

The future skill-sets expectations of IT graduates in Malaysia IT outsourcing industry

Abdul Rahman Ahlan, Yusri Arshad, Mohd Adam Suhaimi, Husnayati Hussin

Department of Information Systems

Kulliyah of Information and Communication Technology (KICT),

International Islamic University Malaysia (IIUM),

P.O. Box 10, 50728 Kuala Lumpur, Malaysia

MALAYSIA

arahman@kict.iiu.edu.my; yusriarshad@gmail.com; adam@kict.iiu.edu.my; husnayati@kict.iiu.edu.my;

<http://kict.iiu.edu.my>

Abstract: The issue of IT outsourcing (ITO) impact on IT workforce has been at the forefront agenda of many discussions in many developed countries so much so that the concerns have been tense in that more IT jobs will be transferred to developing countries which provide IT outsourcing services. In addition, with the growth of IT outsourcing and emerging new outsourcing business models such as utility demand, application service provider, business process outsourcing, offshore outsourcing and many more servicing different industry vertical sectors increase the demand for multiple IT skills and capabilities of IT workforce. In this study, we review relevant literature, newspapers and non-academic articles, websites of companies, governments and non-governmental organisations and others. An outsourcing Malaysia (OM) CEO roundtable discussion was also held to hear the practitioners' views on the topic. Further to that, we sought in-depth insights from seven senior executive managements in service provider firms on the skill sets requirements of fresh IT graduates to fulfill the market needs of IT outsourcing in Malaysia. The four-member research team found that technical, soft and problem-solving skills are the main concerns raised by the key informants. This is in line with the literature review and also the present higher education policy concerns by the Malaysia government.

Keywords: Malaysia, IT outsourcing, skill sets, workforce, curriculum

1. Introduction

An excerpt from Society for Information Management (SIM) [16] Report, 2006: "Paradigm shifts from rapidly changing technological and business environments dictate that IT professionals adjust their skills and capabilities to effectively support their organization's mission. Global IT sourcing, the shift from IT services to business process services, pending baby-boomer retirements and declining IT enrollments in U.S. and European universities are prompting fundamental changes in the nature of IT skills and capabilities available to and desired by both vendor and client organizations. The resulting potential for a mismatch of supply and demand is a source of concern for business executives and academics alike." The study reports of increased IT hiring and also of evolving needs for more business knowledge and project management skills in the US IT workforce. Experts predict that although many entry-level jobs are being moved offshore, there is a looming shortage of technical workers in the US [9] [11] [13].

Recent media reports on the frantic efforts by Malaysia to become the top shared services and outsourcing (SSO) hub in Asia has opened up the issue on IT workforce to complement this noble business move by the government. The global worldwide SSO market is expected to grow at a CAGR of 15 per cent over the next few years, reaching USD1.43 trillion by 2009 as compared to USD930 billion in 2006. "The outsourcing need is growing and we intend to fully leverage on our achievements to meet this need," said Badlisham of Multimedia Development Corporation (MDec) Chief Executive Officer. He added that ICT services like SSO contributed MYR2.8 billion to the Malaysia Gross Domestic Product of MYR495.6 billion. David Wong, Outsourcing Malaysia and PIKOM chairman, cited that the local SSO industry is currently worth USD300 million growing at a CAGR of 30% year on year, compared with the current global IT outsourcing size of USD24 billion. In 2012, the Malaysian SSO industry is targeted to be worth USD2 billion providing 300,000 jobs.ⁱ

Multimedia development Corporation (MDec) is a government arm charging the MSC Malaysia flagship initiatives since 1994. "The MSC Malaysia Initiative was launched as a catalyst to the national ICT agenda and Multimedia Development Corporation (MDeC) was formed to drive the development of the MSC... ", said YAB Dato' Seri Abdullah Bin Haji Ahmad Badawi, The Prime Minister of Malaysia on 10th MSC Malaysia Anniversary. There are seven flagships being developed under this initiative which includes Telehealth, eGovernment, MyKad and Smart Schools. Thus, MDec has been promoting SSO in different vertical sectors, such as finance, logistics, transportation, energy, technology, manufacturing and healthcare, either domestically or internationally. To ensure high standard of services and capabilities, 60 MSC-status companies, out of a total of 2600 in MSC directory, are from world-class organizations. In addition, local companies having Capability Maturity Model (CMM) certificates level 2 at least are rising.

