2009 ITWeb-JCSE Skills Survey

Summary of Main Findings

JOBURG CENTRE FOR SOFTWARE ENGINEERING

2009

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Summary of Main Findings

Introduction

In the third quarter of 2008, ITWeb and the Joburg Centre for Software Engineering (JCSE) published their first (annual) Skills Survey report. In the preceding years, much of the news about the ICT sector concerned the perceived lack of available skills in South Africa and various sources were quoted as defining the required numbers of practitioners as being anywhere between 37 500 and 115 000. The challenge for employers and practitioners alike is to "sort the wheat from the chaff" to assess the true picture of skills available and skills development in this critical section of the South African economy.

At the end of 2008, the global economic crisis began to take its toll on the world's markets. The big question, of course, was the extent to which the global shrinkage would affect the South African business community and would this lead to a drastic change in the perceptions about the skills shortage. A report in *Business Day* on 6 October 2009 quoted Mark Walker (analyst at International Data Corporation) as saying that South Africa's IT sector should grow from 430 000 to 524 000 employees by 2013. The base number seems higher than has been traditionally accepted, but it does seem to indicate that there will continue to be strong demand. This 2009 Skills Survey report, based on data collected between July and September 2009, will illustrate the extent to which the perceptions have changed and will re-evaluate the conclusions reached a year ago.

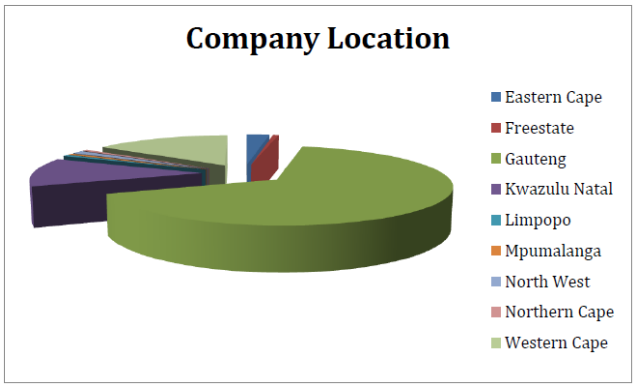
Survey Process

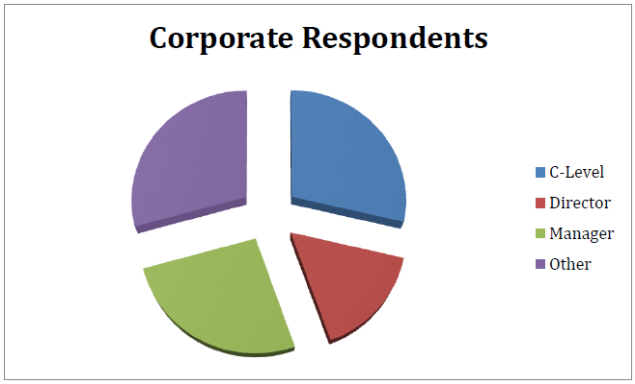
As with the 2008 Skills Survey, the objectives were to identify the most pressing skills needs from the corporate perspective and to balance that with a view of the current skills capacity of the practitioners and their intentions for future skills development. The process was the same – using an almost identical questionnaire, devised by the JCSE, and published as an on-line survey by ITWeb. Additional participation was solicited with the support of the Information Technology Association and Computer Society South Africa.

Following analysis of the data by JCSE, this summary and other reports are compiled. The findings are to be discussed at a Round Table in November 2009 and relevant coverage will be published in *Brainstorm* in 2010.

Corporate Responses

157 valid responses were received from corporate executives, 37% up on the 2008 level. All nine Provinces were represented (2008 – 5) and two thirds of the respondents were located in Gauteng. 45% of the respondents were C-level executives or Directors and





25% were Managers.

