



Cambodian IT industry: skills for a digital economy

**Authors: Jitka Markova
Chris Wray**

DigitalRain (research@digitalrainagency.com)

In partnership with British Chamber of Commerce (Britcham)

October 2016

This research was inspired by the growing interest, and investment, in the Cambodian IT sector driven by the current 7% growth of the local economy. The Royal Government of Cambodia is expecting to maintain this growth in 2016 and in the following years. With the increasing prosperity and growth of both manufacturing and agricultural industry, the demands on the IT sector will increase in order to provide modern IT solutions for other non-technology businesses. In addition, the technology industry is extensively marketing itself as the new place for outsourcing and innovation. This level of planned growth will require a skilled and experienced workforce to meet the needs of local and international businesses.

The main research objectives were a greater understanding of the current market drivers within the Digital, Technology and IT industries, their relevance to the skills needed currently, and those within the sector in the next 3 to 5 years. In light of these needs, we focused on identifying skills gaps in the sector driven by the requirements of employers while mapping both technical knowledge and experience, as well as necessary soft skills and language skills. We hope that this paper will inform decision makers and industry experts in order to prioritise human resources and monetary investment to align the job market with industry needs (including provision of skills training, soft skills development, recruitment and career progression pathways).

In total 21 businesses took part in the research, with a primary focus on IT specialist businesses such as web and IT software development companies, as well as businesses whose growth is driven by the increase in internet and mobile phone use such as banks (increasingly focusing on e-commerce) and local mobile phone and ISP providers. A broad range of Cambodian and international businesses of different size and ownership were selected to provide greater understanding of the issues faced by employers and the complexity of skills needed within the industry.

In addition, 63 young people aged 17-26 years took part in the research from 3 training providers: Passerelles numériques Cambodia (PNC), IT STEP and Institute of Technology Cambodia (ITC). The National Institute of Posts, Telecommunications and ICT (NIPTICT) was also interviewed during this research, however their students did not take part.

The technology sector in Cambodia could be described as being at a crossroads. On the one hand penetration of mobile devices, and especially mobile internet, means there is significant adoption and access by the population.



In Cambodia 88% of people now access the internet via their phones, compared to 71% in 2014. On the other hand, the lack of infrastructure to take advantage of this opportunity is limited. Whilst Cambodia shares the consumer trust and Internet infrastructure issues of its neighbours, its' logistics and lack of payment mechanisms remain significant barriers to gaining momentum. One of the additional challenges – Talent and the IT skills gap forms the core of this report.

The body of this research clearly shows a clear skills gap within the current Cambodian IT sector with ¾ of businesses interviewed being unable to hire the employees they are looking for and finding it difficult to recruit competent IT staff. At entry level, there are plenty of applicants, but the level of skills is very low; resulting in most organisations being forced to train their own staff. In terms of senior level staff, there is a widespread lack of local applicants that have the skills and experience to take on senior roles. The low number of senior managers and C-level leaders is pushing the remuneration packages out of sync with the rest of the industry, putting in question the notion of Cambodia as the new international IT outsourcing location.

The IT industry as a whole focuses on a long-term sustainability of its workforce by developing strong local Cambodian staff, while the use of expatriate staff is seen as necessary (for the moment) for highly specialised roles. However, most see the expatriate staff as temporary, with a clear focus on mentoring and training of their local colleagues. Several companies stated that in the past they had difficulties with managing international staff and that they had a negative impact on their organisations. The biggest problems being sighted as lack of understanding of the local culture, feeling superior, unwilling to learn and behaving disrespectfully to the local teams.

Due to the limited technical skills of new graduates and those seeking employment, the vast majority of employers are choosing those with higher levels of soft skills over those with technical abilities. 72% of the employers said that the most important selection priority are soft skills, compared to 22% who prioritised technical skills over all others. This data noticeably aligns with their recruitment strategy of hiring young motivated graduates with the right attitude which they can then upskill and provide technical training. 55% of business see technical skills as their second highest priority, with an equal number of participants seeing the priority as soft skills and language skills.

