



UNIVERSITI SAINS MALAYSIA
PUSAT PENGAJIAN ILMU KEMANUSIAAN • SCHOOL OF HUMANITIES
11800 USM PULAU PINANG • MALAYSIA

28hb. Okt. 2002

Professor Ahyaudin Ali
Timbalan Naib Canselor
Penyelidikan dan Pembangunan
Canselor

Melalui,
Prof. Madya Norizan Md Nor
Dekan
Pusat Pengajian Ilmu Kemanusiaan

Disijuk
Mls
PROF. MADYA NORIZAN MD. NOR
Dekan
Pusat Pengajian Ilmu Kemanusiaan
Universiti Sains Malaysia
11800 USM Pulau Pinang

Y.Bhg. Profesor, Assalamualaikum wbt.

LAPORAN AKHIR PROJEK KAJIAN: "THE USE OF INFORMATION TECHNOLOGY IN SMALL AND MEDIUM INDUSTRIES IN MALAYSIA IRPA LONG-TERM (No. Projek: 04-02-05-0003)

Dengan hormatnya sukacita saya merujuk kepada perkara di atas

Bersama ini disertakan tiga (3) naskah laporan Penyelidikan bertajuk seperti di atas yang telah siap disediakan bagi rujukan, perhatian dan tindakan pihak Y.Bhg. Profesor seterusnya.

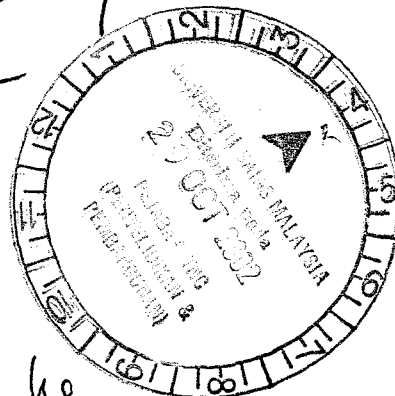
Sukacita saya mengambil kesempatan ini untuk mengucapkan berbilang terima kasih kepada pihak tuan di atas perhatian dan kerjasama baik yang ditunjukkan sepanjang perjalanan projek Penyelidikan tersebut sehingga kepada laporan akhir.

Sekian, wassalam

"BERKHIDMATA UNTUK NEGARA"
"Cintailah Bahasa Kita"

Yang benar,

su dan fahmi
D/4
s.k.h. HZ
PROF. MADYA MOHA ASRI ABDULLAH
Ketua Projek



② Baidel

*Anda dituntut ke
MOSTC s/k Perkerusi
J/K Sains berhubung.*

11/10/02

END OF PROJECT REPORT

A. Project number: 04-02-05-0003

Project title: The Use of Information Technology in Small and Medium Industries (SMIs) in Malaysia

Project leader: Associate Professor Moha Asri Abdullah

Tel: 04-6577888 ext. 2706

Fax: 04-6563707

B. Summary for the MPKSN Report (For publication in the Annual MPKSN Report, please summarise the project objectives, significant results achieved, research approach and team structure)

Project Objectives

- To examine the use of information technology (IT) especially the type of software and its application adopted by small and medium industries (SMIs) in Malaysia
- To investigate the level of IT usage with respect to sector of the industry, location, owner/entrepreneurs, education and experience of owner/entrepreneurs, as well as the performance of SMIs
- To identify factors influencing the different levels of IT usage by SMIs
- To recommend appropriate policy directive with a view towards enhancing the use of IT among SMIs

Significant Results Achieved

- Identifying nature, characteristics, types and extent of IT usage among SMIs especially type of software and its application with respect to sector of the industry, location, owner/entrepreneurs, education and experience of owner/entrepreneurs
- Distinguishing the factors influencing the IT usage and the performance of SMIs as well as appropriate policy with regard to enhancing the use of IT among SMIs
- Publication and dissemination of SMIs' facts and figures as well as knowledge's materials to enrich Malaysia's SMIss nationally and globally
- Training and supervision of two graduates, i.e. one master's student and one Ph.D students:-
 - i. The use of IT among SMIs: A case study of SMIs in Selangor and Penang
 - ii. Linkages and performances of SMIs: A case study of the manufacturing sector in Terengganu
 - iii. Financial and credit facilities among entrepreneurs of SMIs in Malaysia: A case study of Kelantan

Research Approach

- Use of the stratified and random sampling, open-ended structure of interview and evaluation research in the data collection
- Use of SPSS for data entry, analysis and advanced statistical analysis
- Application of social research methods whereby local and foreign experts were consulted to develop a viable and sustainable plan of action

Team Structure

- Project Head, Co-researchers, Research Officer and Assistant Researchers

C. Objectives achievement

-Original project objectives (Please state the specific project objectives as described in Section II of the Application Form)

- Identify and recognizes a range of types, levels and characteristics of IT usage among SMIs, while revealing different factors influencing SMIs' usage as well as levels of success among SMIs' using IT

-Objectives Achieved (Please state the extent to which the project objectives were achieved)

- Identifying types and extent of IT usage among SMIs as well as constraints that SMIs' face in utilizing IT. Numerous factors have also been identified as crucial for SMIs in adopting IT in their operation. Some policy recommendations indentified in order to enhance the utilization of IT among them
- Publication and dissemination of SMIs' facts and figures as well as knowledge's materials to enrich Malaysia's SMIs nationally and globally. At least four papers have been presented/published from this research project, other than journal's papers
- **Objectives not achieved** (Please identify the objectives that were not achieved and give reasons)

D. Technology Transfer/Commercialisation Approach (Please describe the approach planned to transfer/commercialise the results of the project)