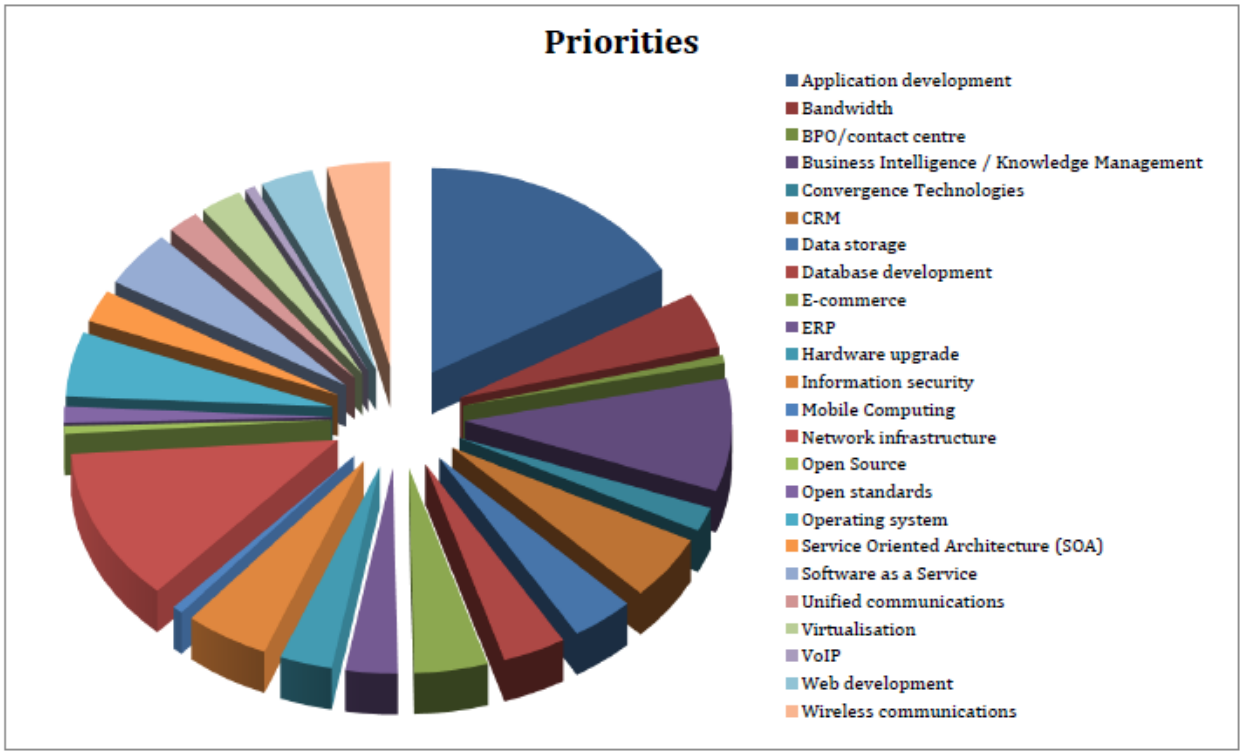
As with the 2008 Survey, 61% of the enterprises were South African privately-owned (non-listed) companies and 18% (15%) listed companies. 57% were operating in the ICT sector and the remaining enterprises were drawn from the Construction, Education & Training, Financial Services, Government, Manufacturing/Engineering, Media/Advertising/Printing/Publishing, Retail/Wholesale, Tourism, Transport and other Services sectors – again, a very similar pattern to the 2008 results.

Half of the enterprises have less than 50 employees (2008 – 40%) and 20% have between 50 and 250 staff members (20%). 40% of all respondents employ less than 10 people internally to supply ICT functions.

The ISETT SETA Sector Skills Plan 2009 (SSP) reports that there are 2 428 companies that it classifies as within its sector (i.e. they are paying the Skills Development Levy and have a payroll exceeding R500 000 per year) and that they employ 141 929 people. Of these companies, 85% have 1-49 employees, 10% have 50 to 149 employees and 5% have 150 or more. Approximately one-third of these companies submit a Workplace Skills Plan.

As the SSP points out, there are companies which have defined themselves as being in other sectors (e.g. Dimension Data in Services) and there are organisations (such as the banks) with a large ICT skills component which belong in other sectors. This means that the ISETT SETA data represents a sub-set of the ICT sector and is not directly comparable with the results of our Survey.

ICT Priorities



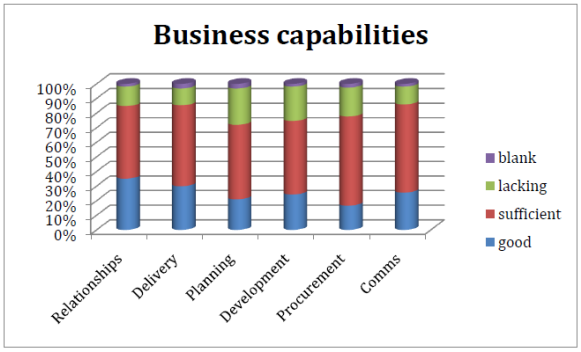
The 2008 Survey identified the top 6 priorities, based on the selection of their own top 3 by each respondent. That analysis showed that **Business Intelligence/Knowledge Management** was the top-ranked priority, followed by **Application Development** and **Software as a Service**. These were supported by Service Oriented Architecture, Web Development and Mobile Computing.

Our 2009 data has been revised to include all identified priorities, and the chart shows that **Application Development** is this year's top priority, with **Business Intelligence/Knowledge Management** being pushed into third place by the (perhaps) surprise entry of **Network Infrastructure** in second place. CRM, Information Security and the Operating System have become the supporting cast, although there is little difference between many of these "other" priorities.

While not wishing to speculate about the trends emerging in such a short period, it is worth noting that the emphasis on Network Infrastructure in 2009 reflects the growing realisation that effective broadband access is essential if the benefits of many of the other areas of development are to be felt.

Business Capabilities

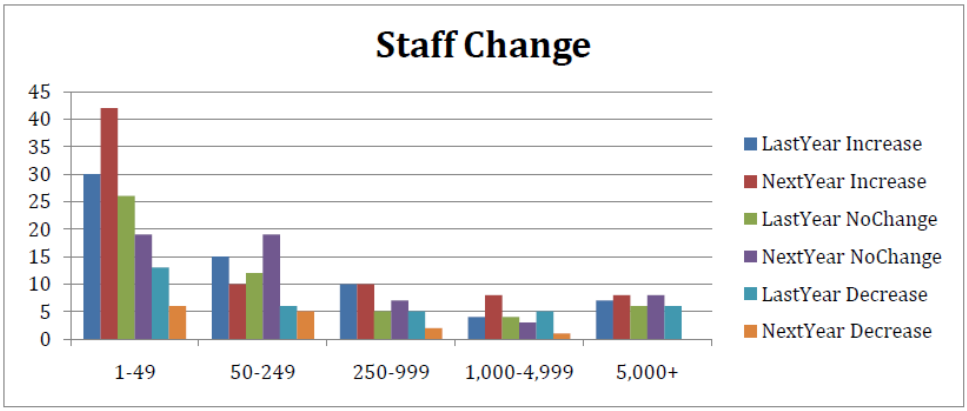
Not much seems to have changed in the perception of the capability of technical staff to meet the business needs of a transaction, with the relative importance of the different capabilities remaining pretty much the same. There has been a slight deterioration in the combined "good" and "sufficient" ratings, which should be a warning signal to those managers concerned with maintaining and improving service quality within their enterprises.



