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ABSTRACT

In August 1992, the Eastern Iowa Community College District convened a 2-day Developing a Curriculum (DACUM) workshop involving a panel of six computer programmer/analysts (CP/A's) in the identification of specific competencies and tasks expected of CP/A's. To validate the entry-level skills identified, a survey was conducted of 96 businesses employing CP/A's. The survey instrument listed 106 specific job skills in the following categories: communication skills (e.g., display a positive attitude and demonstrate good listening skills); working as part of a team (e.g., follow directions and brainstorm ideas); utilizing organizational skills (e.g., develop task lists and manage multiple projects); designing/writing programs/systems (e.g., test and debug programs/systems); changing/modifying programs/systems (e.g., modify job control structure); creating documentation (e.g., identify level of documentation being created); continuing education (e.g., share information with colleagues and utilize available manuals); operating personal computers (e.g., follow shutdown and security procedures); and utilizing mainframe resources (e.g., follow log on/off procedures and perform file maintenance). Respondents were asked to identify the skills they expected entry-level CP/A's to perform and to indicate the importance of each skill. A total of 22 usable surveys were returned for a 25% response rate. Only two of the 106 skills were not considered to be entry level by a majority of the respondents: selecting the language to be utilized and conducting training. The survey instrument is provided. (PAA)

PROGRAMMER/ANALYST COMPETENCY VALIDATION FOR THE EASTERN IOWA COMMUNITY COLLEGE DISTRICT

EASTERN IOWA COMMUNITY COLLEGE DISTRICT
District Office of Academic Affairs and Planning

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PROGRAMMER/ANALYST COMPETENCY VALIDATION
FOR THE
EASTERN IOWA COMMUNITY COLLEGE DISTRICT

I. INTRODUCTION

This survey was conducted to validate the competencies defined for entry-level programmer/analysts through the Programmer/Analyst DACUM workshop held on August 26 and 27, 1992. DACUM, an acronym for Developing A Curriculum, is a process that analyzes an occupation systematically. The analysis is performed by a panel of experts from the occupation under consideration, in this case programmer/analysts. Using a modified brainstorming method, the panel members participate in a two-day workshop under the direction of a qualified facilitator. The result of the process is a DACUM chart which graphically describes an occupation in terms of specific tasks that workers must perform.

The Programmer/Analyst DACUM workshop consisted of six programmer/analyst panel members. These programmer/analysts represented a variety of business/organizations in the Merged Area IX and Illinois Quad Cities area.

II. THE STUDY

Target Population. A total of 96 businesses within the Merged Area IX and Illinois Quad Cities area were identified for survey distribution. These businesses were respondents to the initial Programmer/Analyst Labor Market Assessment which was conducted in October 1991 and who indicated in that survey that they employed programmer/analysts.

Data Collection, Tabulation and Analysis. The survey was mailed on September 22, 1992 to 96 businesses in the Merged Area IX and Illinois Quad Cities area. A cover letter and return envelope accompanied the survey. A second copy of the survey was mailed on October 9, 1992, to those who did not respond before the stated deadline. A total of 24 surveys were returned; this represents 25% of the total population polled. Of the 24 surveys returned, 22 were considered valid for the purposes of this assessment. The survey instrument can be found in Appendix A.

All surveys were tabulated and analyzed using the Statistical Package for the Social Sciences (SPSS).

Survey Design

The survey instrument requested information on the following:

1. The skills the employer expects an entry-level programmer/analyst to perform.
2. The degree of importance of each specific skill for the entry-level programmer/analyst.

III. RESULTS

Entry-level skills. The respondents were asked to indicate the skills they expect an entry-level programmer/analyst to perform and the degree of importance for each specific skill. The complete results are shown on Table 1.