- Methodologies used in the social sciences research.
- Research students
- Involvement in the Asia pacific Forum for Small Business (AFSB) that provides networks to develop a concerted effort for the growth and development of SMIs in the Asia Pacific countries
- Participations in other seminars and conferences nationally and internationally

E. Benefits of the Project (Please identify the actual benefits arising from the project as defined in Section III of the Application Form. For examples of outputs, organisational outcomes and sectoral/national impacts, please refer to Section III of the Guidelines for the Application of R&D Funding under IRPA)

- **Outputs of the project and potential beneficiaries** (Please describe as specifically as possible the outputs achieved and provide an assessment of their significance to users)

- Problems's identification and policy proposals for enhancing greater utilization of IT among SMIs and hence the development of SMIs in Malaysia
- Contribution to various agencies and institutions dealing with or providing support programmes for SMIs in the country such as SMIDEC, MARA, MEDEC, KPUs, MIDA, MITI, SEDCs etc.
- Identification of global network and experts who are able to collaborate future project in the areas of SMIs' development

- **Organisational Outcomes** (Please describe as specifically as possible the organisational benefits arising from the project and provide an assessment of their significance)

- Procurement of new equipment, training of research staff, post graduate researchers, and supporting staff in the use of equipments
- Linkages with officers from various agencies dealing with development of SMIs especially when the Chief of Researcher in this project was appointed as the representative consultant for Small and Medium Industrial Development Corporation (SMIDEC)
- Promotion of inter-disciplinary research fields to enhance further collaboration of future researchers to add the available pool of resources on the development of SMIs
- Increased recognition as a centre of excellence, nationally and internationally

- **National Impacts** (If known at this point in time, please describe as specifically as possible the potential sectoral/national benefits arising from the project and provide an assessment of their significance)

- Linkages with foreign researchers and foreign research institutions such as Economic Research Center, Nagoya University, Mie University and Centre for Enterprise and Economic Development Research, Middlesex University, UK.
- Linkages with domestic researchers and research institution such as IKMAS, MEDEC, NPC, SMIDEC, MEF, FMM etc.
- Skills upgrading and improved efficiency of support programmes provided for the development of SMIs in the country

F. Assessment of project structure

- **Project Team** (Please provide an assessment of how the project team performed and highlight any significant departures from plan in either structure or actual man-days utilised).

Very Good

- **Collaborations** (Please describe the nature of collaborations with other research organisations and/or industry)
- School of Humanities, USM (project Leadership, Management and Design of the whole research project)
- School of Social Sciences, USM and Faculty of Economic, UKM (provide expertise's)
- SMIDEC (becoming consultant for SMIDEC)
- AFSB (networking and conferences)

G. Assessment of Research Approach (Please highlight the main steps actually performed and indicate any major departure from the planned approach or any major difficulty encountered)

- Literature Review
- Fieldwork and Data Collection
- Analysis of Data using SPSS
- Report Writing
- Dissemination of findings through existing networks
- Participating in national and international seminars/conferences

H. Assessment of the Project Schedule (Please make any relevant comment regarding the actual duration of the project and highlight any significant variation from plan)

The project was further extended for six months instead of originally planned two years. This short extension was necessary in order to compile updated data and information of the ICT's development in Malaysia especially with regard to national IT agenda, development of the multimedia super corridor and development of communications infrastructure as well as funding for ICT industry. This indeed enabled the researchers to collect more updated resources for the purpose of documentation and dissemination of the results obtained.

I. Assessment of Project Costs (Please comment on the appropriateness of the original budget and highlight any major departure from the planned budget)

The budget was insufficient to cover wider areas of study. This made the study narrowed down to the two sates of the Peninsular Malaysia only, i.e. Selangor and Penang.

J. Additional Project Funding Obtained (In case of involvement of other funding sources, please indicate the source and total funding provided)

None

K. Other Remarks (Please include any other comment which you feel is relevant for the evaluation of this project)

ICT has direct effect on SMIs' development. SMIs seem have no choice, instead have to trasform their domestic market orientation to a more globally competitive one, whereby levels of technology, productivitiy and effieciency are the essential components to success and sustained development. This scenario becomes more of great concern for most SMIs for the simple reason that they relatively lack economies of scale, appropriate technological capability and management expertise. This is highly relavant to the Malaysian SMIs, where the realization towards higher productivity through IT and high value-added economic activities become the core development effort through multi-media super corridor (MSC) and ICT. As SMIs have been regarded as the backbone of economic and industrial development of the country, issues, problems, challenges and prospects pertaining the use of IT among SMIs should be given special attention and necessary funding to assist the collection of resources, data and information, which be useful for planning and support programmes towards future development of SMIs in the country.

Date: 28/10/02

Signature: 