Success is not just about the technical solution – good customer relationships, efficient delivery, effective planning, managed development, proper procurement and good communications are essential ingredients for excellent performance. With an average of less than a quarter of respondents feeling they have good capabilities in these areas, we need to consider the effect this must have on our competitive edge. With the high proportion of technical employees who include the "soft skills" in their job roles, management attention to these capabilities will have an early pay-off.

Staff Dynamics

This is the section of the Survey where we would expect to see the immediate effect of the economic downturn. In 2008, one-third of corporate respondents said that there had been/would be no change in staff numbers in the previous/next year. The majority of enterprises expected to increase staff numbers by between 10% and 50% and almost nobody anticipated lower numbers in 2009. It was these results that led us to extrapolate the forecast demand to suggest that as many as 70 000 new practitioners would be required.



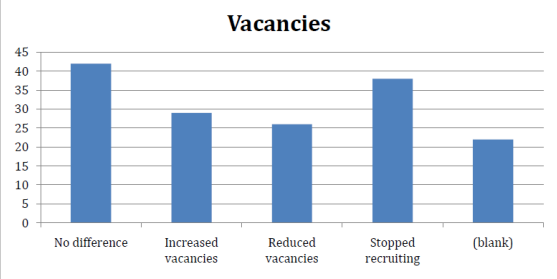
It comes as no surprise, therefore, to see that, although the number of enterprises reporting no change in either year is still around the one-third mark, there is an appreciable shift towards the reporting of lower staff numbers in the year to mid/late

2009 and in the year ahead. 23% of respondents said they had reduced staff in the last year and 10% anticipated this would continue into 2010.

However, the first two colour bands in the Staff Change chart show that a sizeable proportion of respondents increased their staff numbers in the last year and intend to do so again in the year ahead. 43% report growing last year and 58% indicate that this trend will continue. If we look at how this optimism is distributed across the sizes of enterprises, it is the small companies (less than 50 employees) that are showing the most growth – in the 40% increase range. But even taking into account the naturally more conservative approach of the medium to large enterprises, there is still an "average" growth rate exceeding 30%.

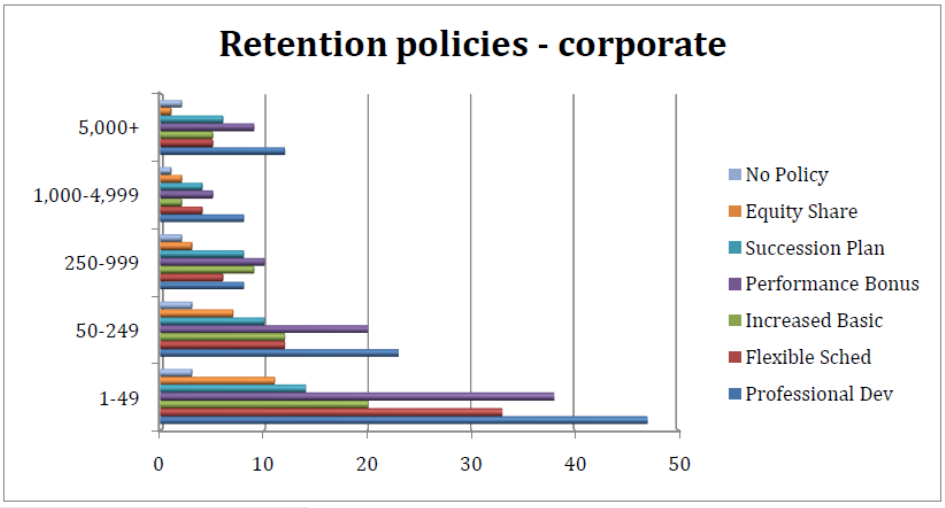
To offset this, there is much clearer evidence of some companies reducing staff numbers. Those who reported having lowered the complement last year indicated that reductions were in to order of 20%, improving slightly to 14% in the forecast year ahead.

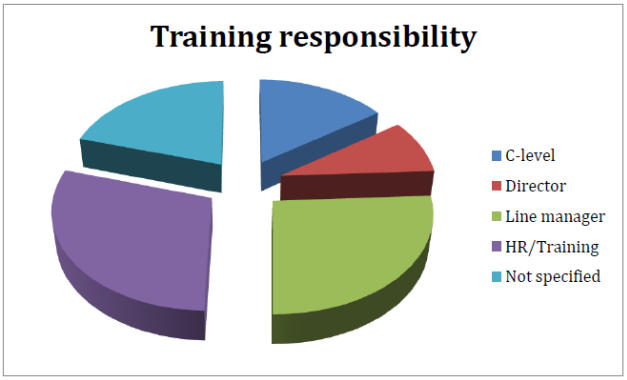
Extrapolation of these trends suggests that the anticipated (in 2008) growth in 2009 of 25% became a little less than 15% and that the forecast "skills gap" for 2010 will be in the region of 20%. Although this indicates an easing in demand, it also shows that there remains a strong need for the education and training institutions to renew their efforts to improve the output of trained practitioners into the ICT market. In context, the demand is for tens of thousands of new skills but perhaps not the 100 000-plus suggested by the IDC report.



