

The Malaysian Surveyor

THE PROFESSIONAL JOURNAL OF THE INSTITUTION OF SURVEYORS, MALAYSIA

Development of GIS Technology



A Conversation with
Dato' Seri Sr Hj Md
Isahak Md Yusuf

Sale-and-Leaseback:
Market Transactions or
Financial Engineering?



Master of Science (MSc)

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Level 8, Kelana Brem Tower 2, Jalan Stadium (SS7/15), 47301 Kelana Jaya, Selangor Darul Ehsan, Malaysia.

Tel: +603-7492 2490 Fax: +603-7492 0397 Email: enquiry@imperia.edu.my Website: www.imperia.com.my

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The Institution of Surveyors, Malaysia
3rd Floor, Bangunan Juruukur
No. 64-66, Jalan 52/4
46200 Petaling Jaya
Selangor Darul Ehsan
t: +603 7954 8358 (hunting line) / 7956 9728 / 7955 1773
f: +603 7955 0253
e: editor@ism.org.my
w: www.ism.org.my

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t: +603 2718 9688
f: +603 2718 9788
e: deepa@decalais.com

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Percetakan Printpack Sdn Bhd
3, Jalan Jurutera U1/23
Hicom Glenmarie Industrial Park
40150 Shah Alam, Selangor Darul Ehsan
t: +603 7805 3722
f: +603 7805 5370



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EDITORIAL

REACHING 50 AND
SURVEYING AHEAD

The Institution of Surveyors, Malaysia (ISM) founded in 13 March 1961, will be celebrating its Golden Jubilee in year 2011, marking its 50 years of contribution to nation building. Starting with 92 surveyors from the Divisions of Land Surveyors (LS), Quantity Surveyors (QS) and Property Consultancy and Valuation Surveyors (PCVS) formerly known as General Practice Division, to date, the ISM has over 5,000 members with the inclusion of the Building Surveyors (BS) Division since 1990.

Throughout the years, ISM plays a major role in promoting the surveyors profession nationally and internationally by conducting various activities such as dialogue with universities, professional workshops, CPD events e.g. "Galaxy of Surveying Stars", career guidance talk, international surveying students conference co-organised with RICS, Jamboree for undergraduate students, technical visits and many congresses held with the latest being the 12th International Surveyors Congress held in June at Kuala Lumpur.

The worldwide recognition on ISM is reflected by the appointments of ISM Past Presidents, Dato' Prof. Sr Dr. Abdul Kadir bin Taib was appointed as the Chairman of Asia South-East and Pacific South-West Division (ASEPSW), United Nation Group of Expert on Geographical Names (UNGEGN) for the year 2010-2015, Sr Ong See Lian was confirmed as President-elect of the RICS for the 2011/2012 term and Sr Teo Chee Hai was selected to be the next President of the International Federation of Surveyors (FIG) from 2011 until 2014.

Having 50 years of experience, ISM will not stop here as a note of satisfaction, it will continue to strive the best for the future for the sake of surveyors in Malaysia. The prospects of expanding

the size of ISM memberships is in-line with the increasing number of students at the institution of higher learning in the various academic disciplines related to surveying. Apart from the existing student awards and education loans provided by ISM to eligible students, existing activities can be improved in terms of introducing the role and attractive benefits that can be gained by being a member of ISM. These can be of interest to them and consequently, resulting with them joining ISM as a student member or graduate member before they become a full member.

Surveyors in the public and private sectors can also play their roles by exposing these students to the fields in which they can work upon graduation. For example, JUPEM created a section called Utility Mapping to handle jobs relating to mapping of utilities not only those on the surface of the earth but also underground and this involve the application of Ground Penetrating Radar (GPR), Global Positioning System (GPS) and Geographical Information System (GIS) technology.

Additional membership drive is also needed to attract practicing surveyors to be a member of ISM. We at the Editorial Board will continue to improve on the dissemination of vital relevant information which is of interest to the surveyor's community. For this edition, a peer reviewed article from each division was published and we welcome more article contributions from the practitioners of the surveying community in the near future.

Azman Mohd Saldi

Sub-Editor

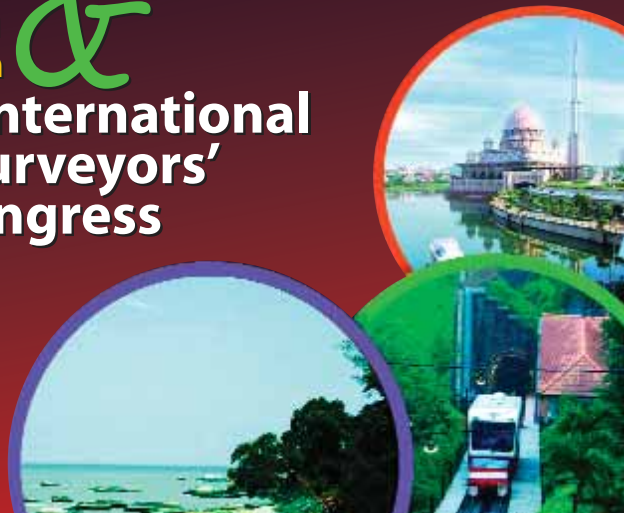
ANNOUNCEMENTS

11th South East Asian & Survey Congress **13th International Surveyors' Congress**

"Innovation Towards Sustainability"

Date: **22 -24 June 2011**

Venue: **Kuala Lumpur, Malaysia**



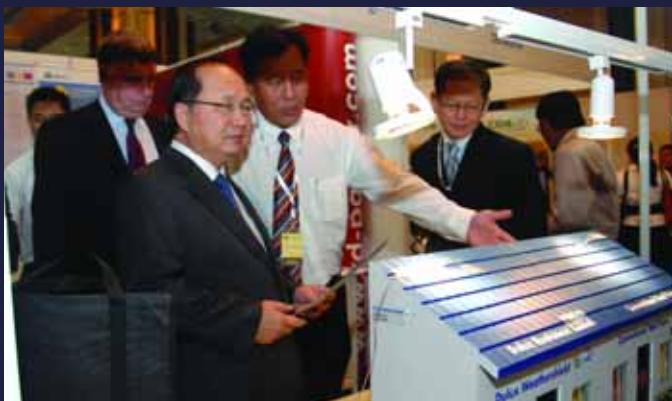
CONGRESS REPORT

12TH INTERNATIONAL
SURVEYORS' CONGRESS

The 12th International Surveyors' Congress was successfully held from 17-18 June 2010 at the Hotel Istana, Kuala Lumpur and was officiated by YB Tan Sri Sr Bernard Giluk Dompok, Minister of Plantation Industries & Commodities.

The International Surveyors' Congress which is organised each year in the month of June is a Congress to address the issues of the day that the four branches of the surveying profession face. As ISM would be approaching its 50th year come 2011, the theme for this year's Congress was "Reaching 50 and Surveying Ahead".

In the Plenary and Parallel sessions, the two-day Congress dwelt not only on technical issues but also discussed interesting issues on green initiatives of today, the shifting standards of financial reporting, the health of the Malaysian bond market, the surveying profession in Singapore and Hong Kong, and even the effects of earthquakes on our buildings and structures. The participants also had the opportunity to hear the immediate



Past President Associate Prof. Sr Dr Hjh. Wan Maimun Wan Abdullah who spoke on the "State Of The Union Of ISM" as well as the President of The Royal Institution of Chartered Surveyors from London, Mr Max Crofts who gave his views on the future of the surveying profession.

The Congress culminated with the 49th Annual General Meeting, Extra-Ordinary General Meeting and 49th Annual Dinner, which was held on Saturday, 19 June 2010. The 49th Annual Dinner was graced by YB Senator Dato' Sri Shahrizat Abdul Jalil, Minister of Women, Family and Community Development.

To the Organising Committee of the 12th International Surveyors' Congress 2010, congratulations for the job well done! ■



SPEECH BY

YB DATO' SRI SHAHRIZAT ABDUL JALIL

MINISTER OF WOMEN, FAMILY AND COMMUNITY DEVELOPMENT

ANNUAL DINNER, THE INSTITUTION OF SURVEYORS, MALAYSIA (ISM) SATURDAY, 19 JUNE 2010

Associate Prof Sr Dr Wan Maimun Wan Abdullah
President of ISM

Sr Elvin Fernandez
Organising chair of ISM 49th Annual Dinner

Dear Surveyors
Ladies and Gentlemen
A very good evening to you all

I am honoured and privileged to have been invited to grace the 49th Annual Dinner of the Institution of Surveyors, Malaysia.

I would like to note on the outset that being here is particularly momentous for me given that ISM has elected its first female president, Assoc. Prof. Sr Wan Maimun Wan Abdullah, for its 49th session. I am proud of her achievements. On a personal level, this is an impressive accomplishment more so because the surveying profession, like politics, is a primarily male-dominated field. On an institutional level, this is indeed a progressive step forward, and is truly deserving of congratulations! It is a reflection that ISM acknowledges and appreciates leadership and quality performance, regardless of gender.

The surveyor's contribution towards the development of the nation is irrefutable. One glance at the horizon stretched out before us confirms this. While for many the term 'engineer' and 'architect' spring to mind, what many people do not realise is that before these individuals can even begin their work, the surveyor must precede and work his or her magic. Your work changes the landscape of countries, and influences decision makers in both the public and private sectors.

I am made to understand that while the overall number of ISM members who are women is 31 percent, the percentage of Fellows at the highest level of the class is less than 10 percent. In industries as important as surveying, as in politics, the need for diversity and gender balance cannot be overemphasised. When any level of diversity exists, statistics indicate that higher levels of innovation are present and gender diversity is not an exception.

Women and men do not necessarily have the same approach to tackling a task, and the varying approaches create a nice balance that enable good decision making to take place. As there is usually more than one way to solve a problem, the different perspectives that men and women have are valuable.

In that same vein, women and men have a different way of looking at things and therefore design different solutions. In most cases, women, by virtue of their different needs, have a different perspective from men and propose different solutions to the design of a landscape, for instance. In that regard, gender diversity ensures a balanced gender perspective, which takes into account the varying needs of both men and women that live in a society.

Ladies and Gentlemen:

Many of you might wonder what can we, as an institution, do?

As the professional institution representing the surveying profession in Malaysia, ISM has an important role to play in advocating for gender balance within the institution and the industry. Professional institutions such as ISM are often able to promote the adoption of comprehensive gender policies by employers, which include measures to help professional women balance the demands of a family and their profession.

Work-life balance policies that contribute not only to the overall well-being of all staff, but also to those men and women with families make for attractive employment packages. With women still considered society's primary caregivers for small children, maternity and paternity leave, flexible working hours, part-time work and child care facilities address young families' and women's needs.

It is important to note that the benefits of achieving a successful work-life balance are not limited to individual practitioners but extend to all family members as well. This ultimately leads to a healthier, happier and more productive nation as a whole.



Ladies and Gentlemen:

ISM, like the professionals it represents, plays an important role in ensuring the country's continued growth. By advocating for such progressive policies, ISM will directly contribute to Malaysia's national prosperity and sustainable development. In the context of the nation's skill shortages and the prospect of an ageing workforce, the promotion of such practices help attract and retain talent from among untapped and diverse social groups such as working mothers, mature workers and other minority groups. These non-traditional social groups provide an alternative pool of talent that will move our nation towards the high-income economy we are aiming for.

Gender equality and work-life balance should become a reality in our working environment. The framework is in place: with leadership and our own efforts we can make it happen.

I would like to end my speech by recording my thanks once again to ISM for inviting me to your 49th Annual Dinner. On this special occasion, allow me to congratulate all of you in advance on ISM's 50th Years celebration, which will be coming up in 2011. I would also like to extend my warmest wishes to you and the Institution for its continued success in the years to come.

On that note, thank you once again.

Wassalamualaikum Warahmatullahi Wabarakatuh. ■



THE INSTITUTION OF SURVEYORS, MALAYSIA EXCELLENCE AWARD 2010

The Institution of Surveyors, Malaysia (ISM) is proud to present the ISM Excellence Awards to deserving participants who have demonstrated excellence and leadership to the property and construction industry. The ISM Excellence Awards are intended to be premier awards recognising the efforts of individuals and organisations that have attained outstanding achievements in the property and construction industry.

i. Malaysian Surveyor of the Year Award

YB PP Senator Dato' Sr Hj Abdul Rahim Rahman

This Award is presented to a Member/Fellow of the Institution of Surveyors, Malaysia in recognition of his/her excellence in any field of surveying i.e. geomatic and land surveying, quantity surveying, property consultancy and valuation surveying and building surveying. This Award will also recognise that although there are four different Divisions of seemingly separate disciplines, we are united in that we are all surveyors.

ii. Lifetime Achievement Award

Sr Hj Hashim Ismail

This Award is presented to a Member/Fellow of The Institution of Surveyors, Malaysia in recognition of his/her outstanding achievements in the Surveying Profession over a long period of time and for dedicated service to the Institution.

iii. Outstanding Journalist on Property and Construction

Mr Cheah Chor Sooi

This Award is to recognise excellence in journalism for positive reporting of the Property and Construction Industry and in particular the Surveying Profession. The Award aims to recognise journalists who promote interest in the Surveying Profession to the Government, Regulators and the Public in general. The Award is presented in honour of the best written feature article or series of articles in the electronic or print media. ■

14TH PAQS CONGRESS IN SINGAPORE

The 15th PAQS congress was held in Singapore from 24 - 27 July 2010. Organised by Singapore Institution of Surveyors and Valuers, it was held jointly with the International Cost Engineering Council (ICEC) 7th Congress. A total of 49 Malaysian delegates attended the congress lead by our council member and chief Delegate, Dato' Sr Abdull Manaf.

The theme of the congress is 'Sustainable cost management: Borderless innovation' and quality papers delivered along this theme were indeed invigorating.

The congress started on Friday, 23 July with the PAQS Golf tournament at Sentosa Golf Club. The Education & Accreditation sub-Committee and the Research sub-Committee held their meetings on 24 July followed by the ICEC Board meeting. The PAQS Board meeting was a whole day affair on the 25 July 2010. The congress proper was from 26 to 27 July 2010, culminating with the Farewell Dinner.

Ikatan Quantity Surveyor Indonesia made a presentation during the Board meeting and it is hoped that Indonesia will soon be the 13th member of PAQS. Canada Institute of Quantity Surveyors was requested to nominate a candidate for the 2nd Vice Chairman post by the 15th PAQS Congress. It was also reported that Brunei, Sri Lanka and Singapore are currently drafting a QS Act or equivalent.

This year PAQS achieved a major milestone with the 1st formal accreditation visit and subsequent



PAQS Officers



Malaysia representatives - ISM & BQSM

endorsement of a university QS programme from Unitec, Auckland, New Zealand. Many delegates see this as the beginning of a new chapter towards mutual recognition of qualifications among member countries.

The Research sub-Committee will be working alongside the new IT sub-committee to upload all congress papers and research projects of member countries onto the PAQS website. With resources gathered from 14 previous congresses, there is a wealth of information within PAQS which if well managed, will be of tremendous asset to be shared for the profession.

Much interest was generated by ICEC African delegates on the KL Pact

signed in during the 13th PAQS Congress. The KL pact sets a ready framework for mutual cooperation between six international cost management organisations in enhancing the profession. Sr Kwan Hock Hai was appointed by the Board to monitor activities of KL Pact on behalf of PAQS

The 15th PAQS Congress will be organised Institute of Quantity Surveyors of Sri Lanka in Colombo on 22 to 26 July 2011.

Reported by:

Sr Chew Nane Cheong
Chairman QS Division
28th July 2010

PAQS Delegates



Congratulations

The Council and all members of The Institution of Surveyors, Malaysia would like to extend their heartiest congratulations to:



YBhg Dato' Prof Sr Dr. Abdul Kadir Taib

For his election as the Chair of the United Nations Group of Experts on Geographical Names (UNGEGN) Asia South-East and Pacific SouthWest Division.



Sr Ong See Lian

Elected as President-elect of the RICS for the 2011/2012 term.



Sr Teo Chee Hai

Elected to be the next President of the International Federation of Surveyors (FIG) from 2011 until 2014.



YB Senator Dato' Sr Hj Abdul Rahim Rahman

For his appointment as Senator by the Government of Malaysia.

We are proud and honoured that our past presidents have been recognised for their services rendered to the surveying profession and the community at large. We hope that their exemplary services and leadership provided to the profession will motivate younger members in this profession to scale greater heights.

A CONVERSATION WITH DATO' SERI SR HJ MD ISAHAK MD YUSUF

The Malaysian Surveyor had the privilege of interviewing YBhg Dato' Seri Sr Hj Md Isahak Md Yusuf to learn more about the man and his insights into the current surveying education and profession, especially in the area of Quantity Surveying and his vision towards the Institution of Surveyors Malaysia (ISM)

YBhg Dato' Seri Sr Hj Md Isahak Md Yusuf is the Chairman/Managing Director of Pakatan International Md Isahak dan Rakan-rakan Sdn Bhd and Council Member cum Education & Accreditation Board Chairman of The Institution of Surveyors, Malaysia (ISM) for the session 2010/2011.

He was born on 21 August 1934 in Penang and received his early education in Penang Free School. He is the first *bumiputra* Quantity Surveyor in the corporate sector in Malaysia. He graduated in Quantity Surveying from Perth Technical College now known as Curtin University, Western Australia. In 1966 after returning to Malaysia from Australia, he joined a firm known as Suckling & McDonald as a Quantity Surveyor. After four years, he was promoted as a Partner and the firm was re-named as Suckling, McDonald & Md Isahak. Since 1977, he was appointed as the Chairman/Managing Director, and the firm was changed to Pakatan International, Md Isahak dan Rakan-rakan Sdn Bhd. After over 30 years of involvement in the quantity surveying consultancy practice, Pakatan International, Md Isahak dan Rakan-rakan Sdn Bhd has many projects locally and abroad. Some mega projects that have been completed are Kuala Lumpur International Airport (KLIA), Pusat Dagangan Dunia Putra (PWTC) and Komplek Tun Abdul Razak (KOMTAR) in Penang etc.

