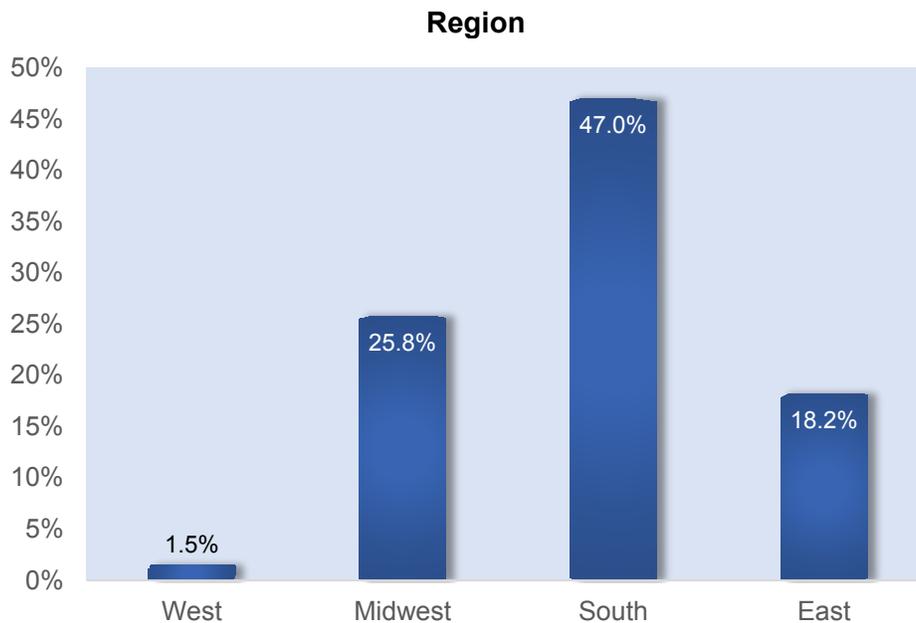


Figure 1. Location (recoded into Region) (n=69)

Survey respondents were first asked to indicate the location in which they work. As shown in *Figure 1*, the respondents were distributed across the U.S. The largest group (47.0%) of respondents was from the South. This demographic variable was used to create subgroups for task analysis (see Appendix F).

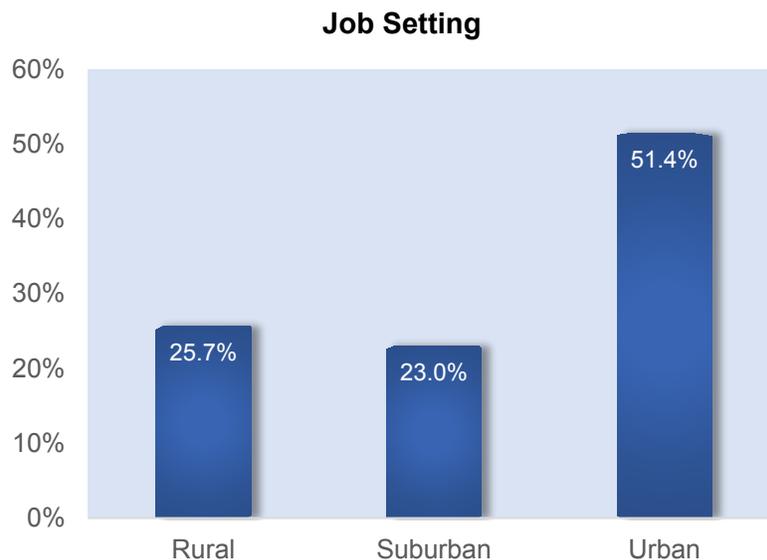


Figure 2. Job Setting (n=74)

*Figure 2* shows the job setting respondents held. Approximately half (51.4%) of the respondents reported they worked in an urban setting, while 25.7% reported a rural setting.

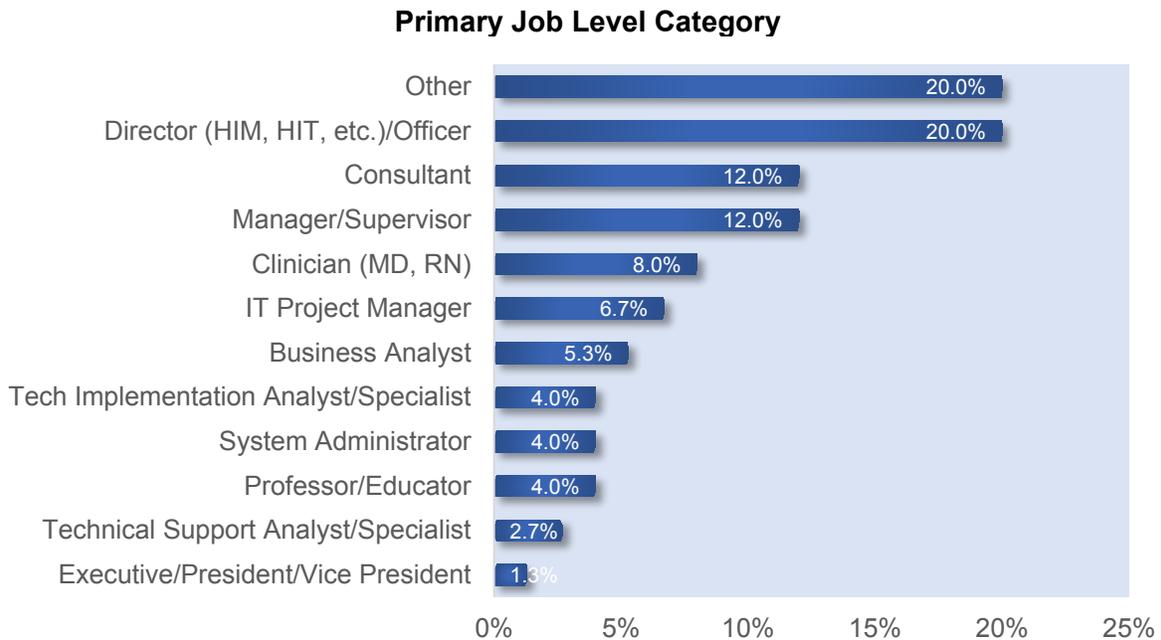


Figure 3. Primary Job Level Category (n=75)

Figure 3 shows the primary job level categories that respondents described themselves. The largest groups described themselves as a Director/Officer (20.0%). This demographic variable was used to create subgroups for task analysis (see Appendix J).

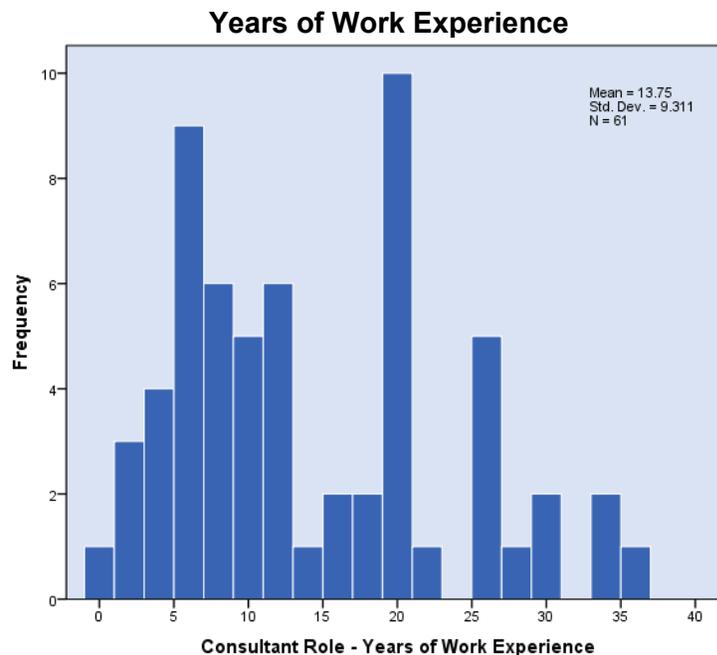


Figure 4. Years of Work Experience (n=61)

Figure 4 shows the years of work experience held by the respondents. This demographic variable was used to create subgroups for task analysis (see Appendix G). The average years of experience among the respondents was 14 years.

### Highest Level of Education

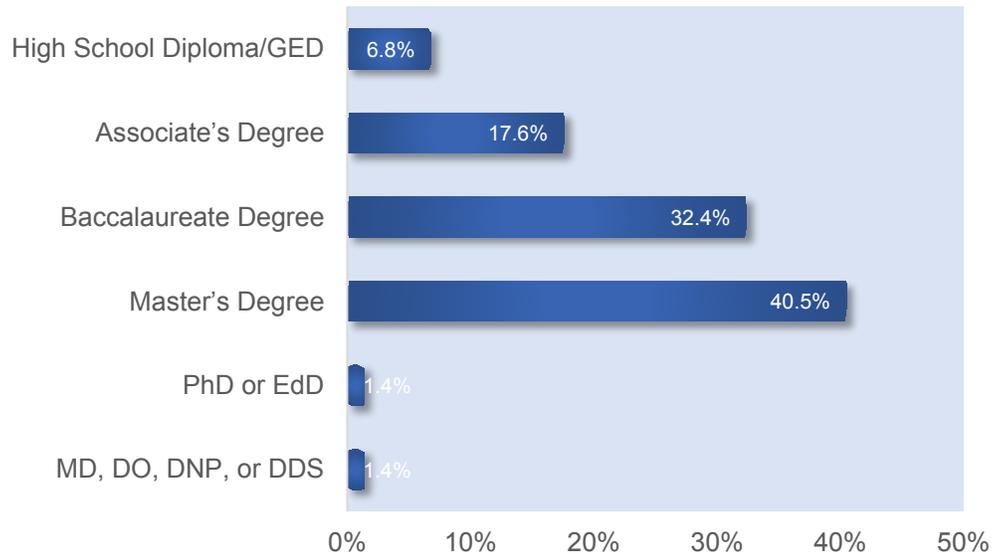


Figure 5. Highest Level of Education (n=74)

Figure 5 shows the highest level of education that was achieved by the respondents. A majority (72.9%) hold either a Baccalaureate or Master's degree. This demographic variable was used to create subgroups for task analysis (see Appendix H).

### Educational Experience

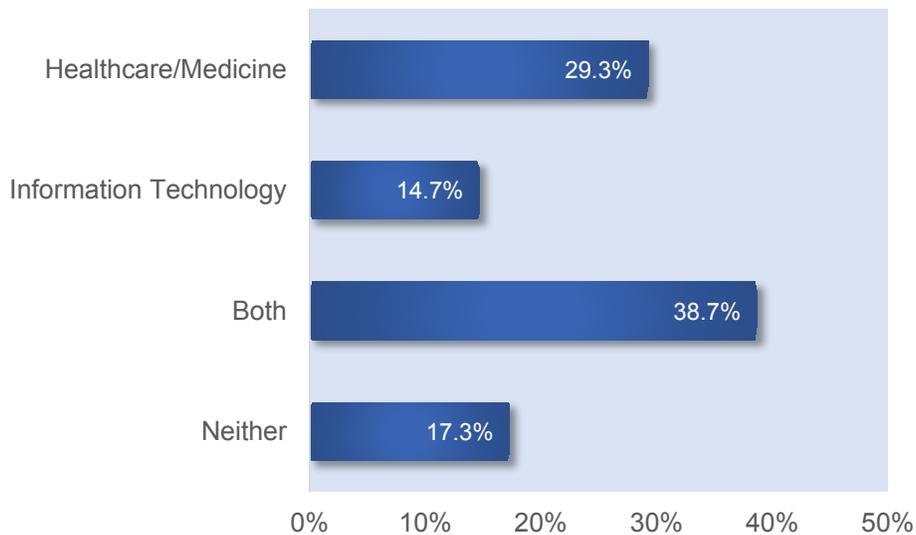


Figure 6. Educational Experience (n=75)

In Figure 6, survey respondents were asked to indicate whether their educational experience included healthcare/medicine or information technology. More than a third (38.7%) of the respondents indicated that they have experience in both Healthcare/Medicine and Information Technology.

### Hold the CHTS Credential

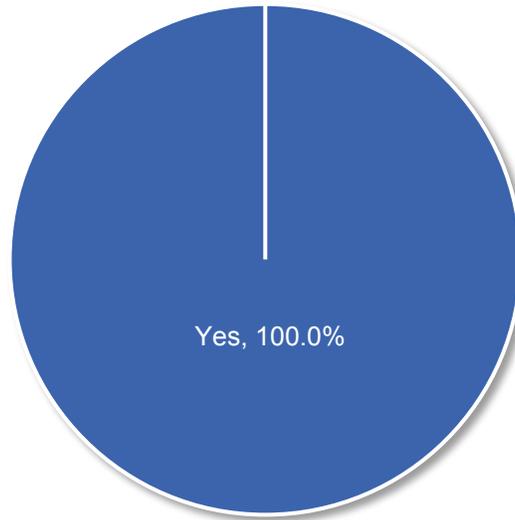


Figure 7. Hold the CHTS Credential (n=75)

In *Figure 7*, survey respondents were asked to indicate whether they hold the CHTS credential. All (100.0%) of the respondents hold a CHTS credential.

### Years Held the CHTS Credential

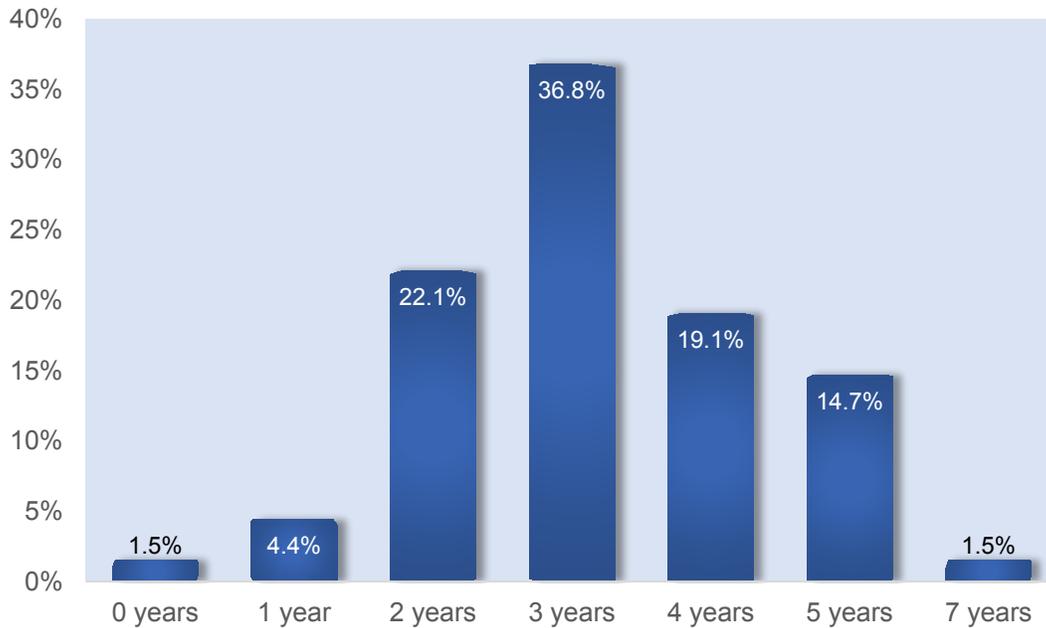


Figure 8. Years held the CHTS Credential (n=68)

*Figure 8* shows that most respondents have held the CHTS credential between 2 and 5 years. The average length of time holding the CHTS credential is 3.2 years.

### CHTS Credentials Held

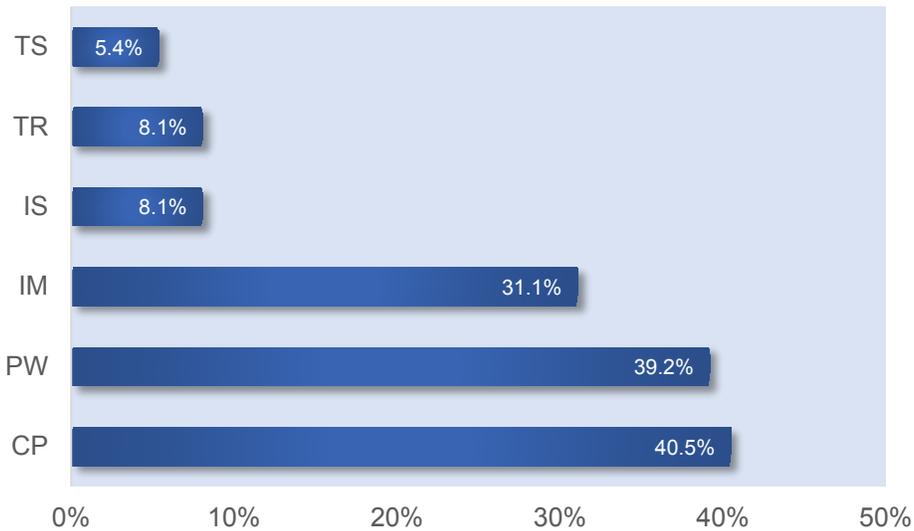


Figure 9. CHTS Credentials Held (n=74)

Figure 9 shows that most respondents held the Implementation Manager (IM), the Practice Workflow and Information Management Redesign Specialist (PW), and/or the Clinician/Practitioner Consultant (CP) credential. This was a select all that apply variable. This demographic variable was used to create subgroups for task analysis (see Appendix I).

