ICT Graduate Career Awareness

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Abstract

The ICT skill shortage worldwide has attracted the attention of governments, academics, industry and the local press. A number of institutions are encouraging scholars to enter the ICT industry and the number of ICT graduates has declined the past number of years. The ICT industry is constantly evolving and new technologies are continuously being introduced. The new technologies create new ICT positions, such as Social Networking Manager, IT Architect, Knowledge Manager and Web Specialist. Existing job descriptions such as Systems Analyst, Project Manager and Programmer still exist.

ICT students graduating for tertiary institutions are not aware of the possible ICT career opportunities and career tracks available. The research study conducted among final year Computer Science and Information Systems graduates indicated that the students were unaware of possible ICT career opportunities available. The study further showed that academics are unaware of the magnitude of possible career opportunities available for new ICT professionals. The paper suggests methods to educate and provide the relevant information on ICT career opportunities to new ICT professionals.

Introduction

The number of Information and Communication Technology (ICT) professionals working in the ICT industry in the U.S.A. alone exceeded 4 million in 2008. In the United Kingdom it is estimated that more than 1 million people presently work in the ICT industry (BCS, 2010). The National Association for Colleges and Employers (NACE) reports that there are fifty five different ICT job categories that are offered to ICT graduates with degrees relating to Management Information Systems (MIS) in 2006 (Aken and Michalisin, 2007). The British government-backed Skills Framework for the Information Age (SFIA) has defined 290 different types of ICT jobs and ICT career tracks at different levels (BCS, 2010).

Hoffman (2010) provided a guide to degree programs for students interested in Computer Science and Information Technology and linked the programs to career tracks. A large number of organisations, such as IBM, Oracle, SAP, HP and professional ICT bodies, including the ACM, IEEE and the British Computer Society provide career guidance and describe possible career paths and career tracks in ICT. Organisations employing ICT graduates, such as OpenBox in Cape Town (OpenBox, 2010), are providing ICT graduates with a choice of career paths and ICT career opportunities.

ICT career paths are evolving and changing, new job titles are continuously created and new career paths are being introduced. A number of universities, nationally and internationally have linked degree programs offered by the institutions to specific ICT industry career tracks, for example Business Analyst, Software Architect, ERP Specialist, Project Manager, IS/IT Auditor and Systems Analyst.

Departments of Computer Science, Information Systems, Information Technology and other related departments are following degree programs as provided in the ACM degree program curriculum guidelines. The latest Information Systems 2010 curriculum guidelines as published by the ACM (ACM IS2010, 2010), links IS core and elective courses with specific IS career tracks (Figure 1).

Figure 1: Information Systems 2010.

Structure of the IS Model Curriculum:Information Systems specific courses

Career Track:	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
Core IS Courses:																	
Foundations of IS	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Enterprise Architecture	○	●	○	○	○	●	○	○	○	○	●	○	○	○	●	○	○
IS Strategy, Management and Acquisition	○	●	○	○	○	●	○	○	●	○	●	○	○	○	●	○	○
Data and Information Management	●	○	○	●	●	○	○	●	●	○	●	○	●	○	○	○	○
Systems Analysis & Design	●	●	●	○	○	○	●	○	○	○	○	○	○	○	●	●	●
IT Infrastructure	○	○	○	●	○	○	○	●	●	●	○	○	●	●	○	○	○
IT Project Management	●	○	○	○	○	●	○	○	○	○	●	○	○	○	●	●	●
Elective IS Courses:																	
Application Development	●	○	○	○	○	○	○	○	○	○	○	○	○	○	○	●	●
Business Process Management		●	●			○	○	○		○	●				○		
Collaborative Computing						○								○			○
Data Mining / Business Intelligence		●		●	●	○	○	○	●		○	○	○	○	○		○
Enterprise Systems		●	●	○	○	○	●	●	○		●	●	○	○			
Human-Computer Interaction	●					○	○				○					●	
Information Search and Retrieval		○		○	●								○				●
IT Audit and Controls	○		●	○	○	○	○	●		●	○		○	○	○		○
IT Security and Risk Management	○			○	○	○	○	●	●	○	○		●	●	○		○
Knowledge Management		●		○		○	○			○							
Social Informatics													○		○		

A = Application Developer
B = Business Analyst
C = Business Process Analyst
D = Database Administrator
E = Database Analyst
F = e-Business Manager
G = ERP Specialist
H = Information Auditing and Compliance Specialist
I = IT Architect
J = IT Asset Manager
K = IT Consultant
L = IT Operations Manager
M = IT Security and Risk Manager
N = Network Administrator
O = Project Manager
P = User Interface Designer
Q = Web Content Manager

Key:

● = Significant Coverage

○ = Some Coverage

Blank Cell = Not Required

Career Awareness Survey

Research indicates that generally, scholars, ICT students, academics and professionals are uninformed or misinformed about the ICT job descriptions of the computing profession (Biggers, et al., 2008; Koorsse, et al., 2010). The Career Awareness survey was intended to answer the following questions:

- What career choice have students made?