Students appreciation of the IT sector's roles is very limited, leading to a simplistic view of the opportunities available to them. In addition, their understanding of the sector is minimal and their expectations can be at times seen to be out of touch with the current job market, especially in terms of earning potential after graduation.

In general, the workforce analysis shows a picture of a growing sector with the demand for a well-qualified workforce rising as the economy grows. This reflects the current roles and skills required.

The most difficult roles to fill were IT project managers and team leaders where there is a small pool of talent to choose from. Software engineers were identified as the second most sought-after candidates, even though many interviewees previously said that they found it easy to train, or recruit software programmers. In order to understand the core of this issue, we further analysed of the sample. A more complex picture was uncovered, with a clear split between large companies who have the capacity to train their own staff, and small start-ups. Smaller organisations have a very limited ability train their own programmers.



In addition, they do not have the time and resources to support this sometimes lengthy process, as their main focus is on their business growth not staff development. As a consequence, smaller organisations and start-ups are looking for technically proficient and broad-skilled programmers able to work independently with minimal supervision and training, while larger organisations take on fresh graduates with minimal technical skills.

From an industry point of view, programmers still lack in-depth experience and technical knowledge even when having coded for a number of years. Due to the limited experience in the short term local staff will continue to be utilised primarily for coding work rather than software architects and security specialists.

Research data demonstrates that Cambodia still has a considerable challenge in building an educational programme across the whole sector that would ensure an ongoing supply of skilled entry level staff and senior technical leads - team leaders, scrum masters and project managers.

Employers have clearly identified that soft skills are key to workforce development and underpin any technical ability the staff might have. Currently those entering the industry lack these skills. It is important to note, that given the current levels of growth within the IT sector and the unceasing challenges faced by many of the Cambodian start-ups, soft skills are probably in greater demand now, than if the industry was well established. Within the context of this research, we aimed to identify which soft skills are important to employers within the IT industry and which skills they find potential employees are missing. The research participants from the employers' sample group agreed that the top four skills currently missing were: accountability, responsibility, skills in dealing with difficult/unexpected situations and leadership skills (from a list of 22 soft skills).

Further clustering using a USAID's framework for soft skills (2015) enabled us to produce a more strategic overview of the soft skills currently absent from the sector. The two main areas for soft skills development were identified as: higher order thinking skills (HOTS) and self-control. Both of these soft skills developmental areas are essential to the ability of the workforce to produce senior managers and leaders, as well as dedicated members of staff who are resilient and able to deal with the challenges and adversities within the workplace. The lack of soft skills needed for dealing with difficult situations, stress and problem solving impacts on: organisational work flow, the ability to deal with complex technical issues and everyday stress, this results in a negative effect on the businesses' ability to deliver against goals and deadlines. Some employers identified it as the leading cause of high levels of absenteeism and low retention of staff as they "shop around" for less demanding roles.

The data from students' sample group show that the top three soft skills students believe they have are: responsibility, teamwork and self-confidence with 75% of the students rating themselves in having these skills. On the other hand the data regarding skills that students feel they lack, are significantly different: with one group rating both self-awareness and skills in dealing with difficult situations the lowest (13% acquisition rate), followed by analytical thinking (17%). While the second group rated the lowest stress management (38%), followed by leadership (41%) and analytical skills (47%). In addition, both student groups reported low levels of loyalty and work ethic during the research, which will require employers to develop new approaches to retain their Generation-Y and Millennial employees.



The combination of a lack of structured monitoring of soft skills within the business, and the minimal academic understanding of how soft skills are acquired and developed (by both the businesses and IT students), forms the greatest vulnerability for the potential growth of the sector, and needing to be addressed.

It is widely recognised that English is the main communication language for the Cambodian IT industry, even though there are several leaders within the sector who are Francophone. Other languages from the ASEAN region have not penetrated the market, leaving English to be the main business language across South East Asia.

Due to the limited scope of this research, we were unable to analyse the technical and soft skills of students, and their motivation for studying computer science and technology at the point of enrolment to training providers. Given our increasing understanding (globally) of those who choose to pursue computer sciences, these aspects need to be filtered into the overall Cambodian workforce development strategy.