Isat Pengajian	Kod Projek	Tajuk Projek	Penaja	Tarikh Mula	Tarikh Hingga Kini	Tarikh Tutup	Taraf Projek	Jumlah Geran (RM)
ASRI BIN ABDULLAH								
P ILMU KEMANUSIAAN								
	P1165	Pekerja Asing di Sektor Perkilangan : Satu Kajian di Pulau Pinang	USM	01/11/1994	31/10/1996	15/03/1996	SELESAI	7750.00
	P1351	Industri Kecil dan Sederhana (IKS) Makanan di Malaysia.	USM	01/08/1996	31/07/1998	07/02/1998	SELESAI	6385.00
	J0168	Latihan Kemahiran di Kalangan Pekerja IKS : Satu Kajian Persepsi dan Kemudahan Latihan.	IRPA J/P	01/09/1996	31/08/1997	07/07/1997	SELESAI	11000.00
	A0459	KAJIAN IMPAK PEMBANGUNAN PULAU PINANG	UNIT PENYELARASAN PELAKSANAAN BUMIPUTERA	25/02/1997			AKTIF	300000.00
	J0275	Impak Pembangunan Ekonomi ke atas Profail Sosio-Ekonomi, Migrasi dan Distribusi Penduduk di Pulau Langkawi.	IRPA J/P	01/10/1997	30/09/1998	19/11/1998	SELESAI	19560.00
	J0289	Workers and Their Working Environment in Small-Medium Industries (SMIs) in Malaysia: A Case Study.	IRPA	01/10/1997	30/09/1998	09/03/1999	SELESAI	11718.00
	J0448	Penggunaan IT dalam Enterpris Kecil dan Sederhana.	IRPA J/P	01/04/1999	30/06/2000	07/06/2000	SELESAI	15632.00
	R0601	The Assessibility Of The Government Support Programmes For Small And Medium Industries in malaysia	RM7	01/02/2000	31/10/2002	31/12/2002	SELESAI	116000.00
	R0663	The Use Of Information Technology In Small And Medium Industries (SMIs)	RM7	01/10/2000	30/09/2002	31/12/2002	SELESAI	73600.00
	P1893	Peranan Pasar Pusat Bandar dalam Pemasaran Produk IKS Songket dan Batik : Kes Kaian di Pasar Besar Kota Bharu dan Pasar Payang, Kuala Terengganu	USM J/P				DALAM PERHATIAN	0

A. Project number: **04-02-05-6015**

Project title: **Food Sanitation and safety in various food outlets**

Project leader: **Dr. Noor Aziah Bt. Abdul Aziz**

Tel: **04-6577888 ext 2219**

Fax: **04-6573678**

B. Summary for the MPKSN Report *(For publication in the Annual MPKSN Report, please summaries the project objectives, significant results achieved, research approach and team structure)*

Project objectives (i) To conduct a survey on non-compliance issue of food handlers in various food outlets (ii) To survey the hygiene and sanitation aspects food premises (iii) To conduct microbiological examinations of food samples and food premises so as to identify the sources of contamination.

Significant results achieved:

Higher percentage of the food handlers understood about sanitation from the courses conducted by the Health Ministry. Courses conducted by the management of food premises are ineffective. The food operators indicated that most consumers are not bothered by the way foods are prepared. The food handlers are not willing to sacrifice profit for sanitation and safety. They did not understand the safety of serving safe foods as higher percentage of the respondents indicated the use of low quality ingredient and improper cleaning of kitchen equipments.

The Health inspectors indicated that the food handlers are lacking in awareness in sanitation and food safety. Majority of the food handlers are not willing to spend money to improve sanitation. Shortage of labour forced the management to be lenient to errant food handlers. The food operators felt that the outbreak of food poisoning was not rampant. This may be the reason for them not to comply to the rules and regulations. The health inspectors found that violations among handlers are mostly on their personal habits and hygiene, improper handling of foods, improper toilet facilities and improper waste disposal. The main causes of food poisoning are cross-contamination of foods, contaminated raw ingredients and improper serving temperature. Warning and heavy fines are the main actions taken by the health inspectors. Heavy fines are often reduced due to political intervention.

Visual assessment in various food outlets indicated the critical problems based on the demerit scores showed that food handling practices was the main priority to consider with regard to safety. Others are like improper location, poorly designed stalls, inadequate basic amenities, and lack of adequate health awareness..

Microbiological tests indicated the presence of microbes such as coliforms, *S. aureus*, *E. coli*, *Salmonella*, *C. perfringens* V. *Cholera* in food samples, work areas, utensils and on food handlers. Their existence are due to cross-contamination of foods, improper holding temperatures and heating of foods, improper cleaning of equipments and utensils and personal hygiene. The high total plate count indicated poor personal hygiene and lack of awareness in terms of food safety.

Research approach (i) To conduct survey on food operators hadlers on the issues of their knowledge, attitude and praactice with regard to maintain food sanitation, in the effectiveness of food sanitation training courses and kind of violations of food sanitation standard, (ii) Food sanitation enforcers regarding problems during enforcement, types of violations, actions taken and the common causes of food poisoning. (ii) To conduct visual observations on the physical conditions of the outlets and the handlers, (iv) To conduct microbiological examinations of food samples in various outlets soas to identify the sources of contamination.

Team structure:

Dr. Noor Aziah Bt. Abdul Aziz Main Researcher

Zainol Che Mamat Co-Researcher
Dr. Manan Dos Mohamad Co-researcher till Sept. 1997.

Noor Fezah Mohd. Nur Research Officer

Ad' syang

C. Objectives achievement

- Original project objectives *(Please state the specific project objectives as described Section II of the Application Form)*

- To conduct surveys on non-compliance issue of food handlers in various food outlets
- To survey the hygiene and sanitation aspects in various food premises.
- To conduct microbiological examinations of the food samples and food premises so as to identify the sources of contamination.

- Objectives Achieved *(Please state the extent to which the project objectives were achieved)*

Reasons for the non-compliance issues are: i) consumers are not concern towards safety of food preparation ii) labour shortage, forced the food operators to be lenient to errant food handlers iii) food handlers regarded food poisoning as not rampant resulted in take-it-easy attitude..

Problems encountered by the health inspectors during surveillance are made known. This problems include intervention of political parties in trying to lower the fine imposed to food operators, improper food handling practices and unwillingness of food handlers to prioritized food safety rather than profit.

The physical observations on the food premises enable us to identify the main problems in the respective premises such as poor location, inadequate basic amenities, improper food handling practices, poor personal habits and poorly designed stalls and restaurants.

