

Managing IT Professionals in Hong Kong — A Review of Career Expectations and Progression

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ABSTRACT

A critical issue of concern for Hong Kong organizations is IT staff recruitment and retention. This is reflected by a growing commitment from Hong Kong tertiary institutes to develop academic programs which more closely support market needs. This paper reviews the job characteristics and attitudes of 173 IT professionals in Hong Kong, all of whom have entered the job market over the last five years with professional degree qualifications. The issues related to IT career development are explored in a worldwide context before they are specifically examined within the Hong Kong environment. The paper describes the research model used and analyses the results within Hong Kong but also compares these with the findings from a study conducted in the United States. Finally, the implications for Hong Kong are discussed and extended into global concerns with respect to management of career development within Asian based multinational corporations and academic developments for a global IT society.

Note: In this paper, IT professionals cover all those involved in the implementation of new business processes built around information technology. With respect to their academic qualifications this may be in Information Systems (IS), Computing or Information Technology (IT).

INTRODUCTION

Despite a sustained growth of career opportunities for Information Technology (IT) professionals [25, 17] there is a growing awareness that the tasks and skills associated with the successful IT professional of the past, will no longer be adequate in the future [12, 31]. Changes in corporate computing brought about by advancing but affordable technology have created many new career paths. The linear career path for IT professionals is no longer relevant [31]. Further, the traditional career structure still maintained in many Hong Kong organizations acts as a serious constraint for the development of IT management skills: experience in programming skills may be useful for systems design, only marginally useful for systems analysis and may have no bearing at all on project management. This has profound implications for IT career planning and for IT education [8], particularly so for Asian countries where the growth of the IT industry over the last decade has been phenomenal. From a 30% (US\$70 billion) share of the world IT market in the early

1990s it is estimated that the Asian market share will grow to 50% (US\$240 billion) by the year 2000. [14]. IT Career opportunities will undoubtedly increase but will also demand professional skills which are significantly different from the technical developmental skills on which most IT academic programs focus. The problem is exacerbated in Hong Kong, by a chronic shortage of IT staff. Over the last five years the Hong Kong IT industry has consistently ranked the problem of retaining, recruiting and training IT personnel as the most critical issue for IT management [3, 4, 7]. This is a problem held in common with many other Asian countries [28, 24, 32].

This research study specifically addresses the issues which contribute to the problem and seeks solutions which will impact on the professional IT community and also on the longer term development of academic courses in IT throughout the tertiary sector. While this research is primarily focused on the needs of Hong Kong it also recognizes the implications of a developing global economy and the need

for Hong Kong to play a pivotal role in Asia and worldwide. The research, therefore, adopts a cross cultural perspective with initial comparisons being made between Hong Kong and the US. The study will be extended to include a number of other Asian countries as well as Western groups.

In this paper, we review some international concerns related to IT job characteristics: motivation and management of IT staff, and career development and training in IT, and examine these in the Hong Kong context. The research model, based on prior research from McLean et al [20], is presented with an overview of the study process and the research population. The results are analyzed within the Hong Kong context and then compared with previous findings in the US. [26, 21]. Finally, the implications of differences and similarities in these findings are discussed with regard to their impact on information management in multi-national corporations and to IT curricula developments in the academic sectors.

RESEARCH BACKGROUND

IT Motivation Studies

Over the last ten years or so, Couger and Zawacki [10] have completed an extensive study investigating the motivation of IT professionals in the United States and elsewhere using the Job Diagnostic Survey Data Processing (JDS/DP) methodology. They found that IT personnel have a much higher growth need than their peers (i.e. they have a need for greater responsibility for their own work and tasks which involve new technology, advanced development environments, and state of the art applications). They have a noticeably lower need, however, for social interaction and growth. This aspect was explored in greater depth by Tompkins and Couger [30] measuring different social dimensions related to communication and social behavior.

This work was later extended in Hong Kong by Burn and Ma [3,4] using an adapted form of JDS/DP and used as a basis for the development of an Asia wide study [11]. The results confirmed previous findings suggesting that IT professionals have very different needs and expectations from their working environment. It also, however, suggested the presence of an Asian factor which gave results which were significantly different from their Western counterparts [5]. Asian communication and social behavior norms show culture to be a much more significant factor than vocational orientation when comparing Western results with Asian. The main conclusions drawn from this research have supported the theory that IT personnel exhibit very different motivational needs and these have to be reflected in their career paths and the management style applied to them. In addition, Asian personnel demonstrate a much higher need for social growth within their working environments compared to non-Asians. This has implications not only for Asian companies but also

for multi-national, transnational and global organizations. While the very large database of results continues to confirm that IT personnel are different from others, changes in the use and application of IT in organizations over the last decade have also led to a redefinition of the IT role and this will have a significant impact on the skills and knowledge that will be required for the future IT professional [12, 20, 31].