### Other Credentials Held

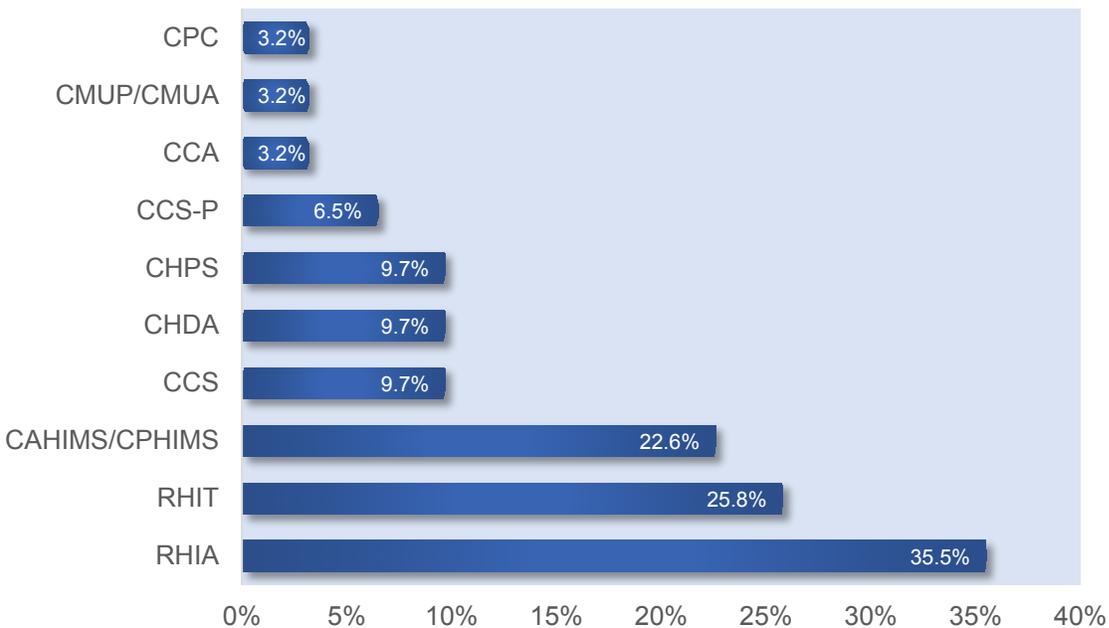


Figure 10. Other Credentials Held (n=31)

Survey respondents were asked about other credentials they may hold. Figure 10 shows that over a third (35.5%) of the sample also held the RHIA credential while a quarter (25.8%) held the RHIT credential. This was a select all that apply variable.

### Licenses Held

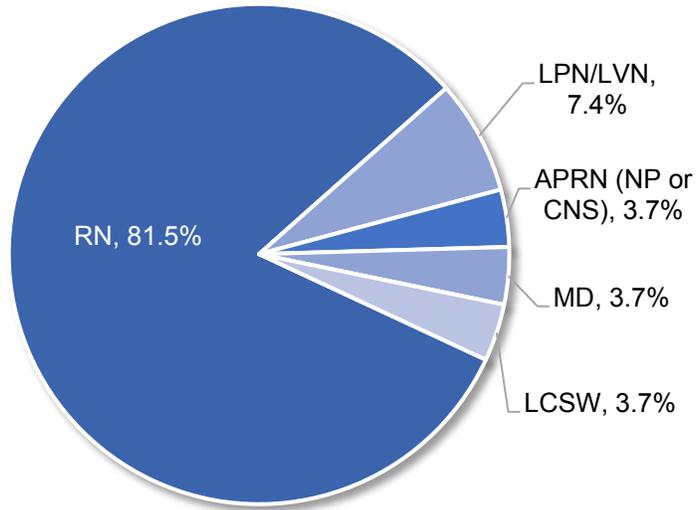


Figure 11. Licenses Held (n=27)

Figure 11 shows that 27 respondents held a license; most (81.5%) held the RN license.

### Primary Work Setting

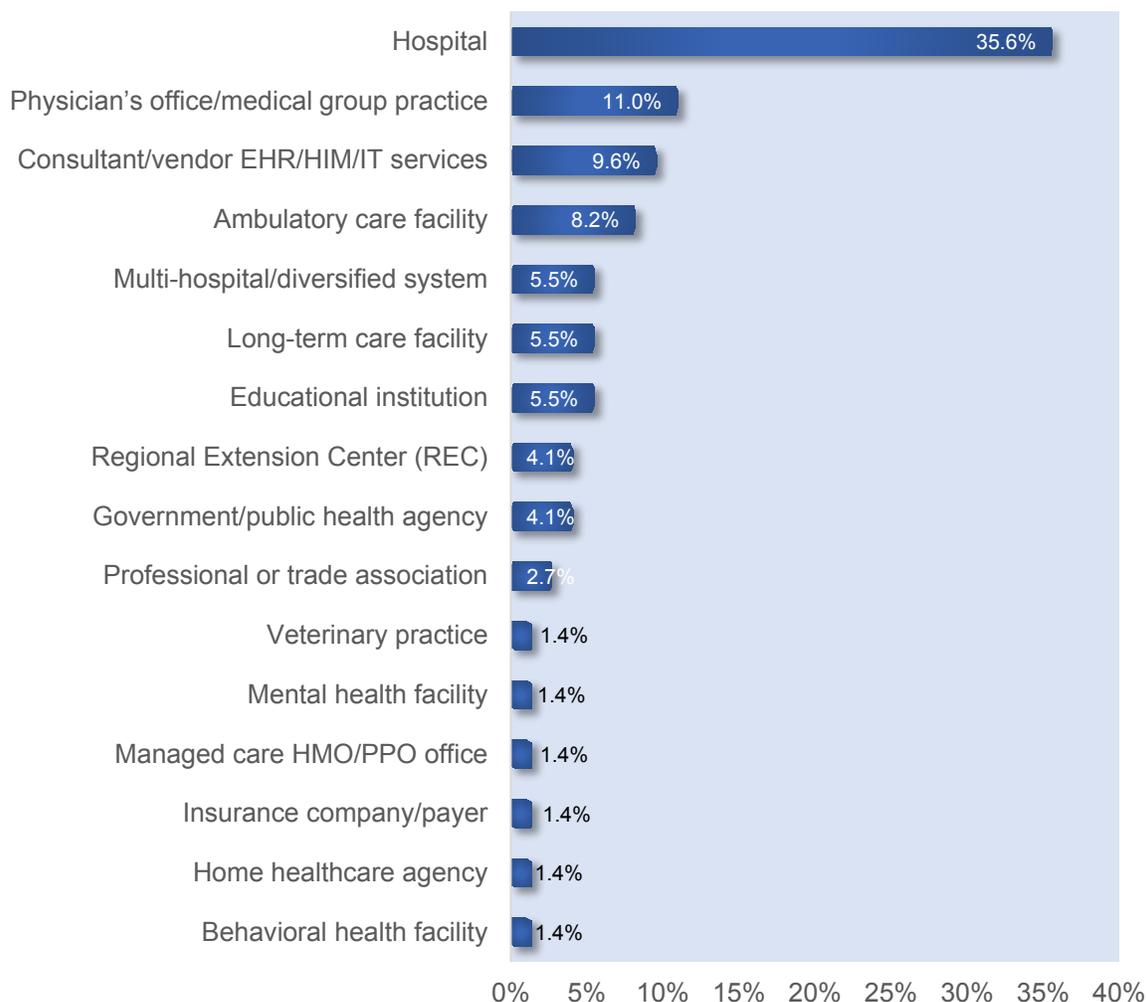


Figure 12. Primary Work Setting (n=73)

The respondents were asked the following question: “Which of the following best describes your primary work setting?” Figure 12 shows that the majority (35.6%) of respondents describes their work environment as a hospital.

### Number of Employees in Organization

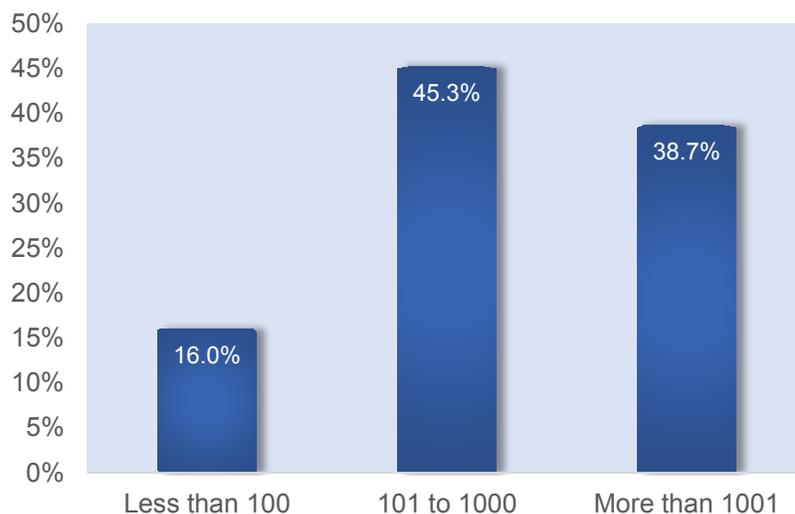


Figure 13. Number of Employees in Organization (n=75)

Figure 13 shows that the majority (45.3%) of respondents work in organizations with between 101 and 1,000 employees. This demographic variable was used to create subgroups for task analysis (see Appendix K).

### Age of Respondents

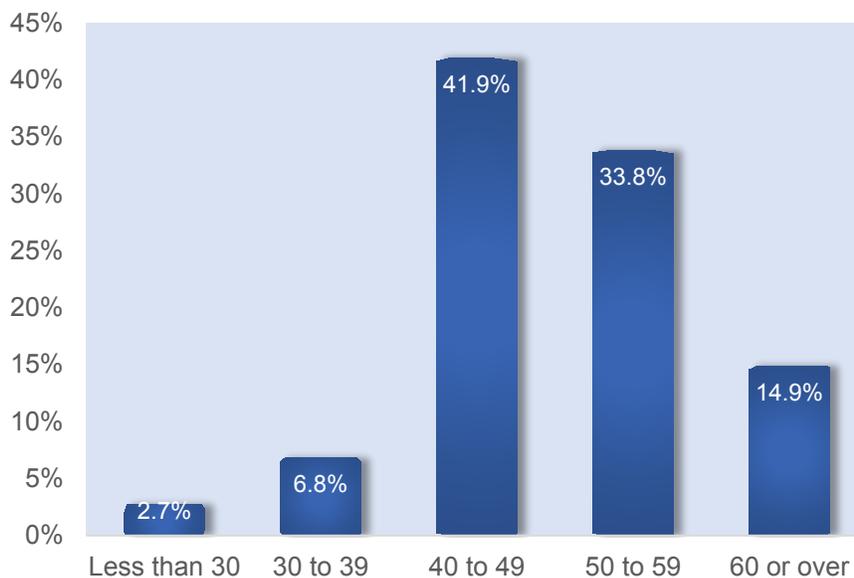


Figure 14. Age of Respondents (n=74)

Figure 14 shows that the majority (75.7%) of respondents are between the ages of 40 and 59.

### Gender of Respondents

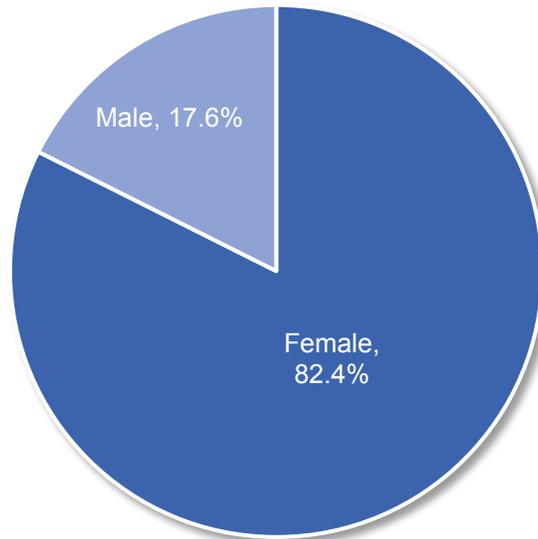


Figure 15. Gender of Respondents (n=74)

Figure 15 shows that most (82.4%) respondents were female.

### Percent of Time Spent

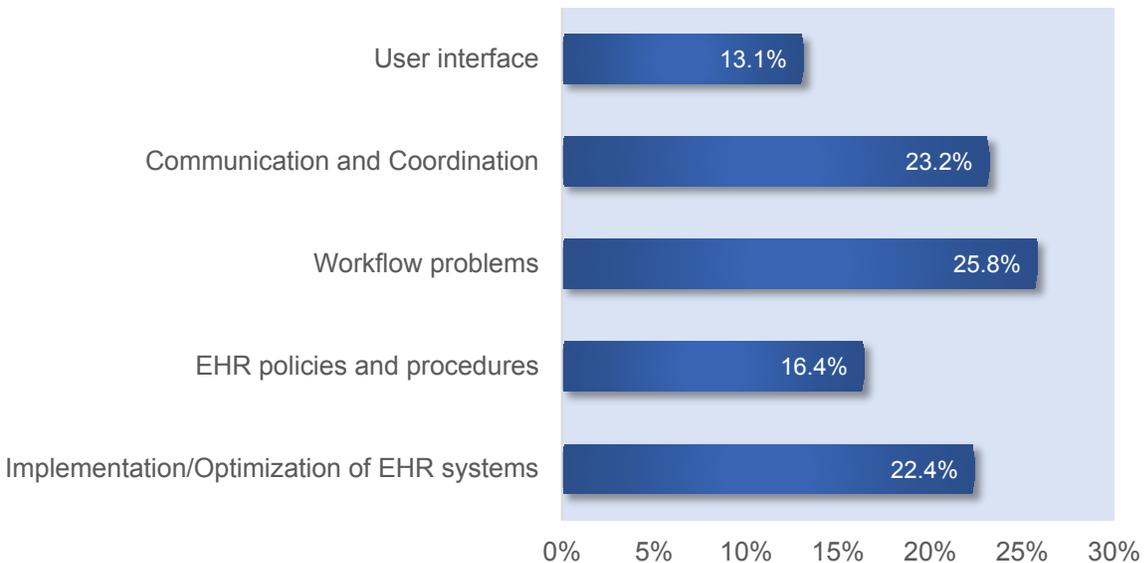


Figure 16. Percent of Time Spent

At the end of the survey, survey respondents were asked to indicate the percent of their time spent in different roles. As shown in Figure 16, respondents reported spending most (71.4%) of their time in communication and coordination, workflow problems, and implementation/optimization of EHR systems.

Respondents were asked to what extent they thought the task and knowledge/skill inventory adequately covered the important job tasks and required knowledge in their role. *Figure 17* below shows that nearly all (95.9%) respondents stated that the task inventory adequately or completely covered the essential job tasks. *Figure 18* shows that nearly all (98.7%) respondents felt that the Knowledge/Skill inventory adequately covered all knowledge requirements that underlie essential job tasks.