The microbiological examination results enable us to identify and relate the source of contamination by looking at the types of bacteria presence in the foods, work area, utensils and food handlers. Thus, effective compliance monitoring is reliant upon adequate laboratory services covering microbiological analysis.

- Objectives not achieved *(Please identify the objectives that were not achieved and give reasons)*

The microbiological examinations are only in Penang but not in Wilayah due to the locality of the Testing Laboratory and cost of chemicals and testing materials.

D. Technology Transfer/Commercialisation Approach *(Please describe the approach planned to transfer/commercialise the results of the project)*

The laboratory can be used for training of laboratory personnels.

It may also advise industry's quality control laboratories on their standards of performance

The sampling method and microbiological tests can be use in training programme for the Health inspectors, food industries and institutional food operators and laboratory personnel in university clinic that deals with food monitoring in canteens.

Regionalisation of food control laboratories allow for expensive equipment and associated skilled expertise to be most cost-effective utilised.

E. **Benefits of the Project** *(Please identify the actual benefits arising from the project as defined in Section III of the Application Form. For example of outputs, organisational outcomes and sectoral/national impact, please refer to Section III of the Guidelines for the Application of R&D Funding under IRPA)*

- **Output of the project and potential beneficiaries** *(Please describe as specifically as possible the outputs achieved and provide an assessment of their significance to users)*

The output achieved are i) information on the magnitude of the food safety problem including both health and economic consequences of unsafe and poor quality foods. ii) Information to improve food safety practices by food operators in various premises, iii) Requirement to increase public awareness of food safety through food safety programme. iv) It provide information on the status of cleanliness of the food premises in terms of the food handlers, work areas, utensils and the foods served and sold. v) Consumers should ensure that offenders of food safety laws are reported to the relevant authorities vi) Information of the types of organisms present relates the sources of contamination which enable the health inspectors to concentrate /monitor the food handlers to overcome the incidence of food poisoning.

- **Organisational Outcomes** *(Please describe as specifically as possible the organisational benefits arising from the project and provide an assessment of their significance)*

Help the health personnels to monitor the safety and sanitation of foods sold in the canteens.
Enable the health personnel to concentrate on the common types of offends made by the food handlers /operators.

Proper sampling and analysis to identify possible problems are required.

Foodborne disease outbreak should be made aware to the public so as to increase their concern towards food safety

- **National Impact** *(If known at this point in time, please describe as specifically as possible the potential sectoral/national benefits arising from the project and provide an assessment of their significance)*

The studies revealed issues of concern in food safety and challenges in regards to public health.

Government should ensure adequate legislation especially on safety and quality of foods.

The National policy should focus on health aspects including personal hygiene, sanitary practices, suitability of the business environment and the application of appropriate technology. This will ensure that hawking will not pose a threat to the public health and environment. Proper location of food premises with basic amenities such as water, electricity and waste disposal must be considered during planning of premises.

Formal education of food handlers with emphasis on health education should be considered through institutionalised training. Suitable code of practice and guidelines on good food handling practices should be established as guide during the course of the training as well as the lifetime of the food handlers.

F. Assessment of project structure

- Project Team *(Please provide an assessment of how the project team performed and highlight any significant departures from plan in either structure or actual man-days utilised)*

Good coordination and cooperation among team members although Dr. Manan Dos Mohamad left the team on secondment to Craun Research center in Sarawak in end of 1997.

- Collaboration *(Please describe the nature of collaborations with other research organisations and/or*

i) Ministry of Health in Wilayah Persekutuan helped out in the survey work on health inspectors and food handlers
ii) Penang state health department, Penang and Seberang Prai local councils helped out with the survey and assisted us in samples collection for microbiological examination in various premises.

iii) British Council and Penang state government jointly organised a seminar entitled- Food Safety-Meeting Challenges.

iv) 3M a Microbiological company supported us in providing speaker for a second workshop on Quality assurance and Risk Analyses in Food Industries and information on the latest fast technique in doing microbiological tests.

v) Nestle's Malaysia, Universiti Putra Malaysia and Ministry of Health helped us in providing speakers for the seminar on Food Safety Meeting Challenges.

vi) Ministry of Health, Food industries, Veterinary department, Institutional Food operators, and hoteliers gained knowledge and information on food safety by attending the workshop and seminar.

vii) University of Tasmania participated with us by providing a prominent Professor on Risk Assessment, Dr. Ross as a trainer and speaker for the workshop.

G. Assessment of Research Approach *(Please highlight the main steps actually performed and indicate any major departure from the planned approach or any major difficulty encountered)*

Survey and microbiological tests as stated in the research approach were performed. Microbiological tests on food samples and food handlers, work areas and utensils are conducted only in Penang due to the location of the laboratory and the higher cost of chemical and microbiological supplies.

The major difficulty was in getting back the survey data and during the inspection. We had to rely on the Health inspectors for the inspection.

H. Assessment of the Project Schedule *(Please make any relevant comment regarding the actual duration of the project and highlight any significant variation from plan)*

The actual duration was extended as we encountered difficulties in getting the chemical and microbiological supplies on time. As we are dependent on the health inspectors for the survey, we have time constraint in scheduling the survey. As a result, sampling number for the whole survey was reduced. We also encountered with lack of cooperation from the food handlers during the survey.

- I. **Assessment of Project Cost** *(Please comment on the appropriateness of the original budget and highlight any major departure from the planned budget)*

The original budget given was insufficient to conduct the original intended plan to carry out microbiological tests on samples in Wilayah and Penang. For that reason, the tests were only carried in Penang and Seberang Prai

- J **Additional Project Funding Obtained** *(In case of involvement of other funding sources, please indicate the source and total funding provided)*

Additional project funding obtained from the state government was by sponsoring the seminar and workshop on food safety.