IT Management Studies

Farwell et al [12] suggest that a new paradigm for Information Systems (IS) is redefining the information management function within industry such that the ideal IT professionals of the 1990s will be multifaceted individuals. They will possess a combination of interpersonal, technical and business skills that will allow them to analyze problems, integrate applications, and implement new business processes built around IT. A number of other researchers have sought to investigate issues related to this redefined role of IT. Research has been initiated into MIS skills for the 1990s [19, 22], human resource development for IT [2], job skills, roles and incentives [16, 17], management of IT professionals [13, 3, 4, 20, 26], and training and experience [3, 18]. The results of these studies have implications for businesses, educational institutions and researchers. Firms can expect to increase their employment in some categories more than in others. The IT function must evolve from systems developer and supplier to systems integrator [12, 31]. By the end of the decade, it is suggested that there will be a shift to employing more business analysts than application programmers [17]. Furthermore, businesses should consider the level of importance placed on interpersonal skills and evaluate their training programs and selection procedures in the light of these findings [19]. Further research is needed with regard to on-the-job training but, also, to more formal education and training. Significant gaps exist between the needs of IT professionals in the future and the college curricula that prepare and educate these future professionals. [31].

One strong implication that comes from research findings [16, 19] is that academic institutions should focus on developing inter-personal and business skills as well as technical skills. Writing, speaking, persuading, working with others and understanding others' emotions are all important to the success of IS development. These findings have recently been corroborated in the Hong Kong context by a study conducted by Chau and Tye [8, 9]. Interpersonal and business skills are ranked first and second in importance over all technical skills for the IT professional of today. They remain the first two skill requirements for the IT professional of the future (1998) but their ranking is reversed.

These previous research studies focused on IT professionals as a homogeneous group rather than the specific

group of IT professionals with graduate qualifications. In order to look at the appropriateness and relevance of IT academic qualifications to IT career development patterns a different sample frame is required.

IT Career Pattern Studies

Recent research by McLean and Smits [20, 21, 26, 27], Igbaria et al [17], provides a basis for further extension and refinement of the original motivation and IT management research and a refocus on the graduate population. Career orientations of employees can, obviously, have important implications for their job satisfaction, commitment and retention within the organization. However, there is little empirical research on the correlates of career orientations held by IT professionals. Igbaria, Greenhouse and Parasuraman [17] completed a research study assessing the career orientations of 464 IT employees as well as their relationship with selected demographic characteristics, job type and career outcomes. A central finding was that technical and managerial orientations are the most prevalent career orientations and this is consistent with the concept of a dual-career path system as proposed by Ginzberg and Baroudi [15]. This study also has implications for educational institutions and graduate programs in IT. Since career orientations do not seem to crystallize until individuals accumulate different kinds of work experience, having IT undergraduates place extensive importance on their dominant career orientation may be inappropriate.

Also among their many useful results is the finding that "young highly educated MIS employees are susceptible to high turnover" [17] and their admonition that employers must understand the sources of disaffection among their younger and more highly educated workforce. This is particularly relevant to Hong Kong where the "Brain Drain" sees a significant proportion of middle management emigrating each year [3], and a very young workforce assuming higher levels of responsibility.

McLean, Smits and Tanner [20, 21] are currently exploring these issues through a longitudinal study of IT graduates. In their preliminary retrospective research on successful IT executives they find that while high technical skills help the new graduate acquire an entry level position and success as a technical expert often propels him or her into stage two or even stage three of their career; success in stage three and four (using Thomson, Baker and Smallwood's four Stage Career Model, [29]) requires strong people skills. Reaching these later stages may, in fact, turn out to be an easier task for the graduate with less mastery in the technical aspects of the discipline. It is therefore important to pursue research which can match the graduate qualifications, career progression and required professional skills.

Research Relationship to Hong Kong

A number of studies has taken place in Hong Kong which indicate that there are problems related to the management and training of IT professionals which are unique to the Hong Kong environment. Studies undertaken by Burn and Ma [3, 4] related to the motivation of IT professionals were initiated because of a continuing shortfall in IT staff and a serious brain drain crisis in the late 1980s early 1990s. The changeover to Chinese sovereignty in 1997 has had a considerable influence on the emigration figures, particularly in professional areas where would be emigrants can more easily achieve landed immigrant status in countries such as Canada and Australia. This impacts seriously on the pool of IT professionals, particularly at middle management level leaving a young and relatively inexperienced IT workforce. Coupled with the expansion of IT services in Hong Kong the shortfall in IT staff has continued to be ranked as the most critical issue of concern for IT managers [7].