YBhg Dato' Seri Sr Hj Md Isahak Md Yusuf is well known with his experience and expertise in quantity surveying because he is committed and professional in his career. During his involvement in the professional field, he used to hold several important posts in several organisations. He is not only active with The Institution of Surveyors,



The ISM must maintain the high standards in QS practice equivalent with the developed countries in the world.

The ISM should work very closely with the universities and colleges, and plan so that the under graduates from universities of higher learning is well qualified with the latest Information Technology (IT) for the requirement of the industry.

Malaysia. In fact, he also participated in other associations such as the Australian Institute of Quantity Surveyors, The Royal Institution of Chartered Surveyors, etc. In 1979, he was appointed as President of The Institution of Surveyors, Malaysia for the session 1979/1980. To commemorate all his contributions, he was awarded with a few honours from the Penang state government and Malaysian nation tokens of appreciation. The latest was in 2008, where he was awarded with the 'Darjah Gemilang Pangkuan Negeri' (D.G.P.N) by T.Y.T. Yang Di Pertua Negeri Pulau Pinang, Tun Dato' Seri Haji Abdul Rahman bin Haji Abbas which carries the title of 'Dato' Seri'.

How long have you been a member of the ISM and what are the positions that you have held during those years as a member?

I have been a member for 36 years since 1974 and the positions I have held are as follows:

1978 - 1979	Vice President of the Institution of Surveyors Malaysia
1979 - 1980	President of the Institution of Surveyors Malaysia
1980 - 1981	Immediate Past President of the Institution of Surveyors Malaysia.
2004 - 2010	Chairman of the Education & Accreditation Board Institution of Surveyors Malaysia

You are the Director of Pakatan International Md Isahak dan Rakan-Rakan Sdn Bhd and you are actively involved with the ISM. How do you manage your precious time?

Yes you are right, time is very precious. Therefore, I have to divide my time carefully between the office and spending time for voluntary work in the association like the ISM. My working day is long; I will be in the office everyday as early as 9.00 am and sometime work on weekends. When I am required to attend a meeting at the ISM, or elsewhere, I will plan a day earlier to finish all the office work and leave the office for the required meeting. I must stress that meeting is not an everyday affair and meetings at the ISM are well planned. It will make your life pleasant and not so much pressure on yourself. I have capable Directors and Secretaries. I should thank them and with their help, I am able to attend meetings without any problems.

What are the progresses that you have seen for the profession and the Institution in particular?

The profession of Quantity Surveying (QS) has moved forward tremendously from the era of the sixties. When I started working, we had to use comptometer operator using a calculator, and the typist using the manual typewriter to work. The comptometer operator and the typist had to calculate and type laboriously the work and had to work overtime to finish on time. Gradually, this process was replaced by the latest Information Technology (IT) and several software for QS work.

Now, Quantity Surveyors do not do taking off manually any more. They have been trained at the Universities and Colleges with the latest Information Technology (IT) and they are familiar with various software in their daily work in producing the BQ, Post Contract and Final Account work using the latest QS software i.e. RIPACS, Masterbills, Buildsofts etc.

The ISM from its humble beginning took over from RICS after independence and had their meetings at borrowed offices. But today, the ISM has its own building in New Town Centre, Petaling Jaya.

The ISM with its full management staff headed by the COO, Miss Katherine Thiang who looks after and provide services to the four disciplines i.e. Quantity Surveying, Geomatic & Land Surveying, Building Surveying and Property Consultancy and Valuation Surveying operates from the ISM Building.

Do you have any vision for the ISM in generally?

The ISM should plan and be fully modernised with the latest Information Technology (IT) to serve its members and the public. In order to achieve this, the Council Members have to plan short and long

The QS career has a bright future but professional QS has to keep a high standard of ethics and requirement in the country and abroad in particular, using the latest Information Technology (IT), usage of Green Technology and IBS system.

Next year, the ISM will be celebrating its 50 years anniversary. The success is tremendous which can be seen around us. The ISM has its own building and a good reserve of fund with large a number of qualified professionals.

term improvements in assisting the ISM with up-to-date Cost Analysis and Data Centre for members and public usage. The centre will compliment well with professional bodies locally and abroad.

How do you think you could contribute to make ISM relevant to the industry and the country?

The ISM should work very closely with the universities and colleges, and plan so that the under graduates from universities of higher learning is well qualified with the latest Information Technology (IT) for the requirement of the industry. This will certainly help boost the image of the QS practice in Malaysia and also Malaysian QS can work abroad in many countries i.e. England, Australia, Hong Kong, Singapore, etc.

Could you comment on the surveying education in Malaysia? How do you see surveying as a professional career?

The ISM must maintain the high standards in QS practice equivalent with the developed countries in the world. To achieve this, all qualified and registered QS in Malaysia must be trained at the university that has been accredited by the Board of Quantity Surveyors before they are allowed to practice. Therefore, this practice must always be followed.

The QS career has a bright future but professional QS has to keep a high standard of ethics and requirement in the country and abroad in particular, using the latest Information Technology (IT), usage of Green Technology and IBS system.

Do you think there are any common misconceptions people have about the surveying profession?

Yes, the common misconception is the public thought that Quantity Surveyor is Land Surveyor. I remember when I came back and I mentioned that I am a Quantity Surveyor, the response came was - Yes I know you are the man looking through the Theodolite. But this misconception is now different because they are many QS practicing firms and the media has projected the correct image of QS correctly.

What is your advice to those who wish to pursue a career in Quantity Surveying?

My advice is for them is to be well versed in the English language and *Bahasa Malaysia*, work hard, learn as much as possible on the latest technology in particular, the Green Building Technology, IBS system and Project Management, and for those who

have equipped themselves well, they will be a shining star in the future in the profession.

After nearly 50 years in existence, what are the successes ISM have achieved and what are the challenges ahead?

Next year, the ISM will be celebrating its 50 years anniversary. The success is tremendous which can be seen around us. The ISM has its own building and a good reserve of fund with large a number of qualified professionals. The challenges ahead are to serve the public well and keep up with the latest technology especially the Green Technology as mentioned earlier.

What is your advice to young surveyors?

Do not think to be a "boss" in a day. Be patient, honest, work hard and serve the public and private sectors in particular, their bosses well, and people will respect you for what you have done. This will also be recognised by the Institution and professional colleges. ▀

Be patient, honest, work hard and serve the public and private sectors ... and people will respect you for what you have done.



Rodiah Zawawi, Zuraini Md Ali

Jabatan Ukur Bangunan

Fakulti Alam Bina, University Malaya

e-mail: rodiahzawawi@hotmail.com

KEPENTINGAN MENGETAHUI KOMPOSISI MORTAR KAPUR KEPADA KONSERVATOR BANGUNAN

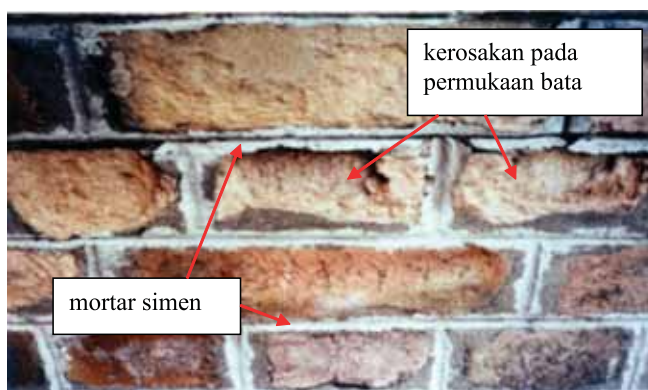


Penggunaan mortar kapur baiki yang sama dengan mortar asal telah dikenalpasti sebagai kaedah terbaik memulihara bangunan batu-bata sebelum perang. Di Malaysia, pemilihan ini adalah tepat kerana kapur merupakan bahan pengikat utama dalam mortar sebelum kilang Portland simen beroperasi di Rawang pada tahun 1953. Maklumat penting yang diperlukan dalam penyediaan mortar kapur baiki adalah komposisinya iaitu jenis kapur, nisbah kapur: pasir, jenis pasir, gred pasir dan jenis bahan tambahan. Kaedah mudah untuk mendapatkan maklumat ini adalah secara pelarutan asid ke atas mortar asal dan diikuti dengan analisis ayak keatas sisa pepejalnya. Pengetahuan mengenai analisis mortar kapur bersejarah dan rumusan formula mortar baiki adalah penting kepada konservator yang terlibat dalam kerja pemuliharaan dan penyenggaraan bangunan batu bersejarah. Artikel ini melaporkan keputusan analisis komposisi mortar kapur bersejarah yang diambil dari tiga buah bangunan sebelum perang di Melaka. Hasil kajian menunjukkan kesemua bangunan yang dikaji dibina menggunakan mortar kapur tulen dengan campuran nisbah berat kapur: pasir adalah di antara 1:2 dan 1:5. Secara amnya keputusan kajian ini boleh digunakan untuk merumus formula mortar baiki namun ia masih kurang lengkap kerana tidak merangkumi ciri-ciri mekanikalnya.

1.0 Pengenalan

Kemerosotan pada fabrik bangunan batu bersejarah sering dikaitkan dengan kehilangan dan kerosakan mortar kapur pada kemas-ikat dan lepaan. Ini berlaku kerana mortar kapur yang digunakan untuk mengikat dan mengemas dinding bangunan ini secara relatifnya rapuh dan telap berbanding unit batu-batanya (Hughes, 1986). Bagaimanapun ciri-ciri yang dimiliki oleh mortar kapur ini dianggap unggul kerana ia dapat berfungsi sebagai bahan korban yang melindungi struktur batu-bata dari agen kemerosotan seperti air, haba, hakisan, garam, tumbuhan dan haiwan perosak. Dari aspek penyenggaraan, kerosakan pada mortar kapur dan lepaan lebih mudah dan murah dibaiki berbanding menggantikan unit batu-bata yang rosak. Justeru, kerosakan mortar kapur pada bangunan batu lama tidak dianggap sebagai kegagalan sebaliknya kejayaan kerana kelakuan ini dapat memanjangkan kitar hayat bangunan (Ratcliffe dan Orton, 1998). Di Malaysia, bukti penggunaan mortar kapur dapat dilihat pada ratusan bangunan kolonial dan rumah kedai yang dibina sebelum Perang Dunia II, 1945 (Syed Zainol, 1995). Bagaimanapun penggunaan mortar kapur pada bangunan beransur-ansur berkurangan dengan beroperasinya kilang simen Portland di Rawang, Selangor pada tahun 1953. Perkembangan ini dapat dilihat dari penggunaan konkrit bertetulang yang meluas dan pesat dalam pembinaan bangunan baru dan infrastruktur (Voon Fee, 2007).

Rajah 1: Kesan penggunaan mortar simen pada bangunan kolonial (Kajian lapangan, 2009)



Sifat simen Portland yang cepat mengeras merupakan antara faktor utama yang menyebabkan penggunaannya meningkat dengan pesatnya bukan sahaja dalam pembinaan bangunan baru tetapi juga dalam kerja-kerja pemuliharaan dan penyenggaraan bangunan batu bersejarah. Siti Umami Sarah (2008) melaporkan kesan penggunaan mortar simen dalam kerja membaikpulih bangunan kolonial telah menyebabkan kerosakan yang lebih teruk pada struktur batu-bata. Kecacatan yang sama juga dilaporkan oleh beberapa penyelidik di negara barat (Hughes, 1986; Ballard, 2004). Keadaan ini berlaku kerana mortar simen adalah padat dan lebih kuat berbanding batu-bata pada bangunan bersejarah. Penggunaan mortar simen pada bangunan bersejarah menyebabkan batu-bata terdedah kepada agen kemerosotan. Keadaan ini berlaku kerana fungsi batu bata berubah menjadi elemen binaan yang lebih lemah dan berliang berbanding mortar simen. Akibatnya, batu-bata terdedah kepada kadar kecacatan dan kerosakan yang tinggi. Keadaan ini seterusnya

menyebabkan kerosakan pada fabrik dan kegagalan kepada struktur dinding galas bangunan (lihat Rajah 1). Menurut Holmes dan Wingate (2002) kecacatan ini boleh dikurangi dan diatasi dengan menggunakan mortar baiki yang sama dengan yang asal iaitu mortar kapur dalam kerja membaiki dan menyenggara bangunan batu-bata bersejarah.

Menggunakan mortar kapur sebagai bahan baiki pada bangunan bersejarah telah bermula lebih seabad yang lalu. Bukti kejayaan penggunaannya diceritakan oleh Holmstrom (1996) dalam projek pemuliharaan bangunan bersejarah di Gamla Stan, Sweden. Praktis menggunakan kapur sebagai bahan pengikat dalam mortar dan cat bukan sahaja mengembalikan nilai estetika tetapi juga memanjangkan kitaran penyenggaraan bangunan lama. Ini berlaku kerana mortar dan cat kapur membenarkan bangunan lama 'bernafas' sebagaimana kelakuan asalnya semasa dibina. Kelakuan ini merujuk kepada pergerakan bebas lembapan melalui elemen binaan terutama struktur dinding galas. Selain itu, mortar kapur juga merupakan bahan boleh terbalik di mana ciri-ciri kimia mortar ini adalah sama dengan bahan mentah asalnya. Ciri-ciri ini menyebabkan mortar kapur boleh ditanggalkan atau diubah dengan mudah tanpa mendatangkan kerosakan kepada tempat yang dibaiki. Keadaan ini memberikan gangguan minima kepada fabrik bangunan di samping dapat mengekalkan ketulenan rekabentuk, teknologi dan bahan binaan asal sesebuah bangunan lama bersejarah.

Di Malaysia, penggunaan mortar kapur dalam kerja membaiki dan menyenggara bangunan warisan bersejarah telah bermula lebih sedekad yang lalu. Ini dapat dilihat dari beberapa kertas seminar konservasi bangunan di peringkat kebangsaan. A. Ghafar (2001) contohnya menceritakan penggunaan mortar kapur dalam kerja-kerja pembinaan semula dinding Kota Cornwallis di Pulau Pinang. Manakala Mohd Zobir et al. (2004) melaporkan keputusan analisis mortar asal bagi bangunan kolonial Panggung Drama yang terletak di Jalan Bandar, Kuala Lumpur. Kedua-dua kajian tersebut bagaimanapun berdasarkan analisis kimia yang menggunakan peralatan canggih. Walaupun kaedah ini berguna, ia secara relatif adalah mahal manakala keputusan kajian tidak boleh digunakan secara tunggal dalam memberikan gambaran sebenar komposisi mortar kapur asal (Middendorf et al., 2000). Keadaan ini berlaku kerana unsur kalsium dan silikon dalam mortar boleh wujud dalam dua bentuk iaitu sebagai pengikat dan/atau agregat.

Menyedari kelemahan ini, Middendorf et al. (2000) mencadangkan supaya mortar kapur dianalisis dengan menggunakan kombinasi beberapa kaedah dan satu darinya mestilah analisis basah iaitu pelarutan asid diikuti dengan analisis ayak. Kedua-dua kaedah ini dipilih kerana ianya mudah dan murah di samping keputusan kajiannya yang tepat dan boleh dipercayai. Berbeza dengan simen mortar pada bangunan moden, mortar kapur yang digunakan pada bangunan bersejarah adalah kompleks di mana ciri-cirinya boleh berubah mengikut masa, kaedah penyediaan, sumber geologinya dan agen kemerosotan. Menurut Goins (2000) ralat kajian boleh dikurangi dengan memahami kaedah analisis dan pensampelan mortar asal.

Jadual 1: Tujuan kajian dan maklumat yang diperlukan (Hughes dan Callebaut, 2000)

Tujuan kajian	Maklumat yang diperlukan
Pemuliharaan / pengekalan	Nisbah agregat/pengikat, kandungan garam, kekuatan mampatan, kekerasan, kandungan lembapan, mineralogi, tahap hidraulik
Akademik (kajian bahan & arkeologi)	Elemen-elemen dalam mortar, kekerasan, keliangan, ketelapan, tahap hidraulik, tekstur

Jadual 2: Kuantiti minimum sampel mortar (Hughes dan Callebaut, 2000)

Maklumat yang diperlukan	Kaedah analisis	Kuantiti sampel (minimum)
Nisbah pengikat / agregat	Pelarutan asid	100g
Mineralogi mortar: <ul style="list-style-type: none"> • Elemen bahan • Garam • Tahap hidraulik 	Instrumental analisis : <ul style="list-style-type: none"> • AAS, EDX, • X-ray Fluoresence, • SEM, ESEM, dll 	10g
Kekuatan mampatan mortar	Tukul Schmidt	200g

2.0 Kriteria Memilih Kaedah Analisis

Pemeriksaan di tapak dan kajian di makmal ke atas mortar asal merupakan langkah awal sebelum memulakan kerja-kerja pemuliharaan dan penyenggaraan bangunan batu bersejarah. Kajian di makmal melibatkan kos yang relatifnya tinggi bergantung kepada jenis analisis, manakala pemeriksaan di tapak memerlukan operator yang cekap dan berpengetahuan luas bukan sahaja dalam menganalisis mortar kapur tetapi juga dalam kerja pemuliharaan bangunan. Pemilihan yang betul ditekankan kerana mortar kapur bersejarah adalah bahan yang kompleks, di mana ciri-ciri mortarnya adalah berbeza mengikut tempat dan kronologi pembinaan (Hughes dan Callebaut, 2000).

Selain itu sifat fizikal, kimia dan mekanikal mortar kapur bersejarah juga boleh berubah terhadap masa (Binda et al., 2000). Justeru, pemilihan sampel yang betul adalah penting supaya data yang terkumpul adalah tepat dan boleh dipercayai. Ini dapat dicapai dengan mengenalpasti objektif utama kajian dan memilih kaedah analisis serta kuantiti sampel yang sesuai.

Menurut Hughes dan Callebaut (2000), pemilihan kaedah bagi menganalisis mortar kapur bersejarah untuk tujuan memulihara bangunan adalah berbeza dari tujuan akademik. Jadual 1 menunjukkan hubungan antara tujuan kajian dan maklumat yang diperlukan. Bagi bangunan bersejarah yang diwartakan, pengambilan sampel adalah terhad kepada kuantiti tertentu. Justeru, kaedah analisis yang dipilih hendaklah bersesuaian dengan

kuantiti sampel mortar asal yang boleh diambil.