Due to high and rising demand for new breed of entry-level IT workforce supporting middle and higher management levels in ITO industry, the government has embarked on many drives and initiatives to enhance the skill-sets and capabilities of new IT graduates through the MDec's Knowledge Development Institute's (KDI) programmes for instance. "An ICT Development Institute will be established to increase the supply of K-Workers by providing the skill sets required by the ICT industry, especially shared services and outsourcing companies" said YAB Dato' Seri Abdullah bin Haji Ahmad Badawi, The Prime Minister of Malaysia in Budget 2006 Speech.

In search for current and future skill sets required for these ITO vertical sectors, we aim to investigate in Malaysia context the following research question:

R1: What are the skill sets of IT graduates required by the ITO industry in the different vertical sectors?

The study is exploratory-descriptive in nature over a period of two. This report presents the literature review and findings to answer the research question on skill-sets and capabilities of IT graduates.

2. Literature review

Past studies on IT skills often debate whether IS personnel should have technical skills, business skills or

both [5]. Some studies note the importance of technical skills [12] [17] [18]. Other studies also note the criticality of "soft" skills such as business knowledge and interpersonal skills [4] [10] [12]. The only common finding from past studies is that over time IS professionals are expected to have more diversified skill sets [8]. IT taxonomies used in the previous studies anchored on different career levels, job domains, task types, and responsibility levels. While there are some commonalities among them at a bird's-eye view, details are different.

Skills are defined by what someone has to accomplish, by the tasks that need completion, and/or by business goals. That is, a skill is directly tied to a task outcome. Proctor and Dutta [15] characterize skills as something that are not innate but must be learned. In their view, skills are developed to meet task needs. Thus, they define skills as "goal-directed, well-organized behavior ... acquired through practice and performance with economy of effort."

Benamati and Mahaney [3] investigated current and future entry-level IT workforce needs in organizations. They attempted to answer two prevailing questions: (1) How are entry-level IT positions evolving? and (2) How well prepared are today's MIS graduates for these positions? In doing that, they interviewed thirteen IS executives in the US organizations to learn their views on the state of the entry-level IS job market and what skills IS graduates lack most at that time. Their findings revealed that programming skills are still needed, and project management skills are both highly desired and lacking. Other soft skills, such as communications skills, business knowledge, and leadership skills are also desired and, like project management, projected to increase in importance.

SIM 20-US and European investigator-team conducted the research in 2005 and found that the skills and capabilities identified by respondents as being sourced to independent contractors or third-party providers are technical in nature. Overall, the data paints a picture of IT managers building an organization of IT professionals who know the industry and business and who can work well with clients and colleagues. However, of significant concern is the apparent divergence between entry-level skills sought by organizations and skills identified as critical to keep in-house, raising questions about how to groom staff from one to the other as they move through the pipeline.

- The majority of respondents indicated that they primarily sought technical skills in entry-level hires. When skills sought in entry-level hires are compared to the skills identified as critical to keep inhouse in 2005 to 2008, there is a striking disconnect.
- Communication was identified as the skill most lacking in entry-level hires.
- Typical entry to the IT workforce is from college graduates although many organizations accelerate this process through internship programs, resulting in college graduates that can enter the workforce at a more advanced level, due to the skills and experience acquired during their internship.
- Overall, respondents are not concerned with the supply of entry-level candidates; which may be a result of lower levels of hiring over the past few years and a lack of awareness of diminished IT-related enrollments.

3. Methodology

In carrying out this exploratory study, we review past literatures, newspaper and non-academic articles, relevant websites such as companies, universities, ministries, government and non-governmental organisations and others. We also held an outsourcing Malaysia (OM) CEO roundtable focus group discussion. From the roundtable discussion, we arranged series of in-depth unstructured interviews (similar to methodology adopted by Nakayama and Sutcliffe [14] with seven senior executive management in ITO service provider firms in Klang Valley to get in-depth insights and ascertain the nature of entry-level positions and expectations in the ITO field. The sample was carefully selected from a list of ITO service provider firms in two relevant and well-known directories. These two groups were selected to represent diverse industries and organizations of different sizes and vertical scope to ensure that the researchers observed a broad view of the evolving entry-level positions in the field.