The results of motivational studies over a three-year period from 1989 showed considerable job dissatisfaction from IT staff in line with similar results worldwide. It was noticeable, however, that Hong Kong IT staff were very much more dissatisfied with the core dimensions of their jobs than their US counterparts. In addition, the needs of Hong Kong IT staff, and indeed, Asian staff were found to be different from their US counterparts with a much stronger emphasis on social need fulfillment in their working environment. Strong correlations were found with those organizations seen to be lacking in this respect and a high staff turnover.

IT staff in Hong Kong have mainly graduated through the Hong Kong academic system which has a much stronger vocational orientation than the North American education system [8, 9]. Nevertheless, Hong Kong IT managers still express concern about the quality of IT graduates produced from the tertiary institutes. In an open forum held in 1990, attended by major employers of IT professionals and academics, the expectation of the required IT skills among employers and universities/polytechnics was found to be very different [1]. Many employers expected fresh graduates to be competent with the technical skills specific to their organizations and to be immediately useful without further training. A difference was recognized between the universities which until recently were strongly computer science oriented and the polytechnics with a stronger business orientation but overall there was still a wide gap between the expressed industry needs and the actual provision of IT professionals. A number of new courses has been developed over the last five years which have tried to target specific industry needs and include several post graduate level courses aimed at "converting" business managers into intelligent IT hybrids. A list of IT related courses offered in Hong Kong is

shown in Appendix 1.

Courses within the Polytechnics have until recently been accredited from the UK and this external validation system has imposed fairly rigid rules on operational procedures. The result has been an emphasis on formal examinations for assessment with little focus on inter-personal skills. This tends to favor the more technically oriented subjects as does the recruitment policies which are biased to mathematical skills.

A further issue relates to the bi-lingual nature of the working environment throughout Asia. In Hong Kong, both Cantonese and English are used with English as the most common medium for instruction in the academic institutions and the lingua franca of working life throughout Asia. English is, nevertheless, a second language and language training remains an essential part of the higher education curriculum. While competency in the language may be achieved, overall communication skills remain weak, often in both languages, and necessarily inhibit interpersonal skills.

The recent studies undertaken by Chau and Tye [8, 9] suggest that Hong Kong managers have now become aware of a shift in emphasis towards inter-personal and business skills and away from technical skills. The typical career structure offered to IT professionals in Hong Kong would

seem to belie this as the post of business analyst is relatively unheard of in Hong Kong and the majority of IT graduates are recruited for technical positions in design and programming. In order to explore these issues further a longitudinal research study was designed to focus specifically on the IT graduate population and their job expectations related to their career progression patterns. The research study is described in detail in the next section.