Jadual 2 menunjukkan kaedah analisis dan kuantiti sampel yang diperlukan. Selain itu, kaedah pensampelan yang betul adalah penting dalam mendapatkan rumusan mortar ganti yang sama dengan mortar asal dan sepadan dengan batu-bata.

2.1 Kaedah Pensampelan

Pengambilan sampel mortar dari bangunan bersejarah mengakibatkan kerosakan kekal pada fabrik bangunan. Justeru, kerja pengambilan sampel perlu dilakukan dengan teliti dan terancang supaya sampel yang diambil mencukupi dan dapat mewakili mortar asal. Beberapa peralatan yang sesuai diperlukan bergantung kepada kekerasan mortar. Tukul dan gerudi teras hanya digunakan sekiranya pengambilan sampel secara manual dengan tangan tidak berjaya. Selain itu, maklumat tentang lokasi dan kondisi sampel mortar serta bahan di sekelilingnya

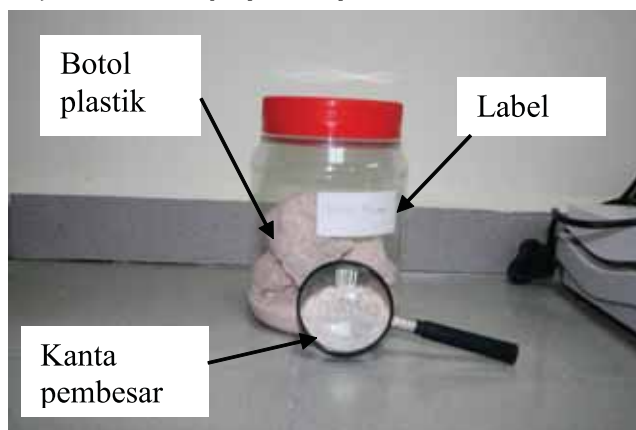
hendaklah direkodkan untuk rujukan semasa dan di masa depan. Sampel yang diambil perlu disimpan segera dalam bekas yang bertutup, kedap dan berlabel (rujuk Rajah 2). Langkah ini penting bagi memastikan sampel kekal dalam keadaan asalnya dan tidak tercemar.

3.0 Metodologi

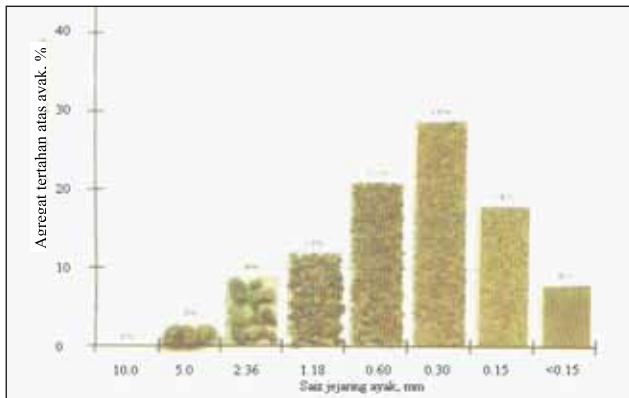
Tujuan kajian adalah untuk merumus formula mortar baik bagi memulihara dan menyenggara bangunan batu-bata bersejarah. Objektif dicapai dengan melakukan pemeriksaan di tapak dan di makmal ke atas mortar yang diambil dari tiga buah bangunan pra perang di bandar Melaka. Pemeriksaan awal di tapak dilakukan dengan menggunakan kanta pembesar untuk mengenalpasti jenis agregat dan bahan tambah dalam mortar. Manakala kajian di makmal dilakukan untuk mengetahui komposisi mortar iaitu jenis pengikat, nisbah pengikat: pasir dan gred pasir. Kaedah yang dipilih untuk tujuan ini adalah pelarutan asid dan analisis ayak. Pemilihan ini adalah selaras dengan pendapat Middendorf et al. (2000) di mana kaedah ini adalah mudah dan tepat untuk menganalisis mortar kapur bersejarah.

3.1 Kajian Kes

Mortar dari tiga buah bangunan lama di bandar Melaka dipilih sebagai kajian kes. Bandar Melaka dipilih kerana kepentingan sejarah dan nilai senibinanya. Bangunan kolonial dan rumah kedai pra perang di bandar ini mempunyai senibina yang unik dan menjadi daya tarikan utama kehadiran pelancong asing ke bandar ini (A. Ghafar, 1998). Menyedari kepentingan ini, berbagai usaha pemuliharaan dan penyenggaraan telah dan sedang dilakukan untuk

Rajah 2: Cara menyimpan sampel mortar

Rajah 4: Contoh pasir bergred baik (The Scottish Lime Centre, 2003)



Rajah 5: Kapur terhidrat terperangkap di dalam mortar kapur bersejarah



2. Timbang kira-kira 100 gram sampel mortar yang belum terusik menggunakan penimbang digital. Kemudian hancurkan sampel ini menggunakan tangan dan asingkan dari sampel bahan-bahan yang berkalsium karbonat seperti kulit kerang, batu kapur atau karang laut.
3. Masukkan sampel mortar yang hancur ke dalam bikar kaca. Kemudian curahkan asid hidroklorik 10% ke dalam bikar sehingga semua sampel mortar tenggelam. Biarkan asid bertindakbalas dengan kapur di dalam mortar. Ini ditunjukkan oleh pembentukan buih yang banyak. Kacau campuran ini menggunakan rod kaca supaya semua sampel bersentuhan dengan asid. Tambah asid dan kacau campuran sekiranya perlu. Rekodkan warna larutan, tahap tindakbalas antara asid dan sampel serta jenis bau yang terbebas.
4. Bersihkan permukaan dinding bikar dengan menyemburkan air suling padanya. Kemudian larutan dalam bikar dibiarkan selama 15 jam supaya bahan sisa pepejal terendap. Larutan jernih tanpa sisa kemudiannya disedut menggunakan pipet. Masukkan sisa basah dalam mangkuk pijar dan keringkannya dalam ketuhar pada suhu 100 darjah Celsius selama 12 jam.
5. Timbang sisa yang kering bersama mangkuk pijar. Kemudian ayak sisa ini menggunakan mesin ayakan dan dulang ayak. Dulang ayak disusun mengikut urutan di mana saiz ayak terbesar terletak di atas diikuti yang kecil dibawahnya. Saiz ayak yang digunakan untuk menganalisis sisa kering ini adalah 5, 2.36, 1.18, 0.6, 0.3, 0.15 dan 0.53 mm.
6. Timbang dan rekodkan berat sisa yang tertinggal di atas setiap dulang ayak. Periksa kondisi pasir dalam sisa ini samada ianya berbentuk pasir butiran terasing atau gumpalan pasir halus yang terikat padat dan padu.
7. Analisis keputusan kajian dengan mengira berat bahan berkalsium karbonat dan peratusan sisa pepejal yang tertahan di atas dulang ayak.

4.0 Analisis Data dan Perbincangan

Keputusan kajian membincangkan sifat fizikal dan komposisi mortar kapur asal iaitu jenis kapur, nisbah kapur: pasir, jenis dan gred pasir yang terdapat dalam mortar bersejarah di bandar Melaka. Gred pasir yang baik membentuk taburan normal, contoh ditunjukkan dalam rajah 4 (The Scottish Lime Centre, 2003).

a) Mortar Kubu Melaka

Berdasarkan rekod sejarah, sampel mortar yang diperolehi dari struktur asas Kubu Melaka dipercayai berusia lebih 400 tahun dan dibina oleh Portugis (Hoyt, 1993). Pemeriksaan visual ke atas ketulan mortar ini mendapati ianya berwarna merah jambu dan agak berdebu. Keadaan ini berlaku disebabkan kehadiran debu tanah atau bata dalam mortar. Praktis mencampurkan debu bata ke dalam mortar kapur merupakan amalan lazim bagi kebanyakan negara barat di abad ke 17 (Baronio dan Binda, 1988).

Pemeriksaan ke atas mortar tak terusik mendapati seketul kapur terhidrat sebesar 15mm terperangkap di tengah mortar (lihat Rajah 5). Kewujudan kapur terhidrat menunjukkan mortar dihasilkan di tapak dan ianya disediakan dengan menimbus pasir basah ke atas kapur tohor. Air dari pasir bertindak dengan kapur tohor dan membentuk kapur terhidrat. Tindakbalas diiringi dengan pembebasan haba yang banyak bergantung kepada ketulenan kapur. Mortar yang terhasil kemudiannya terus digunakan untuk membina dinding bata tanpa menunggu

Berdasarkan rekod sejarah, sampel mortar yang diperolehi dari struktur asas Kubu Melaka dipercayai berusia lebih 400 tahun dan dibina oleh Portugis (Hoyt, 1993).

Jadual 3: Nisbah kapur: pasir bagi mortar bersejarah

Kajian kes	Abad pembinaan, masihi	Sampel (g)	Pasir (g)	Kapur (g)	Nisbah (berat) Kapur:pasir
Kubu Melaka (Asas)	16	100.0	73.7	26.3	1 : 3
Bangunan lama HSBC (lepaan dinding)	Awal 20	110.0	70.4	39.6	1 : 2
Rumah kedai (lepaan dinding)	Awal 19	100.0	82.5	17.5	1 : 5

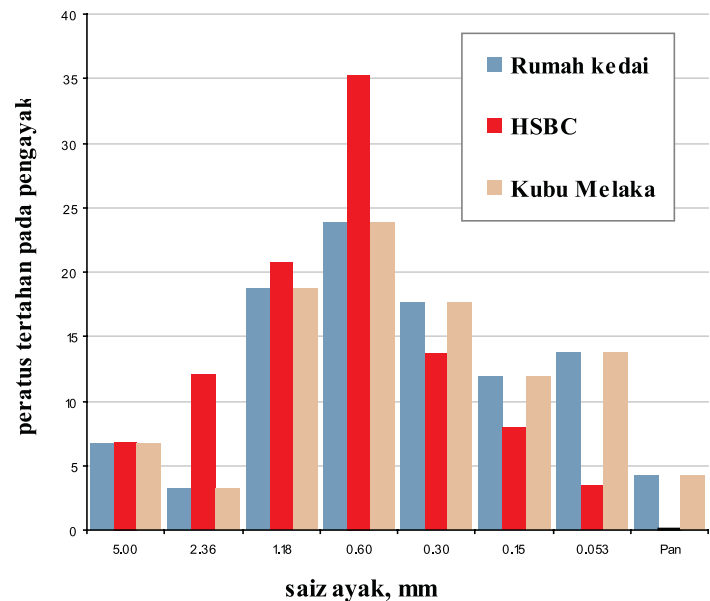
mortar sejuk dan kapur terhidrat sepenuhnya. Kaedah pembinaan ini menjadi pilihan Portugis kerana Kubu Melaka merupakan benteng pertahanan penting dan perlu dibina segera bagi mengekalkan pendudukannya ke atas Bandar Melaka. Praktis menggunakan mortar kapur yang masih panas adalah lazim di negara Eropah bagi tujuan merintang serangan fros (Baronio dan Binda, 1988). Pemeriksaan menggunakan kanta mendapati ketulan kecil arang terdapat dalam mortar ini. Keadaan ini menunjukkan batu kapur beserta sisa pembakaran tercampur semasa penyediaan mortar kapur bersejarah. Ini berlaku kerana kayu dan batu kapur dibakar bersama-sama di dalam tanur tegak. Keadaan ini lazim dalam pengeluaran kapur sebelum tanur berputar diperkenalkan pada pertengahan abad ke 19 (Binda et al., 1988).

Rajah 6 menunjukkan taburan saiz pasir bagi mortar bersejarah yang diambil dari asas kubu Kota Melaka. Merujuk kepada Rajah 4, pasir bagi mortar ini adalah bergred baik tetapi dikelaskan bersaiz halus. Ini berlaku kerana 3 suku daripada pasir ini mempunyai saiz tidak melebihi 0.6 mm. Keputusan kajian menunjukkan 18% agregat adalah bersaiz 0.053 mm dan lebih halus. Ini menunjukkan pasir sungai dan lumpur digunakan dalam penyediaan mortar.

b) Mortar kapur dari Bangunan lama HSBC

Bangunan lama HSBC Melaka dibina pada awal abad ke 20. Pemeriksaan dengan kanta pembesar mendapati tekstur mortar kapur lepaan dinding luar bangunan ini adalah padat. Keadaan ini menunjukkan mortar disediakan dengan cara yang lebih teliti berbanding mortar pada Kubu Melaka. Perkembangan ini sepadan dengan pencapaian baik dari aspek sosio ekonomi di mana penggunaan mortar kapur telah berkembang luas dalam pembinaan bangunan batu.

Rajah 6 menunjukkan taburan saiz pasir yang digunakan dalam mortar bagi melepai dinding luar bangunan lama HSBC di Melaka. Pasir yang digunakan dalam mortar ini adalah bergred baik (rujuk Rajah

Rajah 6: Taburan saiz pasir dalam mortar bersejarah

4). Bagaimanapun ia dikelaskan bersaiz kasar kerana tiga suku darinya tertahan pada ayak bersaiz 0.6 mm. Kandungan pasir kasar yang tinggi menyebabkan mortar mempunyai liang rongga yang banyak. Keadaan ini membantu pengerasan mortar secara pengkarbonan. Selain itu, ia juga membenarkan penyejatan lembapan ke atmosfera dengan cepat. Kewujudan arang dalam mortar menunjukkan sisa pembakar tercampur semasa penyediaan mortar. Ini mungkin dilakukan secara sengaja dengan tujuan untuk memberikan kekuatan tambahan kepada mortar kapur.

c) Mortar kapur dari rumah kedai

Bangunan rumah kedai di mana sampel mortar diambil dipercayai dibina pada awal abad ke 19 (Hoyt, 1993). Mortar kapur ini mempunyai tekstur yang padat dan relatifnya sama dengan mortar dari bangunan lama HSBC.

Analisis ayak menunjukkan pasir yang digunakan adalah bergred baik (rujuk Rajah 4 dan 6). Bagaimanapun pasir dikelaskan bergred kasar kerana 70% tertahan di atas dulang ayak 0.6 mm. Kewujudan 4% pasir bersaiz kecil dari 0.053 mm dan berwarna merah jambu menunjukkan kehadiran sedikit debu tanah dalam mortar kapur. Kewujudan pasir dalam bentuk butiran menunjukkan tiada tindakbalas kimia berlaku di antara debu tanah dan kapur dempol untuk membentuk bahan berhidraulik.

4.1 Nisbah Kapur:Pasir Dalam Mortar

Jadual 3 menunjukkan nisbah berat kapur: pasir bagi tiga kajian kes yang dibincangkan di atas. Hasil kajian menunjukkan nisbah berat kapur: pasir yang digunakan dalam mortar kapur bersejarah adalah di antara 1:2 hingga 1:5. Komposisi mortar mortar

bersejarah didapati berbeza-beza mengikut era pembinaan dan kegunaannya. Kajian menunjukkan lepaan kapur pada bangunan lama HSBC mempunyai kandungan kapur tertinggi. Pemeriksaan kondisi di tapak menunjukkan mortar ini lebih keras serta melekat kuat pada bangunan berbanding mortar yang lain. Ini menunjukkan seluruh kapur dempol yang mengikat agregat telah bertindakbalas dengan gas karbon dioksida di atmosfera dan bertukar menjadi batu kapur. Mortar kapur dari Kubu Melaka juga didapati kaya dengan kapur di mana nisbah berat kapur:pasir adalah 1:3. Mortar ini bagaimanapun agak rapuh kerana terletak di bawah tanah dan sentiasa bersentuhan dengan air. Keadaan ini menghalang pengerasan mortar kapur secara pengkarbonan, iaitu tindakbalas kapur terhidrat dengan gas karbon dioksida.

Keputusan kajian menunjukkan nisbah berat kapur: pasir pada lepaan rumah teres adalah bersamaan 1:5. Nisbah ini adalah bersamaan dengan nisbah piawai penyediaan mortar simen moden iaitu 1:3 (isipadu). Pengurangan nisbah kapur berlaku kerana bahan ini relatifnya mahal berbanding batu-bata. Mortar ini juga mempunyai tekstur yang lebih porous dan berliang.

5.0 Kesimpulan dan Cadangan

Kajian menunjukkan kaedah pelarutan asid adalah sesuai untuk menganalisis mortar kapur bersejarah di Malaysia kerana bahan pengikat yang digunakan adalah jenis kapur tulen. Kajian juga mendapati pasir bergred baik telah digunakan dalam penyediaan mortar kapur bersejarah. Bagaimanapun taburan saiz pasir didapati berbeza

mengikut kegunaan mortar dan era pembinaan. Keputusan analisis pelarutan asid ke atas mortar bersejarah menunjukkan nisbah berat kapur: pasir adalah di antara 1:2 hingga 1:5. Rumusan ini secara amnya boleh digunakan dalam menyediakan mortar ganti bagi kerja memulihara dan menyenggara bangunan lama yang dikaji dan yang seusia dengannya. Walau bagaimanapun, kajian yang lebih mendalam perlu dilakukan untuk mengenalpasti ciri-ciri mekanikal dan kimia mortar kapur bersejarah di samping mengenalpasti kaedah tradisional dalam penyediaan mortar kapur. Kajian yang dicadangkan adalah penting dalam merumus mortar ganti yang lebih tepat dan tahan lasak. ■

Kajian menunjukkan kaedah pelarutan asid adalah sesuai untuk menganalisis mortar kapur bersejarah di Malaysia kerana bahan pengikat yang digunakan adalah jenis kapur tulen.