### Task Inventory Adequacy

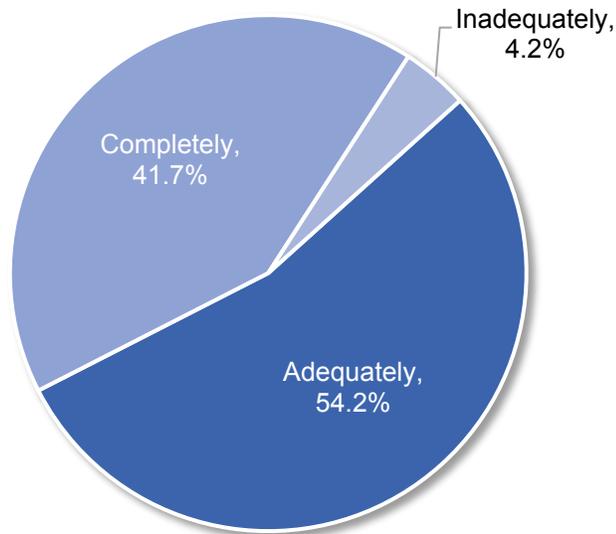


Figure 17. Task Inventory Adequacy (n=72)

### Knowledge/Skill Inventory Adequacy

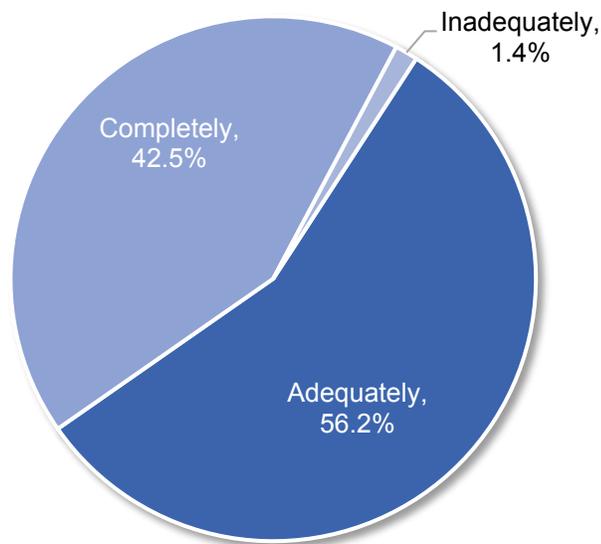


Figure 18. Knowledge/Skill Inventory Adequacy (n=73)

## Mean Task Ratings and Percent Performing

To determine which tasks were more significant and performed by respondents, descriptive data were calculated for each task (see Appendices C – E). Additionally, for each task, the frequency of those who selected each significance rating was calculated. The purpose of these data was to determine which tasks would remain on the final content outline.

For example, task 1 (Assess stakeholder motivation and readiness for change) had a mean significance rating of 2.25. Eleven (11) respondents provided a “not applicable for my role” or “0” rating for the task. The tasks presented in Appendix C are sorted in the order they appear on the survey. Tasks presented in Appendix D are sorted in ascending order by the frequency of respondents who do perform the task. Appendix E provides the same descriptive information as Appendices C and D, but the tasks were sorted in ascending mean significance order.

**Table 3. Summary of Mean Significance Task Ratings**

Significance Value Label	Mean Values Range	Frequency	Percent
Very Significant	2.50 – 3.00	4	10.3
Significant	1.50 – 2.49	35	89.7
Minimally Significant	1.00 – 1.49	0	0.0
	<b>Total</b>	<b>39</b>	<b>100.0</b>

The significance scale had values ranging from 1 (Minimally Significant) to 3 (Very Significant). A summary of the ratings for the significance scale for task ratings is shown above in Table 3. None of the average task ratings were rated as “Minimally Significant.” All the task ratings were rated at least “Significant” by respondents (mean significance rating of at least 1.50).

The AC reviewed the data for each task. They concluded that the ratings obtained from the Job Analysis survey were in agreement with their judgments about the job. Consequently, the AC also concluded that the survey data adequately defined the profession on a national basis. Moreover, the AC judged the results sufficient for the purpose of delineating the structure and content of a national certification examination.

It is critical that the test specifications reflect the responsibilities of the broadly defined population who might be eligible to take the examination. Therefore, it was vital to ensure that the test specifications and resulting examination content included tasks considered important to job success by those for whom the examination was intended. While developing the test specifications, the AC used their collective judgment to interpret the survey results and ensure that the content of the examination was appropriate for a national sample from a variety of backgrounds.

As indicated previously, Appendices D and E show mean significance ratings and percent performed for each task across the whole sample. Appendices F-K show mean task significance ratings for sample subgroups. The AC was encouraged to consider how best to limit the content eligible for the test specifications to only the broadly performed and significant tasks. Therefore, the AC adopted 8 decision rules to identify tasks *ineligible* for assessment, as summarized in Table 4.

**Table 4. Decision Rules**

Appendix	Variable	Number and Description of Decision Rule*		Threshold
D	Percent Not Performing	1	Keep only those tasks performed by at least 71.5% of the respondents.	“Not Performed” rating >28.5
E	Mean Rating	2	Keep only those tasks rated by respondents as at threshold.	2.00
F	Region	3	Keep only those tasks rated at least at threshold by 3 out of 4 subgroups.	1.90
G	Years of Experience	4	Keep only those tasks rated at least at threshold by 3 out of 3 subgroups.	1.90
H	Degree	5	Keep only those tasks rated at least at threshold by 3 out of 3 subgroups.	1.90
I	Certifications Held	6	Keep only those tasks rated at least at threshold by 6 out of 6 subgroups.	1.85
J	Level in Organization	7	Keep only those tasks rated at least at threshold by all 3 out of 4 subgroups.	1.85
K	Number of Employees	8	Keep only those tasks rated at least at threshold by 2 out of 3 subgroups.	1.85

Note: To account for error in the mean ratings based on this sample of respondents, means for all tasks were evaluated for inclusion/exclusion within the 95% confidence interval (1.86-2.14) for each variable.

## Making Decision Rules Operational

Having judged that the sample sufficiently represented the population, the AC applied the following criteria to implement its decision rules.

- Rule 1.** *Keep only tasks performed by 71.5% or more of respondents.*  
Tasks with “not performed” rating frequencies of more than 28.5% were considered ineligible. Applying this rule did not eliminate any tasks.
- Rule 2.** *Keep only tasks rated at least Significant (2.00) by respondents.*  
Realizing that error occurs in every measurement, the AC defined the lower boundary of Quite Significant as a mean rating of 2.00 for tasks. They examined all tasks within a 95% confidence interval ( $2.00 \pm 2^*$  standard errors of .029) for inclusion. Applying this rule did not eliminate any tasks.
- Rule 3.** *Keep only tasks rated at least Significant (1.90) by 3 out of 4 region subgroups (Northeast, Midwest, South, West).*  
Because healthcare compliance professionals across the country should endorse the content of a nationally applied examination, the task ratings were examined by geographic region. Therefore, the AC defined a mean importance rating of 1.90 (+/- 2 SEs) for tasks by 3 out of 4 location subgroups as criteria. Applying this rule to subgroup regions, no tasks were eliminated.

*Rule 4. Keep only tasks rated at least Significant (1.90) by 3 out of 3 years of experience subgroups (0-5 years, 6-16 years, and 17 or more years).*

Because professionals with different years of experience may view the job differently, the AC examined task ratings by years of experience. The AC defined a mean significance rating of 1.90 (+/- 2 SEs) for tasks for 3 out of 3 subgroups as the criteria. Applying this rule did not eliminate any additional tasks.

*Rule 5. Keep only tasks rated at least Significant (1.90) 3 out 3 by all levels in the organization subgroups (High School thru associates, baccalaureate, or master's +).*

Because professionals at different educational levels in the organization may view the job differently, the AC examined task ratings by level of education in the organization for all 3 subgroups as the criteria. Applying this rule did not eliminate any additional tasks.

*Rule 6. Keep only tasks rated at least Significant (1.85) by 6 out of 6 certifications held subgroups (CP, IM, IS, PW, TR, and TS).*

Because professionals at with various types of certifications may view the job differently, the AC examined task ratings by level in the organization. The AC defined a mean significance rating of 1.85 (+/- 2 SEs) for tasks for 6 out of 6 subgroups as the criteria. Applying this rule did not eliminate any additional tasks.

*Rule 7. Keep only tasks rated at least Significant (1.85) by 3 out of 4 primary job levels. (Director/Executive, Manager, Technical, and Other).*

Because professionals with different levels of experience may view the job differently, the AC examined task ratings by level of experience. The AC defined a mean significance rating of 1.90 (+/- 2 SEs) for tasks for 3 out of 4 subgroups as the criteria. Applying this rule did not eliminate any additional tasks.

*Rule 8. Keep only tasks rated at least Significant (1.85) by 2 out of 3 number of employees subgroups (Less than 100, 101 to 1,000, and more than 1,000).*

Because professionals at different sized institutions may view the job differently, the AC examined task ratings by level of education. The AC defined a mean significance rating of 1.90 (+/- 2 SEs) for tasks for 2 out of 3 subgroups as the criteria. Applying this rule did not eliminate any additional tasks.

After all decision rules were applied, the AC reviewed and considered all respondent comments, no tasks were removed.

Table 5 presents information used by the AC to determine the number of items for each of the major areas of practice. The goal was to distribute items in accordance with observed working patterns across the major content areas. Respondent data were used to suggest a starting point for the content experts. The AC discussed the respondents' time spent in the five content domains and considered their time spent as how the items should be distributed. The AC decided to start with the respondent's response to percentage of time spent in each of the major domains, and make adjustments based on their expert opinion.

**Table 5. Respondent Time Spent**

What percentage of your time in the Clinician/Practitioner Consultant Role is spent in each of these areas?

	N	Min.	Max.	Mean	SD
1. Implementation/Optimization of EHR systems	69	0	70	22.4	14.2
2. EHR policies and procedures	70	0	50	16.4	12.2
3. Workflow problems	71	0	70	25.8	12.9
4. Communication and Coordination	71	5	100	23.2	15.3
5. User interface	67	0	60	13.1	9.8

## Cognitive Complexity

After the number of items was determined for each major domain, the next step involved defining the cognitive complexity of the content domain. A complexity scale was used to determine at what cognitive level individual tasks were performed. The information provided a basis for matching test item complexity to job complexity. The AC discussed each task in each section and considered the typical complexity of task performance using the descriptions described in Table 6. They then determined a distribution for each major category by the cognitive categories of recall, application, and analysis, using Table 7 as a guideline. The AC then finalized the exact distribution based on its experience and perceptions about each major content domain.

Section and task complexity is based on Bloom's *Taxonomy of Educational Objectives* (1956, pp. 201-207) and follows:

**Table 6. Cognitive Complexity Scale**

<b>Recall</b>	Requires only the identification, recall, or recognition of isolated information, such as specific facts, generalizations, concepts, principles, or procedures. The information generally does not vary relative to the situation.
<b>Application</b>	Requires comprehension, interpretation, or manipulation of limited concepts or data, in which the response or outcome is situationally dependent, but not overly complex (e.g., application of knowledge which varies based on patient characteristics and environment). Activities that require candidates to recognize elements and relationships among data and to classify, explain, or differentiate are usually application level.
<b>Analysis</b>	Requires the integration or synthesis of a variety of concepts or elements to solve a specific problem situation (e.g., evaluating and rendering judgments on complex problems with many situational variables).

**Table 7. General Guidelines for Item Distribution by Cognitive Level based on Mean Cognitive Level by Major Content Domain**

	<1.45	<2.05	<2.45	>2.449
<b>Recall</b>	100%	40%	20%	20%
<b>Application</b>	0%	60%	60%	20%
<b>Analysis</b>	0%	0%	20%	60%

## Test Specifications

The AC reviewed 39 tasks that remained eligible for the examination, assigned cognitive levels to each, and determined the number of items in each category to develop the final detailed content outline. To determine the allocation of content, the AC members expressed independent judgments about the percentage of the examination that should be allocated to the five major domains (content areas) on the examination. They were asked to consider the mean percentage of time in the domains indicated by the survey respondents (Table 5), the number of tasks in each content area, the breadth of those tasks, as well as the mean importance of the tasks expressed by the survey respondents. After discussion, the AC agreed upon the percentage of the examination to be allocated to each area. The AC decided that a 100-item examination sufficiently samples the content domain to render a pass or fail decision based on examination scores. The resulting examination matrix and detailed content outline will be used by AHIMA to assemble future examination forms. An overview of the final test specifications is shown in Table 8. The full specifications, including the final detailed content outline, is presented in Appendix M. Test developers, item writers, and the Examination Committee will use the test specifications and detailed content outline to build future forms of the examination.

**Table 8. CHTS-CP Test Specifications**

Content Area	Cognitive Level			Total
	Recall	Application	Analysis	
1. Implementation/Optimization of EHR systems	5	12	7	24
2. EHR policies and procedures	4	10	4	18
3. Workflow problems	5	8	10	23
4. Communication and Coordination	4	10	8	22
5. User interface	4	5	4	13
<b>Total</b>	<b>22</b>	<b>45</b>	<b>33</b>	<b>100</b>

## Knowledge/Skill Areas

In addition to the task inventory, survey respondents were asked to rate the significance of 80 knowledge/skill statements identified by the AC. The eighty knowledge/skill statements were organized into the following four major domains:

1. Technical Knowledge: Health Data Management
2. Technical Knowledge: Health Information Technology & Systems
3. Non-Technical Knowledge: Hard Skills
4. Non-Technical Knowledge: Soft Skills

To determine which knowledge/skill statements were rated more significant by respondents, descriptive data grouped by CHTS role was calculated for each statement (see Appendix L). The purpose of these data was to determine which tasks would remain on the final content outlines. The AC developed and used an exclusion decision rule to identify knowledge/skill statements appropriate as supplemental information to the examination content outline. Of the 80 knowledge/skill statements on the original survey, 4 statements were excluded based on the following exclusion criterion.

**Rule 1** *Keep only tasks rated at least Significant (1.70) by respondents.*

Applying this rule eliminated four statements. (K17: General hardware maintenance; K32: Servers; K45: Ergonomics, K50: Inferential statistics).

One purpose of the knowledge/skill statements is to provide guidance to the item writers/exam committee. As such, the AC decided to use priority designations (low, medium, or high) to provide some additional detail on the level of emphasis for each knowledge/skill statement. Table 9 below shows the criteria used by the AC when assigning level of priority to each statement. Full details of the final list of knowledge/skill statements sorted by priority can be viewed in Appendix M, after the task inventory.

**Table 9. Knowledge/Skill Statement Thresholds**

Mean Threshold	Priority
if mean > 1.995	High
if mean is 1.90 to 1.99	Medium
if mean is < 1.90	Low
if mean is < 1.70	Not included <sup>1</sup>

<sup>1</sup> Unless included by unanimous AC vote due to its importance.

## Conclusions

The Job Analysis described in this report was undertaken to provide evidence supporting content valid inferences from examination scores. The study was conducted to determine and comprehensively describe the job of the healthcare technology specialists in a Clinician/Practitioner Consultant Role, to evaluate this description through the ratings of job experts, and to define areas that should be assessed in CHTS-CP examination.

The AHIMA formed the AC, who prepared a comprehensive list of tasks describing the job. A representative sample of job experts completed the survey. The AC reviewed the survey results and used the survey ratings to develop test specifications directly related to the significant tasks that the healthcare technology specialists perform. These test specifications will be used to ensure the examination is current and job-related. Each future form of the examination will contain the specified number of items distributed across the content areas. Because each test form will be developed to match these job-related test specifications, valid content-related inferences can be drawn about candidates' abilities to perform the job of the healthcare technology specialist in a Clinician/Practitioner Consultant Role.

## References

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- Hopkins, K.D., Stanley, J.C., Hopkins, B.R. (1990). *Educational and Psychological Measurement and Evaluation*, (7<sup>th</sup> edition). New Jersey: Prentice Hall.
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## Appendix A. Job Analysis Survey

### Welcome to the Job Analysis Survey for Healthcare Technology Specialists

This survey will be used to help define the content for the Certified Healthcare Technology Specialist (CHTS) Exams. You will be asked demographic questions about your background and profession, and then asked to rate tasks, knowledge and skills that may be applicable to your work. Your ratings will provide information about the requirements related to the effective job performance as a healthcare technology specialist.

The survey should take approximately 15 minutes to complete. You will be able to close the survey and begin again where you left off if you do not complete the survey in one session.

If you experience any technical difficulties, please email: [AHIMAJASurvey@goamp.com](mailto:AHIMAJASurvey@goamp.com).

This survey is being conducted by American Health Information Management Association (AHIMA).

Please click 'Next' below to begin the survey.

## Role Description

The CHTS certification program intends to assess basic competency of individuals who are seeking to demonstrate their proficiency in certain health IT workforce roles integral to the implementation and management of electronic health information in **one or more** of these roles:

- Assess workflows
- Manage projects
- Select hardware and software
- Work with vendors or users
- Install or test systems
- Diagnose IT problems
- Train practice staff on systems

## Demographics

**Please answer the following questions about your background. This information is confidential and will be used only to analyze the data across different groups of respondents (e.g., respondents from different geographical region; respondents with different level of education).**

Please indicate the location of the facility in which you primarily work.

Is the facility in which you work located in a rural, suburban, or urban area?

- Rural
- Suburban
- Urban

Which of the following best describes your primary job level category?

- |  |  |
|--|--|
| <input type="radio"/> Executive/President/Vice President | <input type="radio"/> Business Analyst                       |
| <input type="radio"/> Director (HIM, HIT, etc.)/Officer  | <input type="radio"/> System Administrator                   |
| <input type="radio"/> Professor/Educator                 | <input type="radio"/> Tech Implementation Analyst/Specialist |
| <input type="radio"/> Manager/Supervisor                 | <input type="radio"/> Technical Support Analyst/Specialist   |
| <input type="radio"/> Consultant                         | <input type="radio"/> HIM Technician Role (e.g., coder)      |
| <input type="radio"/> Clinician (MD, RN)                 | <input type="radio"/> Clerical/Administrative support        |
| <input type="radio"/> IT Project Manager                 | <input type="radio"/> Not currently working                  |
| <input type="radio"/> Other (please specify)             |  |

## Demographics

How many years of relevant work experience related to this role do you have?