- What sources have students utilised to obtain information about ICT careers?
- Do students understand and can they explain ICT job descriptions?
- Are academics familiar with ICT career tracks and job descriptions?
- Can academics map degree programs with specific career tracks?

The Career Awareness Survey was completed by prospective ICT graduates and academics of the Department of Computing Sciences at the Nelson Mandela Metropolitan University in Port Elizabeth, South Africa in order to determine their understanding of ICT job titles and career descriptions. The participants were requested to study the list of ICT career tracks and job titles (Table 1) and indicate their understanding of IS and ICT career tracks and job titles, using a 5 point Likert scale (1=Totally Unfamiliar and 5=Very Familiar). The sixteen IS job titles/IS careers were obtained from the IS2010 curriculum and the sixteen ICT job titles/careers were obtained from the CS2008 and IT 2008 curriculum guidelines and the ITWeb 2009 Salary Survey (ITWeb, 2009b).

1. Business Analyst	17. Programmer/Software & application developer
2. Knowledge Management Consultant	18. Software QA/test analyst
3. Business Process Analyst	19. Game developer
4. Database Administrator/Analyst	20. IT system auditor
5. e-Business Manager	21. Robotics specialist
6. ERP (SAP/Oracle/etc.) Consultant / Specialist	22. Business Intelligence Consultant
7. Information Auditing and Compliance Specialist	23. Systems Analyst
8. IT Architect	24. IT / IS Manager
9. IT Asset Manager	25. Chief Information Officer (CIO)
10. IT Consultant	26. Business Applications Integrator
11. IT Operations Manager	27. Accounting Information Systems specialist
12. IT Security and Risk Manager	28. Security and Risk Officer
13. Network Administrator/Manager	29. Financial specialist
14. Project Manager	30. Software Engineer
15. User Interface Designer	31. Net-centric developer
16. Web Content Manager/Developer	32. Mobile Specialist

Table 1: ICT career tracks utilised in career awareness survey.

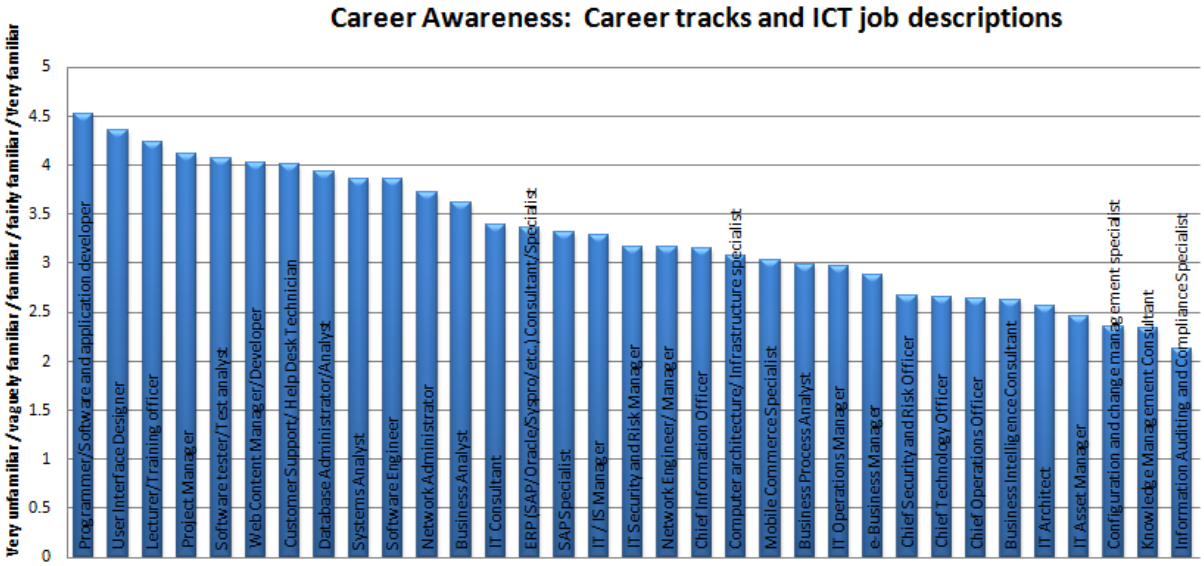
Graduate Career Awareness Survey

The Graduate Career Awareness survey was completed by 42 students. The majority were predominantly male (79%) and only sixty two percent SA citizens. The students from foreign countries included France, Lesotho, Zimbabwe, Zambia, Nigeria and Cameroon.