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***Wan Hussin W.M.A., *Mohd. Sanusi S.A., **Shamshad A.**

*School of Civil Engineering, Universiti Sains Malaysia, Pulau Pinang, Malaysia

**Department of Civil Engineering, Faculty of Engineering & Technology, New Delhi, India

E-mail: * wmabwh@gmail.com, ** sahmad.ci@jmi.ac.in

DEVELOPMENT OF GUI FOR RUNOFF ESTIMATION BY

SCS CURVE NUMBER METHOD USING MAPOBJECTS AND VISUAL BASIC

The Soil Conservation Service (SCS) Curve Number Method has been widely used as the preferred method for runoff estimation. This method simplifies the relationship between rainfall and runoff by introducing the Curve Number as a constant. The Curve Number varies according to land use and soil type which are the two most significant factors governing runoff generation. Presently, many computer programmes provide runoff estimation based on the SCS Curve Number Method such as the WinTR-55. This study made an attempt to develop a Graphical User Interface (GUI) for runoff estimation using the SCS Curve Number Method by integrating Microsoft Excel, MapObjects 2.3 and Visual Basic 6. The programme accepts watershed boundary, soil map and land use map as input. GUI intersects soil and land use maps and then assigns a Curve Number (CN) and the runoff can be calculated using Excel. The spatial display of result provides helpful information in the Best Management Practise (BMP) for watershed management, land use management, and flood mitigation and irrigation planning.

1. INTRODUCTION

In hydrology, the Soil Conservation Service (SCS) Number Method is used to determine how much rainfall infiltrates the ground and how much rainfall becomes surface runoff. A high Curve Number means high runoff and low infiltration, whereas a low Curve Number means low runoff and high infiltration. The Curve Number is defined by the land use and hydrologic soil group data. This is the most common method for predicting storm runoff volume. Many watershed models such as AGNPS (Young et al., 1994), EPIC (Williams, 1995) and SWAT (Arnold et al., 1998) used this method to determine runoff.

Details of spatial variation of catchment are lost when a traditional approach of an area weighted Curve Number for an entire watershed is used to study the runoff. There is a need to develop a watershed-modelling GIS tool for any polygon shape. The advancements and increasing availability of GIS information, high speed computers and software development tools like object-oriented programming (OOP) and visual programming languages also contributed to such developments. The development of a hydrological system has thus become a relatively easy task with data access management and some GIS functionality (Zhan and Huang, 2004).

This study discusses the procedure and also presents partial results to develop a graphical user interface (GUI) for the estimation of runoff using the SCS Curve Number Method. The interface can be developed using Microsoft Visual Basic 6.0 Professional which can be combined with Microsoft Excel and MapObjects. The function of the tool will be to intercept soil type and land use data with each other and that can be used to define the Curve Number automatically by adding the soil and land use data with GIS capabilities.

2. OBJECT-ORIENTED PROGRAMMING (OOP)

There is no standard definition of Object-Oriented Programming (OOP). The tools available to the programmer depend on the type of programming environment used. The Object-Oriented Programming may be defined as the programming language model organised around objects rather than actions and data rather than logic. A programme is viewed as a logical procedure that inputs data, processes it and produces output data. The basic stress in a programme is how to write the logic, not how to define the data. In Object-Oriented Programming, what is of concern is the manner in which the objects are manipulated rather than the logic required to manipulate them.

...the Soil Conservation Service (SCS) Number Method is used to determine how much rainfall infiltrates the ground and how much rainfall becomes surface runoff.

The first step in OOP is the identification of all the objects that are required to be manipulated and to know their relationship with each other, which is often known as data modelling. Once an object has been identified, it is generalised as a class of objects, the kind of data contained by it and logic sequences that can manipulate it are defined. Each distinct logic sequence is known as a method.

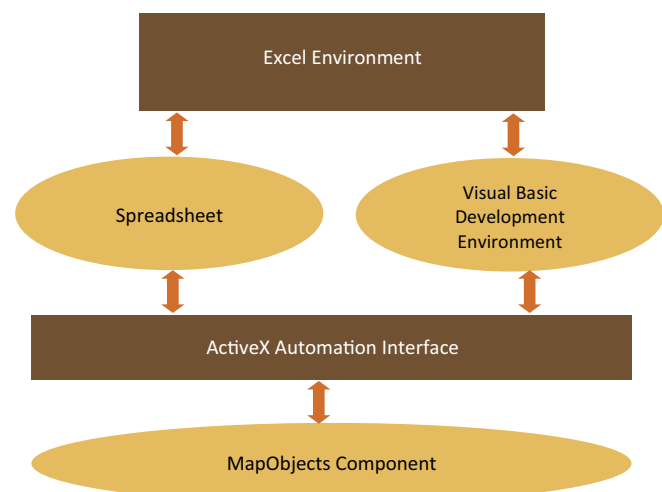
The concepts and rules used in OOP provide the following important benefits (Kristi, 1997):

- **Reusable and maintainable:** The object is designed such that it can solve many problems of the same type, rather than solving a specific problem.
- **Robust:** The object is free of errors and also safe from errors in other objects.
- **Efficient:** The object performs the task quickly using a few resources. The reuse of codes encourages efficiency.
- **Compatible:** Although the object is independent, it can interact with other objects as and when required.
- **Extensible:** The object can incorporate new requirements.
- **Ease of use:** The object is intuitive as it is based on real world examples.
- **High integrity:** The object neither contradicts itself nor the environment by identifying external object interactions.

3. ENVIRONMENT FOR DEVELOPMENT OF GUI

The GUI technical development for the SCS Curve Number Method will consist of three sub-systems namely data management, model management and user interface. Microsoft Excel plays the role of a base for these sub-systems. Sheets are used for data management work, the built-in mathematical functions forms the model base and Visual Basic then integrates both the designing of interfaces and the building of complex models (Figure 1). MapObjects will enhance mapping abilities. In this case,

Figure 1: GUI development environment using Excel and MapObjects



the function is the same as that of ArcView which is needed to intercept between the soil type map and the land use map. The technical details of the software used are discussed in the following sections.

3.1 Microsoft Excel

Excel is a complex software from Microsoft which is used to solve problems in computational science. It is a multi-purpose software used as a calculator, data organiser, graphic programme, database, statistical programme accounting system, etc. Excel is also the most commonly used software for complex statistical and engineering analysis as it provides a set of data analysis tools. It has many built-in functions classified as financial, date and time, statistics, mathematics, etc. The functions can easily be inserted by the user using the function dialog box. These functions can be used for almost all well-structured problems.

Users of Excel can also use Online Analytical Processing (OLAP), which is a type of software that provides analysis of data stored in a database or data warehouse. OLAP tools can quickly provide the answer to complex database queries and enable users to analyse different dimensions of multi-dimensional data. OLAP is often used in data processing of data warehouse which contains large amount of data, which is often termed as data mining, and is a collection of subject-oriented, integrated, time-variant, non-volatile collection of data that supports the decision making process of management.

3.2 MapObjects Application Features and Functions

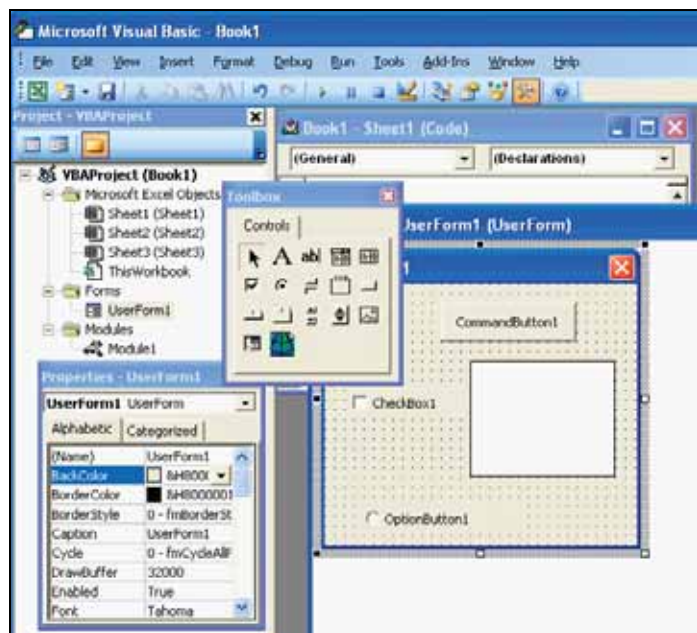
MapObjects is likely to become the programming environment for those wishing to build GIS capabilities into an application developed within a windows-based programming environment. Most of the GIS application developers may be acquainted with popular GIS softwares like IDRISI, ArcView, Erdas Imagine and ILWIS, etc., but may have little idea of MapObjects and the programming environment that it is designed for.

MapObjects is a collection of mapping and geographic information system (GIS) components from the Environmental Systems Research Institute, Inc. (ESRI). It consists of an ActiveX™ Control and many programmable ActiveX Automation Objects that allow application developers to add dynamic mapping and GIS capabilities to applications. MapObjects ActiveX can be used with many standard programming environments, such as Visual Basic, Delphi, Visual C++, etc., so applications can be developed quickly and easily (www.esri.com, 2006).

MapObjects offers capabilities to help programmers for insertion of dynamic maps into multiple applications including the following:

- Supports a variety of data sources and image formats
- Possesses advanced geocoding capabilities
- A scale bar, legend control including source code designed to help in easily developing other applications

Figure 2: Creation of custom dialogs using Visual Basic development environment in Excel



- Management of GPS data
- Possesses advanced data handling capabilities for optimised performance
- Built-in capabilities with ArcIMS Web connectivity middleware for development of a Web-based mapping and GIS applications

MapObjects application contains a standard set of map tools viz. zoom, pan, find, information tool, and layer properties. Points or lines associated with pictures, sub-surface cross sections panoramic movies, sampling descriptions, etc. are hyperlinked to the associated images. For querying the tabular analytical databases, an interface is developed and integrated into the application. The creation of custom dialogs using the Visual Basic development environment in Excel is shown in Figure 2.

The GUI technical development for the SCS Curve Number Method will consist of three sub-systems namely data management, model management and user interface.

Table 1: Hydrological soil group

Soil Group	Runoff potential	Infiltration	Soil structure
A	Low	High	Sand, sandy loam, loamy sand
B	Moderately low	Low	Loam, silt loam
C	Moderately high	Low	Sandy clay loam
D	High	Very low	Clay loam, clay, silty clay, sandy clay

Table 2: AMC Categories

Antecedent Moisture Condition (AMC)	USDA – SCS, 1985 (AMC 5 days)
I (Dry)	< 36mm
II (Normal)	36 – 53 mm
III (Wet)	> 53 mm

4. SOIL CONSERVATION SERVICE (SCS) METHOD

The Soil Conservation Service (SCS) method is used to determine the surface runoff from a watershed. Runoff is affected by several parameters such as soil type, soil moisture content, and land use. As these parameters are not constant throughout the watershed, the Curve Numbers need to be adjusted to this situation as well. Before the programme can carry out modification, a reference Curve Number should be provided. These values of Curve Number differ for every soil hydrological group and land use type (TR-55, 1986).

Many water quality parameters can be calculated such as the sediment and nutrient transports based on the runoff. Some applications of this method with watershed models in Kansas were reported recently (Bhuyan et al., 2002; Bhuyan et al., 2003; Tsou and Zhan, 2004). Traditionally, an area weighted average Curve Number for the entire watershed is used to study the runoff of a watershed. Details of the spatial variation in the watershed are often lost. A software known as ArcCN Runoff was developed to calculate the runoff as an ArcGIS tool for generating Curve Number and runoff (Zhan and Huang, 2004). Standard SCS CN method is based on the following relationship between rainfall depth, P and runoff depth, Q , both in millimetres.

$$Q = \frac{(P - 0.2S)^2}{PI + 0.8S} \quad (1)$$

To obtain the volumes, P and Q (in millimetres) must be multiplied by the basin area. The potential maximum retention, S (in millimetres), represents an upper limit of the amount of water that can be abstracted by the watershed through surface storage, infiltration, and other hydrologic abstractions. For convenience, S is expressed as below in terms of CN , which is a dimensionless watershed parameter ranging from 0 to 100.

$$S = 254 \left(\frac{100}{CN} - 1 \right) \quad (2)$$

A CN of 100 represents a limiting condition of a perfectly impermeable watershed with zero retention and thus, all the rainfall becoming runoff. A CN of zero conceptually represents the other extreme, with the watershed abstracting all rainfall with no runoff regardless of the rainfall amount.

Watershed parameter CN can be determined from empirical information. SCS has developed tables of initial Curve Number (CNi) values as a function of the watershed soil type, land cover/use/condition. These are listed in the SCS-SA User Manual (Schulze et al., 1992).

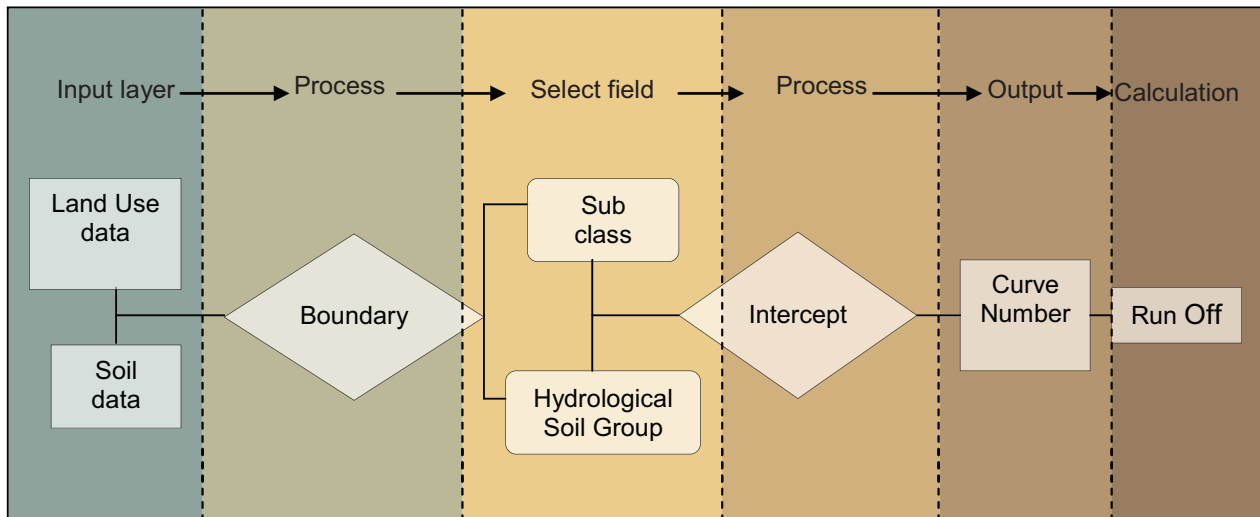
Hydrologic soil groups refer to the standard SCS soil classification procedures, where classification A refers to sand and aggregated silts with high infiltration rates, and goes to classification D, that corresponds to soils that swell significantly when wet and have low infiltration rates. Table 1 summarises the characteristics of the hydrologic soil groupings (Schulze et al., 1992).

For a watershed with sub-areas of different soil types and land cover, a composite Curve Number CN is determined by weighting the CN for the different sub-areas in proportion to the land area associated with each.

After getting the Curve Number value and the rainfall data, the next procedure is to calculate the Curve Number for each drainage basin by area-weighting the land use-soil group polygons within the drainage basin boundaries. The

Creating an easy application to use will save the end-users' cost and time associated with the training generally required to perform analyses associated with more sophisticated GIS software packages.

Figure 3: Process of the model



basic equation for average Curve Number calculation is shown below:

$$CN_{av} = \frac{\sum_{i=1}^n (CN_i * A_i)}{\sum_{i=1}^n A_i} \quad (3)$$

This CN value is for AMC II, and maximum potential retention is given by this equation where CN value obtained is CN II for AMC II.

CN value can be adjusted for near saturated and dry watersheds by using the following two equations:

$$CNI = \frac{4.2 \times CNII}{10 - 0.058 \times CNII} \quad (4)$$

$$CNIII = \frac{23 \times CNII}{10 + 0.13 \times CNII} \quad (5)$$

5. BUILDING APPLICATIONS

Estimating a Curve Number requires the mapping of the soil and land use within the drainage basin boundaries, the specification of unique soil types and the unique land use categories. The application has to be developed systematically. The flow chart in Figure 3 shows the steps implemented in this study.

The typical process for estimating the Curve Number for a drainage area is as follows:

- Define and map the boundary of the drainage basin for which the Curve Number will be calculated.
- Map the soil types and land use for the drainage basin of interest.
- Convert the soil types to hydrologic soil groups.
- Overlay the land use and hydrologic soil group maps, identify each unique land use-soil group polygon, and determine the area of each polygon.

- Assign a Curve Number to each unique polygon, based on the standard SCS Curve Number tables.

Standard coding procedures should be followed to increase efficiency and to organise code in a logical manner and increasing readability.

5.1 GUI Development

The mapping ability in Excel is achieved using MapObjects. The procedure to integrate GIS and spread sheet using Visual Basic Programming environment is as discussed below:

1. Set Excel to design mode using toolbox.
2. Insert MapObjects to the Excel Sheet, and position and size the map control as necessary.
3. In Visual Basic environment, add codes to realise GIS and spread sheet functions, if necessary.

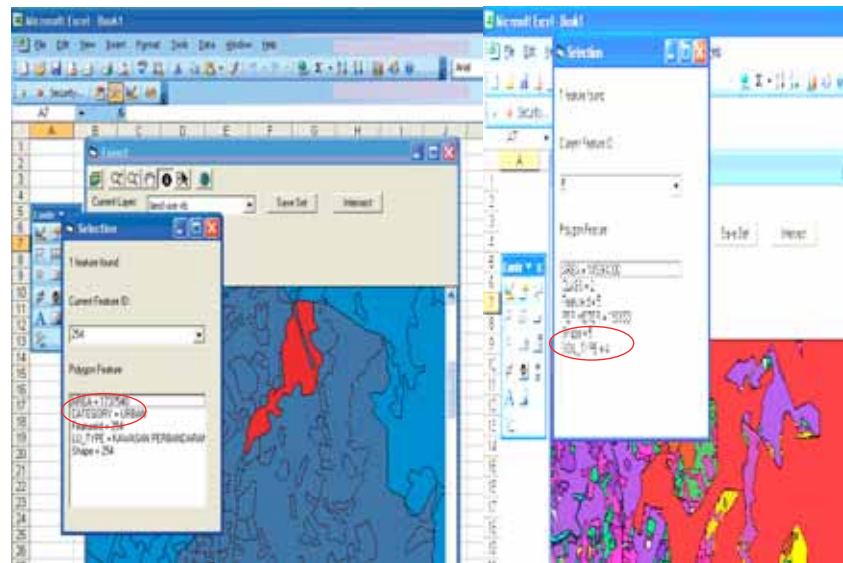
The buttons for opening map layer, Zoom, Pan, Identify, FullMap Extent etc. were created as shown in Figure 4 on Form 1 using Visual Basic, MapObjects and Excel. The

Figure 4: Hydrological soil group map shown in window



Figure 6: The intersected land use map and soil intercepted

...the Soil Conservation Service (SCS) Number Method is used to determine how much rainfall infiltrates the ground and how much rainfall becomes surface runoff.



necessary codes were written for each button to make them operational. Form 2 in the programme is used to add the layer or map that will appear in the programme. The map will be shown on the Form if the checkbox is clicked. Adding map processes is almost similar to adding themes in the ArcView GIS software. The boundary, hydrological soil group map and the land use map were added as shown in Figures 4 and 5, respectively.