What is the HIGHEST level of education you have completed?

- |  |   |
|--|---|
| <input type="radio"/> High School Diploma/GED    | <input type="radio"/> Master's Degree   |
| <input type="radio"/> 1-year Certificate Program | <input type="radio"/> Professional Doctorate Degree (e.g., PT, PharmD, JD, DVM) |
| <input type="radio"/> 2-year Certificate Program | <input type="radio"/> PhD or EdD  |
| <input type="radio"/> Associate's Degree         | <input type="radio"/> MD, DO, DNP, or DDS                                       |
| <input type="radio"/> Baccalaureate Degree       |   |

Did your education include healthcare/medicine or information technology?

- Healthcare/Medicine
- Information Technology
- Both
- Neither

Do you hold the CHTS credential?

- Yes  No

## Demographics

How many years have you held the CHTS credential?

Which of these CHTS certifications do you hold?

*Select all that apply.*

- CP
- IM
- IS
- PW
- TR
- TS

## Demographics

What other certifications do you hold?

*Select all that apply.*

- |   |                                    |
|---|------------------------------------|
| <input type="checkbox"/> CAHIMS/CPHIMS          | <input type="checkbox"/> CHPS      |
| <input type="checkbox"/> CCA                    | <input type="checkbox"/> CMUP/CMUA |
| <input type="checkbox"/> CCS                    | <input type="checkbox"/> CPC       |
| <input type="checkbox"/> CCS-P                  | <input type="checkbox"/> RHIA      |
| <input type="checkbox"/> CHDA                   | <input type="checkbox"/> RHIT      |
| <input type="checkbox"/> Other (please specify) |                                    |

What licenses do you hold?

*Select all that apply.*

- |   |                               |
|---|-------------------------------|
| <input type="checkbox"/> APRN (NP or CNS)       | <input type="checkbox"/> MD   |
| <input type="checkbox"/> DO                     | <input type="checkbox"/> PA   |
| <input type="checkbox"/> LPN/LVN                | <input type="checkbox"/> RN   |
| <input type="checkbox"/> LVT/RVT                | <input type="checkbox"/> LCSW |
| <input type="checkbox"/> Other (please specify) |                               |

## Demographics

Which of the following best describes your primary work setting?

- |  |   |
|--|---|
| <input type="radio"/> Ambulatory care facility                 | <input type="radio"/> Managed care HMO/PPO office                             |
| <input type="radio"/> Behavioral health facility               | <input type="radio"/> Mental health facility                                  |
| <input type="radio"/> Billing agency                           | <input type="radio"/> Military health facility                                |
| <input type="radio"/> Consultant/vendor EHR/HIM/IT services    | <input type="radio"/> Multi-hospital/diversified system                       |
| <input type="radio"/> Correspondence company                   | <input type="radio"/> Outpatient/ambulatory surgery center                    |
| <input type="radio"/> Educational institution                  | <input type="radio"/> Pharma/medical device/biotech manufacturer              |
| <input type="radio"/> Government/public health agency          | <input type="radio"/> Physician's office/medical group practice               |
| <input type="radio"/> Health information exchange organization | <input type="radio"/> Professional or trade association                       |
| <input type="radio"/> Home healthcare agency                   | <input type="radio"/> Regional Extension Center (REC)                         |
| <input type="radio"/> Hospice                                  | <input type="radio"/> Rehabilitation facility                                 |
| <input type="radio"/> Hospital                                 | <input type="radio"/> Transcription company                                   |
| <input type="radio"/> Insurance company/payer                  | <input type="radio"/> Urgent care center (freestanding emergency care center) |
| <input type="radio"/> Jail/corrections facility                | <input type="radio"/> Vendor EHR/HIM software products                        |
| <input type="radio"/> Law firm                                 | <input type="radio"/> Veterinary practice                                     |
| <input type="radio"/> Long-term care facility                  |   |

Approximately how many employees are in your organization?

- |                                    |                                      |
|------------------------------------|--------------------------------------|
| <input type="radio"/> Less than 10 | <input type="radio"/> 101 to 500     |
| <input type="radio"/> 11 to 50     | <input type="radio"/> 501 to 1000    |
| <input type="radio"/> 51 to 100    | <input type="radio"/> More than 1000 |

## Demographics

### Optional Questions

What is your age?

- Less than 30
- 30 to 39
- 40 to 49
- 50 to 59
- 60 or over

With which sex do you identify?

- Female
- Male

## Clinician/Practitioner Consultant Role

### **Clinician/Practitioner Consultant Role:**

This role brings to bear the background and experience of a clinical professional in a healthcare setting. Workers in this role will:

- Suggest solutions for health IT implementation problems in healthcare settings
- Address workflow and data collection issues from a clinical perspective, including quality measurement and improvement
- Assist in selection of vendors and software
- Advocate for users' needs; acting as a liaison between users, IT staff, and vendors

Does this role describe you?

Yes

No

## Task Rating Scale Instructions

Please use the scale shown below to express your judgment of the **significance of each task as it applies to your current role in the health IT workforce.**

Not applicable for my role

Minimally significant

Significant

Very significant

Please consider whether this task is performed in your current role in the health IT workforce; if you do not need to deal with the task, select “not applicable for my role.” If you do need to have the knowledge related to the task, select the rating corresponding to how significant it is to your role in healthcare IT workforce.

## Clinician/Practitioner Consultant Tasks

Please indicate the significance of each task as it applies to your current role in the health IT workforce.

### Implementation/Optimization of EHR systems

	Not applicable for my role	Minimally significant	Significant	Very significant
1. Assess stakeholder motivation and readiness for change	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Promote user buy-in	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Identify human, financial, and technology resources needed to implement EHR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Identify training needs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Provide training to future trainers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Analyze barriers to successful utilization of EHR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Resolve barriers to achieve successful utilization of EHR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Serve as a change agent for the implementation of new technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Customize the delivery of information for the specific audience	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Develop tracking and trending processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Analyze data from tracking and trending processes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. Develop method for determining initial level of knowledge of EHR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Evaluate level of knowledge of EHR post-training	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Clinician/Practitioner Consultant Tasks

Please indicate the significance of each task as it applies to your current role in the health IT workforce.

### EHR policies and procedures

	Not applicable for my role	Minimally significant	Significant	Very significant
14. Develop procedures to comply with regulatory standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Incorporate evidence-based practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Promote quality management (e.g., patient safety, process improvement)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Promote risk management (activity that limits the exposure to liability)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Promote privacy and security of patient information	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Develop standards of documentation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### Workflow problems

	Not applicable for my role	Minimally significant	Significant	Very significant
20. Assess current workflow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. Perform gap analyses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Recommend resources and support tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Recommend solutions that meet the strategic alignment of the organization	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Pilot-test solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. Evaluate pilot-test results	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. Implement adopted solutions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Evaluate the solution-fit	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Clinician/Practitioner Consultant Tasks

Please indicate the significance of each task as it applies to your current role in the health IT workforce.

### Communication and Coordination

	Not applicable for my role	Minimally significant	Significant	Very significant
28. Serve as liaison with vendors	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Serve as a resource to decision makers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Identify and collaborate with stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Educate key stakeholders	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Develop a transfer plan for self-sustainability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. Implement evaluation mechanisms of services provided	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Assist with collection and reporting of data for meaningful use requirements	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Evaluate EHR interoperability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

### User interface

	Not applicable for my role	Minimally significant	Significant	Very significant
36. Develop templates that mirror clinical practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
37. Refine templates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Map the clinical process data to provide input to IT changes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Evaluate current processes for potential redesign efficiency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Clinician/Practitioner Consultant Tasks

How well do you feel the task list covered the important job tasks in the Clinician/Practitioner Consultant Role?

- Completely
- Adequately
- Inadequately (please specify why)

Were any important job tasks in the Clinician/Practitioner Consultant Role omitted from the survey?

What percent of your time in the Clinician/Practitioner Consultant Role is spent in each of these area?  
*Please type your numeric response below (i.e., 25, not 25%). Your choices must sum to 100.*

Implementation/Optimization of EHR systems

EHR policies and procedures

Workflow problems

Communication and Coordination

User interface

## Knowledge and Skills Rating Scale Instructions

Please use the scale shown below to express your judgment of the **significance of each knowledge/skill as it applies to your current role in the health IT workforce.**

Not applicable for my role

Minimally significant

Significant

Very significant

Please consider whether this knowledge is used in your current role in the health IT workforce; if you do not need the knowledge, select “not applicable for my role.” If you do need to have the knowledge, select the rating corresponding to how significant it is to your role in healthcare IT workforce.

## Knowledge and Skills

Please indicate the significance of each knowledge/skill as it applies to your current role in the health IT workforce.

### Technical Knowledge: Health Data Management

	Not applicable for my role	Minimally significant	Significant	Very significant
1. Data analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Health care delivery systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Health care regulation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Health care revenue cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Health informatics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Health information management concepts & principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Diagnostic and procedural coding (e.g., ICD-CM/PCS, CPT, HCPCS)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Information governance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Meaningful use	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Medical sciences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Medical terminology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Knowledge and Skills

Please indicate the significance of each knowledge/skill as it applies to your current role in the health IT workforce.

### Technical Knowledge: Health Information Technology & Systems

	Not applicable for my role	Minimally significant	Significant	Very significant
12. Audio/visual skills (e.g., LCD projector)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. Computer systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. Database structures (e.g., SQL)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. EHR/EMR/PHR principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. Flowchart applications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. General hardware maintenance	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. Health information exchange	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. Health information systems	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. Health IT applications	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. HL7	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. Implementation life cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. Interface integration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Interoperability	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Knowledge and Skills

Please indicate the significance of each knowledge/skill as it applies to your current role in the health IT workforce.

### Technical Knowledge: Health Information Technology & Systems (Continued)

	Not applicable for my role	Minimally significant	Significant	Very significant
25. IT fundamentals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. IT security principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. Network technology (e.g., VPN, cloud-based)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. Platforms and operating systems (e.g., Windows, Mac, Linux, Mobile devices)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. PC skills (e.g., Microsoft Office, internet)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. Performance improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. Peripheral devices (e.g., printers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. Servers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. Software development life cycle	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. Standard technical language	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. Technical specs (hardware, software)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
36. Writing test scripts	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Knowledge and Skills

Please indicate the significance of each knowledge/skill as it applies to your current role in the health IT workforce.

### Non-Technical Knowledge: Hard Skills

	Not applicable for my role	Minimally significant	Significant	Very significant
37. Accreditation standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
38. Adult learning principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
39. Basic statistics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
40. Best practices	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
41. Budget management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
42. Change management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
43. Clinical and operations workflow	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
44. Consumerism and marketing	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
45. Ergonomics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
46. Facilitation skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
47. Gov't agencies associated with healthcare	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
48. Human resource management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
49. Industry trends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
50. Inferential statistics	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
51. Legal and ethical issues	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
52. Nomenclatures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Knowledge and Skills

Please indicate the significance of each knowledge/skill as it applies to your current role in the health IT workforce.

### Non-Technical Knowledge: Hard Skills (Continued)

	Not applicable for my role	Minimally significant	Significant	Very significant
53. Operations management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
54. Organizational structure	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
55. Process improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
56. Project management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
57. Public health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
58. Quality control	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
59. Quality improvement	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
60. Quality of patient care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
61. Report writing principles	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
62. Resource management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
63. Risk management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
64. Simulation technology	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
65. Telehealth and telemedicine	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
66. Training methodologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
67. Virtual training or meeting tools	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
68. Work flow improvement & management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Knowledge and Skills

Please indicate the significance of each knowledge/skill as it applies to your current role in the health IT workforce.

### Non-Technical Knowledge: Soft Skills

	Not applicable for my role	Minimally significant	Significant	Very significant
69. Analytical skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
70. Communication skills (written & oral)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
71. Conflict resolution	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
72. Cultural competency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
73. Culture of health care	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
74. Issue management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
75. Leadership	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
76. Linguistic competency	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
77. Organizational culture	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
78. Presentation skills	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
79. Time management	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
80. Working with teams	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

## Knowledge and Skills

How well do you feel the knowledge and skills list covered the important knowledge and skills in your role?

- Completely
- Adequately
- Inadequately (please specify why)

Were any important knowledge and skills omitted from the survey?

Thank you

**Thank You for Completing the Job Analysis Survey for  
Healthcare Technology Specialists**

If you have any additional questions or comments about this survey, please e-mail:  
[AHIMAJASurvey@goamp.com](mailto:AHIMAJASurvey@goamp.com)



## Appendix B. Job Analysis Survey Demographics

### Clinician/Practitioner Consultant (N=75)

**Table 1. Please indicate the location of the facility in which you primarily work.**

	Frequency	Percent		Frequency	Percent
KY	7	10.1	IA	2	2.9
GA	5	7.2	MD	2	2.9
MI	5	7.2	TN	2	2.9
TX	5	7.2	VA	2	2.9
CA	4	5.8	AR	1	1.4
AL	3	4.3	CT	1	1.4
FL	3	4.3	HI	1	1.4
IL	3	4.3	KS	1	1.4
IN	3	4.3	LA	1	1.4
MO	3	4.3	MA	1	1.4
NC	3	4.3	ND	1	1.4
NY	3	4.3	PR	1	1.4
PA	3	4.3	SC	1	1.4
DC	2	2.9	Total	69	100.0

**Table 2. Region**

	Frequency	Percent
A	6	1.5
B	17	25.8
C	31	47.0
D	12	18.2
Total	66	100.0

*Region A: AK, CO, ID, MT, ND, OR, SD, UT, WA, WY, AZ, CA, HI, NV*

*Region B: IL, IN, IA, KS, MI, MN, MO, NE, OH, WI*

*Region C: AL, AR, FL, GA, KY, LA, MS, NM, NC, OK, SC, TN, TX*

*Region D: CT, DE, ME, MD, MA, NH, NJ, NY, PA, RI, VT, VA, WV*

**Table 2B. Regions grouped for subgroups**

	Geographic Region
A	West
B	Midwest
C	South
D	East

**Table 3. Is the facility in which you work located in a rural, suburban, or urban area?**

	Frequency	Percent
Rural	19	25.7
Suburban	17	23.0
Urban	38	51.4
Total	74	100.0

**Table 4. Which of the following best describes your primary job level category?**

	Frequency	Percent
1. Director (HIM, HIT, etc.)/Officer	15	20.0
2. Manager/Supervisor	9	12.0
4. Consultant	9	12.0
4. Clinician (MD, RN)	6	8.0
3. IT Project Manager	5	6.7
4. Business Analyst	4	5.3
4. Professor/Educator	3	4.0
4. System Administrator	3	4.0
3. Tech Implementation Analyst/Specialist	3	4.0
3. Technical Support Analyst/Specialist	2	2.7
1. Executive/President/Vice President	1	1.3
4. Other (please specify)	15	20.0
Total	75	100.0

**Table 4B. Primary job level for subgroups**

	Frequency	Percent
Director/Executive	16	21.3
Manager	9	12
Technical	10	13.3
Other	40	53.4
Total	75	100

**Table 5. How many years of relevant work experience related to this role do you have?**

Mean: 13.8 years

SD: 9.3 years

	Frequency	Percent	Cumulative Percent
0	1	1.6	1.6
1	1	1.6	3.3
2	2	3.3	6.6
3	4	6.6	13.1
5	8	13.1	26.2
6	1	1.6	27.9
7	4	6.6	34.4
8	2	3.3	37.7
10	5	8.2	45.9
11	3	4.9	50.8
12	3	4.9	55.7
13	1	1.6	57.4
15	2	3.3	60.7
17	1	1.6	62.3
18	1	1.6	63.9
19	2	3.3	67.2
20	8	13.1	80.3
21	1	1.6	82.0
25	4	6.6	88.5
26	1	1.6	90.2
27	1	1.6	91.8
30	2	3.3	95.1
33	1	1.6	96.7
34	1	1.6	98.4
36	1	1.6	100.0
Total	61	100.0	

**Table 5B. Years of experience for subgroups**

	Frequency	Percent
0-7	21	34.4
8-19	20	32.8
20+	20	32.8
Total	61	100

**Table 6. What is the HIGHEST level of education you have completed?**

	Frequency	Percent	Cumulative Percent
High School Diploma/GED	5	6.8	6.8
Associate's Degree	13	17.6	24.3
Baccalaureate Degree	24	32.4	56.8
Master's Degree	30	40.5	97.3
PhD or EdD	1	1.4	98.6
MD, DO, DNP, or DDS	1	1.4	100.0
Total	74	100.0	