4. Findings

Client services department of MDec in 2004 conducted a survey to 760 MSC-status companies with 87% response rate. The survey shows that 59% of the respondents indicated that Malaysia does have the ability to supply sufficient number of ICT talents for MSC status companies. The most wanted technical skills are (i) Software Programming, (ii) Database & E-Commerce, (iii) Software Engineering & Project Management, (iv)

System Administration, Networking & Telecommunications and (v) Creative Multimedia and Security. Writing and communication skills, however, seem to be the major skills that we are lagging in [2].

We then arranged a meeting with a few MDec Knowledge Development Institute's (KDI) executives to get more information on their initiatives. KDI is department within MDec solely responsible on development of knowledge workers. We were informed that KDI has launched and offered a few programmes for skills developments such as USP, GSP and Job camp. They are also building up a Development Centre for this purpose. It is informed that, in 2007, MDec conducted a similar survey to 2004 survey. No detailed information on the methodology or any theoretical foundation for the survey is available to us. The summary result shows that, not surprisingly, the top most sought after skills by employers are ability to communicate effectively in English. This is because English is the business language in Malaysia and most local and foreign clients prefer using English as a medium. The second top skill responded by the respondents are Java technologies skills. This is probably due to Java is the latest fourth generation language adopted in businesses and universities. This is then followed by Microsoft technologies. Even though open source is fast catching up with Microsoft, the business communities are largely still using Microsoft proprietary technologies with a little premium. Other top ten skills listed in the survey are Animation, Operating Systems, Helpdesk Management, Business Analyst, Network Design/Management, Project Management, Data Warehousing and SAP Packaged Implementation. However, these skills categories are not according to those categorized in past literature.

To support the MDec's 2007 survey findings, we further interviewed seven ITO firms senior management. The respondents described a variety of knowledge and skills desired in IT graduates entering their organizations. One thing was obvious, company needs vary. There were, however, common themes that emerged from the discussions to help answer our two research questions. The summary of the common themes, skills and capabilities and entry-level positions are tabulated in Table 1.

The seven key informants described a variety of knowledge and skills desired in fresh IT graduates entering their organizations. One thing was obvious,

companies' needs vary. We, however, able to identify and categorise common themes that emerged from the discussions. The overall views of the respondents are the need for technical, soft and problem-solving skills. Communication and multi-lingual are mostly cited responses.

All the key informants describing the services offered by their firms indicate that both technical and non-technical skills are necessary for ITO implementation. Technical skills and capabilities include programming, databases, multimedia subject, laboratory simulation, practical exposure, professional certification while non-technical/soft skills include communication skills, English and other languages proficiencies, writing skills, thinking ability and business skills.

Most entry levels are given trainee positions, assistance of senior personnel, office duties and others initially. The vast majority of companies, (8 of 10, see Table 1), still put high priority on graduates with programming skills of some sort. The preferred current programming languages mentioned include Java, php, visual basic, C#, SQL server and .Net while SAP knowledge is still widely sought for by employers. In SP3 firm, the respondent highlighted the firm's noble intention in retraining the staff with new skills or certification, efforts by MDec to certify as many MSC-status member companies and equip their staff with relevant professional certificates, recommended for ITO practices. SP2 informant stresses that his firm only sent senior experienced staff to meet, negotiate, solve problems or work onsite at clients' premises. The new inexperienced or little experienced hires are commonly given basic or introductory responsibilities in order for them to be more comfortable and confident with the tasks. They are most often placed to work in the firm's offices under supervision of each line supervisors or managers.

SP5 informant said "we prefer professionals ... who can communicate and solve problems well". SP1 interviewee mentioned on the skills such as ability to express, high confidence, problem solving, multi-lingual as the important skills in IT graduates. He continues "in universities, students do laboratory simulation but in practical works, they do it live... Like surgeons who do heart operation live, engineers also do live operation on clients' systems, workstations or data. They cannot make mistakes which is detrimental...".