- K. **Other Remarks** *(Please include any other comment which you feel is relevant for the evaluation of this project)*

The results from this project enable us to gauge the sanitary status of the various food premises. It also provides valuable information for the Municipal council to plan the types of basic amenities facilities required in the food premises. The health inspectors should be firm with the offenders during surveillance.

Project grant related to food safety should be given priority as this will help to create safety awareness among consumers and food operators.

Date: 3/10/2000

Signature: N. Amari

Technology Transfer/Commercialisation Approach *(Please describe the approach planned to transfer/commercialise the results of the project)*

- Patent *(Please state full title of the patent by giving the patent number or application number)*

- Publication pertaining to the research finding

(a) Report/Conference Paper

Noor Aziah Abdul Aziz, Zainol Che Mamat and Noor Fezah Mohd. Nor. Food Sanitation and safety in various food outlets. Paper was presented during the Food safety –Meeting Challenges Seminar held in University Science Malaysia, Penang on Nov. 10 & 11, 1998.

Noor Aziah Abdul Aziz, Zainol Che Mamat and Noor Fezah Mohd. Nor. Food Sanitation and safety in various food outlets. Report paper presented during IRPA workshop held in Langkawi 31st Aug- 3rd Sept., 1999

(b) Journal Publication *(Use only the standard accepted abbreviations for journal titles. If there are none, give the full journal title)*

~Noor Aziah Abdul Aziz, Nor Fezah Mohd. Nor and Zainol Che Mamat. Microbiological assessment in various food outlets. To be submitted to Journal of Food Protection

~Noor Aziah Abdul Aziz, Nor Fezah Mohd. Nor and Zainol Che Mamat. Visual evaluation of non-compliance habits of food handlers and various food premises. Will be submitting to American Journal of Public Health.

~Noor Aziah Abdul Aziz, Noor Fezah Mohd. Nor and Zainol Che Mamat. Evaluation on the problems encountered by the health inspectors in implementing food rules and regulations in various outlets Will be submitting to British Journal of Public Health.

~Noor Aziah Abdul Aziz, Nor Fezah Mohd Nor and Zainol Che Mamat. Evaluation on non-compliance issues on food handlers in various food premises. Will be submitting to British Journal of Public Health.

(c) Others:

• Post Graduates (*Who graduated or who are still participating the project*)

Student Name & Year of Registration/Nationality	Thesis Title	Ph.D/Ms.c	Year of Completion

• No. of Research Assistants or Officers funded by the project:

(a) Research Officers:

(b) Research Assistants:

One

• Collaboration (*Please describe the nature of collaborations with other research organisations and/or industry*)

Institutions:

(a) Local Institutions:

University Putra Malaysia- speaker for the seminar
Nestle's Malaysia Bhd – speaker for the seminar.

(b) International Institutions:

University of Tasmania, Australia- provided two trainers and speakers for the workshop on Quality Assurance and risk analysis in Food industries.

3M Petrifilms Company – training on rapid film test method for microbiological tests.

British Council- jointly organised and provide a speaker on food safety



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24hb.Okt. 2002

Profesor Ahyaudin Ali
Timbalan Naib Canselor
P&P, Canselor

Melalui,
Prof. Madya Norizan Md Nor
Dekan
Pusat Pengajian Ilmu Kemanusiaan

Y.Bhg. Profesor, Assalamualaikum wbt.

Dipergajikan

PROF. MADYA NORIZAN MD. NOR
Dekan
Pusat Pengajian Ilmu Kemanusiaan
Universiti Sains Malaysia
11800 USM Pulau Pinang

**LAPORAN AKHIR PROJEK KAJIAN: THE ACCESSIBILITY OF THE
GOVERNMENT SUPPORT PROGRAMMES FOR SMALL AND MEDIUM
INDUSTRIES IN MALAYSIA, (Projek Number 08-02-05-6025)**

Dengan hormatnya sukacita dimaklumkan bahawa perkara di atas dirujuk.

Bersama ini disertakan tiga (3) naskah laporan tersebut di atas bagi rujukan, perhatian dan tindakan pihak Y.Bhg. Profesor seterusnya.

Sukacita saya mengambil kesempatan ini untuk mengucapkan berbilang terima kasih kepada pihak tuan di atas perhatian dan kerjasama yang diberikan sepanjang perjalanan projek kajian.

Sekian, terima kasih.

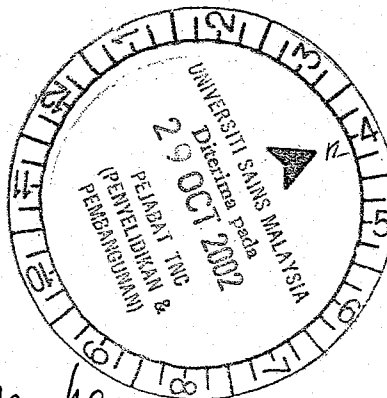
"BERKHIDMAT UNTUK NEGARA"
"Cintailah Bahasa Kita"

Yang benar,

PROF. MADYA MOHA ASRI ABDULLAH
Ketua Projek

② Badre

*untuk ditandatangani ke
MUSTE. s/u Pengetua
Jl Sains berkecuali...*



M. Samsudin

END OF PROJECT REPORT

A. Project number: 08-02-05-6025

Project title: The Accessibility of the Government Support Programmes for Small and Medium Industries in Malaysia

Project leader: Associate Professor Moha Asri Abdullah

Tel: 04-6577888 ext. 2706

Fax: 04-6563707

B. Summary for the MPKSN Report (For publication in the Annual MPKSN Report, please summarise the project objectives, significant results achieved, research approach and team structure)