Level 1: High School Diploma/GED, 1-year Certification program, 2-year certification program, Associates degree

Level 2: Baccalaureate degree

Level 3: Master's degree, PhD, EdD, MD, DO, DNP, or DDS

**Table 6B. Highest level of education for subgroups**

	Frequency	Percent
Level 1	18	24.3
Level 2	24	32.4
Level 3	32	43.3
Total	74	100

**Table 7. Did your education include healthcare/medicine or information technology?**

	Frequency	Percent
Healthcare/Medicine	22	29.3
Information Technology	11	14.7
Both	29	38.7
Neither	13	17.3
Total	75	100.0

**Table 8. Do you hold the CHTS credential?**

	Frequency	Percent
Yes	75	100.0
Total	75	100.0

**Table 9. If yes - How many years have you held the CHTS credential?**

Mean: 3.2 years

SD: 1.2 years

	Frequency	Percent	Cumulative Percent
0	1	1.5	1.5
1	3	4.4	5.9
2	15	22.1	27.9
3	25	36.8	64.7
4	13	19.1	83.8
5	10	14.7	98.5
7	1	1.5	100.0
Total	68	100.0	

**Table 10. If yes - Which of these CHTS certifications do you hold? (Select all that apply.) (N=74)**

	Frequency	Percent
CP	30	40.5
PW	29	39.2
IM	23	31.1
IS	6	8.1
TR	6	8.1
TS	4	5.4
Total	98	132.4

**Table 10B.**

	Yes	No
CP	30	45
PW	29	46
IM	23	52
IS	6	69
TR	6	69
TS	4	71
Total	98	

**Table 11. What other certifications do you hold? (Select all that apply.) (N=31)**

	Frequency	Percent
RHIA	11	35.5
RHIT	8	25.8
CAHIMS/CPHIMS	7	22.6
CCS	3	9.7
CHDA	3	9.7
CHPS	3	9.7
CCS-P	2	6.5
CCA	1	3.2
CMUP/CMUA	1	3.2
CPC	1	3.2
Total	40	129.0

**Table 12. What licenses do you hold? (Select all that apply.) (N=27)**

	Frequency	Percent
RN	22	81.5
LPN/LVN	2	7.4
APRN (NP or CNS)	1	3.7
MD	1	3.7
LCSW	1	3.7
Total	27	100.0

**Table 13. Which of the following best describes your primary work setting?**

	Frequency	Percent
Hospital	26	35.6
Physician's office/medical group practice	8	11.0
Consultant/vendor EHR/HIM/IT services	7	9.6
Ambulatory care facility	6	8.2
Educational institution	4	5.5
Long-term care facility	4	5.5
Multi-hospital/diversified system	4	5.5
Government/public health agency	3	4.1
Regional Extension Center (REC)	3	4.1
Professional or trade association	2	2.7
Behavioral health facility	1	1.4
Home healthcare agency	1	1.4
Insurance company/payer	1	1.4
Managed care HMO/PPO office	1	1.4
Mental health facility	1	1.4
Veterinary practice	1	1.4
Total	73	100.0

**Table 14. Approximately how many employees are in your organization?**

	Frequency	Percent	Cumulative Percent
Less than 100	12	16	16
101 to 1000	34	45.3	61.3
More than 1001	29	38.7	100
Total	75	100.0	

**Table 15. What is your age?**

	Frequency	Percent
Less than 30	2	2.7
30 to 39	5	6.8
40 to 49	31	41.9
50 to 59	25	33.8
60 or over	11	14.9
Total	74	100.0

**Table 16. With which sex do you identify?**

	Frequency	Percent
Female	61	82.4
Male	13	17.6
Total	74	100.0

**Table 17. Task Coverage**

	Frequency	Percent
Adequately	39	54.2
Completely	30	41.7
Inadequately (please specify why)	3	4.2
Total	72	100.0

**Table 18. Knowledge Statement Coverage**

	Frequency	Percent
Adequately	41	56.2
Completely	31	42.5
Inadequately (please specify why)	1	1.4
Total	73	100.0

**Table 19. What percent of your time in the Management Role is spent in each of these area?**

	N	Min.	Max.	Mean	SD
Implementation/Optimization of EHR systems	69	0	70	22.4	14.2
EHR policies and procedures	70	0	50	16.4	12.2
Workflow problems	71	0	70	25.8	12.9
Communication and Coordination	71	5	100	23.2	15.3
User interface	67	0	60	13.1	9.8

**Table 20. Reliability - Task**

Survey Subsection	N	Reliability (consistency)		# of Tasks
		Between Topics (Coefficient Alpha)	Between Respondents (Intraclass Correlation)	
Implementation/Optimization of EHR systems	73	0.942	0.905	13
EHR policies and procedures	73	0.899	0.854	6
Workflow problems	71	0.934	0.876	8
Communication and Coordination	73	0.871	0.918	8
User interface	74	0.908	0.821	4
Total	68	0.972	0.891	39

**Table 21. Reliability – Knowledge Statement**

Survey Subsection	N	Reliability (consistency)		# of Tasks
		Between Topics (Coefficient Alpha)	Between Respondents (Intraclass Correlation)	
Technical Knowledge: Health Data Management	71	0.805	0.892	11
Technical Knowledge: Health Information Technology & Systems	68	0.939	0.966	25
Non-Technical Knowledge: Hard Skills	68	0.954	0.960	32
Non-Technical Knowledge: Soft Skills	72	0.922	0.936	12
Total	61	0.973	0.959	80

## Demographic Questions (Open-ended Question Responses)

Which of the following best describes your primary job level category? – Other (please specify)

1. Account Manager
2. and Systems Administrator for our EHR
3. Application Analyst
4. Auditor
5. CDI Specialist
6. clinical analyst
7. Clinical Applications Analyst (Build and Support)
8. Clinical Data Analyst
9. Clinical Documentation Specialist
10. Clinical Informaticist
11. Clinical IT
12. Clinical Nurse Educator
13. Clinical System Analyst
14. Clinician (RN) working as a Tech Implementation/Support Analyst/Specialist
15. Coder
16. coding compliance auditor
17. Combination of IT PM and System Administrator
18. Credentialed Epic Trainer
19. Demand Management Analyst
20. Director of Finance in a Department
21. Director, Audits and Special Projects
22. Epic Trainer
23. Graduate Medical Education Residency Program Coord
24. health information exchange
25. HIM Assistant Director
26. HIM Educator
27. HIT Adviser on the Iowa Health Information Network IHIN
28. I am an RN in a Neonatal Intensive Care Unit
29. Informatics Manager
30. Joint Venture Integration Manager
31. Meaningful Use and Performance (i.e. Quality) Specialist
32. Medical Transcriptionist
33. NLU Adoptions Specialist
34. Nurse Informaticist
35. PCMH Manager
36. Performance Mangement Specialist/currently installing EPIC
37. Physician Coding Educator Liaison
38. Practice Coach
39. Programmer analyst
40. Programmer, not Healthcare related
41. Project Coordinator
42. Project Manager (2)
43. Quality
44. Quality abstractor
45. receptionist
46. Reimbursement Coordinator
47. Revenue Cycle specialist
48. RN Clinical App analyst, implement clinical programs process
49. Strategist (Informatics Strategist)
50. telehealth clinical technician
51. Trainer (3)

**What other certifications do you hold? - Other (please specify)**

1. A+, Network+, Epic ASAP, Medical Assistant, Emergency Medical Technician
2. AAPC
3. Administrative Assistant
4. ANCC Board Certification - Nursing Informatic
5. Approved AHIMA ICD-10 trainer
6. BPMP
7. CASCC, CRC
8. CBCS, CHI, CMAA, CERHS
9. CBCS, CMAA, CHI, CEHRS
10. CCDS, CDIP, CIC, COC
11. CCHT
12. CCMA
13. CCRN
14. CDIP (3)
15. CDIP, CCDS
16. CEHRS
17. Certified Health Education Specialist (CHES)
18. Certified Healthcare Compliance (CHC)
19. Certified Training Generalist
20. CHAM
21. CHC (3)
22. CHDS (2)
23. CHDS (Certified Healthcare Documentation Specialist (AHD))
24. CHDS, CPEHR
25. CHP
26. CHTS-CP
27. CHTS-IM (2)
28. CIT
29. COC (5)
30. Comptia A+ and Network +
31. CompTIA A+ and Network+
32. CompTIA Healthcare
33. CPA, EA, QPA
34. CPC
35. CPC-I
36. CPHIE, CPEHR, CPHIT
37. CPHQ (8)
38. CPHQ, CHCA
39. CPHT
40. CPMA, CEMC,
41. CPMSS; CPCS
42. CPRP
43. CPT - phlebotomy
44. CRC CDM CFPP CPhT
45. CRCR
46. CSBI, LSSGB
47. CSM
48. CSM, CSPO, Ahima approved icd-10 cm trainer
49. CSSBB
50. CSSYB
51. CTR
52. CVRN, PCMH-CCE
53. EPIC Certifications
54. EPIC's Epiccare Ambulatory and MyChart Certifications
55. ERMp

56. Health Information Security Professional
57. HIPAA - CHTS certification expired
58. ICD 10 CM AND PCS TRAINER APPROVAL
59. Informatics Nurse
60. McIT
61. MCSE, MCSA
62. MHA, CHPQ, FNAHQ, FAHIMA
63. Midas+ Certified System Manager
64. mos
65. NetSmart System Administrator
66. NextGen Certified Professional (NCP)
67. OCSA
68. PMP (6)
69. PMP, scrum
70. Post Bacc. Paralegal certificate
71. PRO-TS
72. Project+
73. RAC-CT
74. RN Board Certified - Informatics
75. RN-BC
76. RN-BC, CDIP, CCDS
77. RNC-NIC, IBCLC
78. Security+, Healthcare IT Technician, A+, Network+
79. Six sigma yellow belt
80. SSMBB, CPHQ, PCMH CCE
81. will be sitting for RHIA exam soon

**What licenses do you hold? - Other (please specify)**

1. CCDS
2. CERTIFICATE IN HEALTH INFORMATION TECH
3. Certified Pharmacy Tech
4. Clinical Laboratory Assistant
5. CMT
6. CNM
7. coa
8. CPA
9. EMT-A (former)
10. EMT-P
11. formerly EMT/Paramedic credential retired
12. Health Life & Accident
13. Licensed Nursing Home Administrator
14. LMT
15. Medical Assistant
16. Medical interpreter
17. PharmD
18. PMP
19. PMP, Scrum
20. Property & Causality Insurance License
21. RHIT
22. RRT PCT
23. RT
24. RT(R)(CT)
25. RTR

## Survey Comments

### Survey Adequacy

#### **How well do you feel the task list covered the important job tasks in the Clinician/Practitioner Consultant Role? - Inadequately (please specify why)**

1. For clinician/practitioner consultants employed by professional associations (not health systems), need to include additional tasks.
2. I am a practitioner, I practice medicine, IT is only small part of my job when it comes to documentation. My facility is only looking in to implementation of some kind of EHR.
3. Most Health Software GUI (Graphical User Interface) cannot be significantly modified by the customers. I think awareness of usability is critical; and the HIT (pre-AHIMA) materials did an absolutely, truly outstanding job of communicating this; however, I can't help but feel it's more in the hands of the developers as they are the ones who can actually touch these things... I believe that clinical practitioners need to be able to accurately identify and communicate (among their peers) the "why are we doing this" part and the net-result to the practice / i.e. - the "champion" role. Actually, I had not seen real champions until 2 years ago when there were a select group of physicians who could communicate with their peers the reality of why massive (almost crushing changes) had to be made. That was real value as we felt a definitive resolve among the physicians to "get with it." Previously, the trainers were the ones left to communicate the whys of change; and, it most certainly did not work as well.

#### **Were any important job tasks in the Clinician/Practitioner Consultant Role omitted from the survey?**

1. CPOE oversight, e-prescribing oversight
2. evaluation of value based reporting options; education regarding changing landscape
3. most of what I do.
4. My current role in build and implementation has not yet utilized all of my certification's scope.
5. Please see the remarks above - I am super confused about what this role is supposed to be. If it is for clinical providers, their main focus of education should be technical components so they can more accurately communicate between the clinical and technical groups... But then again - maybe I do not really understand what this role is all about.
6. Review national health policy tied to health IT, review proposed rules from ONC & CMS and lead official organizational response, design educational content to increase awareness of peer clinicians/practitioners about newly implemented value-based CMS initiatives, presentations to peer clinicians/practitioners about which among many value-based CMS initiatives are most ideal for the provider or practice to pursue, education of clinician/practitioner leadership boards, commission members, and staff about how to download, review and make use of QRUR reports (quality and resource use reports) and other reports providers must actively monitor and use to inform decision making for the many value-based CMS initiatives.

#### **How well do you feel the knowledge and skills list covered the important knowledge and skills in your role? - Inadequately (please specify why)**

1. I am not employed in the healthcare industry. I do not have experience, in spite of my certification.
2. I feel like the questions were geared toward a healthcare delivery facility employee or contractor. It is frustrating that AHIMA focuses so much attention at hospitals when there are so many other areas of health IT.
3. I haven't used any of the knowledge and skills yet. I can't really answer the questions. I haven't found any job requires or need to use the knowledge.
4. not currently employed.
5. The certification is a joke that no one recognizes
6. This is a clerical role

**Were any important knowledge and skills omitted from the survey?**

1. AHIMA CEU Grab.
2. Continuing education
3. How to develop a continuing educational program to continue to make yourself relevant to the ever changing HIT environment.
4. I believe those of us who are professional, accredited coders have been required to attain and demonstrate so many more skills and informational competencies. This survey is very general and really could benefit by focusing on specific HIM roles. What exactly is the point of this survey?
5. I was a systems analyst when I obtained the CHTS credential. At that time, the credential was very relevant to my job. I have since retired and do coding on a per diem basis. The CHTS credential is not relevant to my current role.
6. Just a comment. I hope that AHIMA does not eliminate the CP designation from the CHTS credential. It is valuable to demonstrate expertise in front end data capture and how data are then extracted from the system for reporting purposes. I just think that is getting lost in the shuffle.
7. Keeping up with current technology
8. Literature reviews
9. multitasking problem solving business ethics
10. need an option in the beginning that says N/A for not currently employed.
11. negotiations
12. No, my issue is getting to use the skills I have.
13. Public health
14. Quality Reporting Programs - VPPM, PQRS, MIPS
15. The questions about Projectors, Microsoft office and PC skills are way out of line. Those are basic competencies to the other skill sets listed; akin to being able to read and write before entering high school... It should be more like "Basic PC and User Profile management"...