TABLE 1
Entry-level Skills

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
COMMUNICATION SKILLS			
1.	Display a positive attitude.	100.0	100.0
2.	Maintain an open mind and control your emotions.	100.0	100.0
3.	Interact appropriately with emotions of others.	100.0	100.0
4.	Demonstrate good listening skills.	100.0	100.0
5.	Listen at the level of the speaker.	86.9	95.5
6.	Speak effectively.	100.0	95.7
7.	Speak at the level of the listener.	86.9	90.9
8.	Ask questions to reaffirm interpretation.	100.0	100.0
9.	Write effectively.	100.0	100.0
WORK AS A TEAM			
1.	Follow directions.	100.0	100.0
2.	Define and work toward team goals, incorporating present and anticipating future business needs.	69.6	90.5
3.	Incorporate communication skills.	95.7	100.0
4.	Establish a productive environment conducive to teamwork.	72.7	94.4

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
5.	Brainstorm ideas.	86.4	78.3
6.	Accept others' ideas.	95.5	95.7
7.	Establish deadlines.	86.4	81.8
8.	Delegate and accept responsibilities.	81.8	90.5
9.	Work toward team goals.	100.0	91.3
10.	Assist and work with other team members.	95.5	100.0
11.	Keep team members informed.	95.5	95.7
12.	Hold team meetings regularly to evaluate progress.	54.6	78.9
13.	Adapt to change.	100.0	95.7
14.	Give/accept constructive criticism, praise, and encouragement.	95.2	95.5
	UTILIZE ORGANIZATIONAL SKILLS		
1.	Receive and follow directives.	100.0	100.0
2.	Set goals.	90.9	100.0
3.	Communicate goals.	86.4	100.0
4.	Apply organizational logic.	86.4	90.5
5.	Develop task lists.	90.5	95.2
6.	Manage multiple projects.	63.6	84.2
7.	Progress toward goals.	95.2	100.0
8.	Evaluate and revise goals.	95.5	95.7
9.	Adapt to change.	100.0	100.0

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
DESIGN/WRITE PROGRAMS/SYSTEM			
1.	Follow directions.	100.0	95.5
2.	Work with users in design of application, incorporating present and anticipating future business needs.	85.7	90.5
3.	Apply logic.	100.0	95.5
4.	Define the input and output.	80.9	90.0
5.	Review design with users.	76.2	90.0
6.	Conduct design walk-through.	57.1	83.3
7.	Select the language to be utilized.	35.0	52.9
8.	Write the programs/system.	100.0	90.9
9.	Write code documentation.	95.2	90.5
10.	Conduct code walk-through.	71.4	73.7
11.	Define and create the job control structure.	76.2	90.0
12.	Test and debug programs/system.	100.0	95.5
13.	Review the output with users.	95.2	95.5
14.	Adapt to change.	100.0	100.0
15.	Meet deadlines.	100.0	95.5
16.	Write user documentation.	66.7	80.0
17.	Train users.	76.2	76.2
18.	Implement the programs/system.	85.7	95.0

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
CHANGE/MODIFY PROGRAMS/SYSTEM			
1.	Follow directions.	100.0	95.5
2.	Define required changes with the users.	85.0	85.7
3.	Define scope of the changes.	95.0	86.4
4.	Incorporate present and anticipate future business needs.	75.0	75.0
5.	Review all existing documentation.	95.0	95.2
6.	Apply logic.	100.0	95.5
7.	Make design/code changes.	95.0	100.0
8.	Conduct design/code walk-through.	75.0	73.7
9.	Make necessary modifications to job control structure.	70.0	90.0
10.	Test and debug changes.	100.0	100.0
11.	Review output with users.	100.0	90.9
12.	Adapt to change.	100.0	95.5
13.	Meet deadlines.	100.0	95.5
14.	Modify existing documentation, as necessary.	95.0	100.0
15.	Train users.	85.0	77.3
16.	Implement program changes.	90.0	90.5
CREATE DOCUMENTATION			
1.	Follow directions.	100.0	91.3
2.	Identify level of documentation you are creating.	100.0	91.3

