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The AIS Expectation Gap

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ABSTRACT

In response to the changing terms of competition in business, traditional accounting is becoming AIS – a growing sub-discipline of IS. Visionaries see accounting of the future as primarily an IS discipline as the field changes into a technology-driven information system profession. The challenge for accounting education is to keep pace with the transformation of the profession. This study uses data from four CPA groups (i.e. auditors, tax accountants, managerial accountants, and professors) to identify key AIS knowledge, skills, and personal abilities required in the marketplace. As expected, the results reveal an AIS “expectation gap” between the needs of the profession and academic preparation. The failure of accounting education to make a timely response to changing market conditions threatens the displacement of CPAs by other professionals with the requisite IS skills and knowledge.

Keywords

AIS, CPAs, Accounting Education, Curriculum Gap

INTRODUCTION

Traditional accounting has passed its prime and is in a state of decline as technology is driving down the cost of information (Albrecht and Sack 2000; Elliott 2000). In response to the changing terms of competition in business, accounting is becoming accounting information systems (AIS) – a growing sub-discipline of IS (Arnold and Sutton 2001, Sutton 2002). One of the key drivers of change in accounting activities is information technologies. The American Institute of Certified Public Accountants (AICPA) asserts that the future of the accounting profession is grounded in the strategic use of information systems (Elliott 2000; Scott 1997), as the professionals driving organizations today are no longer the accountants, but information systems specialists (Williams 2000). Accounting leaders believe that the survival and growth of the accounting profession depends on the participation of accountants in all phases of organizational information systems (Hunt 2002). Visionaries see accounting of the future as a technology-driven information systems profession.

One challenge for accounting education is to keep pace with the evolution of an AIS discipline, and to reform pre-entry education. The AICPA’s Pre-Professional Competency Task Force promotes an accounting education framework based on a skills-based curriculum addressing functional competencies, business perspective competencies, and personal competencies (AICPA 1998). Unfortunately, accounting education is criticized as being burdened by university hierarchies that are slow to implement change (Albrecht and Sack 2000). This suggests the existence of an “expectation gap” between the needs of the profession and accounting education.

This study compares the views of accounting practitioners and accounting educators concerning the importance of specific IS proficiencies in the marketplace. Gaps are identified between the expectations of the profession and education in the areas of tax, auditing, and managerial accounting. Key AIS skills, knowledge, and personal abilities are evaluated in each domain. The research questions include: In what area(s) is there an “expectation gap” between academic preparation and the needs of the accounting profession? What specific IS skills, knowledge and personal competencies are most important in accounting practice?

DATA COLLECTION

Four groups of accounting professionals were identified based on three major fields within the accounting discipline, with the fourth group representing AIS educators. The three accounting domains are external reporting (audit), internal reporting (managerial), and tax. Lists of CPAs in these areas were obtained from the AICPA. AIS educators were identified from the *Accounting Faculty Directory 2002-2003* (Hasselback 2003).

A survey identical in format was developed for each accounting domain. The questionnaire measures the importance of specific AIS skills, knowledge, and personal abilities for the professional accountant now and in five years. A fourth survey

captures educators' perceptions of the importance of each item. The survey items were developed based on past IS research highlighting the educational requirements of IS graduates (Trauth, Farwell, and Lee 1993), topics in current AIS textbooks, and perspectives on AIS research (Murthy and Wiggins 1999).

The items are measured on a 1-5 scale with "1" indicating the item is not important to accounting jobs, and "5" indicating the task, knowledge, or ability is very important to accounting activities. The first round of questionnaires were sent to 1000 CPAs and 466 AIS professors. Fifty-five useable surveys were returned from CPAs and 35 from AIS professors. A second round of questionnaires is forthcoming.

It is expected that significant differences in importance among the IS tasks, knowledge, and abilities will reveal expectation gaps between accounting professionals and academics. These gaps may signal deficiencies in the education of accounting students resulting from negligence to modify existing curriculum for the modern marketplace. For example, database is one of the Top 10 Technologies (AICPA 2004) affecting the accounting profession. However, database design and tools are typically taught in the IS major and not as part of the accounting curriculum. Hence, a gap exists that has important implications for the ability of accountants to meet the evolving IS needs of the accounting profession.

EXPECTATION GAP

Tables 1-3 contain the summary results from the first round of questionnaires. The following sections highlight significant differences between professionals and educators in their evaluation of information systems tasks, knowledge, and personal abilities.

Information System Tasks

Although there is considerable agreement between academic respondents and CPAs regarding the importance of specific IS tasks to accounting practice (Table 1), significant differences in means are evident. The items demonstrating expectation gaps in the areas of tax, audit, and managerial accounting are emphasized below.