## Appendix C. Task Ratings in Survey Order

### Task Ratings and Percent Performing in Task Order

No.	Task Statement	N	Mean	SE	SD	% Perform
C1	1. Assess stakeholder motivation and readiness for change	74	2.25	0.093	0.74	85.1
C2	2. Promote user buy-in	73	2.31	0.084	0.70	93.2
C3	3. Identify human, financial, and technology resources needed to implement EHR	74	2.16	0.097	0.77	85.1
C4	4. Identify training needs	74	2.34	0.080	0.67	96.0
C5	5. Provide training to future trainers	74	2.30	0.092	0.72	82.4
C6	6. Analyze barriers to successful utilization of EHR	74	2.49	0.078	0.65	94.6
C7	7. Resolve barriers to achieve successful utilization of EHR	74	2.27	0.084	0.70	94.6
C8	8. Serve as a change agent for the implementation of new technology	74	2.35	0.088	0.74	96.0
C9	9. Customize the delivery of information for the specific audience	74	2.38	0.084	0.69	91.9
C10	10. Develop tracking and trending processes	74	1.87	0.090	0.74	90.5
C11	11. Analyze data from tracking and trending processes	74	1.93	0.093	0.77	93.2
C12	12. Develop method for determining initial level of knowledge of EHR	74	1.98	0.088	0.70	86.5
C13	13. Evaluate level of knowledge of EHR post-training	74	2.03	0.089	0.70	83.8
C14	14. Develop procedures to comply with regulatory standards	74	2.20	0.090	0.73	89.2
C15	15. Incorporate evidence-based practices	74	2.28	0.090	0.73	90.5
C16	16. Promote quality management (e.g., patient safety, process improvement)	74	2.47	0.081	0.68	94.6
C17	17. Promote risk management (activity that limits the exposure to liability)	73	2.40	0.095	0.77	89.0
C18	18. Promote privacy and security of patient information	74	2.60	0.077	0.65	94.6
C19	19. Develop standards of documentation	74	2.36	0.093	0.76	89.2
C20	20. Assess current workflow	74	2.53	0.074	0.63	97.3
C21	21. Perform gap analyses	73	2.26	0.077	0.64	93.2
C22	22. Recommend resources and support tools	74	2.43	0.072	0.60	94.6
C23	23. Recommend solutions that meet the strategic alignment of the organization	74	2.44	0.072	0.61	94.6
C24	24. Pilot-test solutions	74	2.21	0.093	0.75	89.2
C25	25. Evaluate pilot-test results	74	2.24	0.088	0.72	90.5
C26	26. Implement adopted solutions	74	2.23	0.089	0.75	94.6
C27	27. Evaluate the solution-fit	72	2.14	0.091	0.74	91.7
C28	28. Serve as liaison with vendors	74	2.22	0.092	0.73	85.1
C29	29. Serve as a resource to decision makers	74	2.54	0.066	0.56	96.0
C30	30. Identify and collaborate with stakeholders	74	2.50	0.065	0.53	91.9
C31	31. Educate key stakeholders	74	2.43	0.076	0.63	93.2
C32	32. Develop a transfer plan for self-sustainability	73	2.13	0.096	0.75	82.2
C33	33. Implement evaluation mechanisms of services provided	74	1.93	0.090	0.70	82.4
C34	34. Assist with collection and reporting of data for meaningful use requirements	74	2.36	0.099	0.78	82.4
C35	35. Evaluate EHR interoperability	74	2.28	0.093	0.74	86.5
C36	36. Develop templates that mirror clinical practice	74	1.97	0.098	0.75	78.4
C37	37. Refine templates	74	1.97	0.090	0.71	82.4
C38	38. Map the clinical process data to provide input to IT changes	74	2.05	0.093	0.72	81.1
C39	39. Evaluate current processes for potential redesign efficiency	74	2.15	0.094	0.75	87.8



## Appendix D. Task Ratings in Descending Percent Performing Order

### Task Ratings in Ascending Percent Performing Order

No.	Task Statement	N	Mean	SE	SD	% Perform
C36	36. Develop templates that mirror clinical practice	74	1.97	0.098	0.75	78.4
C38	38. Map the clinical process data to provide input to IT changes	74	2.05	0.093	0.72	81.1
C32	32. Develop a transfer plan for self-sustainability	73	2.13	0.096	0.75	82.2
C5	5. Provide training to future trainers	74	2.30	0.092	0.72	82.4
C33	33. Implement evaluation mechanisms of services provided	74	1.93	0.090	0.70	82.4
C34	34. Assist with collection and reporting of data for meaningful use requirements	74	2.36	0.099	0.78	82.4
C37	37. Refine templates	74	1.97	0.090	0.71	82.4
C13	13. Evaluate level of knowledge of EHR post-training	74	2.03	0.089	0.70	83.8
C1	1. Assess stakeholder motivation and readiness for change	74	2.25	0.093	0.74	85.1
C3	3. Identify human, financial, and technology resources needed to implement EHR	74	2.16	0.097	0.77	85.1
C28	28. Serve as liaison with vendors	74	2.22	0.092	0.73	85.1
C12	12. Develop method for determining initial level of knowledge of EHR	74	1.98	0.088	0.70	86.5
C35	35. Evaluate EHR interoperability	74	2.28	0.093	0.74	86.5
C39	39. Evaluate current processes for potential redesign efficiency	74	2.15	0.094	0.75	87.8
C17	17. Promote risk management (activity that limits the exposure to liability)	73	2.40	0.095	0.77	89.0
C14	14. Develop procedures to comply with regulatory standards	74	2.20	0.090	0.73	89.2
C19	19. Develop standards of documentation	74	2.36	0.093	0.76	89.2
C24	24. Pilot-test solutions	74	2.21	0.093	0.75	89.2
C10	10. Develop tracking and trending processes	74	1.87	0.090	0.74	90.5
C15	15. Incorporate evidence-based practices	74	2.28	0.090	0.73	90.5
C25	25. Evaluate pilot-test results	74	2.24	0.088	0.72	90.5
C27	27. Evaluate the solution-fit	72	2.14	0.091	0.74	91.7
C9	9. Customize the delivery of information for the specific audience	74	2.38	0.084	0.69	91.9
C30	30. Identify and collaborate with stakeholders	74	2.50	0.065	0.53	91.9
C2	2. Promote user buy-in	73	2.31	0.084	0.70	93.2
C11	11. Analyze data from tracking and trending processes	74	1.93	0.093	0.77	93.2
C21	21. Perform gap analyses	73	2.26	0.077	0.64	93.2
C31	31. Educate key stakeholders	74	2.43	0.076	0.63	93.2
C6	6. Analyze barriers to successful utilization of EHR	74	2.49	0.078	0.65	94.6
C7	7. Resolve barriers to achieve successful utilization of EHR	74	2.27	0.084	0.70	94.6
C16	16. Promote quality management (e.g., patient safety, process improvement)	74	2.47	0.081	0.68	94.6
C18	18. Promote privacy and security of patient information	74	2.60	0.077	0.65	94.6
C22	22. Recommend resources and support tools	74	2.43	0.072	0.60	94.6
C23	23. Recommend solutions that meet the strategic alignment of the organization	74	2.44	0.072	0.61	94.6
C26	26. Implement adopted solutions	74	2.23	0.089	0.75	94.6
C4	4. Identify training needs	74	2.34	0.080	0.67	96.0
C8	8. Serve as a change agent for the implementation of new technology	74	2.35	0.088	0.74	96.0
C29	29. Serve as a resource to decision makers	74	2.54	0.066	0.56	96.0
C20	20. Assess current workflow	74	2.53	0.074	0.63	97.3



## Appendix E. Task Ratings in Ascending Mean Task Rating Order

### Task Ratings in Ascending Mean Task Rating Order

No.	Task Statement	N	Mean	SE	SD	% Perform
C10	10. Develop tracking and trending processes	74	1.87	0.090	0.74	90.5
C11	11. Analyze data from tracking and trending processes	74	1.93	0.093	0.77	93.2
C33	33. Implement evaluation mechanisms of services provided	74	1.93	0.090	0.70	82.4
C36	36. Develop templates that mirror clinical practice	74	1.97	0.098	0.75	78.4
C37	37. Refine templates	74	1.97	0.090	0.71	82.4
C12	12. Develop method for determining initial level of knowledge of EHR	74	1.98	0.088	0.70	86.5
C13	13. Evaluate level of knowledge of EHR post-training	74	2.03	0.089	0.70	83.8
C38	38. Map the clinical process data to provide input to IT changes	74	2.05	0.093	0.72	81.1
C32	32. Develop a transfer plan for self-sustainability	73	2.13	0.096	0.75	82.2
C27	27. Evaluate the solution-fit	72	2.14	0.091	0.74	91.7
C39	39. Evaluate current processes for potential redesign efficiency	74	2.15	0.094	0.75	87.8
C3	3. Identify human, financial, and technology resources needed to implement EHR	74	2.16	0.097	0.77	85.1
C14	14. Develop procedures to comply with regulatory standards	74	2.20	0.090	0.73	89.2
C24	24. Pilot-test solutions	74	2.21	0.093	0.75	89.2
C28	28. Serve as liaison with vendors	74	2.22	0.092	0.73	85.1
C26	26. Implement adopted solutions	74	2.23	0.089	0.75	94.6
C25	25. Evaluate pilot-test results	74	2.24	0.088	0.72	90.5
C1	1. Assess stakeholder motivation and readiness for change	74	2.25	0.093	0.74	85.1
C21	21. Perform gap analyses	73	2.26	0.077	0.64	93.2
C7	7. Resolve barriers to achieve successful utilization of EHR	74	2.27	0.084	0.70	94.6
C15	15. Incorporate evidence-based practices	74	2.28	0.090	0.73	90.5
C35	35. Evaluate EHR interoperability	74	2.28	0.093	0.74	86.5
C5	5. Provide training to future trainers	74	2.30	0.092	0.72	82.4
C2	2. Promote user buy-in	73	2.31	0.084	0.70	93.2
C4	4. Identify training needs	74	2.34	0.080	0.67	96.0
C8	8. Serve as a change agent for the implementation of new technology	74	2.35	0.088	0.74	96.0
C19	19. Develop standards of documentation	74	2.36	0.093	0.76	89.2
C34	34. Assist with collection and reporting of data for meaningful use requirements	74	2.36	0.099	0.78	82.4
C9	9. Customize the delivery of information for the specific audience	74	2.38	0.084	0.69	91.9
C17	17. Promote risk management (activity that limits the exposure to liability)	73	2.40	0.095	0.77	89.0
C22	22. Recommend resources and support tools	74	2.43	0.072	0.60	94.6
C31	31. Educate key stakeholders	74	2.43	0.076	0.63	93.2
C23	23. Recommend solutions that meet the strategic alignment of the organization	74	2.44	0.072	0.61	94.6
C16	16. Promote quality management (e.g., patient safety, process improvement)	74	2.47	0.081	0.68	94.6
C6	6. Analyze barriers to successful utilization of EHR	74	2.49	0.078	0.65	94.6
C30	30. Identify and collaborate with stakeholders	74	2.50	0.065	0.53	91.9
C20	20. Assess current workflow	74	2.53	0.074	0.63	97.3
C29	29. Serve as a resource to decision makers	74	2.54	0.066	0.56	96.0
C18	18. Promote privacy and security of patient information	74	2.60	0.077	0.65	94.6



## Appendix F. Mean Significance Ratings for Tasks by Region

### Task Ratings by Region

\*The "C" column shows the count of subclasses with mean significance less than 1.90.

No.	West			Midwest			Southeast			Northeast			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	N	Mean	SE	
C1	5	2.00	0.447	17	2.18	0.176	25	2.20	0.163	9	2.67	0.167	0
C2	6	2.00	0.258	16	2.44	0.157	27	2.30	0.139	11	2.36	0.244	0
C3	5	2.20	0.374	15	2.33	0.187	25	2.16	0.170	10	1.90	0.233	1
C4	6	2.33	0.333	17	2.35	0.170	28	2.39	0.119	12	2.17	0.241	0
C5	5	2.40	0.400	14	2.07	0.195	25	2.44	0.142	9	2.22	0.222	0
C6	5	2.40	0.400	17	2.71	0.114	29	2.38	0.135	11	2.45	0.207	0
C7	5	2.20	0.374	17	2.41	0.150	29	2.21	0.144	11	2.18	0.226	0
C8	6	2.17	0.401	17	2.59	0.150	29	2.28	0.148	11	2.45	0.247	0
C9	5	2.40	0.400	17	2.59	0.123	28	2.29	0.153	10	2.50	0.224	0
C10	5	1.80	0.374	17	1.76	0.161	26	2.04	0.152	11	1.55	0.247	3
C11	5	1.60	0.400	17	1.94	0.181	28	2.04	0.158	10	1.70	0.260	2
C12	4	2.25	0.250	16	2.00	0.183	27	2.00	0.160	9	1.78	0.222	1
C13	4	2.25	0.250	16	1.94	0.193	26	2.04	0.152	8	2.13	0.227	0
C14	5	1.80	0.374	16	2.31	0.120	26	2.31	0.164	11	1.82	0.226	2
C15	6	2.17	0.401	16	2.38	0.155	27	2.33	0.141	11	2.27	0.273	0
C16	6	2.33	0.333	17	2.65	0.147	27	2.48	0.135	12	2.42	0.193	0
C17	6	2.33	0.333	17	2.53	0.174	25	2.52	0.143	10	1.80	0.291	1
C18	6	2.67	0.211	17	2.65	0.170	29	2.52	0.137	10	2.60	0.163	0
C19	5	1.80	0.490	16	2.56	0.157	27	2.22	0.163	10	2.50	0.167	1
C20	6	2.67	0.211	17	2.65	0.170	29	2.48	0.118	12	2.42	0.193	0
C21	6	1.83	0.307	16	2.38	0.155	27	2.37	0.132	11	2.09	0.163	1
C22	6	2.00	0.258	17	2.41	0.150	28	2.57	0.120	11	2.36	0.152	0
C23	5	2.20	0.200	17	2.53	0.125	28	2.46	0.131	12	2.33	0.188	0
C24	5	2.00	0.316	15	2.07	0.228	27	2.33	0.151	11	2.18	0.182	0
C25	5	2.00	0.316	15	2.13	0.192	28	2.36	0.147	11	2.18	0.182	0
C26	6	2.17	0.401	17	2.29	0.166	28	2.21	0.149	11	2.00	0.234	0
C27	6	1.83	0.307	17	2.18	0.154	26	2.19	0.167	9	2.00	0.236	1
C28	5	1.80	0.374	16	2.38	0.155	26	2.27	0.142	8	1.88	0.295	2
C29	6	2.17	0.307	17	2.71	0.114	30	2.57	0.104	10	2.40	0.163	0
C30	5	2.40	0.245	17	2.53	0.125	28	2.54	0.096	10	2.50	0.167	0
C31	6	2.00	0.365	17	2.47	0.151	27	2.52	0.098	11	2.45	0.207	0
C32	4	1.75	0.479	16	2.13	0.180	24	2.29	0.127	9	1.89	0.309	2
C33	4	1.75	0.479	16	1.81	0.188	24	2.13	0.125	9	1.67	0.236	3
C34	6	2.33	0.422	15	2.73	0.118	25	2.32	0.160	7	1.71	0.360	1
C35	5	2.60	0.400	16	2.38	0.180	27	2.22	0.145	9	2.22	0.278	0
C36	4	2.00	0.408	14	1.93	0.195	24	1.96	0.153	9	2.11	0.261	0
C37	4	1.75	0.479	14	1.79	0.187	25	1.96	0.147	10	2.30	0.153	2
C38	4	2.00	0.408	16	1.94	0.213	25	2.04	0.135	7	2.00	0.309	0
C39	5	1.80	0.374	16	2.19	0.188	26	2.19	0.157	10	1.90	0.233	2



## Appendix G. Mean Significance Ratings for Tasks by Years of Work Experience

### Task Ratings by Years of Work Experience

*\*The "C" column shows the count of subclasses with mean significance less than 1.90.*

No.	0 – 7 years			8 – 19 years			20 years or more			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	
C1	20	2.20	0.186	14	2.07	0.195	19	2.47	0.140	20
C2	21	2.33	0.159	16	2.25	0.144	18	2.50	0.146	21
C3	17	2.29	0.166	16	1.63	0.155	19	2.42	0.176	17
C4	21	2.29	0.156	18	2.22	0.152	19	2.58	0.159	21
C5	17	2.29	0.206	15	2.13	0.192	17	2.53	0.151	17
C6	20	2.55	0.153	18	2.33	0.162	19	2.58	0.139	20
C7	20	2.50	0.154	17	2.06	0.135	19	2.26	0.168	20
C8	21	2.48	0.164	17	2.35	0.170	19	2.37	0.175	21
C9	19	2.53	0.140	17	2.18	0.176	18	2.44	0.166	19
C10	19	1.89	0.186	17	1.59	0.173	19	2.05	0.162	19
C11	20	2.00	0.192	18	1.56	0.166	19	2.11	0.169	20
C12	17	2.18	0.196	16	1.69	0.151	18	2.06	0.171	17
C13	17	2.29	0.166	15	1.67	0.187	18	2.06	0.171	17
C14	19	2.26	0.168	16	2.19	0.188	18	2.39	0.164	19
C15	19	2.42	0.159	17	2.12	0.189	17	2.41	0.150	19
C16	20	2.55	0.153	18	2.22	0.191	18	2.72	0.109	20
C17	20	2.25	0.190	14	2.43	0.202	18	2.50	0.185	20
C18	21	2.52	0.148	16	2.56	0.182	19	2.79	0.123	21
C19	19	2.42	0.192	14	2.43	0.173	19	2.42	0.176	19
C20	21	2.57	0.163	18	2.44	0.145	19	2.63	0.114	21
C21	19	2.47	0.160	16	2.13	0.125	19	2.42	0.116	19
C22	21	2.43	0.163	16	2.31	0.120	19	2.63	0.114	21
C23	19	2.68	0.110	18	2.22	0.152	19	2.63	0.114	19
C24	19	2.32	0.188	16	2.13	0.180	17	2.35	0.191	19
C25	19	2.26	0.185	16	2.25	0.144	18	2.44	0.166	19
C26	21	2.43	0.163	16	2.06	0.193	19	2.32	0.172	21
C27	20	2.35	0.150	16	1.94	0.170	17	2.35	0.170	20
C28	19	2.47	0.140	16	1.81	0.164	16	2.25	0.194	19
C29	21	2.52	0.131	17	2.59	0.123	19	2.68	0.110	21
C30	20	2.55	0.114	16	2.25	0.112	20	2.70	0.105	20
C31	21	2.57	0.148	17	2.18	0.128	19	2.58	0.139	21
C32	16	2.31	0.198	16	1.88	0.180	17	2.35	0.147	16
C33	17	2.06	0.201	15	1.60	0.131	16	2.19	0.164	17
C34	18	2.39	0.200	13	2.23	0.231	16	2.56	0.182	18
C35	17	2.65	0.147	18	2.17	0.167	16	2.31	0.198	17
C36	16	2.44	0.157	16	1.69	0.176	14	1.86	0.206	16
C37	17	2.35	0.170	16	1.63	0.180	16	1.94	0.143	17
C38	19	2.26	0.168	13	1.77	0.166	16	1.88	0.202	19
C39	19	2.37	0.175	16	1.94	0.170	17	2.18	0.176	19