In order to meet the current skills gap, the IT businesses in Cambodia make a significant investment in the Continued Professional Development (CPD) of their staff. The cost of extensive CPD is currently fully absorbed by each business, however the value gets lost once the employee chooses to leave; resulting in poor return on investment for those with a high staff turn-over. From the long term perspective, it is not only a cost issue but also a resource utilisation and a distraction from delivering the core business activities.

Mentoring is the most popular on-the-job training offered, with 58% of companies supporting their employees in this way, closely followed by 53% offering in-house training. In addition to short term courses providing technical training, project management and leaderships skills, some businesses have developed process-driven courses. These are specialised short-term training programmes to build the capacity of their new recruits. They are often short (2-6 months) training courses that offer specialised technical skills, programming language or specific technical process being used by the firm; in addition to a range of opportunities to develop work-place related soft skills. The least utilised methodologies currently used are online courses and peer-to-peer training. Currently online training is not suitable as this group of learners tend to lack independent learning skills.

There is close co-operation between some businesses and local universities as well as other IT training providers. However, there is a lack of harmonisation and synchronisation of each other's efforts in delivering more holistic learning opportunities for staff.

Our research indicates that the outcome of CPD activities of the sample group is not being measured through any specific monitoring and evaluation method. Therefore, there is little evidence based data to offer any understanding of the impact, usefulness and cost effectiveness. Only anecdotal evidence and individual success stories provide some insight into the current benefits the CPD provides.

Future sectoral changes that will impact workforce needs:

- Lack of specialised technical skills and senior managers might become a limitation to growth - Current economic growth will require more experienced staff to lead new teams, to manage clients' expectations and provide leadership in times of transition and growth. The body of this research clearly shows that a current lack of experienced developers, lack of specialised skills within the current job market and



very limited number of senior project leader/managers and CO level staff might have a negative impact on the continued growth of the economy and sector.

- Cambodia as a low cost option - The vast majority of companies operating in the IT technology sector in Cambodia provide services almost exclusively to foreign markets or international companies operating in Cambodia. Their ability to remain financially competitive is essential for their survival and growth; by offering low-cost high skilled solutions to their business partners and clients. The lack of a skilled workforce and rising costs of keeping skills staff from leaving, needs to be addressed to enable Cambodia to offer comparable market prices to India or the Philippines, for example.
- The future of technology- One of the main challenges faced by the Cambodian IT industry is the way it keeps up with modern computer science, increasingly focused on innovative solutions, the internet of things and artificial intelligence. More developed economies are usually more likely to become technology innovators, by being in the forefront of technological development and innovation. The distance from the forefront of technological innovation determines whether unskilled or skilled human capital should be preferred as a driver for an economic growth. With increasingly more complex IT solutions and use of artificial intelligence, there is increasing need for specialised workers to adopt new innovations. Technical but also soft skills are required in the adoption process. Therefore, advanced computer skills will be required in the following years to keep up with increasingly complex algorithms and product development with integrated artificial intelligence. As the process of programming becoming easier, and more tools becoming available to further streamline this process, we will need more graduates able to analyse extensive data and work with complex algorithms to adapt and imitate new technologies.
- Cultural shift towards innovation and solution development - The Cambodian technology industry, as every other, is striving to establish itself within the highly competitive ASEAN region, and at the same time through the current market forces it needs to be able to innovate in order to stay competitive and gain greater market share over its competitors. There is significant support for the argument that the capability of a country or region to initiate innovation is related to its culture. Given the historical and cultural background of the region, Cambodian IT businesses striving for innovation and development of new products will have to work together to collectively overcome some of the cultural and social barriers that stand in the way of a truly innovative culture within their industry that is flexible, empowering, welcomes ideas, tolerates risk, celebrates success, fosters respect, and encourages fun.

Recommendations

- Economic diversification will be critical for the ongoing growth of the Cambodian IT sector. The Royal Government and its partners might want to consider boosting support for the industry by providing grants and technical advice, enabling new technology products and services to be developed for both domestic use and driving export to new international markets. Diversification of the industry will require additional targeted sectoral strategies; some of those are already being developed in areas such as e-commerce and on-line payment gateways.