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
3.	Familiarize yourself with programs/systems to document.	95.2	100.0
4.	Follow documentation standards established by organization.	95.2	100.0
5.	Apply logic.	100.0	91.3
6.	Write documentation.	95.2	95.7
7.	Test and modify documentation.	85.7	90.9
8.	Present/train in use of documentation.	61.9	80.0
9.	Adapt to change.	100.0	95.7
10.	Meet deadlines.	100.0	100.0
11.	Distribute documentation.	66.7	78.9
12.	Maintain documentation.	85.7	86.4
	CONTINUING EDUCATION		
1.	Share information with colleagues.	95.2	91.3
2.	Expand knowledge of internal business functions.	95.2	100.0
3.	Experiment with computer/technologies.	80.9	82.6
4.	Utilize available manuals.	100.0	95.7
5.	Conduct training.	45.5	70.0
6.	Attend seminars and classes.	90.5	82.6
7.	Read technical journals and magazines.	85.7	82.6
8.	Join and participate in professional organizations.	57.1	50.0

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
OPERATE PERSONAL COMPUTER			
1.	Follow start-up procedures.	75.0	85.7
2.	Load software.	71.4	85.0
3.	Follow file backup procedures.	80.9	85.7
4.	Follow shutdown procedures.	80.0	85.7
5.	Follow security procedures.	85.0	80.9
6.	Perform hardware and software maintenance.	57.1	63.2
7.	Demonstrate procedures to hook up and move computers.	61.9	73.7
8.	Demonstrate familiarity with PC components.	70.0	85.0
9.	Demonstrate familiarity with peripherals and their functions.	70.0	85.0
10.	Demonstrate familiarity with operating system/environment (i.e., LAN).	60.0	70.0
11.	Demonstrate familiarity with fundamental software basic (i.e., spreadsheet, database, word processing, graphics).	75.0	75.0
12.	Differentiate between batch and on-line processing.	65.0	73.7

		Percent indicating this is an entry-level task	Percent who indicated task to be Extremely Important, Very Important, or Important.
UTILIZE MAINFRAME RESOURCES			
1.	Follow log on/off procedures.	95.2	100.0
2.	Follow security procedures.	95.24	100.0
3.	Exhibit knowledge of fundamental software basics and utilities.	90.0	95.0
4.	Utilize commands and utilities.	90.5	81.0
5.	Perform file maintenance.	76.2	76.2
6.	Exhibit knowledge of peripherals.	85.7	76.2
7.	Exhibit knowledge of mainfram components.	90.5	86.4
8.	Differentiate between batch and on-line processing.	90.5	95.2

Concluding Remarks

The following skills were not considered to be entry-level by the majority of the respondents

Not Entry-Level Skills

Design/Write Programs/System
Select the language to be utilized.

Continuing Education
Conduct training

APPENDIX A

CLINTON COMMUNITY COLLEGE
SCOTT COMMUNITY COLLEGE
MUSCATINE COMMUNITY COLLEGE

EASTERN IOWA COMMUNITY COLLEGE DISTRICT

306 West River Drive · Davenport Iowa · 52801 (224) · (319) 322-6015

PROGRAMMER/ANALYST VALIDATION SURVEY

The purpose of this survey is to assist the Eastern Iowa Community College District in validating the skills performed by a programmer/analyst in your organization. Your responses will help provide direction to the Business Computer Programming program offered at Scott Community College. The names of firms and businesses replying will not be released. We appreciate the time you will take to complete this survey.

The following is a list of tasks/skills performed by a programmer/analyst. Please indicate if your organization expects an entry-level programmer/analyst to perform each skill listed below. Then rate each skill according to its importance for an entry-level programmer/analyst. Circle the answer which best corresponds with your response.

	Entry Level Skill	Order of Importance to New Employee
	1. Yes 2. No	1. Extremely Important 2. Very Important 3. Important 4. Some Importance 5. Not Important 6. Not Used
COMMUNICATION SKILLS		
1. Display a positive attitude.	Yes No	1 2 3 4 5 6
2. Maintain an open mind and control your emotions.	Yes No	1 2 3 4 5 6
3. Interact appropriately with emotions of others.	Yes No	1 2 3 4 5 6
4. Demonstrate good listening skills.	Yes No	1 2 3 4 5 6
5. Listen at the level of the speaker.	Yes No	1 2 3 4 5 6
6. Speak effectively.	Yes No	1 2 3 4 5 6
7. Speak at the level of the listener.	Yes No	1 2 3 4 5 6
8. Ask questions to reaffirm interpretation.	Yes No	1 2 3 4 5 6
9. Write effectively.	Yes No	1 2 3 4 5 6
WORK AS A TEAM		
1. Follow directions.	Yes No	1 2 3 4 5 6
2. Define and work toward team goals, incorporating present and anticipating future business needs.	Yes No	1 2 3 4 5 6
3. Incorporate communication skills.	Yes No	1 2 3 4 5 6
4. Establish a productive environment conducive to teamwork.	Yes No	1 2 3 4 5 6