## Appendix H. Mean Significance Ratings for Tasks by Highest Level of Education

### Task Ratings by Highest Level of Education

*\*The "C" column shows the count of subclasses with mean significance less than 1.90.*

No.	HS - Associate			Baccalaureate			Masters or above			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	
C1	15	2.07	0.228	18	2.28	0.16	20	2.40	0.15	0
C2	16	2.25	0.194	19	2.37	0.11	20	2.45	0.15	0
C3	13	2.23	0.201	17	1.88	0.17	22	2.27	0.18	1
C4	16	2.19	0.188	20	2.30	0.15	22	2.55	0.14	0
C5	12	2.08	0.260	18	2.33	0.18	19	2.47	0.14	0
C6	15	2.47	0.192	20	2.55	0.14	22	2.45	0.14	0
C7	15	2.40	0.190	19	2.26	0.15	22	2.23	0.15	0
C8	16	2.38	0.202	19	2.58	0.12	22	2.27	0.18	0
C9	14	2.43	0.173	19	2.42	0.16	21	2.33	0.16	0
C10	14	1.79	0.214	20	1.80	0.17	21	1.95	0.16	2
C11	15	1.93	0.228	20	1.75	0.18	22	2.00	0.16	1
C12	12	2.00	0.246	19	2.00	0.15	20	1.95	0.17	0
C13	12	2.17	0.207	18	2.00	0.18	20	1.95	0.17	0
C14	14	2.14	0.206	20	2.25	0.16	19	2.42	0.16	0
C15	14	2.36	0.199	20	2.35	0.15	19	2.26	0.17	0
C16	15	2.53	0.192	21	2.38	0.16	20	2.60	0.13	0
C17	15	2.27	0.228	17	2.47	0.17	20	2.40	0.18	0
C18	16	2.56	0.157	18	2.67	0.14	22	2.64	0.15	0
C19	14	2.57	0.202	17	2.41	0.17	21	2.33	0.17	0
C20	16	2.50	0.204	20	2.55	0.14	22	2.59	0.11	0
C21	14	2.36	0.199	18	2.33	0.14	22	2.36	0.10	0
C22	16	2.31	0.198	19	2.47	0.12	21	2.57	0.11	0
C23	14	2.64	0.133	20	2.45	0.14	22	2.50	0.13	0
C24	14	2.14	0.231	18	2.33	0.16	20	2.30	0.18	0
C25	14	2.07	0.221	18	2.39	0.14	21	2.43	0.15	0
C26	16	2.31	0.198	19	2.32	0.17	21	2.24	0.17	0
C27	15	2.20	0.175	19	2.21	0.16	19	2.26	0.17	0
C28	14	2.50	0.174	18	1.94	0.15	19	2.21	0.18	0
C29	16	2.50	0.158	19	2.63	0.11	22	2.64	0.10	0
C30	15	2.53	0.133	18	2.39	0.12	23	2.61	0.10	0
C31	16	2.50	0.183	19	2.37	0.14	22	2.50	0.13	0
C32	11	2.27	0.273	19	2.05	0.16	19	2.26	0.15	0
C33	12	2.00	0.246	18	1.78	0.15	18	2.11	0.16	1
C34	13	2.31	0.237	16	2.44	0.20	18	2.44	0.18	0
C35	12	2.58	0.193	20	2.30	0.16	19	2.32	0.17	0
C36	11	2.36	0.203	18	1.94	0.17	17	1.82	0.20	1
C37	12	2.33	0.188	18	1.83	0.19	19	1.89	0.15	2
C38	14	2.14	0.206	16	2.06	0.17	18	1.83	0.19	1
C39	14	2.21	0.214	18	2.22	0.17	20	2.10	0.16	0



# Appendix I. Mean Significance Ratings for Tasks by Certifications Held

## Task Ratings by Certifications Held

\*The "C" column shows the count of subclasses with mean significance less than 1.90.

No.	CP			IM			IS			PW			TR			TS			C*
	N	Mean	SE	N	Mean	SE	N	Mean	C*	N	Mean	SE	N	Mean	SE	N	Mean	SE	
C1	26	2.62	0.125	21	2.05	0.161	6	2.17	0.307	23	2.22	0.153	6	2.83	0.167	3	2.33	0.333	0
C2	29	2.45	0.117	21	2.43	0.130	6	2.17	0.307	26	2.23	0.150	6	2.67	0.211	3	2.00	0.577	0
C3	25	2.36	0.140	19	2.16	0.175	6	2.50	0.224	24	2.08	0.180	6	2.67	0.211	4	2.00	0.408	0
C4	29	2.38	0.135	22	2.41	0.126	6	2.50	0.224	27	2.07	0.140	6	2.67	0.211	4	2.25	0.479	0
C5	25	2.44	0.142	18	2.28	0.177	6	2.00	0.258	22	1.95	0.180	6	2.50	0.342	3	1.67	0.333	1
C6	27	2.67	0.107	22	2.50	0.127	6	2.67	0.211	27	2.30	0.139	6	2.83	0.167	4	2.00	0.408	0
C7	27	2.37	0.143	22	2.36	0.124	6	2.33	0.211	27	2.19	0.142	6	2.83	0.167	4	2.00	0.408	0
C8	29	2.45	0.137	22	2.45	0.127	6	2.00	0.258	28	2.07	0.154	6	2.67	0.211	3	2.00	0.000	0
C9	27	2.52	0.135	22	2.45	0.109	6	2.33	0.211	25	2.16	0.149	6	2.67	0.211	3	2.00	0.000	0
C10	27	1.89	0.145	22	1.82	0.156	6	2.33	0.211	25	1.84	0.149	6	2.83	0.167	3	2.00	0.577	2
C11	28	1.82	0.146	22	1.86	0.151	6	2.17	0.167	27	1.93	0.140	6	2.67	0.211	2	2.00	0.000	1
C12	25	2.04	0.135	22	2.00	0.147	6	2.17	0.167	23	2.00	0.154	6	2.33	0.333	4	1.75	0.250	1
C13	25	2.32	0.125	22	1.86	0.151	6	2.00	0.000	23	1.91	0.139	5	2.60	0.245	3	2.00	0.000	0
C14	27	2.19	0.151	21	2.38	0.129	5	2.20	0.200	24	2.08	0.169	6	2.83	0.167	4	2.00	0.408	0
C15	28	2.46	0.141	19	2.32	0.134	5	2.00	0.000	25	2.08	0.172	5	2.80	0.200	3	2.00	0.577	0
C16	29	2.59	0.105	20	2.50	0.154	5	2.40	0.245	26	2.35	0.135	5	2.80	0.200	3	2.00	0.577	0
C17	25	2.48	0.154	20	2.45	0.153	5	2.80	0.200	26	2.08	0.156	5	2.60	0.400	2	3.00	0.000	0
C18	28	2.68	0.090	22	2.73	0.135	6	2.83	0.167	28	2.46	0.141	6	2.83	0.167	3	3.00	0.000	0
C19	28	2.57	0.130	20	2.40	0.152	6	2.83	0.167	26	1.96	0.162	6	3.00	0.000	3	3.00	0.000	0
C20	29	2.62	0.092	22	2.59	0.126	6	2.33	0.211	28	2.39	0.130	6	2.67	0.211	4	2.00	0.408	0
C21	29	2.17	0.122	21	2.48	0.131	5	2.00	0.000	27	2.26	0.126	6	2.67	0.211	3	2.00	0.000	0
C22	29	2.52	0.107	22	2.41	0.126	6	2.50	0.224	27	2.37	0.132	6	2.83	0.167	3	2.33	0.333	0
C23	28	2.57	0.108	22	2.50	0.109	6	2.50	0.224	26	2.42	0.126	6	2.83	0.167	4	2.00	0.408	0
C24	27	2.41	0.134	21	2.19	0.178	6	2.33	0.211	24	2.08	0.169	6	2.67	0.211	3	2.33	0.333	0
C25	28	2.46	0.120	21	2.19	0.164	6	2.33	0.211	25	2.12	0.156	6	2.67	0.211	3	2.00	0.577	0
C26	29	2.31	0.150	22	2.32	0.138	6	2.50	0.224	27	2.11	0.163	6	3.00	0.000	3	2.67	0.333	0
C27	26	2.35	0.135	22	2.14	0.136	6	2.17	0.307	25	2.04	0.178	6	2.67	0.211	3	2.00	0.577	0
C28	24	2.21	0.159	21	2.33	0.144	6	2.67	0.211	24	2.13	0.151	6	2.67	0.333	3	2.33	0.667	0
C29	28	2.50	0.109	23	2.78	0.088	6	2.67	0.211	28	2.36	0.117	6	2.83	0.167	3	2.67	0.333	0
C30	27	2.70	0.090	22	2.45	0.109	6	2.67	0.211	26	2.42	0.113	6	3.00	0.000	3	2.67	0.333	0
C31	27	2.63	0.121	22	2.45	0.109	6	2.67	0.211	26	2.35	0.146	6	3.00	0.000	4	2.25	0.479	0
C32	24	2.21	0.159	22	2.23	0.160	6	2.33	0.333	20	2.10	0.176	5	3.00	0.000	3	2.67	0.333	0
C33	25	1.92	0.162	21	2.00	0.138	6	2.33	0.333	20	2.00	0.162	6	2.67	0.333	3	2.67	0.333	0
C34	23	2.22	0.177	20	2.70	0.105	6	2.67	0.211	24	2.33	0.167	6	2.33	0.333	4	1.75	0.479	1
C35	24	2.13	0.163	19	2.58	0.116	6	2.33	0.333	26	2.35	0.135	5	2.60	0.245	4	2.25	0.479	0
C36	25	1.96	0.158	16	1.88	0.202	4	1.75	0.250	22	2.05	0.167	5	2.40	0.400	2	1.50	0.500	2
C37	26	2.08	0.135	18	1.89	0.179	5	2.00	0.000	24	2.04	0.141	6	2.33	0.333	3	2.00	0.000	0
C38	26	2.08	0.146	17	2.06	0.201	5	2.00	0.000	25	2.12	0.133	6	2.67	0.211	3	2.00	0.000	0
C39	28	2.25	0.142	19	2.16	0.175	5	2.00	0.000	27	2.11	0.145	6	2.67	0.211	3	1.67	0.333	1



## Appendix J. Mean Significance Ratings for Tasks by Job Title

### Task Ratings by Job Title

\*The "C" column shows the count of subclasses with mean significance less than 1.90.

No.	Director/Executive			Manager			Technical			Other			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	N	Mean	SE	
C1	15	2.33	0.159	7	2.00	0.218	10	1.90	0.277	31	2.39	0.137	0
C2	15	2.47	0.133	9	2.11	0.200	10	2.40	0.267	34	2.26	0.129	0
C3	15	2.07	0.182	8	2.25	0.250	9	1.89	0.309	31	2.26	0.139	0
C4	16	2.44	0.157	9	2.22	0.278	10	2.30	0.213	36	2.33	0.113	0
C5	14	2.29	0.163	7	2.14	0.261	7	2.43	0.297	33	2.30	0.134	0
C6	16	2.38	0.125	8	2.63	0.263	10	2.30	0.260	36	2.56	0.109	0
C7	15	2.27	0.118	8	2.13	0.227	10	2.40	0.221	37	2.27	0.132	0
C8	16	2.50	0.158	9	2.00	0.236	10	2.40	0.267	36	2.36	0.127	0
C9	15	2.27	0.206	8	1.88	0.125	9	2.67	0.167	36	2.47	0.116	0
C10	16	1.94	0.193	8	1.88	0.125	9	2.11	0.261	34	1.76	0.134	1
C11	16	2.25	0.194	8	1.88	0.227	10	2.00	0.258	35	1.77	0.130	1
C12	15	1.73	0.153	8	1.88	0.125	9	2.11	0.261	32	2.09	0.137	1
C13	15	1.93	0.182	8	1.88	0.227	9	2.00	0.289	30	2.13	0.124	0
C14	15	2.27	0.182	8	2.00	0.189	9	2.33	0.236	34	2.18	0.137	0
C15	15	2.27	0.153	8	1.75	0.250	8	2.63	0.183	36	2.33	0.132	1
C16	16	2.38	0.155	8	2.63	0.183	8	2.75	0.164	38	2.42	0.123	0
C17	15	2.07	0.228	8	2.50	0.189	8	2.75	0.164	34	2.44	0.135	0
C18	15	2.60	0.163	9	2.89	0.111	10	2.60	0.221	36	2.53	0.116	0
C19	15	2.47	0.192	9	2.33	0.289	8	2.38	0.263	34	2.32	0.132	0
C20	16	2.38	0.155	9	2.67	0.167	10	2.50	0.224	37	2.57	0.106	0
C21	16	2.31	0.120	9	2.00	0.167	9	2.56	0.242	34	2.24	0.120	0
C22	16	2.44	0.128	9	2.22	0.222	10	2.20	0.249	35	2.54	0.095	0
C23	16	2.44	0.128	8	2.38	0.183	9	2.56	0.176	37	2.43	0.113	0
C24	15	2.20	0.145	7	2.57	0.297	8	2.25	0.313	36	2.14	0.133	0
C25	15	2.27	0.118	8	2.50	0.267	8	2.25	0.313	36	2.17	0.129	0
C26	16	2.13	0.155	9	2.11	0.261	10	2.20	0.249	35	2.31	0.135	0
C27	15	2.13	0.133	9	1.89	0.261	9	2.11	0.261	33	2.21	0.143	0
C28	16	2.00	0.158	8	2.00	0.267	10	2.70	0.153	29	2.24	0.146	0
C29	16	2.50	0.129	9	2.44	0.242	10	2.80	0.133	36	2.50	0.093	0
C30	16	2.50	0.129	8	2.13	0.227	10	2.50	0.167	34	2.59	0.086	0
C31	16	2.44	0.128	8	2.25	0.250	10	2.50	0.167	35	2.46	0.118	0
C32	15	1.93	0.182	7	2.14	0.261	9	2.22	0.278	29	2.21	0.144	0
C33	15	1.87	0.165	7	2.00	0.218	9	2.33	0.167	30	1.83	0.145	1
C34	12	2.50	0.195	8	2.25	0.313	9	2.56	0.176	32	2.28	0.150	0
C35	13	2.54	0.144	7	2.29	0.286	9	2.56	0.242	35	2.11	0.135	0
C36	14	2.21	0.155	5	1.20	0.200	7	2.43	0.297	32	1.88	0.133	1
C37	15	2.07	0.153	6	1.33	0.211	8	2.38	0.263	32	1.94	0.127	1
C38	13	1.85	0.191	7	1.57	0.202	8	2.38	0.263	32	2.16	0.128	2
C39	16	2.13	0.155	8	1.75	0.250	9	2.33	0.236	32	2.22	0.147	1



## Appendix K. Mean Significance Ratings for Number of Employees

### Task Ratings by Number of Employees

\*The "C" column shows the count of subclasses with mean significance less than 1.90.