- The IT industry and technology training providers will be required to work in close collaboration with these sectors to anticipate and plan for technology introduction in these traditionally non-IT sectors. In addition, there is a need to conduct a short and mid-term IT workforce audit within other non-IT sectors to anticipate needs and prevent brain-drain from an already under-resourced IT industry.
- To enhance growth and productive employment, it is necessary to ensure that the skills supplied by the Cambodian workforce match skills demanded by the IT and technology industry. Emphasis should be given to the design of IT and technology courses, ensuring that employment based skills can actually be acquired and that students have the minimal technical and soft skills required by employers, at the entry point to the job market.
- The current soft skills gap needs to be bridged through a holistic approach to developing a soft skill framework for the industry. The focus should be on skills acquisition and ongoing soft skills development; with methodology to measure the skills outcomes. Currently, most soft skills training opportunities are provided by the private sector and nongovernment organisations (NGOs), formally and informally. An inter-sectoral approach is needed to create a joint agenda to allow for a long-term plan to match soft skills with employment opportunities. Emphasis should be given to acquisition of Higher order thinking skills (HOT) and self-management skills. Perhaps this could be an opportunity to review curricula and teaching methods, as well as to upgrade the skills of teaching staff, for the successful development of soft skills education.
- The IT sector needs to reduce the knowledge gap and the current lack of understanding by young people, of the employment and growth opportunities available within the sector. A better overview of the IT sector, its makeup, and the identity of individual roles and responsibilities within it, needs to be provided to young people and their families, so they can make well informed decisions on their educational choices. A better flow of information, and more of it, is needed for efficient job/skills matching.
- The ongoing upgrade of skills for the current workforce needs to be enhanced by promoting continued professional development (CPD), with non-formal education and lifelong learning opportunities. Due to the rapid growth of the industry, the low educational attainment and low skills level of the current workforce, it is important to provide opportunities for continuing education for those who are already working in the industry.
- Individual companies, and the sector itself would benefit greatly from increased co-operation, and sharing of costs for training courses and other CPD support. There are potentially large gains from working together to provide continued professional development and education and address the relatively low level of skills in the existing workforce.
- A broader range of continued professional development (CPD) programmes needs to be developed to meet a wide range of learning styles and preferences. A greater emphasis should be on learner-directed opportunities, (where learning is self-directed and encourages ownership and personal growth), as global development in technology and science demands a workforce with a culture of life-long learning. Peer-to-peer learning and action learning are examples of such learning methodology.



- The current lack of local senior IT project managers and CO level staff (that leads to higher than average costs and high turn-over of staff) should be addressed through development of a sector-wide leadership programme. A new generation of local leaders will need access to a training programme that offers technical and leadership skills in a creative, flexible and empowering environment which tolerates risk and enables a cultural shift towards greater innovation within the sector. As part of the sector-wide approach to leadership development, no-poach agreements should be explored to allow for a truly collaborative process.

- Within the next 10 years the Cambodian IT industry anticipates a move from technology adoption and imitation toward technology innovation. This will enable development of new technologies and regional focussed solutions that will in turn lead to greater opportunities for their return on investment. This shift will require a novel approach (rooted in academic research and innovation theories) to workforce and organisational development. The current growth of incubator hubs and innovation initiatives that mainly focus on technology imitation, will have to be evaluated and further developed to meets the needs of the industry in the years to come.

Recommendations for further research:

- Comprehensive mapping of secondary school graduates entering computer science and IT training programmes - assessment of their level of soft skills and logical reasoning; and their motivation/main drivers for choosing a career in IT sector. Is the Cambodian IT student population reflective of the global trend, with a high proportion of “geeks”?
- Action research – evaluating and measuring effectiveness of a range of soft skills training interventions to be used within the IT sector.
- Analysis of the long term cost effectiveness of Cambodia as low cost outsourcing centre for the technology sector
- Short and mid-term IT workforce audit needs within non-IT sectors
- Understanding the impact of Cambodian culture on innovation
- Assessing current levels of innovation skills in the Cambodian IT industry