This programme then identified the land use and the soil type when a point was selected using the identify function. Then a Form will show the data which is included in the map. All the information in the land use map and the soil hydrologic type map were saved in Excel. Both the hydrological soil group map and land use map were then intersected to determine the Curve Number. Figure 6 shows how the programme works during intersecting process. Figure 6 also shows the data of one selected point in the land use and soil map. It shows that the land use category is urban and the soil type group is A.

Combination of the land use map and soil map at this location indicates Urban-A category. The corresponding value of the Curve Number for this selected point is obtained from Table 4 which is 77. Similarly, all other Curve Numbers corresponding to the land use and soil categories are determined. All the Curve Numbers are then entered in Excel and the average Curve Number is obtained.

6. CONCLUSION

The methodology for development of the GUI for estimation of runoff from a watershed with GIS capabilities is presented and partially implemented by integrating Microsoft Excel, Visual Basic and MapObjects. The tool is helpful to research communities for protection of water resources and water quality in watersheds. The proposed integration is useful and simple to help the success of this modelling. The programme has helped the process of determining the Curve Number more accurately and faster. However, there are user-friendly scopes of improvement and more functions can be added to this programme to make it more user-friendly and all the parameters to model the rainfall and runoff can be calculated. The application can be developed as a stand-alone product to eliminate the need for the end user to purchase a GIS software. Creating an easy application to use will save the end-users' cost and time associated with the training

Figure 5: Land use map shown in window



MapObjects offers capabilities to help programmers for insertion of dynamic maps into multiple applications...

Table 3: Curve Number of study area

Land Use	Hydrological Soil Group			
	A	B	C	D
Rubber	64	74	81	85
Coconut	71	80	87	90
Oil Palm	64	74	81	85
Cocoa	64	74	81	85
Pineapple	71	80	87	90
Paddy	64	75	83	86
Mixed Plantation	67	78	85	89
Fruit Farm	64	74	81	85
Sugarcane	67	78	85	89
Mixed Vegetable	67	78	85	89
Tropical Forest	32	53	67	74
Mangrove Forest	35	56	70	77
Cleared Land	77	85	90	92
Range Land	59	74	82	86
Mineral Mines	68	79	86	89
Urban Land	77	85	90	92

generally required to perform analyses associated with more sophisticated GIS software packages.

Acknowledgement

The study was undertaken for the project entitled GIS Based Watershed Management System for Non-Point Source (NPS) Pollution Modelling from the Ministry of Science, Technology and the Innovation (MOSTI) Malaysia, and Universiti Sains Malaysia (USM) under IRPA grant. ■

The tool is helpful to research communities for protection of water resources and water quality in watersheds.

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ISU-ISU BERKAITAN BURUH MAHIR ASING

DALAM INDUSTRI BINAAN

Radzi Ismail, Prof Madya Abdul Aziz Hussin, Dr Mohd Wira Mohd Shafiei

Pusat Pengajian Perumahan, Bangunan dan Perancangan, Universiti Sains Malaysia

Email: radhi_ismail@yahoo.com, abdaziz@usm.my, wira@usm.my

Isu utama dalam sektor binaan negara adalah lambakan buruh mahir asing yang mengurangkan peluang pekerjaan kepada penduduk tempatan. Artikel ini membincangkan mengenai punca pengambilan buruh mahir asing berbanding buruh mahir tempatan oleh kontraktor dan mengenalpasti bidang kemahiran yang ditawarkan di institusi kemahiran samada ia mengikut keperluan sektor binaan negara. Penemuan kajian telah mendapati separuh daripada buruh mahir yang bekerja dengan mereka adalah buruh mahir asing. Seterusnya, faktor sikap buruh mahir asing menjadi daya tarikan kepada majikan untuk mengambil mereka bekerja. Kursus yang ditawarkan oleh institusi kemahiran tidak memenuhi kehendak majikan terhadap buruh mahir. Selain itu, kerajaan perlu menyelaraskan upah bagi buruh mahir tempatan dan asing supaya tidak mempunyai perbezaan yang ketara. Institusi kemahiran perlu menilai kursus yang ditawarkan di peringkat sijil agar memenuhi keperluan buruh mahir dalam sektor binaan dan menerapkan sikap bertanggungjawab dan keutamaan kualiti kerja kepada pelajarnya.

Jadual 1: Keluaran dalam negeri kasar (KNDK) mengikut sektor 2006-2008

Keluaran Dalam Negeri Kasar (KNDK) mengikut Sektor 2006-2008 (pada harga 2000)

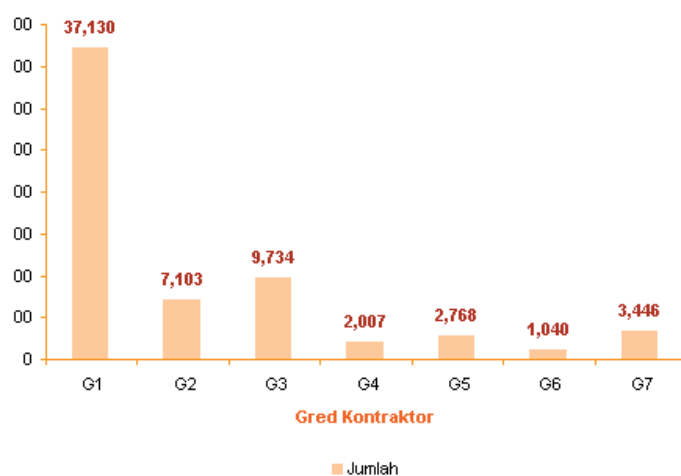
Sektor	Perubahan (%)			Bahagian kepada KDNK (%)			Sumbangan kepada Pertumbuhan KDNK (mata peratusan)		
	2006	2007(1)	2008(2)	2006	2007(1)	2008(2)	2006	2007(1)	2008(2)
Pembinaan	-0.5	5.2	6.3	3.1	3.0	3.0	0.0	0.2	0.2

(1) Anggaran (2) Unjuran

Sumber: Jabatan Perangkaan Malaysia 2008

PENGENALAN

Kemasukan buruh asing adalah bermula daripada penjajahan British yang membawa masuk buruh-buruh asing, secara tidak langsung pada ketika itu telah merubah corak ekonomi Tanah Melayu iaitu daripada ekonomi tradisional kepada ekonomi secara kapitalis atau moden. Negara awal pada awal kemasukan buruh asing adalah India dan China (kumpulan Intelek J.P.M U.M 1995). Pada tahun 1901 menunjukkan terdapat 58,211 orang India, 299,739 Cina dan pada tahun 1911 menunjukkan bilangan mereka semakin bertambah, orang India seramai 172,465 dan Cina 433,244. Keadaan ini mewujudkan bentuk masyarakat berbilang bangsa di Negeri Melayu iaitu Melayu, Cina dan India yang mempunyai perbezaan samasekali dalam kebudayaannya, bahasa, cara hidup, sosial dan politiknya. Perbezaan ini menyebabkan adanya konflik nilai dari aspek kepercayaan, hak kelahiran, politik, ekonomi, pendidikan dan sosial di antara kaum ini di Malaysia. Sumber-sumber input binaan dalam pembinaan adalah gunatenaga, bahan binaan, loji dan alat binaan dan kewangan (Abu Bakar, A H 1998). Guna tenaga merupakan salah satu input utama yang berpengaruh. Sekiranya, berlaku kelebihan bilangan buruh intensif penggunaan buruh di dalam pembinaan akan menjadi lebih ekonomi tetapi sekiranya berkurangan terutama melibatkan bidang khusus akan timbul masalah dan kesukaran di dalam membuat penentuan berkaitan kenaikan harga (Aqua Group, 1999). Setelah menilai isu-isu berkaitan buruh mahir asing yang datang ke negara untuk bekerja dalam industri binaan, kajian ini telah menetapkan beberapa objektif-objektif iaitu mengenalpasti punca pengambilan buruh mahir asing berbanding buruh mahir tempatan dan mengenalpasti bidang kemahiran yang ditawarkan di institusi kemahiran samada ia mengikut keperluan sektor binaan di negara ini.

Rajah 1: Pendaftaran kontraktor sehingga Disember 2005

Sumber: Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB)

PENGENALAN SEKTOR BINAAN

1.0 Perkembangan Industri Binaan Negara

Perkembangan industri binaan negara terus mencatatkan kenaikan. Jadual 1 menunjukkan KDNK sektor binaan, bagi tahun 2006-2008 secara keseluruhan sektor ini dijangkakan akan terus mencatatkan kenaikan. Pada tahun 2007 kadar pertumbuhan sebanyak 5.2% akan memberikan perkembangan positif kepada kenaikan pada tahun seterusnya. Pada tahun 2008 sebanyak 6.3% kadar perubahan kenaikan dijangka akan berlaku, berikutan peningkatan aktiviti kejuruteraan awam pada separuh kedua tahun. Pada suku keempat 2007, sektor pembinaan terus mengekalkan pertumbuhan pada kadar 4.7 peratus. Pertumbuhan ini didorong oleh perkembangan dalam projek kejuruteraan awam seperti pembinaan lebuh raya,

lapangan terbang, stesen jana kuasa dan aktiviti infrastruktur yang lain oleh sektor swasta dan kerajaan. Bagi keseluruhan tahun, sektor pembinaan mencatatkan pertumbuhan tahunan tertinggi sejak tahun 1999 dengan peningkatan sebanyak 4.6 peratus. Dalam hal ini, sektor swasta telah membantu dalam peningkatan ini, terutamanya kerja-kerja tempaan industri minyak dan gas serta projek pengantian dan pemasangan paip. (Prestasi dan Prospek Laporan Ekonomi 2005/2006).

2.0 Pendaftaran Kontraktor Mengikut CIDB (Construction Industry Development Board)

Perkembangan industri binaan negara telah mendorong peningkatan bilangan kontraktor mengikut kelas. Rajah 1 menunjukkan pendaftaran kontraktor sehingga Disember 2005.

Rajah 1 menunjukkan kelas kontraktor gred G1 merupakan pendaftaran yang tertinggi iaitu 37,130 berbanding gred kelas yang lain. Perkembangan ini berlaku disebabkan jumlah modal yang perlu dikeluarkan adalah lebih sedikit berbanding dengan gred yang lain dan gred ini hanya melibatkan bumiputera. Selain itu, perkembangan ekonomi negara yang semakin memberangsangkan telah membantu peningkatan bilangan kontraktor.

KATEGORI PEKERJA DALAM SEKTOR PEMBINAAN

Dalam industri binaan terdapat beberapa kategori iaitu pakar teknologi, buruh mahir, buruh separuh mahir, tidak mahir dan am.

Pakar Teknologi - Merupakan golongan yang mempunyai kelayakan dan pengalaman kepakaran yang diperlukan ditapak bina. Golongan ini mempunyai pengkhususan dalam bidang teknologi, sains dan pengurusan bangunan. Dikategori dalam kelompok ini adalah seperti pengurus tapak, juruukur bahan dan jurutera.

Buruh Mahir - Buruh mahir dari takrifan Seksyen 2 Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994 ialah seorang yang mempunyai suatu tahap kemahiran yang boleh diterima oleh Lembaga Pembangunan Industri Pembinaan (CIDB). Jadual 2 menunjukkan senarai kategori buruh mahir.

Pekerja Separuh Mahir, Tidak Mahir dan Am - Dari pendapat Wang (1987), buruh separuh mahir terdiri daripada pekerja yang mendapat kemahiran dan pendidikan dalam bidang tertentu tetapi kurang pengalaman di tapak. Menurut Wang (1987), buruh tidak mahir dan am merupakan pekerja yang tidak mempunyai kepakaran.

KEPERLUAN BURUH MAHIR

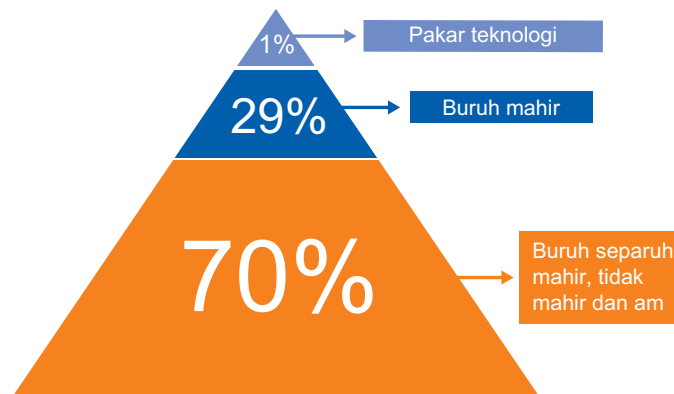
Buruh mahir merupakan orang perantara di antara pakar teknologi dan buruh tidak mahir dan am. Kedudukan buruh mahir adalah amat penting dalam sektor binaan kerana buruh mahir boleh menterjemah projek yang hendak dilaksanakan mengikut acuan yang sebenar.

Jadual 2: Klasifikasi Kerja Mahir Mengikut Jadual Ketiga Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994

a)	Tukang konkrit	h)	Tukang plaster /Tukang Turap
b)	Tukang kayu	i)	Pembekok bar
c)	Juruelektrik berlesen	j)	Pengimbal
d)	Tukang cat	k)	Tukang jubin
e)	Pekerja logam	l)	Tukang kayu halus
f)	Tukang kaca	m)	Tukang buat longkang
g)	Pengendali logi binaan	n)	Penurap batu/Tukang batu

Sumber: Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994

Rajah 2: Peratus penggunaan tiga kategori guna tenaga dalam industri binaan



Sumber: Pengurusan Projek Perspektif Industri Pembinaan Abdul Rashid Abdul Aziz dan Abdul Aziz Hussin (1999)

Penggunaan tiga kategori guna tenaga dalam industri binaan iaitu pakar teknologi, buruh mahir dan buruh separuh mahir, tidak mahir dan am adalah seperti Rajah 2. Pakar teknologi merupakan jumlah bilangan yang kecil iaitu sebanyak 1%. Pakar teknologi merupakan golongan yang memandu arah, merancang, mengawal, mengorganisasi dan menyusun sesuatu projek ke arah mencapai kejayaan.

Manakala bagi buruh mahir, mereka adalah golongan yang memahami tugas yang disampaikan oleh golongan profesional atau pakar teknologi untuk diterangkan kepada pekerja di bawahnya atau buruh separuh mahir, tidak mahir dan am. Mereka mempunyai kepakaran tersendiri yang tidak dapat dilakukan oleh orang bawahan dan mempunyai

pengalaman yang luas dalam industri binaan. Menurut Wang (1987), buruh mahir merupakan pekerja yang pakar secara khusus dalam sesuatu bidang dan boleh bekerja sendirian. Mereka telah melalui pendidikan formal bagi menaikkan taraf tersebut ataupun mereka telah menjadi perintis dalam sesuatu bidang pembinaan untuk tempoh yang lama. Oleh itu, mereka menjadi mahir dalam bidang tersebut seperti kerja kayu, kerja besi, kerja konkrit dan sebagainya. Buruh mahir yang diperlukan sektor binaan adalah 29% daripada keseluruhan projek yang bakal dilaksanakan. Peratusan ini adalah kedua tertinggi dalam keseluruhan kategori pekerja dalam sektor binaan.

Namun golongan yang menjadi pendokong atau penyumbang terbesar dalam projek pembinaan

Kedudukan buruh mahir adalah amat penting dalam sektor binaan kerana buruh mahir boleh menterjemah projek yang hendak dilaksanakan mengikut acuan yang sebenar.

Jadual 3 Butiran Statistik Permohonan Syarikat Kemasukan Pekerja Asing Binaan

Tahun	Bil. Syarikat Memohon	Bil. Syarikat Diluluskan
2005	4, 545	3, 023
2004	2, 106	1, 020
2003	1, 560	1, 714
1998-2002	4, 847	964

Sumber: Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB)

Jadual 4: Butiran Statistik Permohonan Pekerja Asing Binaan

Tahun	Bil. Pekerja Dipohon	Bil. Pekerja Diluluskan
2005	244, 242	63, 538
2004	170, 822	24, 077
2003	77, 952	49, 904
1998-2002	422, 558	26, 316

Sumber: Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB)

adalah buruh separuh mahir, buruh tidak mahir dan am. Walaupun golongan ini tidak mempunyai pengalaman yang luas tetapi mereka merupakan penyumbang tenaga yang besar dalam merealisasikan kejayaan projek pembinaan.

INSTITUSI KEMAHIRAN

Institusi kemahiran merupakan satu badan atau pusat yang bertanggungjawab untuk menyediakan tenaga mahir dalam industri di negara. Tujuan penubuhan institusi kemahiran adalah untuk mengambil pelajar lepasan SPM yang kurang bernasib baik untuk meneruskan pengajian ke peringkat yang lebih tinggi.

1.0 Politeknik

Politeknik yang terdapat di semenanjung Malaysia, Sabah dan Sarawak mempunyai 21 buah. Kursus yang relevan dengan senarai 15 jenis kemahiran yang ditarifkan buruh mahir adalah sijil kejuruteraan awam dan kejuruteraan perkhidmatan bangunan. Menurut Berita Harian 8 Ogos 2006, sejumlah 113,060 permohonan diterima daripada lulusan Sijil Pelajaran Malaysia (SPM) tahun lalu untuk melanjutkan pelajaran ke politeknik pada sesi kemasukan Julai 2006/2007.