6.	Accept others' ideas.	Yes	No	1	2	3	4	5	6
7.	Establish deadlines.	Yes	No	1	2	3	4	5	6
8.	Delegate and accept responsibilities.	Yes	No	1	2	3	4	5	6
9.	Work toward team goals.	Yes	No	1	2	3	4	5	6
10.	Assist and work with other team members	Yes	No	1	2	3	4	5	6
11.	Keep team members informed.	Yes	No	1	2	3	4	5	6
12.	Hold team meetings regularly to evaluate progress.	Yes	No	1	2	3	4	5	6
13.	Adapt to change.	Yes	No	1	2	3	4	5	6
14.	Give/accept constructive criticism, praise, and encouragement.	Yes	No	1	2	3	4	5	6

UTILIZE ORGANIZATIONAL SKILLS

1.	Receive and follow directives.	Yes	No	1	2	3	4	5	6
2.	Set goals.	Yes	No	1	2	3	4	5	6
3.	Communicate goals.	Yes	No	1	2	3	4	5	6
4.	Apply organizational logic.	Yes	No	1	2	3	4	5	6
5.	Develop task lists.	Yes	No	1	2	3	4	5	6
6.	Manage multiple projects.	Yes	No	1	2	3	4	5	6
7.	Progress toward goals.	Yes	No	1	2	3	4	5	6
8.	Evaluate and revise goals.	Yes	No	1	2	3	4	5	6
9.	Adapt to change.	Yes	No	1	2	3	4	5	6

DESIGN/WRITE PROGRAMS/SYSTEM

1.	Follow directions.	Yes	No	1	2	3	4	5	6
2.	Work with users in design of application, incorporating present and anticipating future business needs.	Yes	No	1	2	3	4	5	6
3.	Apply logic.	Yes	No	1	2	3	4	5	6
4.	Define the input and output.	Yes	No	1	2	3	4	5	6
5.	Review design with users.	Yes	No	1	2	3	4	5	6
6.	Conduct design walk-through.	Yes	No	1	2	3	4	5	6
7.	Select the language to be utilized.	Yes	No	1	2	3	4	5	6
8.	Write the programs/system.	Yes	No	1	2	3	4	5	6
9.	Write code documentation.	Yes	No	1	2	3	4	5	6
10.	Conduct code walk-through.	Yes	No	1	2	3	4	5	6
11.	Define and create the job control structure.	Yes	No	1	2	3	4	5	6
12.	Test and debug programs/system.	Yes	No	1	2	3	4	5	6
13.	Review the output with users.	Yes	No	1	2	3	4	5	6
14.	Adapt to change.	Yes	No	1	2	3	4	5	6
15.	Meet deadlines.	Yes	No	1	2	3	4	5	6

17. Train users.	Yes	No	1	2	3	4	5	6
18. Implement the programs/system.	Yes	No	1	2	3	4	5	6

CHANGE/MODIFY PROGRAMS/SYSTEM

1. Follow directions.	Yes	No	1	2	3	4	5	6
2. Define required changes with the users.	Yes	No	1	2	3	4	5	6
3. Define scope of the changes.	Yes	No	1	2	3	4	5	6
4. Incorporate present and anticipate future business needs.	Yes	No	1	2	3	4	5	6
5. Review all existing documentation.	Yes	No	1	2	3	4	5	6
6. Apply logic.	Yes	No	1	2	3	4	5	6
7. Make design/code changes.	Yes	No	1	2	3	4	5	6
8. Conduct design/code walk-through.	Yes	No	1	2	3	4	5	6
9. Make necessary modifications to job control structure.	Yes	No	1	2	3	4	5	6
10. Test and debug changes.	Yes	No	1	2	3	4	5	6
11. Review output with users.	Yes	No	1	2	3	4	5	6
12. Adapt to change.	Yes	No	1	2	3	4	5	6
13. Meet deadlines.	Yes	No	1	2	3	4	5	6
14. Modify existing documentation, as necessary.	Yes	No	1	2	3	4	5	6
15. Train users.	Yes	No	1	2	3	4	5	6
16. Implement program changes.	Yes	No	1	2	3	4	5	6