Project Objectives

- Determining the characteristics and types of the government support programmes for small and medium industries (SMIs) as well as problems faced by SMIs in obtaining those support programmes
- Identifying the success of the recipients as compared to the none-recipients of the government support programmes, and
- To suggest policy recommendations on the existing government support programmes for the development of SMIs

Significant Results Achieved

- Identifying nature, characteristics, types and extent of accessibility of the government support programmes for SMIs as well as constraints that SMIs' face in securing the government support programmes
- Distinguishing the levels of success between recipient and none-recipient SMIs of the government support programmes as well as policy proposals for the development of SMIs
- Publication and dissemination of SMIs' facts and figures as well as knowledge's materials to enrich Malaysia's SMIs nationally and globally
- Training and supervision of two Ph.D graduates:-
 - i. Accessibility of the government support programmes for SMIs in Kelantan and Terengganu: A case study of textile and wood-based industries
 - ii. Linkages and performances of SMIs: A case study of the manufacturing sector in Terengganu

Research Approach

- Use of the stratified and random sampling, open-ended structure of interview and evaluation research in the data collection
- Use of SPSS for data entry, analysis and advanced statistical analysis
- Application of social research methods whereby local and foreign experts were consulted to develop a viable and sustainable plan of action

Team Structure

- Project Head, Co-researchers, Research Officer and Assistant Researchers

C. Objectives achievement

-Original project objectives (Please state the specific project objectives as described in Section II of the Application Form)

- Identify and recognizes a range of types, levels and characteristics of accessibility of the government support programmes among SMIs, at the same time reveals different levels of success between recipients and none-recipients' SMIs of the government support programmes

-Objectives Achieved (Please state the extent to which the project objectives were achieved)

- Identifying nature, characteristics, types and extent of accessibility of the government support programmes for SMIs as well as constraints that SMIs' face in securing the government support programmes. The levels of success between recipient and none-recipient SMIs of the government support programmes as well as policy proposals for the development of SMIs have also been identified
- Publication and dissemination of SMIs' facts and figures as well as knowledge's materials to enrich Malaysia's SMIs nationally and globally. At least four papers have been presented/published from this research project
- **Objectives not achieved** (Please identify the objectives that were not achieved and give reasons)

D. Technology Transfer/Commercialisation Approach (Please describe the approach planned to transfer/commercialise the results of the project)

- Methodologies used in the social sciences research.
- Research students
- Involvement in the Asia Pacific Forum for Small Business (AFSB) that provides networks to develop a concerted effort for the growth and development of SMIs in the Asia Pacific countries
- Participations in other seminars and conferences nationally and internationally

E. Benefits of the Project (Please identify the actual benefits arising from the project as defined in Section III of the Application Form. For examples of outputs, organisational outcomes and sectoral/national impacts, please refer to Section III of the Guidelines for the Application of R&D Funding under IRPA)

- **Outputs of the project and potential beneficiaries** (Please describe as specifically as possible the outputs achieved and provide an assessment of their significance to users)
- Policy proposals for strengthening the existing support programmes for the development of SMIs in Malaysia
- Contribution to various agencies and institutions dealing with or providing support programmes for SMIs in the country such as SMIDEC, MARA, MEDEC, KPU, MIDA, MITI, SEDCs etc.
- Identification of global network and experts who are able to collaborate future project in the areas of SMIs' development

- **Organisational Outcomes** (Please describe as specifically as possible the organisational benefits arising from the project and provide an assessment of their significance)

- Procurement of new equipment, training of research staff, post graduate researchers, and supporting staff in the use of equipments
- Linkages with officers from various agencies dealing with development of SMIs especially when the Chief of Researcher in this project was appointed as the representative consultant for Small and Medium Industrial Development Corporation (SMIDEC)
- Promotion of inter-disciplinary research fields to enhance further collaboration of future researchers to add the available pool of resources on the development of SMIs
- Increased recognition as a centre of excellence, nationally and internationally

- **National Impacts** (If known at this point in time, please describe as specifically as possible the potential sectoral/national benefits arising from the project and provide an assessment of their significance)

- Linkages with foreign researchers and foreign research institutions such as Economic Research Center, Nagoya University, Mie University and Centre for Enterprise and Economic Development Research, Middlesex University, UK.
- Linkages with domestic researchers and research institution such as IKMAS, MEDEC, NPC, SMIDEC, MEF, FMM etc.
- Skills upgrading and improved efficiency of support programmes provided for the development of SMIs in the country

F. Assessment of project structure

- **Project Team** (Please provide an assessment of how the project team performed and highlight any significant departures from plan in either structure or actual man-days utilised).

Very Good

- **Collaborations** (Please describe the nature of collaborations with other research organisations and/or industry)
- School of Humanities, USM (project Leadership, Management and Design of the whole research project)
- School of Social Sciences, USM and Faculty of Economic, UKM (provide expertise's)
- SMIDEC (becoming consultant for SMIDEC)
- AFSB (networking and conferences)

G. Assessment of Research Approach (Please highlight the main steps actually performed and indicate any major departure from the planned approach or any major difficulty encountered)

- Literature Review
- Fieldwork and Data Collection
- Analysis of Data using SPSS
- Report Writing
- Dissemination of findings through existing networks
- Participating in national and international seminars/conferences

H. Assessment of the Project Schedule (Please make any relevant comment regarding the actual duration of the project and highlight any significant variation from plan)

Soon after Asian financial crisis and economic downturn, there have been various changes affecting the survival, growth and development of Sims in Malaysia directly and indirectly. This means that new development in issues relating to accessibility of support programmes for SMIs. Hence, the project schedule was further extended to the third year instead of originally planned two years. This indeed enabled the researchers to collect more updated data and resources for the purpose of documentation and dissemination of the results obtained.