2.0 Institut Kemahiran Mara (IKM)

Terdapat 12 buah IKM di semenanjung, Sabah dan Sarawak yang telah dibina untuk menampung keperluan

di dalam bidang pendidikan dan industri di Malaysia. Antara kursus yang relevan dengan takrif buruh mahir ialah Kejuruteraan Bangunan, Teknologi Bekalan Air & Pembentungan dan Kejuruteraan Awam Lukisan Struktur.

3.0 Kolej Komuniti

Pada masa sekarang Kolej Komuniti mempunyai 34 buah yang terkini. Di antara kursus yang ditawarkan relevan dengan takrif buruh mahir adalah sijil teknologi pembinaan, sijil pelukis pelan senibina dan sijil penyenggaraan bangunan. Bilangan pengambilan yang dibuat oleh Kolej Komuniti adalah melalui dua peringkat iaitu pada bulan Julai untuk 3,420 tempat dan bulan Disember untuk 2,760 tempat di semua 34 kolej.

4.0 Pusat Giat Mara

Terdapat 105 buah pusat giat mara di seluruh Malaysia termasuk Sabah dan Sarawak. Antara kursus yang ditawarkan berkaitan dengan takrif buruh mahir ialah pemasangan paip domestik, teknologi bangunan berasaskan batu-bata dan teknologi bangunan berasaskan kayu.

5.0 Akademi Binaan Malaysia (ABM)

Akademi Binaan Negara adalah hasil daripada penelitian kajian yang dijalankan oleh CIDB dalam usaha meningkatkan bilangan buruh mahir di dalam sektor binaan. Terdapat enam pejabat ABM diseluruh Malaysia termasuk Sabah dan

Sarawak. Kursus yang ditawarkan oleh ABM adalah 14 yang relevan dengan senarai buruh mahir dalam takrifan buruh mahir. Kursus yang relevan yang terdapat di ABM ialah program latihan kemahiran belia.

PENGLIBATAN BURUH MAHIR ASING DI DALAM INDUSTRI BINAAN

Program kemasukan pekerja asing adalah sentiasa berlaku sehingga waktu dan ketika ini. Ini adalah kerana permintaan daripada majikan tempatan masih berlaku. Jadual 3 menunjukkan bilangan syarikat yang membuat permohonan dan bilangan yang diluluskan dari tahun 1998 hingga 2002, 2003, 2004 dan 2005 bagi kemasukan buruh asing dalam sektor binaan.

Sekiranya diteliti bagi tahun 2005 bilangan syarikat yang memohon adalah 4,545 dan yang diluluskan adalah 3,023. Kelulusan yang dibuat akan menambahkan lagi bilangan kemasukan buruh asing.

Merujuk kepada Jadual 4 bagi tahun 2005 bilangan buruh asing yang dipohon adalah 244,242 orang dan yang diluluskan adalah 63,538 orang. Perkara ini menunjukkan masih ramai lagi warganegara asing yang mahu datang ke Malaysia saban tahun kerana gaji lebih lumayan berbanding negara asal mereka di samping bilangan peluang pekerjaan yang banyak diwujudkan oleh kerajaan dan pihak swasta.

Permintaan terhadap buruh asing adalah berlaku apabila buruh tempatan menolak pekerjaan yang ditawarkan kerana kadar gaji yang rendah, kurangnya latihan, ketiadaan minat dan kemahiran oleh buruh tempatan

Jadual 5: Keperluan Kontraktor Dan Penyediaan Buruh Mahir Oleh Institusi Kemahiran

Bil.	Kategori Buruh Mahir	Keperluan Kontraktor	Institusi Kemahiran				
			Politeknik	IKM	Kolej Komuniti	Pusat Giat Mara	ABM
1	Tukang konkrit	√		√			√
2	Pembengkok bar	√		√			√
3	Tukang kayu	√				√	√
4	Penurap batu/Tukang batu	√		√		√	√
5	Tukang plaster/Tukang turap	√		√			√
6	Tukang jubin	√		√			√
7	Tukang cat	√					
8	Tukang kayu halus	√					√
9	Pekerja logam	√					√
10	Tukang buat longkang	√					√
11	Tukang kaca	√					√
12	Pengimpal	√					√
13	Pengendali loji binaan	√					√
14	Tukang paip	√		√		√	√
15	Juruelektik berlesen	√	√	√	√	√	√

Sumber: *Isu-isu Berkaitan Buruh Mahir Asing Dalam Industri Binaan Radzi Ismail (2007)*

FAKTOR-FAKTOR YANG MENDORONG MAJIKAN MENGAMBIL BURUH MAHIR ASING

"Permintaan terhadap buruh asing adalah berlaku apabila buruh tempatan menolak pekerjaan yang ditawarkan kerana kadar gaji yang rendah, kurangnya latihan, ketiadaan minat dan kemahiran oleh buruh tempatan" dinyatakan oleh Fevre (1984). Perkara ini berlaku disebabkan sikap rakyat tempatan yang terlalu memilih pekerjaan tanpa memikirkan peluang yang telah diwujudkan menjadi punca pengambilan buruh asing.

Berdasarkan kenyataan yang dikeluarkan oleh Chang See Ten ADUN Gelang Patah (4 April 2002) dalam ucapannya ketika mesyuarat di Dewan Rakyat iaitu "Kegiatan ekonomi insentif buruh ini menghadapi masalah untuk mendapatkan tenaga kerja daripada rakyat tempatan sama ada mereka menceburi diri dalam export-orientated atau untuk kegunaan atau pengeluaran untuk kegunaan tempatan. Mereka sangat memerlukan buruh asing. Sebagai contoh, rakyat tempatan sudah tidak berminat untuk menjadi buruh pembinaan atau bekerja di ladang yang memerlukan kekuatan dan kelasakan fizikal tetapi tidak menjanjikan gaji yang tinggi. Persekitaran kerja di bawah matahari sebagai buruh pembinaan atau pekerja ladang juga kurang menyenangkan dan menjadikan peluang pekerjaan sedemikian kurang menarik kepada rakyat tempatan."

Kelebihan utama untuk Malaysia menggunakan pekerja buruh yang diimport secara besar-besaran adalah kos yang rendah (Malaysia Today Sunday 10 Oktober 2004). Perkara ini memberikan garisan keuntungan yang lebih baik berbanding dengan mengambil buruh tempatan kepada majikan.

Menurut Katz (1986), upah tinggi boleh meningkatkan daya usaha pekerja, mengurangkan kos pusing ganti buruh, menggelak pekerja bersatu dan mengenakan tekanan melalui kesatuan sekerja dan menarik pekerja

yang berkualiti. Hubungan produktiviti dan upah adalah selari iaitu apabila upah meningkat dan produktiviti turut meningkat. Perkara ini, memberikan gambaran bahawa sekiranya majikan mahukan peningkatan produktiviti syarikat maka peningkatkan kadar upah perlu dilakukan. Sekiranya diteliti kadar upah buruh asing yang datang ke negara kita, upah mereka adalah lebih tinggi berbanding upah di negara mereka. Walaupun kadar upah mereka adalah rendah berbanding buruh tempatan dalam industri binaan negara.

PENYELIDIKAN

1.0 Sampel

Sampel yang diambil pada bulan Mac 2007 melibatkan pihak yang menggunakan buruh asing dalam kerja pembinaan mereka iaitu kontraktor. Sebanyak 30 sampel yang terdiri daripada kontraktor yang berdaftar dengan Pusat Khidmat Kontraktor (PKK) serta Lembaga Pembangunan Industri Pembinaan Malaysia (CIDB) di sekitar negeri Perlis dan Pulau Pinang. Tumpuan hanya diberikan ke atas penggunaan buruh mahir oleh kontraktor di sekitar dua buah negeri ini.

2.0 Analisis

Beberapa penemuan berikut telah diperolehi hasil daripada soal selidik yang dijalankan. Penemuan utama ialah pengambilan buruh mahir asing adalah melebihi daripada buruh mahir tempatan yakni melebihi separuh daripada keseluruhan buruh mahir di syarikat-syarikat yang terlibat. Kecenderungan untuk menggunakan tenaga kerja asing boleh dikaitkan dengan sebab-sebab berikut :

- Sikap buruh mahir asing yang kurang cuti.
- Kadar upah yang lebih rendah berbanding upah yang perlu dibayar kepada buruh tempatan.
- Ketahanan dalam melaksanakan kerja .
- Sikap yang lebih komited dalam pekerjaan.

Berhubung objektif kedua, adalah didapati terdapat sedikit perbezaan di antara bidang kemahiran yang ditawarkan di institusi kemahiran dengan keperluan sektor binaan. Didapati semua kategori buruh mahir adalah di tahap yang diperlukan dalam syarikat yang dikaji tetapi tidak kesemuanya ditawarkan oleh institusi kemahiran. Kursus-kursus yang diperlukan oleh sektor binaan tidak ditawarkan oleh institusi kemahiran termasuklah kursus tukang cat, tukang kayu halus, pekerja logam, tukang buat longkang, tukang kaca, pengimpal dan pengendali loji binaan.

3.0 Penemuan

Penemuan utama yang diperolehi adalah kontraktor yang mengguna tenaga buruh mahir asing adalah melebihi separuh daripada jumlah buruh mahir yang bekerja dengan mereka. Perbezaan sikap, kesanggupan dan komited terhadap kerja adalah sebab-sebab yang membezakan antara buruh mahir asing dan buruh mahir tempatan. Perkara ini jelas menggambarkan sebab berlakunya pengambilan buruh mahir asing di negara kita.

Perbezaan kadar upah bagi buruh mahir tempatan dan asing menyebabkan kontraktor lebih gemarkan pengambilan buruh mahir asing di mana kadar upah yang rendah akan meningkatkan keuntungan kepada kontraktor.

Hasil kajian yang dilakukan menunjukkan keperluan tenaga buruh mahir dalam sektor binaan masih pada tahap yang diperlukan kerana institusi kemahiran tidak menyediakan kursus yang lebih menjurus kepada penyediaan buruh mahir dalam sektor binaan. Hanya Akademik Binaan Negara (ABM) sahaja yang menyediakan buruh mahir mengikut keperluan. Perkara ini boleh dilihat dengan lebih jelas dalam Jadual 5 iaitu keperluan kontraktor dan penyediaan buruh mahir yang disediakan oleh institusi kemahiran. Akademik Belia Negara yang lebih memberi fokus dalam menyediakan buruh mahir dalam sektor binaan iaitu 14 kursus daripada 15 kesemua senarai buruh mahir yang dikeluarkan oleh CIDB.

CADANGAN

Dalam pemerhatian dan penelitian terhadap kajian yang telah dilakukan ini, pengurangan pengambilan buruh mahir asing boleh dilakukan dengan semua pihak memainkan peranan masing-masing. Kekurangan buruh mahir tempatan merupakan faktor pengambilan buruh mahir asing berlaku. Oleh itu, kerajaan perlu melakukan penilaian terhadap kursus yang ditawarkan oleh institusi kemahiran kerana kursus yang ditawarkan perlulah memenuhi kemahiran yang dikehendaki oleh kontraktor dalam sektor binaan dan bukan hanya menumpukan kepada bidang profesional dan pra-profesional.

Institusi kemahiran perlulah memainkan peranannya sendiri dalam melakukan kajian terhadap kursus yang relevan dengan keperluan dalam sektor binaan. Seterusnya, penambahan pengambilan pelajar untuk memasuki institusi kemahiran perlulah dilakukan supaya masalah lambakan buruh mahir asing dapat diatasi dengan segera dan berkesan.

Faktor-faktor lain juga perlu dilihat oleh institusi kemahiran dalam menyediakan buruh mahir yang memenuhi segala kehendak kontraktor. Sikap merupakan perkara penting dalam pengambilan pekerja oleh majikan kerana kecenderungan kepada hasil kerja akhir.

KESIMPULAN

Secara kesimpulannya, pengurangan pergantungan kepada buruh mahir asing dapat dilakukan dengan kerjasama daripada semua pihak yang terlibat. Kerajaan melalui institusi kemahiran perlulah menambah bilangan pengambilan pelajar ke dalam institusi kemahiran dengan menambah bilangan pusat kemahiran atau membesarkan institusi kemahiran. Selain itu, institusi kemahiran perlu menjalankan kajian terhadap kursus yang relevan dalam menyediakan buruh mahir dalam sektor binaan termasuklah kursus terhadap keperibadian buruh mahir itu sendiri. Oleh itu, kesedaran dalam diri masyarakat adalah penting dalam membangunkan negara dengan menggunakan kemahiran dan kudrat sendiri. Perkara ini akan menjadi kebanggaan kepada negara sekiranya pembangunan yang dicapai adalah hasil kerja rakyatnya. ■

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Dato' Mani Usilappan

Mani Usilappan Chartered Surveyors

SALE-AND-LEASEBACK

MARKET TRANSACTIONS OR FINANCIAL ENGINEERING?



Building contract.

of _____, referred to as _____ and has

A sale-and-leaseback deal is one in which the owner of an asset sells his asset and lease back from the purchaser at an agreed rent or terms of payment for a period of years.

In other words, the asset's ownership and occupation or use are differentiated and separated. The leaseback is usually for a fixed term of years, with guaranteed rentals by the vendor.

Introduction

According to Tipping and Bullard (2007), the normative sale-and-leaseback transaction is one in which the owner of a property sells that property to a third party and simultaneously takes a lease on that property from the third party (Adams and Clarke, 1996). In other words, the original owner sells the property to an investor, who immediately becomes his landlord.

Hence, in a sale-and-lease back arrangement, the vendor disposes his asset together with all the risks of ownership of that asset to a third party, but the risks of occupation is retained by way of an assured leaseback mechanism.

In a normal sale and purchase, the asset is transferred without any rental arrangements; both the ownership and occupational rights and risks are transferred.

The history and growth of the sale-and-leaseback, as traced by Tipping and Bullard (2007), are as follows:

Adams and Clarke state that the sale-and-leaseback model can be traced back to the UK in the late 1920s and early

1930s, having been used there by a number of retailers to raise capital. The model's first large-scale use was in the USA, where it was first used in 1936 by Safeway Stores (Adams and Clarke, 1996). Here, it was used for several supermarket premises. Usually, it was used as a device to facilitate the takeover of family-owned supermarket businesses. Often, the capital released from the sale-and-leaseback of a supermarket premises raised sufficient capital to pay for both the premises and the business. This set the precedent for the large-scale growth of the model for many types of operational property in the USA.

In Malaysia, the growth of the sale-and-leasebacks (SAL) can be traced to the Employment Provident Fund (EPF) which chose this mechanism in the mid-nineties to invest into real estate, buying such properties as KFC Building in Jalan Sultan Ismail, the Giant Supermarket Chain, SOGO along Jalan Tuanku Abdul Rahman, etc.

The real growth and impetus into the SAL took off when M-REITs gained popularity. The Al-Aqar and the Boustead REITs are wholly SALs, whilst the others have some properties under SAL arrangements. The AmanahRaya REIT has a large holding of SALs.

The growth in SALs was a result of the move towards strategic Corporate Real Estate Asset Management (CREAM). Operational enterprises found a substantial amount of their assets locked in real estate. Strategic corporate planners found that through SAL, they could unlock the assets and deploy the liquid assets in expanding the businesses or venturing into new businesses.

Devaney and Lizieri (2004) state that most businesses can expect their normal trading activities to achieve a considerably greater return than that which could be expected from property yields. They argue that where this is so, the holding of operational property has a detrimental effect on the value of the business. Hence, if the capital locked into property were to be released and re-deployed in the business, that business could be more profitable. Holding both the business and the operational property within a single company will distort the company's accounts. Placing them into separate entities can overcome this.

Using the proceeds of property sales to recycle capital back into the core business, and generate a return on capital that is higher than the cost of funds, is for many an often far more

attractive commercial proposition. The increasing breadth and depth of quality assets becoming available is welcomed by investors enabling them to demonstrate their financial and property management skills and expertise and achieve greater economies of scale (KPMG, 2006).

Operational property can be used by enterprises in several ways. SAL is not the only way to use operational property. Other ways, with an infinite number of variations have always been used by businesses. These are:

- inclusion of all operational property within the structure of a single trading entity;
- separate property and trading divisions;
- sale-and-leaseback;
- sale-and-manage back; and
- property outsourcing.

These approaches are capable of adaptation and variation. In addition, a number of premises have never been owned by operating companies. Instead, they have always been rented from landlords (Tipping and Bullard, 2007).

Examples of SALs in Europe

Some important SALs done in Europe pre 2006 are featured in Table 1.

The main motives driving the sale-and-leaseback model, as per Tipping and Bullard (2007), which are not necessarily mutually exclusive, are:

- finance;
- accounting;
- taxation;
- specialisation; and
- flexibility.

As explained by Aart C. Hordijk, Dirk Rompelman & Leonie Koerhuis (2010), the release of capital is presently one of the main factors driving the sale-and-leaseback model in the UK. Barris (2002) identifies capital release as being an important consideration in sale-and-leaseback since the turn of the century. The attractions are that a trading company may be able to better optimise its capital through focusing on trading activities or may be able to reduce its borrowings through adoption of the model.

... [the] sale-and-leaseback transaction is one in which ... the original owner sells the property to an investor, who immediately becomes his landlord.