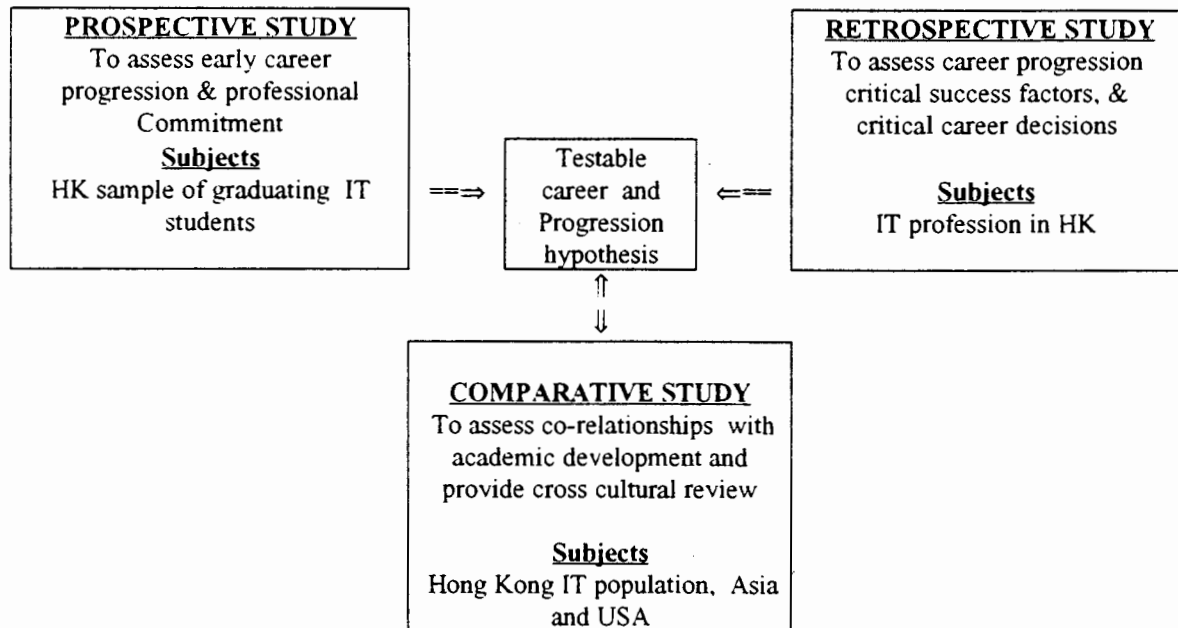
THE RESEARCH STUDY

The full research study focuses on three major areas:

- the career patterns of IT professionals and the match with their academic and professional training;
- the motivation of IT professionals and the career management that is required to successfully match their career orientation; and
- the cross cultural differences in job expectations and the impacts for multinational or global enterprises.

The study is part of a longitudinal research program on career motivation and progression which will involve all Hong Kong tertiary institutes offering IT programs and with comparative data from a national sample of IT professionals

Figure 1
Overall Research Model*



* Source: "IS curriculum development through career progression analysis", Department of Computing, Hong Kong Polytechnic Research Working Paper.

Table 1
Overall Response

Graduation Year	No. of Students	No. of Response	Response Rate	% of Respondents by Year
1988	32	12	37.5%	6.8%
1989	72	32	44.4%	18.2%
1990	76	43	56.6%	24.4%
1991	69	44	63.6%	25.0%
1992	76	45	59.2%	25.6%
Total	325	176	54.2%	100.0%

in the States (McLean et. al 1991, 1993). The overall study has three thrusts: a prospective longitudinal study designed to track a sample of graduating IT students from tertiary institutes in Hong Kong into their IT careers; a retrospective study of IT professionals examining their career progression, critical success factors and pivotal career decisions; and a comparative study relating Hong Kong data to US and other international studies. The overall research model is presented in Figure 1. This paper reports the findings of the first part of the study which examined the current career position of IT professionals who graduated within Hong Kong over the last five years. The job characteristics and their job attitudes are explored and then compared with similar results from the US.

THE RESULTS

A total of 325 questionnaires was sent out to all Computing graduates who graduated in 1988 to 1992 from the Department of Computing, Hong Kong Polytechnic. (This sample was selected as this was the first business related computing course to produce graduates and so provided a uniform sample). 176 responses were received as shown in Table 1. The response rate is relatively low for graduates in 1988-90 and follow-up investigation suggests that this can be directly attributed to a higher rate of emigration opportunities for IT professionals with three or more years of experience.

Not unnaturally, respondents earn more as they become more experienced, receiving twice as much after working only for five years. Interestingly, the salary of the graduates is inversely proportional to their class of award as shown in Table 2. Third class honors graduates earn as much as 15% more than their first class honors classmates and leads us to the unfortunate conclusion that the class of award has nothing to do with subsequent job performance. It may also be

related to the number of job changes. The first class award holders tend to have fewer job changes (see Table 2) implying that they are either satisfied with their jobs or less ambitious for their career progression. Another interpretation can be that first class degree awards in Hong Kong generally reflect high technical skills rather than people skills and that this graduate will therefore be comfortable in a technical position rather than seeking advancement up the managerial ladder.

Table 2
Ranking of "Class of Award" versus "Existing Salary" and "No. of Jobs Held"

Class of Award	Existing Salary per Month (HK \$)	No. of Jobs Held
First class	13833 (3)	1.17 (4)
Second class (Division A)	13795 (4)	1.61 (3)
Second class (Division B)	15676 (2)	1.68 (2)
Third class	16383 (1)	1.69 (1)

The number of jobs held is not directly related to the year of graduation with some years showing much higher turnover rates than others. The average number of jobs held since graduation ranges from 1.44 to 1.88 suggesting that most of the respondents were dissatisfied with their first job and are exploring second or third job possibilities. This does not necessarily reflect dissatisfaction with IT as a career since around 60% of them have no doubts or few doubts

about their chosen career. Nevertheless, around 17% of the respondents have changed or plan to change their career. There is very little difference between genders in terms of the positions they are in and their career paths (see Table 3). However, females in general earn slightly less than their male counterparts (HK\$14,975 (US\$1,920) versus HK\$15,344 (US\$1,967) per month). If the earlier assumption that the more frequently a respondent changes his job, the more he earns is true then this may explain this phenomenon because females change their jobs less often.