The Vacancies chart shows that there is almost a balance between the number of enterprises who say that they have the same number or an increased number of vacancies and those who report a lower number or a cessation of hiring, following the recession.

There has been little change in the pattern of staff retention policies reported in the last year. Support for professional development and performance bonuses remain the most utilised policies, with flexible scheduling being particularly used in small companies.





In our 2008 report, we commented that many small and medium size companies do not have a specific training function within their structure. The pattern remains the same, with C-level executives or owners in small businesses carrying this responsibility (as would be

expected) but with a high proportion of line managers shouldering the burden in medium and large enterprises.

We continue to feel that this may face the manager with the dilemma of needing to satisfy the pressure of deadlines and delivery schedules against the need to grant time for training and career development to key employees.

As with last year, only a small number of companies recruit skills from overseas – about 10% reported doing so (2008 – 19%). Europe/Middle East and Africa are the preferred sources.

Corporate Preferences

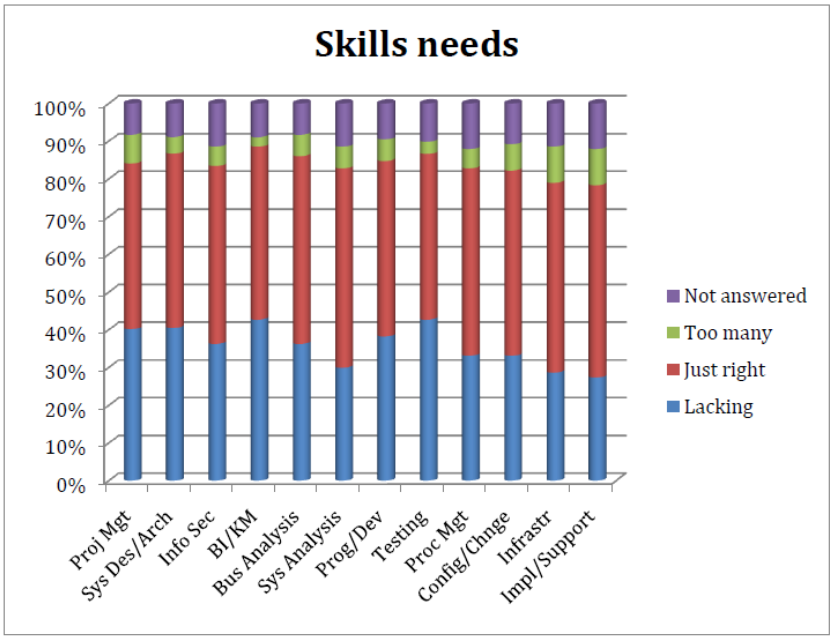
Over 50% of respondents indicated that they preferred training to take place on-site (2008 – 65%) and 20% selected off-site (11%). The distribution across the type of facilitated training remains very similar to the previous results, with the use of coaches/mentors and formal courses most supported. The combination of coaching/mentoring and self-regulated knowledge sharing continues to lead the way in transferring skills internally.

When external providers are required, there is now an equal disposition towards vendor and commercial providers, with academic institutions remaining in third place. From the corporate perspective, this is the result of needing to "plug in" relevant skills as required, rather than supporting a longer and less focused approach through academic qualification.

The responses to our question about the relative importance of pre-hiring qualifications and certifications revealed very little differentiation between the different types. A preference for graduate degrees was slightly ahead of the pack and recognition of vendor certifications brought up the rear. There continues to be general agreement that qualifications must be internationally comparable.

Skills Needs

In this chart, we attempt to illustrate the technology roles where skills are most lacking. In 2008, we reported that the skills in highest demand were Process Management, Business Intelligence & Knowledge Management, Business Analysis and System(s) Analysis. It was anticipated that Programming/Development and Systems Design/Architecture would be in short supply in 2009.



Infrastructure design/management and Implementation/Support were the areas of least concern.

It must be noted that there are significant needs across all these roles, as the variation between 25% (lowest demand) and 40% (highest demand) is not that great. There has been a shift away from System(s) Analysis and a greater emphasis on Testing. There has been the anticipated improvement in Process Management skills from 70% lacking in 2008 to just over 30% in 2009.

Java, C# and VB topped the list of programming languages in demand this year (very similar to 2008).

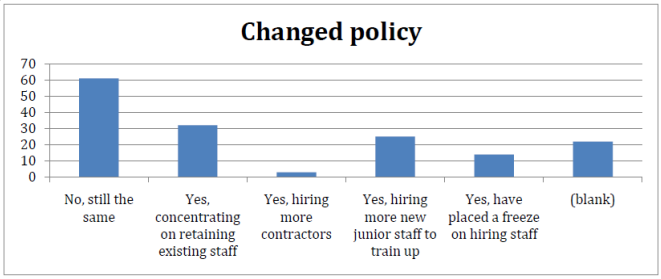
Cape Town's Bandwidth Barn carried out its own survey in 2009, which highlighted the particular need for technical skills and for business administration skills, following which they have launched a programme with the Western Cape Economic Development Department to train 100 people in these areas. The survey revealed that 45% of job vacancies listed project management as a requirement, mirroring the findings of our 2008 Survey, according to the CEO of the Bandwidth Barn.