5. Discussion

Past researches on skills and capabilities of IT graduates emphasize more on the technical knowledge and capabilities. Clearly, there is still a need to understand programming by IT/CS majors. Although many of the companies were not hiring graduates to write programs, most felt an understanding of programming was essential. One subject stated, "We look for technical expertise, a good foundation in programming - .Net, Visual Basic, C#, or SQL Server, [although] we are not looking for 'heads down' programmers." Another stated, "They must understand programming, but not necessarily be good at it." Other technical skills that were mentioned multiple times were Web knowledge, database, security, and hardware [16].

Not forgetting the recent ITO phenomenon and the changing business strategies and technologies, the emphasis on non-technical or soft-skills begin to appear. IT graduates are nerd but instead a representation of their organizations. Practically, companies appear to be looking for real-world experience in either internships or volunteer work. There is a consensus of the importance of oral and written communication, and teamwork. Companies also desire that recent graduate exhibit the potential to become project leaders with backgrounds in project management and business knowledge.

Ferguson's [6] [7] survey reveals a greater importance of almost all background areas. Without adding courses the challenge to educators in the field becomes how to integrate the development of oral and written communication, teamwork, project management and business knowledge in addition to the technical skills in an already crowded curriculum.

The recommendations for academia to do differently to help prepare students include increased focus on experiential learning. This means that there should be more and formalized internship and coop programs to help students gain experience. Several of the companies rely on internships and coops heavily in their current recruiting models, hiring the majority of their entry-level workers after "test driving" them through internships or coops [16]. In addition, most companies suggest for the increased focus in MIS curricula. Consistent with earlier responses, suggestions for non-technical skills or knowledge outnumbered technical skills and knowledge more than two to one.

Non-technical skills – project management, business knowledge, and understanding methodologies – were the most agreed upon areas for improving the preparation of MIS graduates. This is very consistent with the experiential learning suggestion above. These skills take experience to really understand and master. Communication and a global awareness or perspective was also identified by multiple companies.

Technical skills were a mixed bag of mostly infrastructure technologies. This was consistent with answers to the earlier questions. Surprisingly, two subjects discussed a growing need for mainframe skills that is currently not filled. Although eight of the ten companies specifically identified programming as a currently desired skill, none suggested that more programming was necessary. A director of Application Development for a consumer research firm did ask that MIS should “...not simply produce consultants...” and stated “... MIS professionals must be passionate about both technology and business [16].”

From the findings, we are able to induce that employers generally look for total package of personality, experience, general potential and aptitude in incumbent candidates. This is because none of the professionals were performing the same duties that they had when they graduated from school. This is probably the reason why they cannot pinpoint details of their personal IT skills portfolio. Too many changes in duties occurred to make such an exercise meaningful [14].

We inferred from the information we got from the interviews that IT professionals and managers do not need a micro-focused IT skills framework. They need a macro-focused, directional IT skills management framework that gives some focus on IT talent acquisition and management.

6. Conclusion

The results of this study predominantly confirm the findings of [3] [14] [16] studies. We infer that employers look for a good personality graduates with multi-skills and right attitude to work and learn. It is true that employers look for certain technical skills before interviews but the skills must be updated and adapted accordingly to market and job changes. Hence, we concur [14] findings that IT professionals and managers do not need a micro-focused IT skills framework. They

need a macro-focused, directional IT skills management framework that gives some focus on IT talent acquisition and management.