I. Assessment of Project Costs (Please comment on the appropriateness of the original budget and highlight any major departure from the planned budget)

The budget was insufficient to cover many sectors of the economy and was less appropriate to include wider areas of study. This made the study narrowed down to the two sub-industries of textile and apparels, and wood-based sub-industries, as well as covered only SMIs in Kelantan and Terengganu.

J. Additional Project Funding Obtained (In case of involvement of other funding sources, please indicate the source and total funding provided)

None

K. Other Remarks (Please include any other comment which you feel is relevant for the evaluation of this project)

SMIs account for nearly 90 percent of the total number of enterprises in many countries. Malaysia is not exceptional. Much more important than its numerical predominance is, however, the significant role which SMIs play in the overall economic development of the country. Briefly, SMIs generate employment and income distribution, serve as training ground for workers and entrepreneurs, complementary role to large and MNCs, enhance forward and backward linkages throughout economically diverse sectors of the economy, investment and saving and technology transfer. Since SMIs provide significant contribution to the industrial and economic development, issues, problems, challenges and prospects pertaining SMIs development should be given the necessary funding to assist in the collection of resources, data and information, which would be useful for the purposes of planning and future support programmes.

Date: 22/10/02

Signature: 

End of Project Report

A. Project number: 190/9706/3107

Project title: Thermoplastic Elastomer Based on PVC/ENR Blends for shoe sole and cable formulations.

Project leader: Dr. Umaru Semo Ishiaku

Tel: 04-6577888 ext. 2215

Fax: 04-6573678

B. **Summary for the MPKSN Report** *(For publication in the Annual MPKSN Report, please summaries the project objectives, significant results achieved, research approach and team structure)*

This project took off in June 1997 as approval was received in May. The main objective of the project is to produce PVC/ENR compounds for specific end uses such as shoe sole and cable.

Thermoplastic elastomers (TPE's) are rubbery materials that can be melt processed like plastics but have the performance properties of thermoset rubbers. TPE's production is the latest trend in the elastomer industry and these materials are replacing conventional elastomers in **automotive body parts, and engine components, wire and cable jacketing, architectural applications, hose, tubing, footwear etc.** PVC/ENR TPE's were initially prepared in a laboratory scale by melting mixing in a Brabender Plasticorder Torque Rheometer. The investigation progressed to pilot plant scale in which HAAKE twin screw extruder was used to make a shoe sole compound. Two forms of the compound were investigated i.e. the plain and the dynamically vulcanized blends. Mechanical and rheological properties, thermo-oxidative ageing and oil resistance were the focus of investigation. The materials were found suitable.

Shoe soles from PVC/ENR TPE's can enjoy wide application in industrial shoes for oil industries particularly the dynamically vulcanized TPE which shows enhanced oil resistance and mechanical properties. PVC/ENR TPE's also have the potential to excel in other applications where oil resistance and enhanced mechanical properties and aging resistance are required e.g. cable jacketing, hose and tubing. The compound is subject to further developments to make prototypes shoes and do field testing as well as up-scaling the production process.

NI Siano

C. **Objectives achievement**

- **Original project objectives** *(Please state the specific project objectives as described Section II of the Application Form)*

1. To develop novel thermoplastic elastomers based on PVC/ENR blends by the melt mixing method.
2. To identify specific end uses for the new materials by fully characterizing the relevant mechanical, electrical thermo-oxidative and rheological properties.
3. To produce prototypes and conduct field tests.

- **Objectives Achieved** *(Please state the extent to which the project objectives were achieved)*

Objectives #1 and #2 have been achieved as the project progressed from laboratory scale to pilot plant scale.

- **Objectives not achieved** *(Please identify the objectives that were not achieved and give reasons)*

Objective #3 has not been achieved due to the problem of finding suitable research officers at the right time and subsequently the money finished, and time expired.

D. **Technology Transfer/Commercialisation Approach** *(Please describe the approach planned to transfer/commercialise the results of the project)*

Arrangements are being made with a PVC compounder to apply for a research and development grant to make prototypes, carry out field tests and commercialisation and patenting arrangements.

E. **Benefits of the Project** *(Please identify the actual benefits arising from the project as defined in Section III of the Application Form. For example of outputs, organisational outcomes and sectoral/national impact, please refer to Section III of the Guidelines for the Application of R&D Funding under IRPA)*

- **Original of the project and potential beneficiaries** *(Please describe as specifically as possible the outputs achieved and provide an assessment of their significance to users)*

Two grades of PVC/ENR shoe sole compounds have been developed. The direct potential beneficiaries are PVC compounds who will supply shoe manufacturers.

- **Organisational Outcomes** *(Please describe as specifically as possible the organisational benefits arising from the project and provide an assessment of their significance)*

1. One Ph.D study was based on the project (the candidate graduated in 1999).
2. A pelletising unit was purchased, and thus completing the production line for the HAAKE pilot plant.
3. Linkage was established with a PVC compounding company, with whom collaboration is still on to produce final products.

- **National Impact** *(If known at this point in time, please describe as specifically as possible the potential sectoral/national benefits arising from the project and provide an assessment of their significance)*

The project will strengthen Malaysia's capacity in polymer compounding and equally increase productivity and competitiveness of PVC and ENR both of which are manufactured locally.