Impact of the Skills Shortage and the Economic Downturn

In 2008, all respondents indicated that the skills shortage was having at least a major effect on their business, with a few indicating that it was affecting the viability of their operations. This year, we asked the same question but added that we needed to know if they had perceived any change in the availability of skilled practitioners and whether they had changed their policies as a result of the changed economic environment.

Interestingly, 75% still say that the skills shortage is having a major effect on their business and a few are still concerned about their viability for this reason. This suggests that the recessionary influences have not yet filtered through to the IT departments or to the plans to procure IT solutions that were already in place last year.

Although the majority of respondents indicated that they had noticed a change in the availability of skilled resources, there seems to be an equal balance between those who see more practitioners available and those who see less. We would need to ask for a more detailed response to be able to drill down into which particular roles were affected.



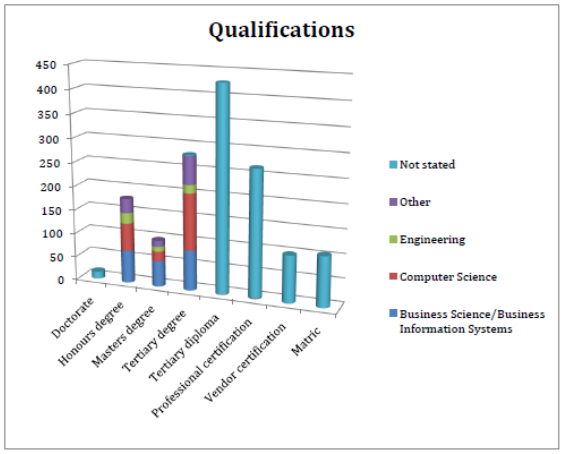
About 40% of respondents indicated they had changed their hiring policy to counter the economic change and it is interesting to note that most of them were focused on retention or hiring and only less than 10% had placed a freeze on hiring.

Corporate Summary

It is possible that the year between Surveys is not sufficient for the full effect of the external influences on the South African ICT sector to be felt. There has been much speculation in the business press that our economy lags behind the developed world in the timing of the cycle and this would explain some of the findings that have come out of this year's analysis. Emile Bosman of HR Services at Softline VIP is quoted in *iWeek* October 8, 2009, as saying, "The skills shortage has been hailed as one of the major factors imposing a less-than-favourable impact on our business efficiency (ranked 30th in 2009), our global competitiveness (ranked 48th in 2009) and our economic GDP growth (-2,8% in June 2009)."

Sandra Burmeister of Landelahni Business Leaders said in ITWeb on the same day, "Technology is the biggest single driver for the skills shortage globally, because it causes [this] redundancy of skills every three years due to the rate of changing technology." She was commenting on a report that shows the SA telecommunications sector to be growing at 14% per annum.

Overall, based on a bigger sample than before, the results are broadly similar to the year before and underline the fact that South Africa continues to endure a significant shortage of skilled ICT practitioners.

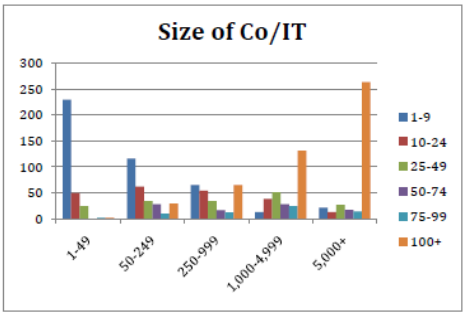


Practitioner Responses

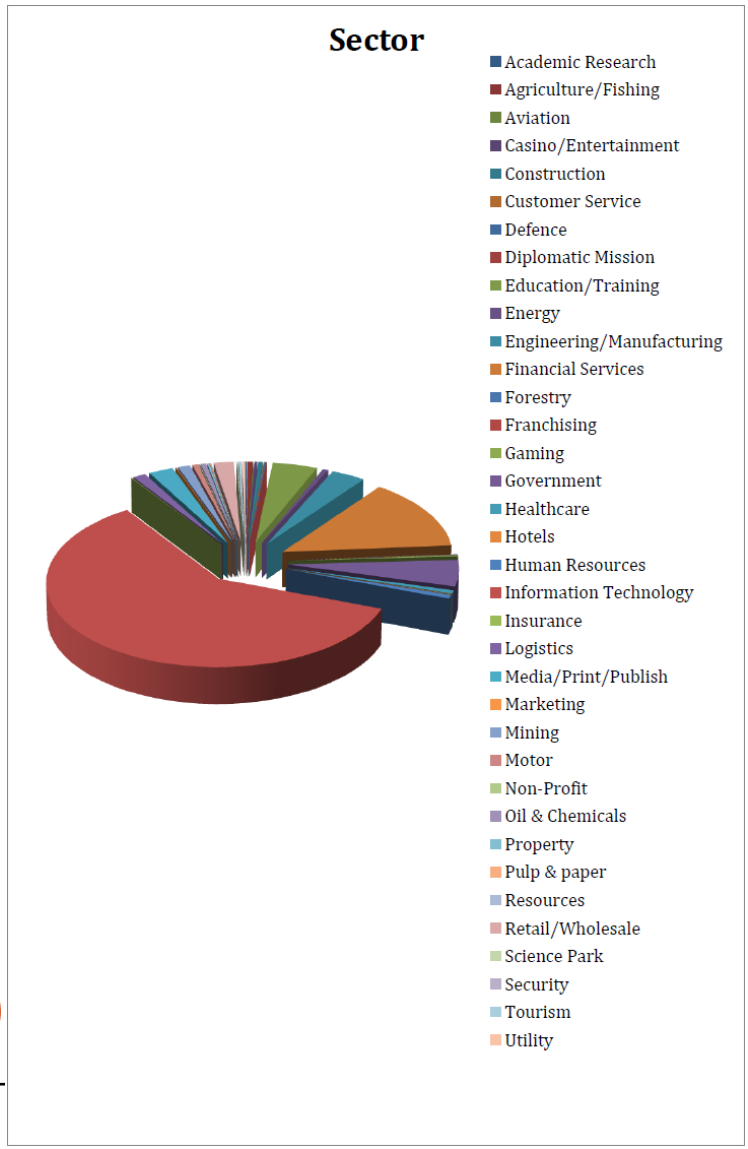
1471 valid Practitioner responses were received, 52% up on 2008's 965. This is an encouraging increase and ensures that the sample is large enough from which to draw valid conclusions.