Table 3
“Gender” versus “Professional Area”

Professional Area	Male	Female
Programming	35.85%	38.83%
Systems analysis	20.75%	18.45%
Information system	15.09%	17.48%
Sales/Marketing	8.18%	5.83%
IS Project management	6.29%	4.85%
Database administration	5.03%	3.89%
IS consultancy	5.03%	2.91%
Business management	1.87%	2.91%
IS/DP management	0.63%	0.00%
IT communications	0.00%	0.00%
Others	1.26%	4.95%

Comparative Results (Hong Kong vs. United States)

The respondents were asked to rate 20 questions on Job Characteristics and 20 questions on Job Attitudes respectively using a 5-point Likert-scale with 1 as “strongly disagree” and 5 as “strongly agree.” The questions were adapted from a similar study by Smiths et al [27]. The job characteristic questions are used to assess the respondent’s self-description of work-related traits and behavior while the job attitude questions are used to assess the respondent’s present job and future career plans. Questions are related to three factors labeled “hygiene,” “motivation” and “interpersonal” using the JPI analysis employed by McLean et al [21] in their earlier US study.

Job Characteristics

Hong Kong respondents give lower scores for all questions over the scores from their US counterparts (see Figure 2). The scores range from 2.30 to 3.81 for Hong Kong respondents but range from 3.17 to 4.05 for US respondents. Out of the top five rated questions, three are related to hygiene factors. They are “is supervised,” “provides security/stability” and “promotion within IS.” For the US counterparts, three of the top five rated questions are related to motivation factors, implying that US IT personnel are better motivated. However, this does not mean that Hong Kong respondents are not happy with their jobs. The results indeed are the opposite, with the majority satisfied with the stability and promotions prospects of an IT career. Hong Kong IT personnel appear to regard extrinsic rewards more important, however, than intrinsic rewards.

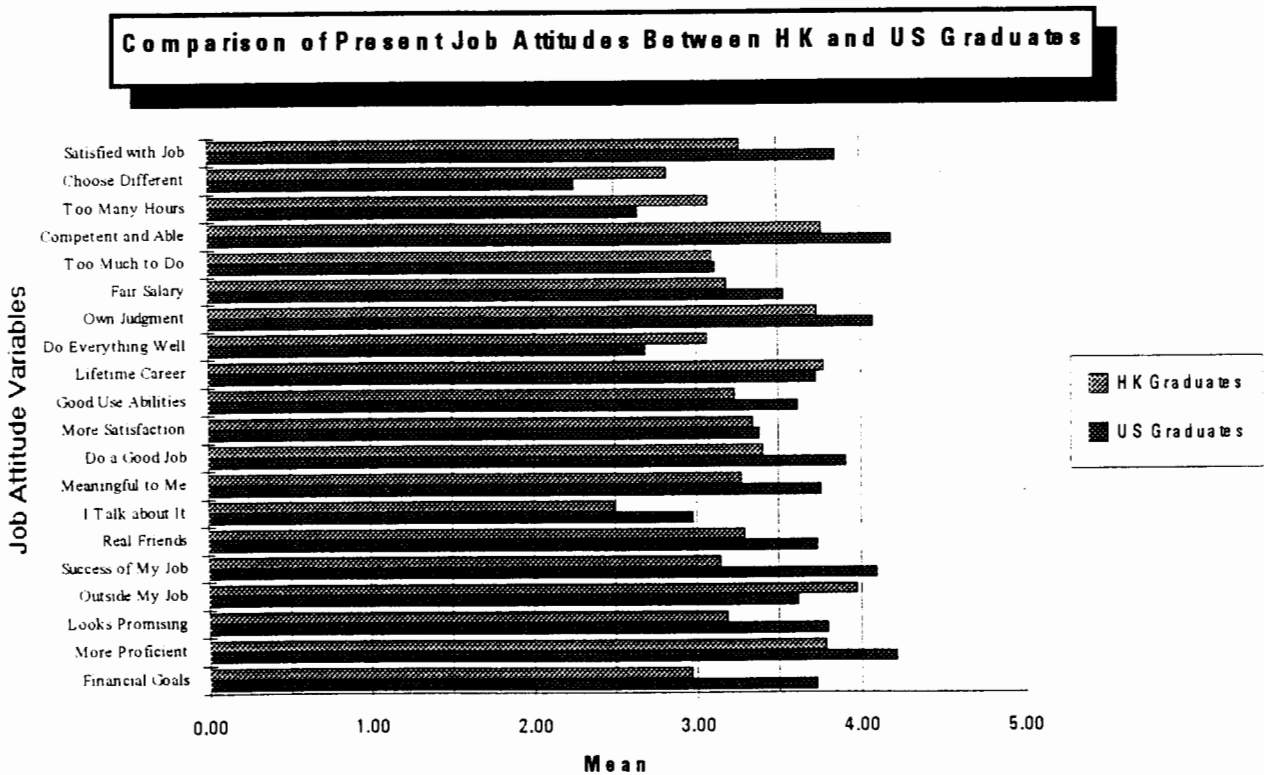
All five least rated questions by Hong Kong respondents are related to motivation factors. These are “promotion outside IS,” “impact of overall organization,” “management promotion,” “without relying on others” and “opportunities to do different jobs.” This is the same for the four least rated US results with the exception that “opportunities to do different jobs” is the fifth least rated question in Hong Kong but the fourth top-rated question in the US. This reflects the belief of IT managers and supervisors in Hong Kong that job specialization is appropriate for IT career development whereas their subordinates find that it creates job monotony and dissatisfaction.