References

- [1] Ahlan et al. (2008). Assessing the impacts of IT outsourcing phenomenon on IT education in Malaysia. Proceedings of WSEAS Transactions on Education Technologies, Corfu, Greece, 2008.
- [2] Ahmad, U.H (2004). Meeting The Demands of Global Firms: Survey Finding. Workshop on Enhancing Graduates Employability in a Globalised Economy. Economic Planning Unit, Malaysia. Putrajaya Shangri-La. 26 July 2004.
- [3] Benamati, J.S. and Mahaney, R.C. (2007). Current and Future Entry-Level IT Workforce Needs in Organizations. SIGMIS-CPR'07, April 19–21, 2007, St. Louis, Missouri, USA. Copyright 2007 ACM 978-1-59593-641-7/07/0004.
- [4] Benbasat, I., A. S. Dexter, and R. W. Mantha (1980). Impact of Organizational Maturity on Information System Skill Needs. MIS Quarterly, 4(1), 21-34.
- [5] Byrd, T. A., B. R. Lewis, and D. E. Turner (2004). The Impact of IT Personnel Skills on IS Infrastructure and Competitive IS. Information Resources Management Journal. 17(2), 38-62.
- [6] Ferguson, E. (2004). Journal of Computing Science in College, 19, 4, April 2004
- [7] Ferguson, E. (2005). Changing Qualifications For Entry-Level Application Developers. Journal for Computing Sciences in Colleges. 106-111. JCSC 20, 4 (April 2005)
- [8] Gallivan, M., D. Truex, and L. Kvasny (2004). Changing Patterns in IT Skill Sets 1988-2003: A Content Analysis of Classified Advertisements. Database for Advance Systems, 35(3), 64-87.
- [9] Gibson, S. (2005) “IT Workforce Gap Looming,” eWeek, 22(48), December 15, p. 37.
- [10] Green, G. I. (1989) Perceived Importance of Systems Analysts’ Job Skills, Roles, and Non-Salary Incentives. MIS Quarterly, 13(2), 115-133.
- [11] Kamal, M. (2005) “Information Technology Workforce – Planning for the Future,” The Journal of American Academy of Business, Cambridge, 7(2), pp. 23-26.
- [12] Leitheiser, R. L. (1992) MIS Skills for the 1990s: A Survey of MIS Managers’ Perceptions. Journal of Management Information Systems, 9(1), 69-91.
- [13] Melymuka, K. (2006) “Workforce Crisis: Preparing for the Coming IT Crunch,” Computerworld, July 3.

[14] Nakayama, M and Sutcliffe, N.G. (2007). Perspective-Driven IT Talent Acquisition. Proceedings of SIGMIS-CPR'07, April 19–21, 2007, St. Louis, Missouri, USA. ACM 978-1-59593-641-7/07/0004, 2007.

[15] Proctor, R. W., and A. Dutta (1995). Skill Acquisition and Human Performance. Thousand Oaks, CA: SAGE Publications.

[16] Society for Information Management (2005). IT Workforce Executive Summary 2006. The Information

Technology Workforce: Trends and Implications 2005-2008.

[17] Todd, P. A., J. D. McKeen, and R. B. Gallupe (1995). The Evolution of IS Job Skills: A Content Analysis of IS Job Advertisements from 1970 to 1990. MIS Quarterly, 19(1), 1-27.

[18] Watson, H. J., D. Young, S. Miranda, B. Robichaux, and R. Sheeley (1990). Requisite Skill for New MIS hires. Data Base, 21(1), 20-29.

Themes	Responses on Skills/Capabilities	Entry-level Positions
A) Technical Skills	<ul style="list-style-type: none"> - Programming - Databases - Multimedia subject - Laboratory simulation - Practical exposure - Professional certification 	<ol style="list-style-type: none"> 1. Database / Networking support - Database administrator, system administrator, helpdesk analyst, network engineer, technical support, IT support and MIS executive 2. Software / Programming - Application developer, programmer, system analyst, web designer, game developer, software engineer, web developer. 3. Computer Engineering - Software architect, configuration engineer, IC design engineer, R&D engineer, software engineer, test engineer 4. Project management assistant/trainee 5. Junior Business IT consulting/trainee
B) Non-technical / Soft Skills	<ul style="list-style-type: none"> i) Communication skills <ul style="list-style-type: none"> - Ability to express, Self-confidence, Self-esteem, Courage, Culture understanding, Public speaking ii) Language subject <ul style="list-style-type: none"> - English, Japanese, Mandarin, Korean iii) Writing skills iv) Skills exposure vi) Thinking ability vii) Business skills 	<p>All positions</p> <p>Programmers, Helpdesk analyst and IT support</p> <p>Business consulting executive/trainee Project management assistant/trainee</p>
C) Problem solving		All positions
D) Career-oriented thinking		All positions
E) Quality of talent		All positions
F) Right attitude		All positions
G) Employability		All positions
H) Training		All positions
I) Ethics		All positions

Table 1: Matching of skill-sets/capabilities with job positions for IT graduates.

ⁱ <http://www.outsourcingmalaysia.org.my/index.php?pg=news> accessed on 10.7.2008