Practitioner Profile

Last year, we stated that the "average" respondent was a 35 year old male "permanently" employed in Gauteng with more than 10 years IT experience, less than 5 years at their current employer and working as a technical manager or as a developer/ programmer. Not much has changed.

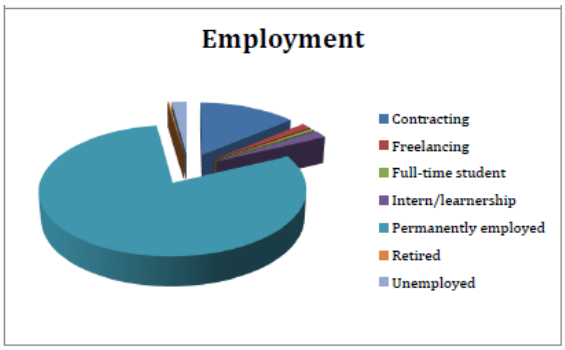


Two-thirds have a tertiary qualification, 70% are in Gauteng, 16% in the Western Cape, 7% in KZN. All Provinces are represented in the 2009 respondents. 21% of the practitioners who responded are female.



As before, most respondents work in a small (1-9) department or a large one (100+). The majority have worked for their current employer for between 1 and 5 years and as many as 17% have been in their current job for less than a year. Last year, this figure was as high as 22%, supporting the trends identified from the Corporate respondents of lower hiring in the past year.

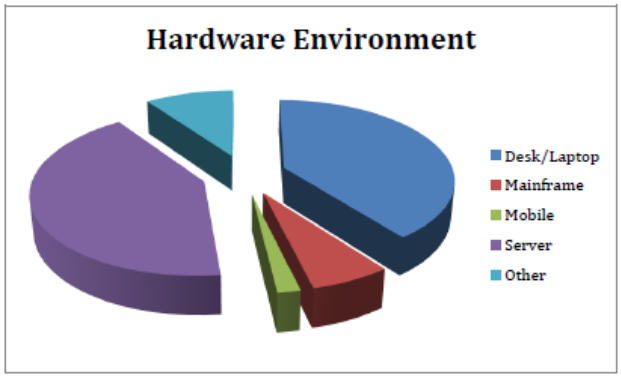
In 2008, 57% of respondents worked in the ICT sector. This year, the figure has risen to 60% but the number of other sectors



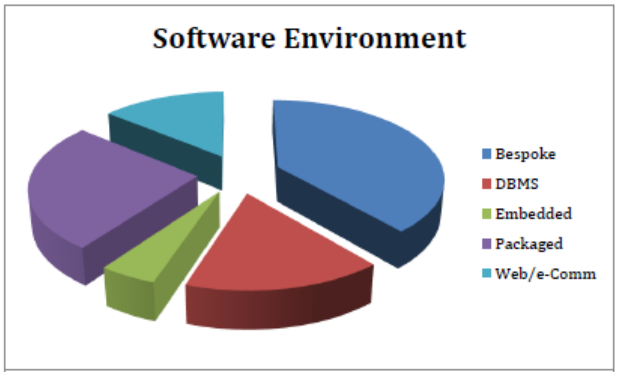
reported has increased dramatically from 12 to 35, although it must be acknowledged that only the Financial Services, Government, Education/ Training and Manufacturing/ Engineering sectors include significant numbers of practitioners.

Approximately 200 or 14% of responding practitioners are contractors and would be affected by the proposed banning of Labour Brokers, if the proposals were to be legislated in the form currently touted by the Department of Labour.