In general, the ratings given by Hong Kong and US respondents differ widely except for the bottom four as mentioned above. The greatest deviations relate to the broader factors affecting motivation : “do different jobs,” “professional friendships/relationship,” “impact on overall organization,” “promotional opportunities outside IS” and “creative and challenging.” The least deviations are found in those characteristics related to hygiene and line promotion : “promotion within IS,” “security/stability,” “is supervised,” “member of a team” and “without relying on other.” This suggests that companies provide similar extrinsic rewards to IS professionals regardless of country boundary.

Job Attitude Variables

The Hong Kong respondents give a narrower range of scores to the twenty questions asked than their US counterparts (see Figure 3). The scores range from 2.49 to 3.98 from Hong Kong respondents but from 2.26 to 4.22 from US respondents. The top five rated questions are “look outside of my job,” “become more proficient,” “lifetime career,” “feel competent and able” and “use own judgment.” The results show that the training graduates receive in Hong Kong is relevant and adequate for their jobs, though they find their jobs somewhat boring. The result is similar in the

Figure 2
Comparison of Present Job Characteristics*



* Source: "IS curriculum development through career progression analysis," Department of Computing, Hong Kong Polytechnic Research Working Paper.

United States except that US respondents rate "had made a success of their career" the third top rated score and "look outside my job" as the twelfth top rated score.

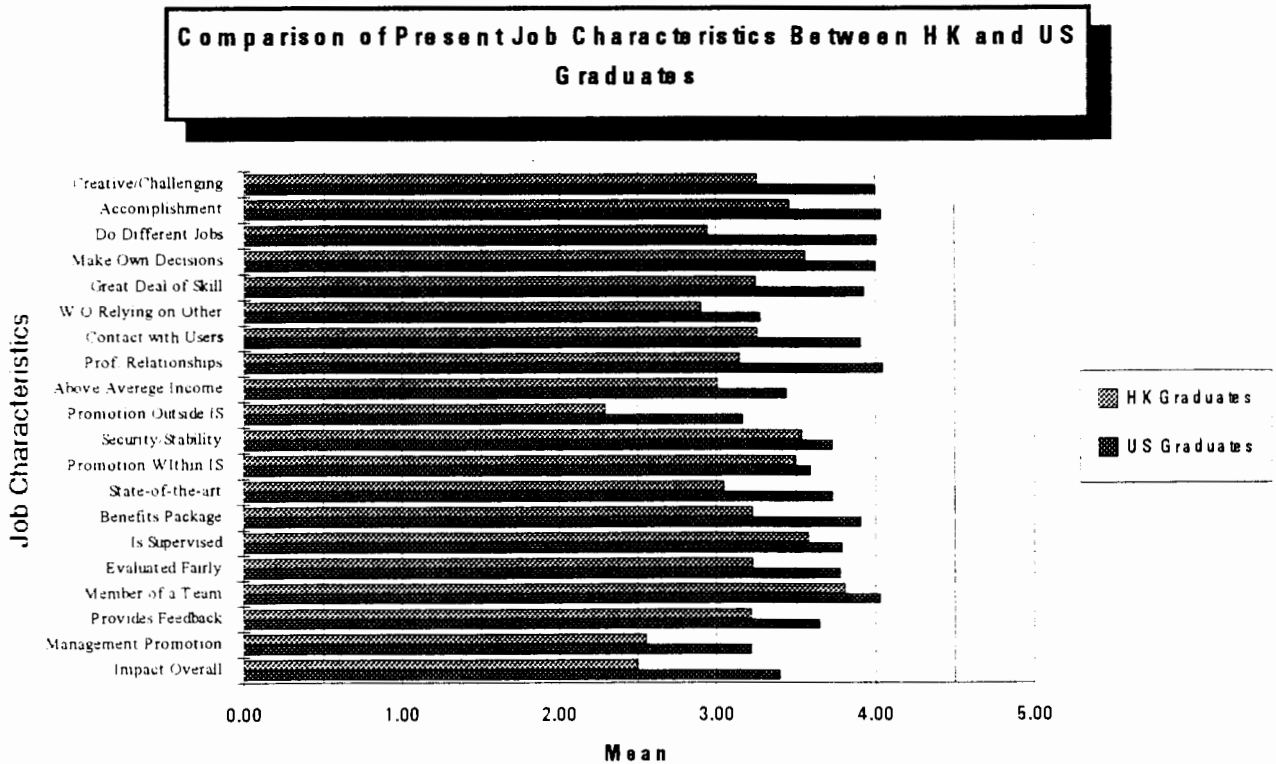
The five least rated questions are "I talk about it," "choose different line of work," "help towards financial goals," "too much to do" and "work too many hours." The US respondents give very similar answers except "help towards financial goals" which is rated tenth instead of seventeenth. While the findings in Hong Kong with regards to financial rewards are consistent over similar questions, the findings from the US are rather contradictory. US respondents rank their jobs as providing "above average income" as the fifth least rated score but they think that their present jobs help them toward their set financial goals. One possible reason is that US respondents have lower financial goals which can be satisfied even with a below average income.