F. **Assessment of project structure**

- **Project Team** *(Please provide an assessment of how the project team performed and highlight any significant departures from plan in either structure of actual man-days utilised)*

No significant departure

- **Collaboration** *(Please describe the nature of collaborations with other research organisations and/or industry)*

G. **Assessment of Research Approach** *(Please highlight the main steps actually performed and indicate any major departure from the planned approach or any major difficulty encountered)*

The investigation was focused on product development. One end use was pursued instead of the original two proposed. The compound for industrial shoe sole for workers in the oil industry was developed to a stage while the work could not extend to cable formulation, fabrication and testing of prototype, wear and durability tests were not done.

H. **Assessment of the Project Schedule** *(Please make any relevant comment regarding the actual duration of the project and highlight any significant variation from plan)*

Laboratory stage and pilot plant stage investigations were done but technology transfer activity such as factory scale fabrication was not done although the achievement was substantial internals of reports and seminars. 3 papers were presented at international conferences while 7 papers were published in refereed journals.

I. **Assessment of Project Cost** *(Please comment on the appropriateness of the original budget and highlight any major departure from the planned budget)*

No major departures

J. **Additional Project Funding Obtained** *(In case of involvement of other funding sources, please indicate the source and total funding provided)*

none

K. **Other Remarks** *(Please include any other comments which you feel is relevant for the evaluation of this project)*

Date:

29 - 7 - 2000

Signature:

W. Schiaku

Maklumat Tambahan Yang Diperlukan

Technology Transfer/Commercialisation Approach *(Please describe the approach planned to transfer/commercialise the results of the project)*

- **Patent** *(Please state full title of the patent by giving the patent number or application number)*

- **Publication pertaining to the research finding**
 - (a) **Report/Conference Paper**

3 papers presented in International Conferences (See Appendix A)

 - (b) **Journal Publication** *(Use only the standard accepted abbreviations for journal titles. If there are none, give the full journal title)*

6 papers published in International Refereed journals

 - (c) **Others:**

-

- **Post Graduates** *(Who graduated or who are still participating the project)*

Student Name & Year of Registration/ Nationality	Thesis Title	Ph.D/MSc.	Year of Completion
Ahmad Mousa	Rheological and dynamic mechanical properties of dynamically vulcanized PVC/ENR blends	Ph.D.	1999

- **No. of Research Assistants or Officers funded by the project:**

(a) Research Officers: 4

(b) Research Assistants:

- **Collaboration** *(Please describe the nature of collaborations with other research organisations and/or industry)*

Institutions:

(a) Local Institutions:

-

(b) International Institutions:

-

List of Equipment Bought

The main equipment bought are Accessories for HAAKE (Germany) Rheodrive 5000

1. HAAKE : Pelletizer C/W control box with roller.
2. HAAKE Water Bath, C/W roller to guard the extrudate into the pelletizer

Appendix A

(a) International Conference Papers

1. A. Mousa, U.S. Ishiaku, H. Ismail and Z.A. Mohd Ishak. The Mechanical and Thermo-oxidative Aging of Dynamically Vulcanized PVC/ENR Thermoplastic Elastomers. International Rubber Conference 1997 (IRC '97) Kuala Lumpur, MALAYSIA, 6-9 October 1997. ✓
- ②. A. Mousa, U.S. Ishiaku, H. Ismail and Z.A. Mohd Ishak. The effect of prolonged thermooxidative ageing on the mechanical properties of dynamically vulcanised PVC/ENR Thermoplastic Elastomers. International Conference on Thermo-Physical Polymeric Methods, Singapore, N.U. (1999). ✓
- ③. U.S. Ishiaku, A. Mousa, H. Ismail, and Z.A. Mohd Ishak. The Fatigue and Viscoelastic Behavior of Dynamically vulcanized PVC/ENR Thermoplastic Elastomers. IUPAC World Polymer Congress. 12-17 July (1998). Gold Coast, Australia. ✓

(b) International Refereed Journals

4. A. Mousa, U.S. Ishiaku and Z.A. Mohd Ishak. Oil Resistance Studies of Dynamically Vulcanized Poly(vinyl chloride)/Epoxidized Natural Rubber Thermoplastic Elastomer. J. Appl. Polym. Sci. 69(1998) 1357-1366. ✓
5. A. Mousa, U.S. Ishiaku and Z.A. Mohd Ishak. Dynamic Vulcanization Studies of Poly (vinyl chloride)/Epoxidized Natural Rubber Thermoplastic Elastomer. Part I: Mixing Rheology and Processibility. PLASTICS RUBBER and COMPOSITES: Processing and Applications. 26(1997)331-335. ✓
6. A. Mousa, U.S. Ishiaku and Z.A. Mohd Ishak. Dynamic Vulcanization Studies of Poly (vinyl chloride)/Epoxidized Natural Rubber Thermoplastic Elastomer. Part 2: Mechanical Properties and thermo-oxidative Aging. PLASTICS RUBBER and COMPOSITES: 28(1999)288-295. ✓
7. A. Mousa, U.S. Ishiaku and Z.A. Mohd Ishak. Rheological Properties of Poly(vinyl chloride)/Epoxidised Natural Rubber Thermoplastic Elastomers: Effect of Processing Variables, Polymer Testing 19(1999)193-204. ✓
8. A. Mousa, U.S. Ishiaku and Z.A. Mohd Ishak. Rheological and Viscoelastic Behaviour of Dynamically Vulcanized PVC/ENR Thermoplastic Elastomers, Journal of Applied Polymer Science. 74(1999)2886-2893. ✓

9. A. Mousa, U.S. Ishiaku and Z.A. Mohd Ishak. Thermo-oxidative Ageing Study and Fatigue Behaviour of Dynamically Vulcanised Poly(vinyl chloride)/Epoxidised Natural Rubber Thermoplastic Elastomers. European Polymer Journal (Accepted, In press).