CREATE DOCUMENTATION

1. Follow directions.	Yes	No	1	2	3	4	5	6
2. Identify level of documentation you are creating.	Yes	No	1	2	3	4	5	6
3. Familiarize yourself with programs/systems to document.	Yes	No	1	2	3	4	5	6
4. Follow documentation standards established by organization.	Yes	No	1	2	3	4	5	6
5. Apply logic.	Yes	No	1	2	3	4	5	6
6. Write documentation.	Yes	No	1	2	3	4	5	6
7. Test and modify documentation.	Yes	No	1	2	3	4	5	6
8. Present/train in use of documentation.	Yes	No	1	2	3	4	5	6
9. Adapt to change.	Yes	No	1	2	3	4	5	6
10. Meet deadlines.	Yes	No	1	2	3	4	5	6
11. Distribute documentation.	Yes	No	1	2	3	4	5	6
12. Maintain documentation.	Yes	No	1	2	3	4	5	6

CONTINUING EDUCATION

1. Share information with colleagues.	Yes	No	1	2	3	4	5	6
2. Expand knowledge of internal business functions.	Yes	No	1	2	3	4	5	6
3. Experiment with computer/technologies.	Yes	No	1	2	3	4	5	6
4. Utilize available manuals.	Yes	No	1	2	3	4	5	6
5. Conduct training.	Yes	No	1	2	3	4	5	6
6. Attend seminars and classes.	Yes	No	1	2	3	4	5	6
7. Read technical journals and magazines.	Yes	No	1	2	3	4	5	6
8. Join and participate in professional organizations.	Yes	No	1	2	3	4	5	6

OPERATE PERSONAL COMPUTER

1. Follow start-up procedures.	Yes	No	1	2	3	4	5	6
2. Load software.	Yes	No	1	2	3	4	5	6
3. Follow file backup procedures.	Yes	No	1	2	3	4	5	6
4. Follow shutdown procedures.	Yes	No	1	2	3	4	5	6
5. Follow security procedures.	Yes	No	1	2	3	4	5	6
6. Perform hardware and software maintenance.	Yes	No	1	2	3	4	5	6
7. Demonstrate procedures to hook up and move computers.	Yes	No	1	2	3	4	5	6
8. Demonstrate familiarity with PC components.	Yes	No	1	2	3	4	5	6
9. Demonstrate familiarity with peripherals and their functions.	Yes	No	1	2	3	4	5	6
10. Demonstrate familiarity with operating system/environment (i.e., LAN).	Yes	No	1	2	3	4	5	6
11. Demonstrate familiarity with fundamental software basic (i.e., spreadsheet, database, word processing, graphics).	Yes	No	1	2	3	4	5	6
12. Differentiate between batch and on-line processing.	Yes	No	1	2	3	4	5	6

UTILIZE MAINFRAME RESOURCES

1. Follow log on/off procedures.	Yes	No	1	2	3	4	5	6
2. Follow security procedures.	Yes	No	1	2	3	4	5	6
3. Exhibit knowledge of fundamental software basics and utilities.	Yes	No	1	2	3	4	5	6
4. Utilize commands and utilities.	Yes	No	1	2	3	4	5	6
5. Perform file maintenance.	Yes	No	1	2	3	4	5	6
6. Exhibit knowledge of peripherals.	Yes	No	1	2	3	4	5	6
7. Exhibit knowledge of mainframe components.	Yes	No	1	2	3	4	5	6
8. Differentiate between batch and on-line processing.	Yes	No	1	2	3	4	5	6

THANK YOU. Please return the survey in the postage paid envelope.