Although Hong Kong respondents again, give lower ratings to most of the questions asked, they rate five questions higher than their US counterparts. They are: "choose differ-

ent work," "work too many hours," "have to do everything well," "look outside my job" and "lifetime career." The implication is that IT staff in Hong Kong have very demanding jobs and would rather do something else. Yet, these findings are contradictory to the findings from the job characteristics section where most of them indicate that they have few doubts in choosing IT as their career. It may actually relate more generally to the working culture of Hong Kong where very long hours are the norm in most walks of life and the job structures are narrowly defined and constricting.

Hong Kong respondents rate the following questions significantly lower than their US counterparts. The lower scores are "make a success of my job," "help towards financial goals," "career looks promising," "satisfied with job" and "people do a good job." This further illustrates the shortfall between the HK respondents' expectations of themselves and their careers and the opportunities presented to them in the IT profession.

Figure 3
Comparison of Present Job Attitudes Between HK and US Graduates*



* Source: "IS curriculum development through career progression analysis," Department of Computing, Hong Kong Polytechnic Research Working Paper.

IMPLICATIONS

The Issues

Overall there is a reasonable congruence between the US and Hong Kong data sets although Hong Kong graduates are less content with their "lot" than their US peers! Where significant differences occur these must be examined from within the Hong Kong context since this greatly influences the working environment and future career prospects.

Over 30% of respondents indicate that they already hold, have applied for, or intend to apply for a foreign passport and that emigration is a real possibility. The total figure may, in fact, be significantly higher since informal feedback indicates that many of the non-respondents have already emigrated suggesting 50% to be closer to the truth. This is a problem unique to Hong Kong due to the 1997 issues and in many ways stimulates further job turnover in the market with continual vacancies on offer and shorter promotion cycles. As a result, it is hardly surprising that most of the critical issues relate to job turnover. These are considered briefly below.

Reasons for Changing Jobs

"Compensation package" is ranked as the most popular reason for changing jobs. This is followed closely by "promotion prospects" (which also indirectly affects compensation) and "job satisfaction." These three factors were also ranked as the three most important motivation factors by IT professionals in the 1990 study conducted by Burn et al [5] as shown in Table 4. The remuneration packages between senior and junior IT personnel in Hong Kong vary greatly and the variance is much greater than that of Singapore [23] and the US [27]. Annual remuneration packages for graduate programmers in large organizations (with less than two year experience), IT manager (over 6 years experience), and head of very large IT departments (over 15 years experience) could respectively be HK\$170,000 (US\$22,000), HK\$550,000 (US\$70,000) and HK\$1.5 million (US\$200,000). Furthermore, the rapid increase of costs for buying/renting a flat in Hong Kong affects the quality of living of young professionals. This may partly explain why the respondents place greater value on extrinsic rewards over

intrinsic rewards and many IT staff try very hard to secure higher salaries through promotion.