Tax

- Integrating new business and e-business applications
- Analyzing business problems
- Implementing data management procedures
- Implement system surveys and evaluations
- Diagramming entity relationships
- System flow charts and data flow diagrams
- Systems auditing
- Integrate wireless technologies
- Managing customer relationships

Audit

- Train/educate end users
- Develop in-house applications
- Systems auditing
- Manage customer relationships

Managerial

- Implement data management procedures
- Plan/Manage AIS technology architecture

In the area of tax, it appears that educators may hold to a more traditional view of accounting activities. Educators view the importance of all IS tasks at or below the midpoint (mean = 3.0), suggesting they believe IS tasks are not a significant part of tax practice. However, tax practitioners indicate that several IS areas are extremely important such as analyzing business problems, managing customer relationships, as well as data management activities. Interestingly, entity-diagramming which represents a Top 10 technology (database) is very important to practitioners but not viewed as applicable to tax practice by educators.

TASKS	Importance by CPAs			Importance by Educators		
	Tax	Audit	Man	Tax	Audit	Man
1. Find IS solutions for business problems	3.32	3.80	4.08	2.60	3.00	4.00
2. Integrate Networks	2.90	3.09	3.08	2.40	2.29	2.70
3. Integrate new business and e-business applications	*3.10	3.09	3.62	*2.00	2.71	3.30
4. Analyze business problems	**4.62	4.45	4.62	**3.00	4.86	4.80
5. Develop databases	3.10	2.91	2.92	2.80	2.43	3.30
6. Implement new computer supported business processes	3.33	2.91	3.85	2.60	2.43	3.60
7. Manage/Plan corporate AIS strategies	2.83	3.00	3.38	2.80	2.43	4.00
8. Implement AIS security	2.83	3.18	3.62	2.80	3.14	4.00
9. Implement data management procedures	**3.19	3.18	*3.23	**2.00	2.57	*3.90
10. Train/educate end users	3.05	*2.91	2.85	2.20	*1.71	2.80
11. Plan/Manage AIS technology architecture	2.44	2.27	**2.62	2.00	1.86	**3.80
12. Develop In-House applications	2.57	**2.27	2.23	1.60	**1.14	2.80
13. Plan/Manage systems development or project implementation	2.55	2.73	2.92	2.00	2.14	3.30
14. Plan/Manage feasibility studies for new technology	2.40	2.91	3.08	2.00	2.14	3.50
15. Implement system surveys and evaluations	*2.60	3.00	2.85	*1.60	2.57	2.90
16. Manage ERP systems	2.37	2.64	2.92	1.80	2.29	3.50
17. Produce accounting information from databases	3.57	3.73	4.31	3.00	4.00	4.90
18. Entity-relationship diagramming	**3.33	3.00	3.08	**1.60	3.00	2.50
19. System flowcharts and data flow diagrams	**2.90	3.55	3.38	**1.80	4.14	3.60
20. Implement internal controls over the AIS	3.30	3.45	3.92	2.80	3.00	4.50
21. Design and implement web-based strategies	3.05	2.73	3.31	2.20	1.86	3.00
22. Systems auditing	**2.95	*4.18	3.69	**1.80	*4.86	4.00
23. Disaster recovery planning	3.43	3.82	4.15	2.60	2.86	3.60
24. Intrusion detection	3.25	2.91	3.54	2.60	2.43	3.30
25. Information security and privacy	3.50	3.55	4.15	2.80	3.29	4.10
26. Integrate wireless technologies	*2.80	2.27	2.85	*1.80	1.57	2.80
27. Manage customer relationships	**4.38	**3.36	4.00	**2.60	**1.14	3.80

Table 1. CPA and AIS Educator Evaluation of the Importance of IS Tasks.

Bold indicates significant differences.

* $p < .05$

** $p < .01$

In the area of auditing the major differences occur in relationship-oriented tasks as well as technical tasks. Practitioners specify that training end-users and managing customer relationships are more important than educators believe. Also, auditors indicate that developing in-house IS applications is an important part of their work. Results suggest educators may place too much emphasis on systems auditing in the academic setting.

It is curious that in managerial accounting educators appear to view the practice of cost accounting as more technically oriented in terms of data management and managing the development of AIS in the organization. It may be that educators are not aware of how the structure of organizations today is arranged.

Information System Knowledge

It is interesting that significant differences occur only in the area of tax and managerial accounting in the evaluation of the importance of IS knowledge. The following is a summary of the significant differences in means between practitioners and educators.

Tax

- Relational databases
- Operating systems: Mainframes
- Object-oriented language

Managerial

- EDI
- XML or ebXML

In the area of tax, it appears that educators once again underestimate the importance of IS knowledge to practice. Database and data management knowledge are top concerns for practitioners as well as communication/networking knowledge. This reflects the growing significance of electronic media to a successful practice. In managerial accounting, it appears that educators overestimate the importance of business languages (i.e., EDI and XML). It may be that recent attention given to document reporting languages in academic journals signals importance to AIS educators whereas there is a delay in practical implementation.