Practitioner Roles

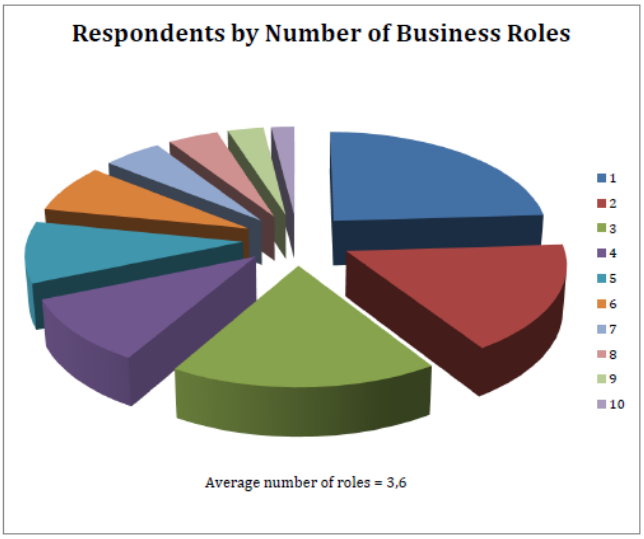


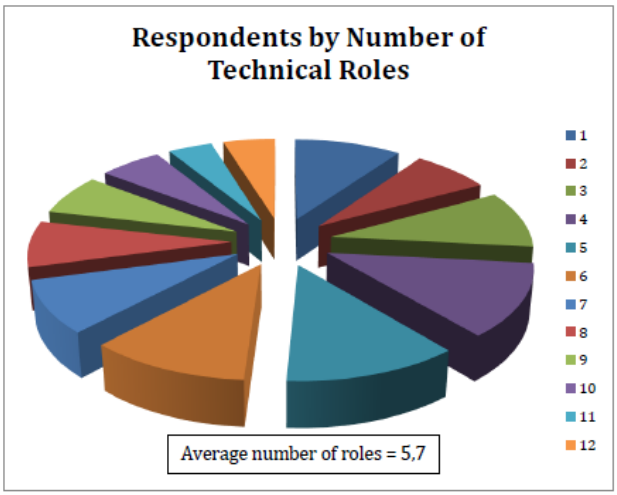
Similar to the 2008 results, 35% of respondents are working with Hardware and Infrastructure (38%) and



46% with Software Applications (47%). There is an almost equal split between practitioners working in the PC (desktop/laptop) environment and those in the server field. In spite of the apparent rapid growth in the market for mobile applications, only a very small percentage of our respondents are working in this arena from a hardware perspective. In software development and implementation, customised solutions occupy the largest number of practitioners, followed by significant numbers involved in packaged software and database management.

70 practitioners (5%) are working as C-Level executives or Directors, 150 (10%) are managing Operations or Development, 5% are Project Managers, 15% are in Programming or Development roles and another 15% are in Support functions.





In the 2008 Survey, we pointed out that a dominant feature was that very few respondents focused on a single area of activity. Almost all report that they carry out a range of functions, requiring a range of relevant skills and experience. In that Survey, the average

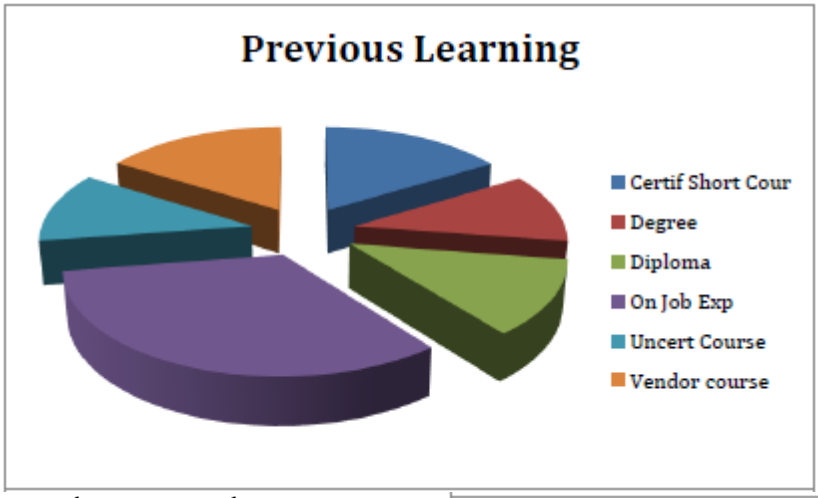
respondent reported being involved in 5 activities. In 2009, this figure has increased to 5,7 activities for technical staff, although it is somewhat better at 3,6 activities on average for those performing in business roles.

We repeat our concern about this possibly being a cause or an effect of the skills shortage, particularly in the performance of technical roles. Although it may not be surprising that staff perform multiple roles within small enterprises, there are risks attached to this use of "multi-purpose" employees. The loss of such a practitioner in any enterprise would have a serious impact on the operations of the company and finding an equally competent replacement becomes more difficult.