The majority of the students used the Internet (86%) to source information on career choices, followed by fellow students (52%) and lecturers (43%). Career information was also obtained from career presentations on campus by businesses (38%), friends (38%) and parents (29%). Only 33% indicated that they have made a possible career choice which included the career tracks of a Business Analyst, Systems Analyst, Project Manager, Programmer, Web Developer and ERP specialist.

The Graduate Career Awareness Survey results (Figure 2) indicated that students in general, did not have a clear understanding of ICT job titles and specific knowledge of career descriptions. The students indicated that they had a fairly good understanding of certain careers, including Programmer, Project Management, User Interface Designer, Web Manager/developer, Database Administrator and Systems Analyst. In certain instances the students indicated that they were not familiar with specific ICT job descriptions, for example Knowledge Management Consultant, Information Auditing and Compliance Architect, Chief Technology Officer and IT Asset Manager.

Figure 2: Graduate Career awareness.



Conclusions: Graduate Career Awareness Survey

The results indicate that a small number of students have made a definite career choice. The students mainly used the Internet to obtain career information, followed by lecturers and friends providing the relevant information. The Graduate ICT students are generally not familiar with and are unaware of current ICT careers and job descriptions. The results obtained in this study confirm similar research study results that indicate that students are uninformed or misinformed about ICT job descriptions (Biggers, et al., 2010; Koorsse, et al., 2010).

Academics Career Awareness Survey

An Academic Career Awareness Survey was also conducted amongst the Department of Computing Sciences at NMMU academics in order to determine their understanding of ICT career tracks and ICT job descriptions. Academics were requested to link selected career tracks provided in Table 1 with seven degree programs offered by the Department of Computing Sciences (Table 2). The seven degree programs were listed in a table and academics were requested to map ICT career tracks with the specific degree programs. Twenty two academics were requested to complete the survey and an example of required output is provided in Table 2.

CS Degree Programs	1	2	3	4	5	6	7	8	9	10
1. BSc CS/IS	4	8	10	11	12	14	17	19	31	32
2. BSc IS	1	4	5	8	10	14	15	23	32	
3. BCom CS/IS	1	4	5	7	10	14	15	17	23	32
4. BCom CS/IS Rat	7	10	14	20	23	25	27	28	29	
5. BCom IS (Business Management)	1	3	6	10	14	23	29			
6. BCom IS (Accounting)	3	6	27	29						
7. BCom IS (Auditing)	3	6	7	20	27					

Table2: Degree programs and corresponding career tracks identified by academics.

The results could not be meaningfully analysed as the academics were unable to complete the tasks due to their limited knowledge of ICT career tracks and job descriptions. A number of academics indicated that they would have completed the survey if they were provided with a list of ICT job titles and career descriptions beforehand. One senior academic indicated that she completed the survey *"Based on my interpretation of jobs above (which could be flawed)".*

Conclusions: Academic career awareness survey

Academics are not familiar with or in agreement on ICT careers and ICT career definitions. Academics in ICT departments need constantly to familiarise themselves with the current ICT job titles and job descriptions. The results indicate that departments will require a major intervention to rectify the lack of career knowledge of academics. ICT Departments must further link degree programs offered by departments with specific career tracks.

Recommendations

The British Computer Society (BCS) have documented 290 ICT careers descriptions and career tracks available internationally (BCS, 2010). Scholars and ICT students, including teachers, career counsellors and academics are generally not familiar with ICT career opportunities, job descriptions and the specific career paths and career tracks which each degree program enables. Graduates further do not actually know the technology-related skills they poses and find it difficult to identify ICT career opportunities and career tracks that relate to the skills they obtained whilst studying (Portet, 2010).

The results indicated that the students did not have a clear understanding of ICT job titles and specific knowledge of career descriptions. The BCS advises graduates to "explore as many options beyond graduation as possible" and investigate a range of possible career opportunities, career paths and career tracks (BCS, 2010). ICT graduates generally obtain information about ICT career opportunities provided by the department and academics they are associated with. The Graduate Placement services offered by universities are also a valuable source of information.

ICT students need to be made aware of the large number of ICT career opportunities available, specifically when choosing a specific ICT degree program or when applying for a position in the ICT industry. The ACM (ACM, 2010), IEEE and the British Computer Society (BCS, 2010) provide career guidance and describe possible career paths and career tracks in ICT. Tertiary institutions should further provide brochures and talks by ICT professionals in industry to provide prospective graduates with career advice. The careers/career tracks further needs to be provided on departmental web sites.

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