Table 1: Selection of key announced and completed sale-and-leasebacks

Name	Date	Size	Buyer	Country
ABN AMRO	Jul-05	£175 million	Evans Randall	UK
Boots	Aug-05	£298 million	REIT Asset Management	UK
Coop	Dec-05	€442 million	ING Real Estate	Sweden
Debenhams	Mar-05	£495 million	British Land	UK
Dresdner Bank	Dec-05	€2 billion	Fortress	Germany
Goldman Sachs	Jun-05	£280 million more than £120 million	Tishman Speyer	UK
IBM	Nov-05	million	Highcross	UK Germany, Hungary and
Praktiker	Dec-05	€500 million	IXIS AEW Comme rzLeasing und Immobilien	Portugal
State of Hessen	Oct-05	€1.07 billion	Gruppe	Germany
Tesco	Mar-05	£366 million	Consensus Business Group	UK
Tesco	Nov-05	£270 million	Morley Fund Management	UK
Travel Lodge	Oct-04	£400 million	Prestbury	UK
Vendex	Nov-05	Approx. €1.4 billion	IEF Capital	Netherlands

Reference: KPMG (2006), "Sale-and-leaseback takes the spotlight", available at: www.kpmg.co.uk/pubs/sale_and_leaseback.pdf

Another important advantage of a sale-and-leaseback transaction, next to Tipping and Bullard (2007) and Korb (1972) described by Clark (1964) and Rhoads (2001), is the use of sale-and-leaseback to avoid taxes. Without the ownership of the building, the company does not pay property taxes. At the same time, the rent paid to the lessor is generally fully deductible, which could lower income tax. This might be a motive for the management of a company to choose for the sale-and-leaseback model.

The company's management can also have a more strategic motive for the choice for the sale-and-leaseback model. Specialisation is an important point in a lot of companies. The property can be sold to a company which had the expertise in exploiting properties, and the selling company can specialise itself in his own core business which releases the company from the liability to manage the property.

Leasing instead of owning also creates a certain kind of flexibility. It can, for example, be decided based on a business plan that a certain location should be closed in the future, and management considers it sensible to divest the ownership of this location in a timely manner via a sale-and-leaseback transaction. By securing in the agreement the right to sub-lease the building, the lessee can even create extra flexibility.

Further, it can be the case that in an overstressed property investment market, high-book profits can be achieved, while management believes that this will not be possible to this extent in the future. From the point of view of timing, it can then be decided to make such a transaction. An important consideration furthermore is that there will be no more liability for fluctuations in the value of the property.

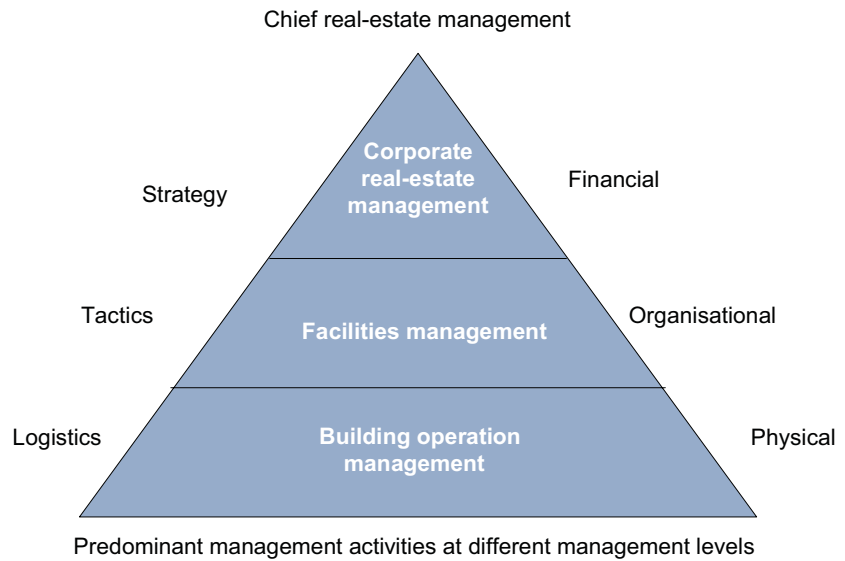
Potential Benefits for Vendor and Purchaser

KPMG (2006) identified in their publication "sale-and-leaseback takes the spotlight", the following benefits:

Potential seller benefits

- Frees up capital to fund CAPEX or merger and acquisition activity or to reallocate to core activities.
- Tax benefits are realised by offsetting lease costs as an operating expense.
- Seller remains in day-to-day operational control of the property.

Figure 1: The Three Levels of Real Estate Management



Source: From property measurement by Renko Bon, MacMaha & Carder, (1995)

...the selection of the right type of property, the need for operational purposes, the track record and quality of vendor is vital to the success of the SAL.

- Improvement of balance sheet through exchange of fixed assets, often carried at a below market value, for cash.
- One-off profit and loss account benefit reflecting profit realised over book value.
- Transfers property value risk to a third party on a fully transparent basis.

Potential investor benefits

- Property value may appreciate during the lease term.
- Investment often requires no or only modest property management activity.
- Long-term leases are attractive to lenders, enabling high debt leverage.
- Immediate positive cash returns on equity which may improve during lease term to facilitate refinancing.

The Three Levels of Real Estate Management

In corporate Real Estate Management, three levels of management have been recognised. These are explained by way of a chart. At the third level is the corporate strategic level. It is this level that is addressed in SALs. The other two levels are really general property management functions.

Risks and Uncertainties in SAL

Baum and Crosby (1988), have identified a number of possible risks which could affect a property investment, for instance:

- 1 tenant risk
- 2 sector risk
- 3 structural risk
- 4 legislation risk
- 5 taxation risk
- 6 planning risk
- 7 legal risk

The table below analyses the risks as identified by Baum and Crosby (1988) as to who will be liable for the risks. It is clear that by divesting the real estate the owner-occupier of an operational enterprise is able to diversify his risks to the purchaser, but remains responsible for the payment of rent. Hence, it can be argued that the biggest risk for the purchaser in a SAL is the tenant risk which is borne by the vendor.

Table 1: Risk Spread between Owner Occupied and Tenanted Properties

Type of Risks	Owner occupied	Tenanted	Sale-and-leaseback
Tenant Risk	By Owner-Occupier	By Occupier	By Occupier
Sector Risk	By Owner-Occupier	By Owner	By Owner
Structural Risk	By Owner-Occupier	By Owner	By Owner
Legislation Risk	By Owner-Occupier	By Owner	By Owner
Taxation Risk	By Owner-Occupier	By Owner	By Owner
Planning Risk	By Owner-Occupier	By Owner	By Owner
Legal Risk	By Owner-Occupier	By Owner	By Owner

Reference: Baum and Crosby (1998) modified by Mani Usilappan

...SALs can easily be turned into a financing activity rather than a property investment. Especially in the current deregulations on finance and the globalisation of funds, the distinction between capital and assets is being blurred.

Issues and Problems with SAL

Win-win arrangements

As explained above the attraction of SAL is that it provides a win-win attraction for both the vendor and the purchaser. For the vendor capital tied up in the assets is unlocked and is available for use in business expansions or reinvestment into other businesses. For the purchaser there is the assurance of income, through the leaseback guarantees by the vendor. It is this win-win position that gives rise to lots of manipulations especially if the vendor or the purchaser does not act in accordance with robust market practices.

As the sale-and-leaseback can be easily turned into a "money lending" exercise, prudence and knowledge of property market activity, trends, price levels and property risk analysis play a major role.

Cheaper costs of funds

The unlocking of assets provides cheaper access to money. The borrower will probably be given a loan of 70% loan to value and the bank's lending rates which are usually 150 to 200 basis points above Base Lending Rates. Currently cost of funds will be in the region of 7.5 to 8.0%. With leaseback guaranteed pegged at 7%, the borrower cost of funds is cheaper. Obviously, it is possible for large tranches of loans to be borrowed at between 4.5 to 5%. In this case the ability of the usage of funds in business expansion will outweigh the extra cost. Also the advantage of writing of rental payments as expense, added with the ability of the new investment to bring in higher than rental income makes SAL a means to cheaper access to funds.

Vehicle for investment

The guaranteed rentals built into the leaseback make it a good investment vehicle for large tranches of cash. Pension funds and other investors will find this sort of investment attractive because large amounts of money can be invested with assured security of rental income.

Assured returns for purchaser

The leaseback provides for guaranteed income. However, these guarantees are only as good as the guarantor. If the lessee is unable to meet the commitments, then the investment will be at risk. Hence, the selection of the right type of property, the need for operational purposes, the track record and quality of vendor is vital to the success of the SAL.

Legal and financial instruments

The very nature of a tied arrangement in a SAL requires careful legal arrangements to prevent it becoming a disaster. The tenant's covenants need to be verified. The period of lease, agreed rents, increases in rents according to market changes, break clauses, if any, buy back arrangements, manner of arbitration, in the event of disputes all need to be spelt out clearly.

High pricing

The Malaysian experience with sale-and-leasebacks is that the investors in SALs want a 7% return on their historical cost. This means that for some time of properties for which

...it will appear a better proposition that the SALs be structured in such a way that a professional property manager be appointed or outsource the property management to credible professional property managers with sound exposure and fully underpinned by professional indemnity insurances.

the market yield is more than 7%, the prices being paid would be high.

Generally, industrial buildings such as warehouses, factories and plantation lands would fetch a higher yield than 7%. This would mean that investors, such as REITs, by buying at a 7% return on their investment would actually be paying higher prices.

On the flip side, when vendors sell office properties which generally now are valued at 6 to 6.5%, would be selling their property cheaper. Hence, very few quality office buildings are in the portfolio of Fund Managers. In instances where such properties exchange either the prices are priced high with a rental guarantee of 7%, which the market might not be able to support. This provides added risks to the vendor, especially if the lessee defaults on his payments. Some vendors provide a capital amount as sinking fund to top up the difference of the rental and the agreed 7%. It is submitted this kind of arrangement is not property investment, but more akin to money lending.

Support by Market Rents

In some cases, the market rents passing cannot sustain the 7% wanted. Although the vendor gives a guarantee, this guarantee, in the absence of a market supported rental must be viewed with great care. Although finance documents tie down agreed increases in the future these are not attractive.

No considerations for overage i.e. rental growth

Often the leaseback arrangement is fixed at the agreed 7% return on the historical price. Although some leasebacks do allow for agreed increases, these increases are often miniscule. There are instances when rental increases are reaped or creamed away by the vendor/lessee. When rental yields rise above the 7%, the vendor/lessee takes the overage as his. Agreements must be structured such that the purchaser can obtain a share of the growth, if not the whole of the growth. Most SAL agreements in the UK are upwards only reviews. This safeguards the investors' returns.

Financial Engineering

As observed earlier, SALs can easily be turned into a financing activity rather than a property investment. Especially in the current deregulations on finance and the globalisation of funds, the distinction between capital and assets is being blurred. The SAL vehicle can be used as a lending package where the vendor obtains as much as 100% of the value by paying a fixed rate of 7%. If he borrows money on the asset, traditionally, he will only obtain 70% of the value with a 150 to 200 basis points over the Base Lending Rate, thus effectively making his borrowing not only expensive, but also getting a lower amount. In addition, whenever there is an increase in rentals, the vendor/lessee stands to gain because of the overage.

As observed by Devaney and Lizieri (2004), businesses can expect their normal trading activities to achieve a considerably greater return than that which could be expected from property yields. Therefore, unlocking 100% of their asset value for 7% is attractive against a business return of 15 to 20%.

Property Management Issues

In most SALs the vendor/lessee is responsible for service charges, outgoings and other property expenses. The return to the purchaser is not only net, but is also hassle free and relieves him of any property management activities, save those of a watch dog nature. As the property management is by the vendor/lessee the purchaser needs to keep tight control over what is being spent and done on the property so that any depreciation or obsolescence effects are mitigated and prompt action taken by the vendor/lessee. A under provision for property management expenses would be detrimental to the investor, as in the long run his investment would be severely depreciated.

On the other hand, the vendor/lessee by accepting the property management function carries the risk of the proprietor of the property whose liability and risk is to ensure that proper property management takes place.

Again looking into managing corporate real estate, if the leaseback carries the property management function, then the corporate strategy to sell the property to concentrate on the core business is not achieved as the vendor/lessee is still encumbered with the property maintenance and management function, even though the property is no longer his.

Looking at these scenarios, it will appear a better proposition that the SALs be structured in such a way that a professional property manager be appointed or outsource the property management to credible professional property managers with sound exposure and fully underpinned by professional indemnity insurances. ■

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LIST OF NEW MEMBERS

July-August 2010

QUANTITY SURVEYING FELLOW

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Perunding DMA S/B, KL

Sr Mohd Farid b Naim

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Kem. Tenaga, Teknologi Hijau & Air,
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Sr Kee Ching Ching
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Caw. Pengurusan Korporat, JKR HQ

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Unitech QS Consultancy S/B, Penang

Azman b Hamzah
Total QS Services S/B, JB

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KPK QS (Sarawak) S/B

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KCL QS Konsult, KL

Chin Wei Min
Perunding C + T Management, KL

Ewe Jun Wei
Unitech QS Consultancy S/B, Penang

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Rider Livett Bucknall LLP, Singapore

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Pembinaan BLT S/B, Putrajaya

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Amer & Associates, Sel

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GAPPDMS, Kuching

Mustafa b Mohd Said
Dasa Sentosa S/B, PJ

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Caw. Pengurusan Projek, JKR HQ

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Primakos, Penang

Nurul Hani bt Muhamad Sabri
Ahmad Zaki Perunding NFL S/B, KL

Nurul Izzati bt Mohamed Najib
Perunding NFL S/B, KL

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JKR HQ, KL

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Primakos, Penang

Syuhada bt Mohamad
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Goh Chung Han
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KPK QS (Sabah) S/B

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Chee Eng Seng

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Foo Sze May

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Muhamad Taufiq b Abdul Majid

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Norain bt Abbas

Nordiana bt Abu Bakar

Norfarhana bt Zakaria

Norjuhaida bt Abd Razak

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Noor Suhaida bt Mohamad Said

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JUPEM Negeri Sembilan

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Firdaus b Yusof
Perbadanan Bekalan Air Pulau Pinang

Haliza bt Ab Karim
Politeknik Kota Melaka

Mardhati bt Abdul Rahim

Mashita bt Abdul Razak

Mohamed Solleh b Shamsudin
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Pucak Palma S/B, Perak

Norazura bt Mizal azzmi
UiTM Perak

Norimah bt Madding

Norizan bt Mahmud
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Akhtar b Ahmad Izzat

M Fadlee b Hamzar

Mohamad Nazri b Ngabeni

Mohammad Akmal b Abdul Aziz

Mohd Amirudin b Abu Zar

Mohd Fikri b Mohd Sidek

Mohd Ire b Abdul Hamid

Muhammad Zekry b Mohamad Zaki

Nur Ain Izzati bt Mamat

Ros Afidah bt Saharudin

Siti Nadiyah bt Abdul Rahim

Syed Ahmad Hafiz b Syed Mohd Zainudin



Educational Loan Awards for 2010/2011

The Institution of Surveyors, Malaysia invites application from Malaysia Citizens for Educational Loans to pursue full-time courses at local universities.

Universities

University of Malaya
University of Technology Malaysia
University of Technology MARA
University of Science Malaysia
International Islamic University of Malaysia
University Tun Hussein Onn Malaysia

Field of Study

Land Surveying
Quantity Surveying
Building Surveying
Property Management / Estate Management

Eligibility

- Candidates must have obtained an offer for admission for full time studies to any of the universities in any of the field specified above.
- Candidates must not have received any scholarship or financial assistance from the Government or any other organization.

Special Incentive

Candidates who obtained in their studies;

- a. 1st Class Honours:- The whole of Educational Loan will automatically be awarded as scholarship.
- b. 2nd Class Upper:- 50% of the Total Educational Loan may be considered to convert as scholarship upon reviewed by Committee.

Value of Loan

Degree: Up to RM7,000 per annum
Diploma: Up to RM5,000 per annum

Guarantors

Candidates shall obtain the consent of two acceptable guarantors who must provide personal guarantee for repayment of the loan.

Repayment of Loan

Loan amount must be repaid with a period of not less than 36 months after the recipient has graduated.

How to apply

The application form, may be obtained from the ISM Secretariat or downloaded from ISM website:
<http://www.ism.org.my>.

(Closing Date: 31 December 2010)

All application must be sent to:

The Chairman

Scholarship and Education Fund Committee

The Institution of Surveyors, Malaysia
3rd Floor, Bangunan Juruukur, 64-66, Jalan 52/4, 46200 Petaling Jaya



Educational Loan Awards 2010/2011 for Post Graduate Programme

The Institution of Surveyors, Malaysia invites application from Malaysia Citizens for Educational Loans to pursue full-time courses at local universities.

Universities

University of Malaya
University of Technology Malaysia
University of Technology MARA
University of Science Malaysia
International Islamic University of Malaysia
University Tun Hussein Onn Malaysia

Field of Study

Land Surveying
Quantity Surveying/Project Management/Construction Management
Building Surveying
Property Management / Estate Management

Eligibility

- Candidates must have obtained an offer for admission for full time studies to any of the universities in any of the field specified above.
- Candidates must not have received any scholarship or financial assistance from the Government or any other organization.
- Candidates must be at least a Graduate member of the Institution not less than 3 years at the time of application.
- Repayment of study loan within the period of 3 and 5 years for the Master Programme and the PhD programme respectively.
 - Duration of Studies for:-
 - a) Master Program- must not exceed 2 years
 - b) PhD Program- must not exceed 5 years

Value of Loan

Master Program: Up to RM10,000.00 per annum
PhD Program: Up to RM20,000.00 per annum

Guarantors

Candidates shall obtain the consent of two acceptable guarantors who must provide personal guarantee for repayment of the loan.

Repayment of Loan

Loan amount must be repaid with a period of not less than 36 months after the recipient has graduated.

How to apply

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3rd Floor, Bangunan Juruukur, 64-66, Jalan 52/4, 46200 Petaling Jaya

Associate Professor Sr Dr Ting Kien Hwa FISM

Editor

Editorial Board

CORPORATE GOVERNANCE AND THE PROPERTY MANAGEMENT OF REIT PROPERTIES

With the successful launching of the Malaysian REITs in 2005, the REIT industry today has grown significantly into a RM10 billion Ringgit indirect property industry. This implies at least RM10 billion worth of public real estate are under formal management of professional Property Managers.

One of the main features of the REIT sector in Malaysia is the high level of ownership concentration and significant participation of owners in management - an insider system of corporate governance.