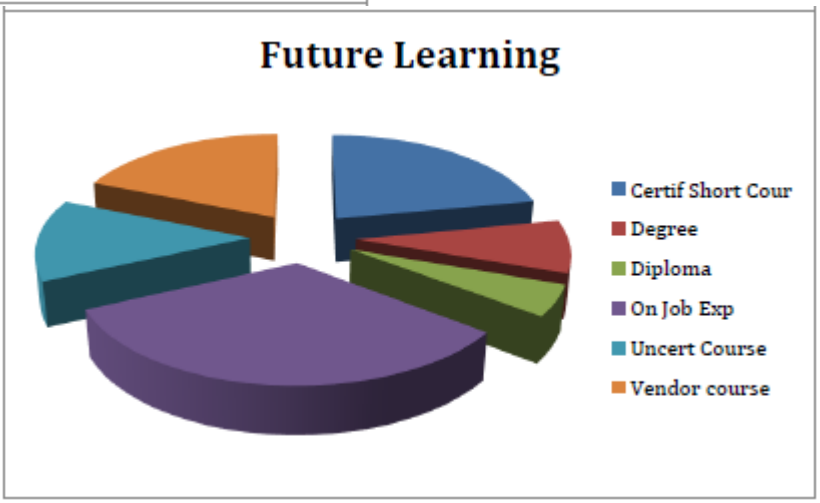
In medium and large enterprises, the use of single practitioners to carry out the different steps in the systems development life cycle, from developing the requirements to testing and implementing the applications, suggests a lack of attention to governance. However, the survey does acknowledge that these "multi-tasking" practitioners may not always be working sequentially on the same project and may be (for example) coding on one project but testing on another.

Skills Acquisition

As in 2008, respondents showed how they had acquired their skills in the past, to qualify them for their current post, and how they intended to acquire skills in the future, to maintain their value in the job market.

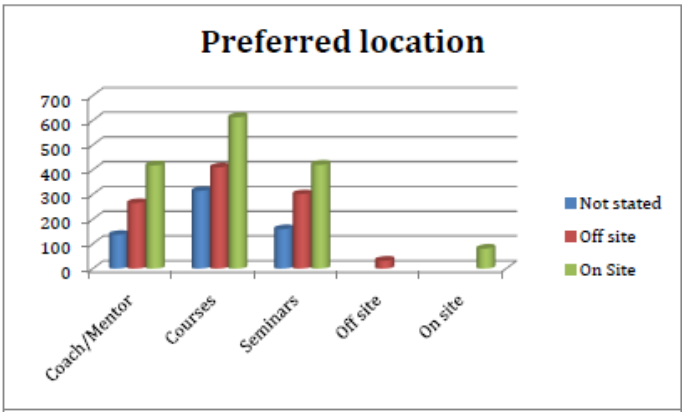


There was a slight drop in the predominance of "on the job experience or mentoring" from over 90% to 86% in the acquisition of skills to date. The remaining distribution was largely unchanged, with 42% each utilising Certificated Short Course and Vendor Certifications. We continue to note that employers are less enthusiastic about certifications than the practitioners, suggesting two factors: one is that commercial training providers "oversell" their courses to practitioners and the other is that practitioners are willing to acquire a certificate even though it may not directly influence their employment.



Looking ahead, these three methods continue to lead the field. There is no doubt that the "no substitute for experience" truism is well-founded and that technical skills acquired beyond the workplace will usually be through the short certificated or vendor course. The pursuit of diplomas and degrees once the practitioner is engaged in a full-time occupation can present a challenge

in terms of balancing the demands of work, study and home life. In spite of the preference for on-site learning, a significant proportion of respondents indicate that the transfer of knowledge is best suited to an environment outside of the actual workplace.



As would be expected from the preference for on the job training, the use of knowledge sharing as the preferred self-paced learning source is dominant. CBT or e-Learning is the second preference as source material and tapes/videos or books are used by only 25% of respondents. As far as external providers are concerned, the balance between academic, commercial and vendor remains even at about one-third each.

Conclusions

In September 2009, the Minister of Communications, speaking at an ICT Careers Expo, expressed concern at the low number of students taking ICT courses and referred to research that showed declining numbers of students registering for such courses since 2002, with the result that qualifying graduate numbers had declined since 2005. Whether this challenge can be overcome in the medium term will depend on the effectiveness of the myriad of interventions that government and the private sector are undertaking to develop critical skills and improve the quality of technology education.

In October 2009, there was an interesting debate fuelled by Alfie Hamid of Cisco contending that Universities need to become industry training academies (*iWeek, 14 October 2009*). This view was hotly contested by a group of professors who firmly believe their curricula are relevant and that their business is education, not training. This exchange highlights the need for closer cooperation between industry and the education and training institutions, as certain skills are appropriately developed in FET colleges and specialist training environments, while others are built on an academic foundation.

Much useful background to the ICT sector skills debate can be found in the ISETT SETA Sector Skills Plan 2009 (http://www.isett.org.za/incASP/frame.asp?theSection=/ssp/default.asp) . However, we believe that more work needs to be done to clarify the segments of the ICT sector covered by the various research sources to enable further quantification of the trends deduced. We are also concerned that there is a lack of current data about the outcomes of the education processes – it is not helpful to know the number of graduates from 5 years ago, when planning interventions in a sector as dynamic as the ICT industry.

Now that the ITWeb-JCSE Skills Survey has completed a second year of data collection, we are confident that we are beginning to build a knowledge store that will help to pinpoint the key issues in defining and qualifying the skills picture in the South African ICT sector. In this critical "first year" of the global economic slow-down, it would seem that SA has been insulated from the worst effects suffered in more developed economies. However, it must be said that the "lag factor" has been demonstrated before, and we can expect that the bottom of the curve has not yet been seen in this country.

Even so, the sector is resilient and a vital contributor to all other sectors of the economy. As Burmeister said, the pace of technology change continues unabated, and the connection of South Africa to the new broadband networks will drive the acquisition and implementation of technology in more and more enterprises, driving the ongoing demand for relevant skills.