KNOWLEDGE	CPA Importance			Educator Importance		
	Tax	Audit	Man	Tax	Audit	Man
1. Networks	3.00	2.91	3.15	2.20	3.43	3.10
2. Telecommunications	3.00	2.82	3.38	2.40	3.14	2.90
3. Relational Databases	*3.00	3.09	3.54	*2.00	3.71	4.00
4. Distributed Processing	2.72	2.45	3.23	2.00	3.14	3.50
5. Data Management	3.10	3.09	3.85	2.20	3.71	4.00
6. Systems Integration	2.80	2.64	3.31	2.20	3.43	3.60
7. Systems Life Cycle Management	2.20	2.45	2.77	1.80	2.71	3.10
8. Operating Systems: Mainframes	*2.05	2.36	2.62	*1.40	2.43	2.10
9. Object-oriented Languages	*1.95	2.09	2.15	*1.40	1.57	2.70
10. Decision Support Systems	2.40	2.55	2.85	2.20	2.71	3.30
11. Expert/Artificial Intelligence Systems	2.29	2.00	2.54	2.40	2.71	2.30
12. Systems Analysis	2.50	3.09	2.85	2.00	3.43	3.50
13. EDI	2.21	2.73	**2.69	2.20	3.00	**3.90
14. Programming Languages: C++, Basic, Java	1.71	2.27	1.77	1.40	1.29	2.20
15. XML or ebXML	1.86	2.27	*2.15	1.80	2.86	*3.30
16. Semantic Net	1.80	1.91	1.85	1.40	1.29	1.80

Table 2. CPA and AIS Educator Evaluation of the Importance of IS Knowledge.

Bold indicates significant differences.

* $p < .05$

** $p < .01$

Personal Abilities

Educators and practitioners appear to agree on the importance of personal abilities in professional accounting. Relational abilities are deemed very important by both CPAs and educators with only two items indicating significant discrepancy. In the tax area, CPAs indicate that “teaching and training others” ($x = 4.33$) and “sensitivity to organizational culture and politics” ($x = 3.86$) are considerably important personal skills, compared to educators ($x = 3.0$ and $x = 2.8$, respectively). Educators may view tax accountants as more independent and uninvolved than they actually are in the organization.

CONCLUSION

Information systems are redefining the role of the CPA in today’s organizations. This study shows that the marketplace expects CPAs to have more than a cursory knowledge of IS. In some sense, the CPA is evolving into a form of IS specialist, although the ultimate outcome and type is unclear. For example, the analytical and problem-solving abilities of CPAs (e.g. “Analyze business problems” and “Find IS solutions for business problems”) remain of primary importance, but take on an IS flavor in the modern business environment.

ABILITIES	CPA Importance			Educator Importance		
	Tax	Audit	Man	Tax	Audit	Man
1. Accomplish Assignments	4.90	4.82	4.92	4.40	5.00	4.90
2. Maintain productive client relationships	4.90	4.91	4.69	4.20	4.57	4.40
3. Plan/Execute work in a collaborative environment	4.57	4.64	4.38	4.20	4.71	4.60
4. Be self-directed and proactive	4.81	4.73	4.69	4.20	4.57	4.90
5. Deal with ambiguity	4.62	4.18	4.46	4.40	4.71	4.80
6. Plan, organize, and lead projects	4.52	4.82	4.54	3.80	4.71	4.60
7. Plan and write clear, concise memos, reports, and documents	4.76	4.91	4.62	4.60	4.86	4.70
8. Develop and deliver effective presentations	4.43	4.45	4.23	4.00	4.57	4.50
9. Teach/Train others	**4.33	4.36	4.00	**3.00	4.14	3.90
10. Understand and integrate new technologies	3.81	4.09	4.15	3.00	4.14	3.70
11. Be sensitive to organizational culture and politics	*3.86	4.55	4.31	*2.80	4.43	4.10
12. Understand the business environment	4.57	4.73	4.54	4.00	4.71	4.70
13. Focus on technology as a means, not an end	4.05	4.36	4.46	3.80	4.29	4.40
14. Ability to understand technology trends	3.67	4.09	4.08	3.40	3.86	4.20

Table 3. CPA and AIS Educator Evaluation of the Importance of Personal Abilities.

Bold indicates significant differences.

* $p < .05$

** $p < .01$

Survey results indicate a probable curriculum gap between the IS skills and knowledge necessary in accounting practice and the emphasis these topics receive in the classroom. The most notable differences occur in managing external relationships and the integration and implementation of new technologies. As accounting activities become embedded in IS, a strong IS-based curriculum must be an important component of accounting education. The skill mix for CPAs today involves both technical IS expertise and people-handling ability. The challenge for higher education is to recognize the marketplace changes and implement strategies that will enable the accounting profession to remain competitive.

In the electronic age, CPAs deal with a rapidly changing business environment. They must be quick to engage new technologies to retain a competitive advantage. Hence, traditional accounting education of the past is insufficient for today's professional. The future success of the accounting profession rests on the preparation students receive today. It is imperative for accounting educators to identify and integrate the IS skills and knowledge required by the profession into a curriculum formatted for the future. CPAs in practice indicate their adaptation and survival in the current marketplace is dependent on IS skills and knowledge.

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