Table 2
Ranking of "Reason for Changing Jobs" versus "Important Motivation Factors"

Reason for Changing Jobs (1993) Important motivation factors (1990)	1993 Ranking	1990 Ranking
Compensation package	1	3
Promotion prospect	2	2
Job satisfaction	3	1
Personal interest	4	4
Working conditions	5	6
Others	6	8
Poor management	7	5
Job security	8	7

Respondents rate "work too many hours" higher than their US counterparts. This may explain why IT personnel in Hong Kong are less happy with their jobs. This was also found in the 1990 study [5] where programmers and programmer/analysts scored much lower in their core job dimensions than their US counterparts. This may be partly due to the Hong Kong work ethic, the highly competitive environment, and increasingly demanding users and employers in Hong Kong. It would also seem that IT managers expect systems to be developed at top speed and at the lowest cost and so underestimate both human and financial resources. More concern for the social work environment could alleviate much of the stress.

The change of government from Britain to China in 1997 has generated a significant level of political uncertainty for Hong Kong people. There was a surge in the emigration of IT personnel from Hong Kong to Canada and Australia in the late 1980's (particularly after June 1989). However, the recent recession in America, Europe and Australia has now reduced opportunities and enthusiasm for emigration in the short term. As 1997 draws closer further uncertainty may again affect the job market and Hong Kong companies should be looking for ways to alleviate pressure on staff and to provide them with some stability and security. Most graduates feel that they are competent in the technical areas of their job. Since there is no feedback from employers as yet about the performance of these graduates, no judgment can

be made as to whether the knowledge and skills of these IT professionals are up to their expectation. We will investigate more on this issue in the second part of this study. It would seem that there is limited opportunity, however, for IT staff to extend their range of skills by "doing different jobs" and to move outside IT for promotion prospects. In order to motivate staff and engender company loyalty there is a strong need for more innovative IT career management.

CONCLUSIONS AND PLANS FOR FUTURE RESEARCH

The results from the first stage of the research study, both in the US and Hong Kong surveys, suggest that there are still a number of problems related to the management of IT professionals. Those held in common relate to poor promotional opportunities and a lack of opportunity to move outside the IT areas in their career development. In addition, the Hong Kong respondents give an image of being overworked with highly specialized job descriptions limiting career advancement. It would seem that few Hong Kong organizations have taken the opportunity to extend the role of IT professionals beyond the traditional boundaries. IT managers must take an active role in career development programs which include the creation of new job descriptions for the systems integrator. They must also become more fully conscious of the social needs of staff in their working environment and stimulate motivation through a variety of job enhancement programs.

This is only the first phase of this research program covering Computing graduates from the Hong Kong Polytechnic and a comparative sample of IS graduates from the US. As such there are as yet few conclusions which can be drawn with respect to changes which may be necessary in the IT curriculum. It would seem, however, that the accusations which have been leveled at the IT managers can be applied equally well to the academic community. Courses which emphasize technical specialization and favor formal written assessment do not seem to produce the new IT professional. While we have to accept that no one person can now do all jobs in IT there may well be the need to provide dual academic paths to match the concept of dual career paths [15, 31].

The next stage will be to extend the study to cover students graduating from various IT related courses in the seven tertiary institutions in Hong Kong (as shown in Appendix 1) and to relate these to a second sample (the prospective study) from the US. This will allow for a more direct comparison of educational provision and professional needs.

In addition, relevant inputs from IT managers and top management on how they assess the performance of IT professionals as well as how they plan for the career of IT

professionals should provide a more comprehensive analysis on the issues of career development.

Finally, Hong Kong is ideally placed to become a global center for organizations with strong Asian interests. Many of these organizations will be unfamiliar with the expectations of Hong Kong professionals and so find difficulties in adapting their management styles to provide harmonious working environments conducive to the fostering of quality professional relationships. Accepting that the job expectations of staff are culturally dependent is a first step in developing more effective people management and more productive IT applications. It is hoped that this research may provide some insights to assist in the management of IT in organizations which are not only multi-national but also multi-cultural.

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Appendix 1
IT Programs Offered by Hong Kong Tertiary Educational Institutions

Tertiary Institutions	Electronic Engineering	Computer Science	Information Technology	Computing	Information Systems	Minor in IS
(Undergraduate Programs)						
Baptist College		✓		✓	✓	
City Polytechnic, H. K.	✓	✓	✓		✓	
Chinese University, H.K.	✓	✓	Information Engineering			✓
Hong Kong Polytechnic	✓		✓	✓		
Hong Kong University of Science & Technology	✓	✓			✓	
Lingnan College						✓
Open Learning Institute						✓
University of Hong Kong	✓	✓				✓
(Masters Programs)						
City Polytechnic, H. K.		✓			✓	
Chinese University, H.K.			Information Engineering			
Hong Kong Polytechnic	✓		✓		✓	
Hong Kong University of Science & Technology		✓				
University of Hong Kong		✓				
Tertiary Institutions	Electronic Engineering	Computer Science	Information Technology	Computing	Information Systems	Minor in IS