Concentrated ownership brings potential advantages such as controlling shareholder has high monitoring incentives, the opportunity to provide more focused strategic direction and could facilitate long term commitment.

However, past studies on East Asian companies have shown that such concentrated ownership with excessive power has reduced the effectiveness of important shareholder protection mechanisms such as shareholder participation through voting, transparency and information disclosure. When ownership is concentrated, the firms' operations could be structured to serve the insiders' interest to the detriment of overall profitability of these

companies. In the past, major shareholders could divert wealth from investors such as paying themselves special dividends, or force the firm to make related party transactions/deals with other companies they own to transfer wealth to themselves.

The central issue for corporate governance under these conditions is therefore to prevent the controlling shareholders from expropriating the assets of the minority shareholders.

The corporate governance practices and policies of REIT Managers are guided by measures recommended in the *Guidelines of Real estate Investment Trusts* issued by the Securities Commission, the *Malaysian Code on*



Corporate Governance and the Listing Requirements of Bursa Malaysia Securities Berhad.

With regard to the property management of REIT properties, under the SC REIT Guidelines, the real estates of a REIT shall be managed by a Property Manager duly appointed by the REIT Manager and approved by the Trustee. The Property Manager appointed to manage the real estates of REITs shall possess adequate human resources with the necessary qualifications, expertise and experience in real estate management.

Of late, there are requests by REIT sponsors to remove the requirement to appoint external independent property managers to manage REIT properties. REIT sponsors have proposed to internalise the property management function by having in-house property management team employed directly by the REIT Managers. This proposal is contrary to the best practice of corporate governance.

For the best practice of corporate governance, there is a need to minimise insider trading, related party transactions and incidences of capricious decision-making. Property management of REIT properties is no exception. Clarity, consistency and timeliness of disclosed information are necessary to protect the interest of minority shareholders.

Members of the ISM who are appointed as independent non-executive directors of REITs would be in a position to explain and convince the sponsors and the Board of Directors of REITs that property managers need to be independent and external to the REIT organisation for the sake of corporate governance where:

"Corporate governance is the process and structure used to direct and manage the business and affairs of the company towards enhancing business prosperity and corporate accountability with the ultimate objective of realizing long term shareholder value, whilst taking into account the interests of other stakeholders."

(HLFC, 1999, p.52) ■

This current requirement on the appointment of an external Property Manager for REIT is in fact a good corporate governance practice, as it ensures that the Property Manager does not have close relationship with the REIT Manager.

If the property manager is not independent of the REIT Manager, in such circumstances, there exists opportunities for favourable treatment of sponsor properties over other REIT properties and/or overpricing of services by the REIT Manager. There would also potentially be a lack of transparency in the costs of maintenance and management of the REIT properties.

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W.M.A. Wan Hussin
Universiti Sains Malaysia

POSITIVE SELF-TALK AND STRESS REDUCTION



Patterns of negative or positive self-talk often start in childhood. The educating roles played by our parents and teachers are significant as its effects are so deep-rooted it colours our thinking. It will dictate the way we think and react to situations that arise before us.

Usually, the self-talk habit influences our thinking pattern and the way stress is handled.

However, any time can be a good time to change the negative self-talk attributes to induce more positive self-talk. By bringing more positive energy into your life and surrounding yourself with positivity it induces the mind to remain optimistic and positive. The following are some easy ways you can stop yourself from using negative self-talk and use your mind to boost your productivity and self-esteem, and relieve stress.

The Connection between Self Talk and Stress

In the therapeutic community, it is believed that negative statements from others can erode our sense of self-worth. Children tend to believe negative assessments of them from teachers and parents, and develop compromised self-concept when criticised on a regular basis. It is vital that the ratio of positive-to-negative comments be at least five to one for a relationship to be healthy and survive the long-term. For these reasons, we are taught not to let others put us down, but sometimes the person eroding our sense of self-worth and limiting our potential is our own self. Our self-talk and the words our inner dialogue uses when we think, can increase our stress levels, limit our potential, and colour our experience with a negative pen.

Language Colours

Often the type of words we use, bring about deep effect on the way we are perceived by others. The usage of wrong words can also divert the perceptions of reality and any corrective measures to alter the situation and

to change the expectations are arduous. The wrong approach adopted can also be very costly, thus failing to change the mind and turning self-mastery into self-sabotage with our own thoughts and negative pen.

The following two (unedited) excerpts, the first by Ms Tishondra Puspa of Seremban and the second, by Ms Ong Tek Koon of Puchong, published in the Weekender Mailbag Column of The Star newspaper dated Saturday 8 May 2010, might shed light on the context of misunderstanding due to perception and different cultures adopting different colours.

Embarrassing Misunderstanding

Late last year, I went on a trip to Beijing, China. I stayed at the Shangrila Hotel. The staff there was conversant in English, and we had no problem communicating with them.

On the first day, we went on a guided tour to the Great Wall of China. It was amazing and the guide was informative. Later, we decided to visit the Summer Palace, the Temple of Heaven, Tiananmen Square, Forbidden City and thought maybe it would be a good idea to go by taxi.

The hotel receptionist arranged a taxi service for us and gave us the contact number. The next day, I called the taxi service and said, "Hello, may I talk to Mr Chong".

The clerk replied, "Lan chow", which sounded like an expletive. I was shocked. I asked again, and she repeated what she said. Disgusted, I put down the phone.

Using self-talk that is optimistic rather than pessimistic has stress management benefits, productivity benefits and even health benefits.

As I pondered the incident, it occurred to me that she must have said, "Lunch hour". It was 1pm, after all. An hour later, there was a knock on my door. I was changing after my bath, so I replied, "Coming", as I emerged from the bathroom. Immediately, somebody opened the door.

Before I could grab a towel, I saw someone standing at the door.

He said, "I thought (you said) come in," and quickly shut the door.

It was the taxi driver the receptionist had arranged for. I decided there and then to change my plans and to take the bus to save from further embarrassment.

The next day at a park, I came across a peddler selling nuts. I enquired, and the peddler said something in Mandarin. I bought a packet and was happily munching away when I felt a pat on my back.

By bringing more positive energy into your life and surrounding yourself with positivity it induces the mind to remain optimistic and positive.

"Hey, these nuts are for birds."

Red with shame, I put the packet down and hurried away.

Embarrassing Understanding

My first trip to Penang was in 1989. Having completed our STPM examination, a few of my classmates and I made our first visit there.

We were very excited. The express bus from Malacca at midnight took five hours to reach Butterworth.

We disembarked at the Butterworth Bus Station, which was very quiet in the early hours of the morning. All the shops were closed, and there was hardly anyone around except for a few passengers.

The ferry ticket counter opened at 6am, and we got our tickets. Hour after hour passed, and we saw everybody grabbing their ferry ride.

We started to feel doubtful - where was the ferry marked "Pulau Pinang" that we were waiting for?

Finally, one of my friends asked a man nearby where the ferry to Pulau Pinang was. The man gave us a strange look and said ALL the ferries were headed to Pulau Pinang. What were we waiting for?

We were surprised and told him that we saw ferries to "Pulau Kapas", "Pulau Langkawi", "Pulau Tioman" etc. but none to "Pulau Pinang".

The man laughed heartily at this and said those were just the names of the ferries. We were stunned and laughed at our own silliness. I'm reminded of this incident every time I travel to Penang.

While the two incidents above are not nerve wrecking, the following are some other common examples we normally encounter in our daily life, and they could end up with negative ill-effects and more stress.

The next time you find yourself stressing about something or deciding you're not up to a challenge, stop and rethink, and see if you can come up with a neutral or positive replacement.

- A disagreement happens between two colleagues due to trivial matters. One is influencing the rest about the negativities of the other party and the time-bomb could explode any time. If many were more receptive to the negative remarks than the true positive values, though limited, a nightmare will crop up. With no training in positive self-talk, you would accept the negativities and the remarks labelled at them.
- Often, we may perceive the same things differently based on the words and the language used to describe them. It could be due to the person who disseminates the information, making it even worse with lots of 'additives' that change the whole scenario. The fact is people who speak different languages in a multiracial community may see the same things differently based on the words their language uses to describe these things as this can affect the perception of colours and the influence is significant.

Increased Perception of Stress

Negative self-talk can alter the experience of stress in many ways. What you perceive and what you dwell on could also colour the scenario of an incident. When your self-talk is negative, you may perceive things as more stressful. For example, when you tell yourself something is 'difficult', 'unfair' or 'hard to come by', it becomes more stressful to deal with unless you tell yourself that everything in life is 'a challenge', 'a test', or 'one of those things that you have to go through in life'. This is because the subconscious mind tends to believe the thoughts it hears. Limiting your abilities by telling yourself you "can't", "this is too hard", or "it's not worth trying" is already losing half the battle in life. Using self-talk that is optimistic rather than pessimistic has stress management benefits, productivity benefits and even health benefits.

When you tell yourself you can't handle something, you tend to stop looking for solutions. The fact that telling yourself you can't handle something is actually depriving the creativity within and prophesying negative self-talk. Stopping negative thoughts and creating habitually positive internal dialogue can reduce stress and self empowerment.

Developing the Positive Self-Talk Habit

The first step toward change is to be more aware of the problems in hand. You probably don't realise how often you say negative things to yourself and to your friends around you, but constant positive self-talk practice can make us more conscious of the internal

Stopping negative thoughts and creating habitually positive internal dialogue can reduce stress and self empowerment.

dialogue, its content and the manner it should be presented.

As you notice yourself saying something negative in your mind, you can stop your thought instantly by saying to yourself "Stop". Saying this repeatedly aloud will be more powerful, and having to say it aloud will make you more aware of how many times you are stopping negative thoughts.

As you find yourself mentally complaining about something, sometimes for the sake of complaining, rethink the assumptions. Are you assuming something is a negative event when it isn't, necessarily? Plans being cancelled at the last minute can be viewed as a negative event, but what you do with your newly-freed schedule can be what you make of it. Sometimes, cancelling the plans may be worthwhile if you stick to your decision and your reasoning. The next time you find yourself stressing about something or deciding you're not up to a challenge, stop and rethink, and see if you can come up with a neutral or positive replacement.

A good way to stop a bad habit is to replace it with something better. ■

W.M.A. Wan Hussin is a Professor at the School of Civil Engineering, Universiti Sains Malaysia. He conducts several courses on stress management and delivers public lectures and talks on management issues for various organisations. He is currently a Licensed Land Surveyor, Malaysian Speaking Professional (MSP) of the Malaysian Association of Professional Speakers, a Fellow of the Institution of Surveyors Malaysia and a Certified Professional Utility Locator and can be reached at wmabwh@gmail.com.

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Dr Richard Stejer
PM-Partners group

APPLYING 'INTELLIGENCE' TO PROJECTS

Approximately two-thirds (66%) of all projects surveyed over the past decade have failed or were challenged. Most troublesome were larger projects. Only 19% of large- projects costing US\$750,000 to US\$3 million were successful in 2009 (The Standish Group 2009).

The major causes of project failure are well documented. The causes highest on the list are not process related, as maybe expected, but are directly driven by the people dynamics of the project. PM-Partners group refers to this as the "art" and "science" of project management. Most organisations invest heavily in the "science" of project management (e.g. systems, methodology and performance management) but neglect the "art" of stakeholder management, team engagement and communication. The ability of a project manager to build a team that addresses both the art and science of project management will substantially improve the success rate of projects for an organisation.

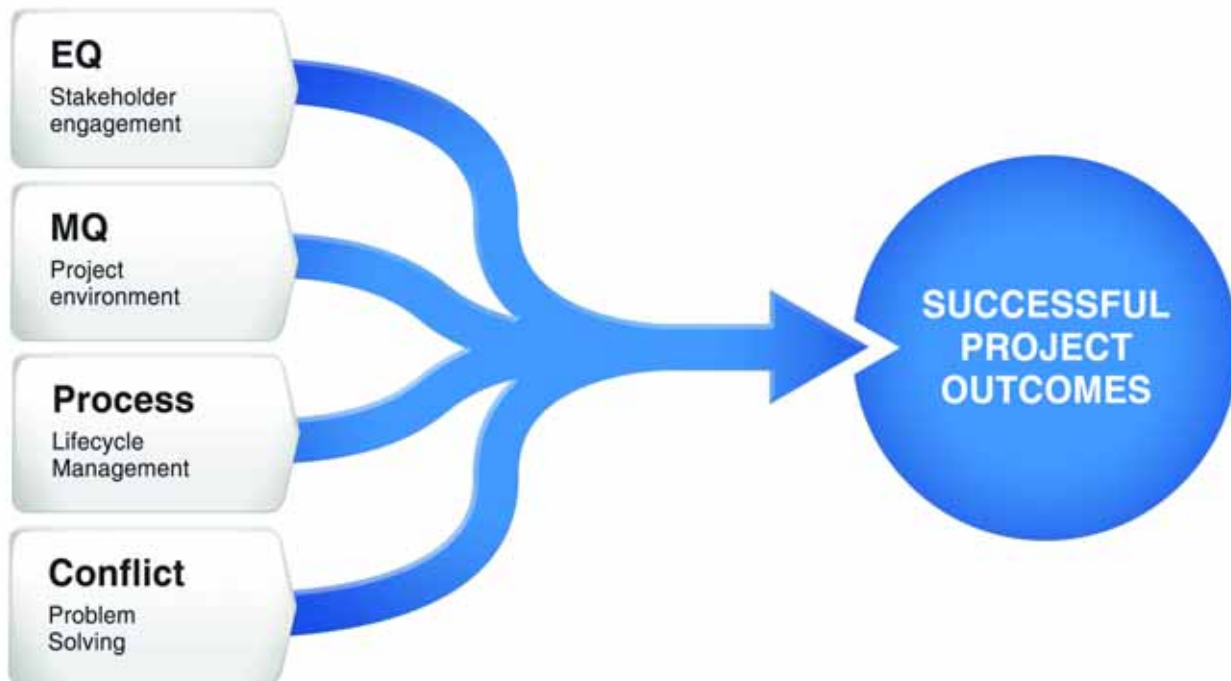
Valuing Diversity

Emerging science indicates that there are four intelligence groups that need to be harnessed within a successful project team.

As with many other aspects of life, people have different ways of approaching a



Model of Team Performance



challenge such as the delivery of a project. Some people will be successful at the art, and others will excel at the science. A person's experience, natural inclinations, education and influences will determine which intelligence they have developed.

Top 3 Causes of Poor Performance*

- Lack of User Involvement 15.9%
- Lack of Executive Support 12.8%
- Lack of User Input 12.3%

(The CHAOS Manifesto, 2009, The Standish Group International)

Emotional Intelligence (EQ)

Emotional Intelligence encapsulates the soft skills required to effectively engage people. Within the project management context these people are most adept when engaging with stakeholders. People with high "EQ" are able to take a very considered approach to their communication and interaction with others. They understand the logic surrounding what needs to be achieved, they can put themselves into the shoes of others and use well-honed communication skills to bring about a positive response. Contrary to popular

Contrary to popular understanding having good "people" skills doesn't mean you're always placating people.

understanding having good "people" skills doesn't mean you're always placating people. Instead, having high EQ means you also know when to stand firm and how to crack the whip when appropriate.

Management Intelligence (MQ)

People with high management intelligence are masters of managing the interface between the project and the organisation. They have a "head" for organisational structure and are able to translate organisational goals and needs into project outcomes. They understand how to work the system to secure resources for the project. They know when to engage in politics and when to avoid it.

Process Intelligence

Vital to all projects is effective methodology; finding the balance between control and flexibility, enabling people to efficiently and effectively complete tasks. People with high process intelligence know how to

strike that balance. They know how to create trusted processes that give people clear direction and confidence.

Conflict Intelligence

In the project management context, conflict intelligence isn't so much about sorting out problems between people but rather having the smarts to effectively manage competing solutions. Often there is more than one way to complete a task or achieve an outcome. A person with high conflict intelligence can work through the benefits of each solution, assess relevance, impact and requirements and then recommend the optimum path.

Optimising Your Project Team

Whether you have the opportunity to build a team from scratch or have inherited an existing team, there are some fundamental steps you can take to optimise the performance of your team.

The first principle to keep top of mind is that you want all four intelligence groups to be covered by your team. The absence of any of the groups will contribute to project failure. If there are any significant gaps in the team then you need to consider ways of bridging that gap, either through recruitment or skills development.

1. Capability Assessments

Conduct an assessment of each team member using proven psychological profiling tools such as Bar-On EQi to identify each person's strengths. Build people's roles within the team to play to their strengths. If you are recruiting new members, assess gaps within the existing team and use your recruitment strategy to address those shortfalls.

2. Competency Training and Mentoring

No team or person is perfect. In most instances new skills will need to be developed. There are a variety of formalised training courses available that address each of the required skills areas. It is important to note, from our experience, that training delivers only part of the desired outcome. If you are managing a complex or important project we strongly recommend

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The causes highest on the list are not process related, as maybe expected, but are directly driven by the people dynamics of the project.

combining training with on-the-job mentoring by experienced project managers with the skill sets you would like to replicate.

3. Health Checks

Project health checks can be conducted at the start, during or at the end of a project. Health checks are an easy, unobtrusive spot check on how the team is performing in practice. Health checks will provide you with valuable insights enabling you to fine-tune team performance. ■

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RESEARCH & CONSULTANCY

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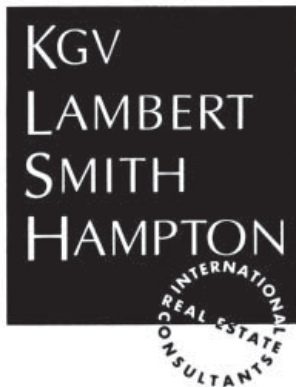
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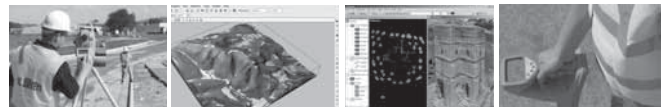
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- To instigate the transformation of quantity surveying business processes and capability through the implementation of innovative tools and practices.
- To explore the expanding roles of quantity surveyors involved in new areas beyond construction.
- To create awareness on the direction of quantity surveying professional services with reference to the global market.
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