No.	Less than 100			101 – 1,000			1,000 or more			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	
C1	11	2.45	0.247	30	2.27	0.117	22	2.14	0.178	0
C2	11	2.36	0.203	32	2.31	0.122	25	2.28	0.147	0
C3	11	2.64	0.203	29	2.17	0.132	23	1.91	0.165	0
C4	11	2.27	0.237	33	2.36	0.105	27	2.33	0.141	0
C5	8	2.25	0.313	31	2.23	0.129	22	2.41	0.142	0
C6	11	2.55	0.207	33	2.52	0.108	26	2.42	0.138	0
C7	11	2.18	0.263	33	2.24	0.123	26	2.35	0.123	0
C8	11	2.09	0.251	34	2.41	0.113	26	2.38	0.158	0
C9	10	2.50	0.224	33	2.36	0.122	25	2.36	0.140	0
C10	11	2.00	0.234	31	1.74	0.131	25	1.96	0.147	1
C11	12	2.00	0.213	32	1.72	0.136	25	2.16	0.149	1
C12	10	2.20	0.249	30	2.00	0.127	24	1.88	0.139	0
C13	10	2.10	0.277	30	2.03	0.112	22	2.00	0.161	0
C14	10	2.40	0.267	34	2.06	0.111	22	2.32	0.166	0
C15	11	2.36	0.244	31	2.35	0.127	25	2.16	0.149	0
C16	12	2.25	0.250	32	2.59	0.099	26	2.42	0.138	0
C17	11	2.18	0.296	30	2.37	0.148	24	2.54	0.120	0
C18	11	2.55	0.247	33	2.58	0.107	26	2.65	0.123	0
C19	11	2.36	0.244	32	2.44	0.118	23	2.26	0.180	0
C20	11	2.64	0.203	34	2.53	0.105	27	2.48	0.124	0
C21	11	2.45	0.157	32	2.25	0.119	25	2.20	0.129	0
C22	11	2.64	0.152	34	2.44	0.105	25	2.32	0.125	0
C23	11	2.73	0.141	33	2.39	0.106	26	2.38	0.125	0
C24	10	1.90	0.314	32	2.28	0.112	24	2.25	0.162	0
C25	10	2.00	0.258	32	2.25	0.119	25	2.32	0.150	0
C26	11	2.09	0.251	34	2.21	0.125	25	2.32	0.150	0
C27	10	2.00	0.258	31	2.19	0.126	25	2.12	0.156	0
C28	9	2.44	0.176	30	2.30	0.128	24	2.04	0.165	0
C29	11	2.73	0.141	33	2.48	0.098	27	2.52	0.112	0
C30	11	2.64	0.152	32	2.47	0.100	25	2.48	0.102	0
C31	11	2.55	0.207	32	2.53	0.100	26	2.27	0.131	0
C32	10	2.10	0.277	28	2.21	0.130	22	2.05	0.167	0
C33	9	2.11	0.309	31	1.94	0.122	21	1.86	0.143	0
C34	11	2.82	0.182	28	2.36	0.147	22	2.14	0.165	0
C35	11	2.36	0.279	31	2.29	0.115	22	2.23	0.173	0
C36	11	2.00	0.234	28	2.00	0.145	19	1.89	0.169	0
C37	11	1.91	0.211	31	2.10	0.117	19	1.79	0.181	1
C38	12	2.08	0.229	29	2.10	0.125	19	1.95	0.179	0
C39	12	2.25	0.218	33	2.12	0.129	20	2.15	0.182	0



## Appendix L. Mean Significance Ratings for Knowledge Statements

### Knowledge Ratings by CHTS Role

\*The "C" column shows the count of subclasses with mean significance less than 1.70.

No.	Management			Technical			Trainer			Consultant			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	N	Mean	SE	
K1	151	2.25	0.059	82	2.34	0.082	86	2.26	0.076	71	2.21	0.094	0
K2	149	2.14	0.060	80	2.24	0.082	81	2.12	0.077	71	2.17	0.090	0
K3	149	2.36	0.059	81	2.35	0.081	87	2.25	0.077	69	2.41	0.088	0
K4	133	1.94	0.068	69	1.96	0.098	77	2.03	0.092	58	1.86	0.106	0
K5	149	2.26	0.057	80	2.35	0.078	87	2.18	0.079	71	2.24	0.084	0
K6	151	2.38	0.056	80	2.53	0.069	89	2.42	0.067	70	2.39	0.085	0
K7	138	1.94	0.067	76	1.89	0.093	84	2.06	0.085	66	1.92	0.095	0
K8	148	2.04	0.061	80	2.09	0.080	87	2.06	0.084	69	2.04	0.096	0
K9	143	2.37	0.059	81	2.43	0.080	81	2.44	0.077	69	2.42	0.084	0
K10	130	1.85	0.070	71	1.87	0.096	78	1.99	0.088	61	1.97	0.104	0
K11	149	2.11	0.067	82	2.12	0.091	87	2.28	0.078	69	2.25	0.096	0
K12	148	2.07	0.065	83	2.11	0.092	92	2.22	0.082	66	2.05	0.095	0
K13	156	2.53	0.051	85	2.60	0.063	92	2.52	0.066	71	2.49	0.077	0
K14	135	1.96	0.070	76	2.21	0.090	81	1.99	0.087	60	2.00	0.111	0
K15	159	2.53	0.052	86	2.60	0.067	94	2.51	0.067	72	2.67	0.066	0
K16	153	2.16	0.061	84	2.20	0.084	89	2.17	0.086	67	2.25	0.091	0
K17	112	1.69	0.074	65	1.80	0.106	67	1.82	0.102	50	1.50	0.104	2
K18	144	2.17	0.063	81	2.15	0.086	88	2.18	0.083	70	2.10	0.094	0
K19	155	2.38	0.056	86	2.49	0.070	90	2.41	0.067	72	2.38	0.078	0
K20	154	2.32	0.060	84	2.46	0.075	90	2.30	0.080	70	2.34	0.088	0
K21	133	1.91	0.071	77	2.00	0.094	78	1.90	0.092	61	1.89	0.102	0
K22	143	2.15	0.066	79	2.25	0.087	83	2.16	0.079	66	2.14	0.089	0
K23	134	1.94	0.068	75	2.11	0.092	76	1.96	0.089	59	1.86	0.101	0
K24	145	2.15	0.063	82	2.28	0.078	86	2.06	0.083	68	2.06	0.093	0
K25	145	2.27	0.061	83	2.33	0.077	83	2.18	0.081	68	2.24	0.094	0
K26	143	2.27	0.056	81	2.28	0.075	86	2.24	0.077	69	2.25	0.076	0
K27	141	1.85	0.059	80	1.96	0.082	79	1.84	0.085	63	1.71	0.092	0
K28	138	1.91	0.065	79	1.95	0.092	77	1.99	0.093	60	1.80	0.103	0
K29	156	2.56	0.049	85	2.56	0.070	91	2.49	0.067	71	2.45	0.080	0
K30	157	2.40	0.054	85	2.46	0.068	91	2.40	0.073	72	2.56	0.068	0
K31	144	1.88	0.064	78	1.96	0.090	84	1.96	0.085	60	1.68	0.090	1
K32	121	1.67	0.067	68	1.79	0.095	67	1.70	0.097	50	1.58	0.103	2
K33	113	1.97	0.077	70	2.14	0.098	67	2.01	0.103	48	1.88	0.125	0
K34	128	1.98	0.066	76	2.11	0.085	69	2.04	0.091	56	1.98	0.107	0
K35	129	1.77	0.067	76	1.91	0.090	69	1.83	0.099	56	1.75	0.103	0
K36	104	1.78	0.076	66	1.88	0.093	62	1.76	0.094	45	1.73	0.116	0
K37	136	2.18	0.066	74	2.12	0.088	83	2.28	0.083	64	2.27	0.100	0
K38	149	2.10	0.064	78	1.99	0.092	91	2.34	0.075	69	2.26	0.089	0
K39	143	1.98	0.064	76	1.99	0.087	89	2.07	0.084	69	2.04	0.098	0
K40	152	2.36	0.056	83	2.34	0.077	92	2.41	0.068	72	2.42	0.076	0
K41	124	1.88	0.070	58	1.79	0.104	74	1.80	0.096	61	1.82	0.106	0
K42	149	2.28	0.059	78	2.28	0.081	84	2.19	0.080	70	2.31	0.088	0
K43	153	2.36	0.056	82	2.49	0.070	86	2.42	0.073	72	2.54	0.074	0
K44	108	1.57	0.069	51	1.63	0.105	63	1.70	0.100	53	1.53	0.096	4
K45	114	1.61	0.071	60	1.65	0.097	75	1.77	0.092	54	1.59	0.101	3
K46	144	2.24	0.062	78	2.19	0.082	87	2.33	0.080	66	2.32	0.092	0

No.	Management			Technical			Trainer			Consultant			C*
	N	Mean	SE	N	Mean	SE	N	Mean	SE	N	Mean	SE	
K47	149	2.23	0.063	79	2.14	0.090	88	2.28	0.074	72	2.38	0.078	0
K48	120	1.83	0.076	56	1.70	0.102	74	1.78	0.095	58	1.83	0.105	1
K49	149	2.17	0.065	82	2.02	0.090	87	2.22	0.081	70	2.23	0.089	0
K50	117	1.63	0.069	64	1.73	0.098	73	1.73	0.096	57	1.63	0.099	2
K51	151	2.09	0.064	80	1.98	0.091	90	2.22	0.077	69	2.07	0.093	0
K52	141	2.03	0.064	75	1.99	0.086	85	2.05	0.084	67	1.90	0.093	0
K53	150	2.05	0.063	82	2.11	0.085	86	2.10	0.083	70	1.99	0.090	0
K54	151	2.12	0.061	80	2.14	0.085	87	2.18	0.078	69	2.16	0.087	0
K55	155	2.46	0.050	85	2.45	0.064	91	2.46	0.069	73	2.62	0.061	0
K56	156	2.37	0.059	85	2.29	0.082	94	2.30	0.078	70	2.46	0.083	0
K57	143	1.83	0.064	74	1.88	0.092	82	1.96	0.086	69	1.99	0.089	0
K58	149	2.15	0.060	79	2.16	0.079	89	2.26	0.072	70	2.29	0.079	0
K59	152	2.34	0.056	81	2.30	0.075	92	2.36	0.068	73	2.49	0.068	0
K60	144	2.25	0.064	80	2.26	0.085	84	2.29	0.082	73	2.44	0.080	0
K61	139	1.99	0.065	75	1.96	0.088	86	2.03	0.087	65	1.98	0.102	0
K62	141	2.01	0.065	71	1.99	0.095	81	2.05	0.088	65	2.02	0.092	0
K63	143	2.00	0.064	75	2.04	0.088	83	2.11	0.086	67	2.04	0.089	0
K64	108	1.67	0.072	63	1.71	0.097	71	1.82	0.097	50	1.68	0.105	2
K65	122	1.69	0.068	63	1.76	0.100	75	1.79	0.094	60	1.70	0.096	2
K66	142	2.11	0.062	74	2.07	0.087	93	2.37	0.075	67	2.12	0.096	0
K67	147	2.16	0.063	77	2.17	0.088	93	2.27	0.080	68	2.09	0.095	0
K68	156	2.42	0.054	82	2.45	0.065	90	2.43	0.071	72	2.57	0.071	0
K69	154	2.51	0.053	84	2.58	0.068	93	2.52	0.069	73	2.48	0.085	0
K70	157	2.71	0.038	84	2.73	0.049	94	2.71	0.049	73	2.74	0.055	0
K71	153	2.37	0.057	82	2.33	0.080	91	2.42	0.072	70	2.46	0.090	0
K72	154	2.27	0.061	82	2.20	0.089	90	2.39	0.077	72	2.33	0.095	0
K73	154	2.39	0.056	82	2.40	0.079	89	2.44	0.075	73	2.38	0.084	0
K74	149	2.44	0.055	82	2.51	0.072	89	2.45	0.073	71	2.37	0.086	0
K75	156	2.49	0.051	82	2.50	0.070	93	2.57	0.066	73	2.53	0.081	0
K76	142	1.99	0.065	78	2.06	0.086	87	2.05	0.086	67	1.99	0.094	0
K77	153	2.30	0.060	82	2.28	0.084	92	2.34	0.082	72	2.29	0.092	0
K78	156	2.58	0.050	85	2.51	0.072	94	2.73	0.055	72	2.64	0.069	0
K79	156	2.62	0.045	85	2.58	0.068	93	2.68	0.055	72	2.67	0.069	0
K80	157	2.71	0.042	86	2.73	0.058	95	2.74	0.052	73	2.68	0.070	0

## Appendix M. Exam Specifications and Detailed Content Outline

 <b>American Health Information Management Association                      Certified Healthcare Technology Specialist (CHTS)                      Clinician/Practitioner Consultant Role                      Detailed Content Outline</b>	Cognitive Level			Total
	Recall	Application	Analysis	
<b>1. Implementation/Optimization of EHR Systems</b>	<b>5</b>	<b>12</b>	<b>7</b>	<b>24</b>
<ul style="list-style-type: none"> <li>A. Assess stakeholder motivation and readiness for change</li> <li>B. Promote user buy-in</li> <li>C. Identify human, financial, and technology resources needed to implement EHR</li> <li>D. Identify training needs</li> <li>E. Provide training to future trainers</li> <li>F. Analyze barriers to successful utilization of EHR</li> <li>G. Resolve barriers to achieve successful utilization of EHR</li> <li>H. Serve as a change agent for the implementation of new technology                             <ul style="list-style-type: none"> <li>I. Customize the delivery of information for the specific audience</li> </ul> </li> <li>J. Develop tracking and trending processes</li> <li>K. Analyze data from tracking and trending processes</li> <li>L. Develop method for determining initial level of knowledge of EHR</li> <li>M. Evaluate level of knowledge of EHR post-training</li> </ul>				
<b>2. EHR Policies and Procedures</b>	<b>4</b>	<b>10</b>	<b>4</b>	<b>18</b>
<ul style="list-style-type: none"> <li>A. Comply with policies and procedures (e.g., internal, regulatory, accreditation)</li> <li>B. Incorporate evidence-based practices</li> <li>C. Promote quality management (e.g., patient safety, process improvement)</li> <li>D. Promote risk management (activity that limits the exposure to liability)</li> <li>E. Promote privacy and security of patient information</li> <li>F. Develop standards of documentation</li> </ul>				



**American Health Information Management Association**  
**Certified Healthcare Technology Specialist (CHTS)**  
***Clinician/Practitioner Consultant Role***  
**Detailed Content Outline**

	Cognitive Level			Total
	Recall	Application	Analysis	
<b>3. Workflow Problems</b>	<b>5</b>	<b>8</b>	<b>10</b>	<b>23</b>
<ul style="list-style-type: none"> <li>A. Assess current workflow</li> <li>B. Perform gap analyses</li> <li>C. Recommend resources and support tools</li> <li>D. Recommend solutions that meet the strategic alignment of the organization</li> <li>E. Pilot-test solutions</li> <li>F. Evaluate pilot-test results</li> <li>G. Implement adopted solutions</li> <li>H. Evaluate the solution-fit</li> </ul>				
<b>4. Communication and Coordination</b>	<b>4</b>	<b>10</b>	<b>8</b>	<b>22</b>
<ul style="list-style-type: none"> <li>A. Serve as liaison with vendors</li> <li>B. Serve as a resource to decision makers</li> <li>C. Identify and collaborate with stakeholders</li> <li>D. Educate key stakeholders</li> <li>E. Develop a transfer plan for self-sustainability</li> <li>F. Implement evaluation mechanisms of services provided</li> <li>G. Assist with collection and reporting of data for meaningful use requirements</li> <li>H. Evaluate EHR interoperability</li> </ul>				
<b>5. User Interface</b>	<b>4</b>	<b>5</b>	<b>4</b>	<b>13</b>
<ul style="list-style-type: none"> <li>A. Develop templates that mirror clinical practice</li> <li>B. Refine templates</li> <li>C. Map the clinical process data to provide input to IT changes</li> <li>D. Evaluate current processes for potential redesign efficiency</li> </ul>				
<b>Total</b>	<b>22</b>	<b>45</b>	<b>33</b>	<b>100</b>

## **Testable Knowledge**

### **High Priority**

- Accreditation standards
- Adult learning principles
- Analytical skills
- Audio/visual skills (e.g., LCD projector)
- Basic statistics
- Best practices
- Change management
- Clinical and operations workflow
- Communication skills (written & oral)
- Computer systems
- Conflict resolution
- Cultural competency
- Culture of health care
- Data analysis
- Database structures (e.g., SQL)
- EHR/EMR/PHR principles
- Facilitation skills
- Flowchart applications
- Gov't agencies associated with healthcare
- Health care delivery systems
- Health care regulation
- Health informatics
- Health information exchange
- Health information management concepts & principles
- Health information systems
- Health IT applications
- Implementation life cycle
- Industry trends
- Information governance
- Interoperability
- Issue management
- IT fundamentals
- IT security principles
- Leadership
- Legal and ethical issues
- Meaningful use
- Medical terminology
- Organizational culture
- Organizational structure
- PC skills (e.g., Microsoft Office, internet)
- Performance improvement
- Presentation skills
- Process improvement
- Project management
- Quality control
- Quality improvement
- Quality of patient care
- Resource management
- Risk management
- Time management
- Training methodologies
- Virtual training or meeting tools
- Work flow improvement & management
- Working with teams

### **Medium Priority**

- Diagnostic and procedural coding (e.g., ICD-CM/PCS, CPT, HCPCS)
- Linguistic competency
- Medical sciences
- Operations management
- Public health
- Report writing principles
- Standard technical language

### **Low Priority**

- Budget management
- Consumerism and patient engagement
- Health care revenue cycle
- HL7
- Human resource management
- Interface integration
- Network technology (e.g., VPN, cloud-based)
- Nomenclatures
- Peripheral devices (e.g., printers)
- Platforms and operating systems (e.g., Windows, Mac, Linux, Mobile devices)
- Simulation technology
- Software development life cycle
- Technical specs (hardware, software)
- Telehealth and telemedicine
- Writing test scripts

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