

# FACTORS CONTRIBUTING TO THE SUCCESS OF HUMAN RESOURCES INFORMATION SYSTEMS (HRIS) IN MALAYSIAN MANUFACTURING FIRMS

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*Human resource information system (MRIS) using information technology(IT) is quite a new phenomenon. It is to be used as a strategic tool for managing human resources, especially for training and development purposes.*

*This paper (i) analyse the factors which influence the successful implementation and utilisation of MRIS, (ii) the extent to which it is being used and (iii) the current state of the art of MRIS in Malaysia, specially in manufacturing organisations. The large organisations appear to be more advanced in their use of MRIS. Involvement in planning and the extent of planning of the implementation MRIS have positive impacts on utilisation and success of implementation of MRIS. Presently, the overall utilisation of MRIS in Malaysian industries is concentrated on the more routine functions of employee information, salary administration, employee attendance and turnover analysis.*

## INTRODUCTION

Most organizations recognize the value of human resources as their most important assets. But many are still treating their employees as an expense, leading to a lack of attention to proper management of information on human resources. This in turn leads to suboptimal utilization of human resources. But some enlightened organizations have adopted information technology (IT) in managing their human resources so as to optimize the utilization of human resources while at the same time attempting to treat them as the prime assets of the organization.

A well-maintained system of accessing pertinent personnel information is of utmost importance to management. The information stored and maintained by the HR department should provide relevant, timely, up-to-date and concise information to managers who need them. Information technology (IT) can help human resources information systems (HRIS) achieve its objectives and contribute towards better allocation of human resources, timely recruitment of personnel, fairer reward systems, etc.

Human resources information system has been in existence for a long time. But integrated human resources information

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system (ITRIS) using the IT is quite a new phenomenon. Its functions include reporting, recruitment support, benefits calculation, salary records, service records, etc. However, a fully utilized ERIS has a higher goal. It is to be used as a strategic tool for managing human resources, especially for training and developmental purposes. Planning, controlling, monitoring personnel and skill inventory can be made much easier and faster especially for large organizations (Walker, 1993). Evaluations and appraisals for promotion and advancement can be processed more quickly and objectively. Employees will feel more secure and stable in their jobs if they know their prospects for promotions and advancement in the organization are well-looked after.

Effective management of human resources contribute towards maximum utilization of skills, while minimizing personnel turnover and absenteeism. HRIS and its utilization is expected to help towards these ends.

## PURPOSE

The purpose of this study is to investigate the contributing factors for the successful implementation and utilization of HRIS. The sample will be drawn from manufacturing firms, considering the fact that manufacturing firms are complete in their functions and are seen as the engine of economic growth for Malaysia. The study intends to help us understand how to maximize the utilization and management of IT in human resources. The main research questions are:

- a) What factors influence the successful implementations of HRIS?
- b) To what extent is HRIS being used?
- c) What is the current state of the art of

HRIS in Malaysia, specifically in manufacturing organizations?

## METHODOLOGY

Based upon Oppedisano's (1992) framework, Martinsons' (1992) findings and Delone's (1987) success factors, this study proposes eight organizational factors and three environmental factors that would influence the successful implementation and utilization of HRIS in manufacturing organizations. Success is measured by satisfaction with the system and the usage of the system. The tool used to measure satisfaction was extracted from Bailey and Pearson (1983) and combined with a modified tool from Oppedisano (1992) to form a Likert-like scale measure. Usage is measured by using a tool developed by the researchers.

The independent variables consist of eight organizational factors namely size, planning, infrastructure, management, users, training and computer knowledge. The three environmental factors are technological change, competition and government. These factors are proposed as contributing towards the successful implementation of HRIS. The research framework is given in figure 1.

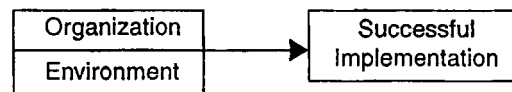


Fig. 1. Research Framework

The questionnaire was developed and tested for validity and reliability in two stages of pilot tests. The first stage was with the faculty of the School of Management, University Sains Malaysia. The feedback from the faculty was used to modify and refine the questionnaire and then tested in the second stage of the pilot test. This was done with the manufacturing firms in the

Bayan Lepas Free Industrial Zone, Penang. Six organizations agreed to participate and be interviewed. The overall pilot test took about four months to be completed. Comments and suggestions given by HR managers and HRIS administrators were taken into account in drafting and refining the actual questionnaire.

A mail survey was conducted on the sample comprising manufacturing firms in Malaysia. The sample was drawn from the Federation of Malaysian Manufacturers (FMM) 1995/96 Directory. After contacts with a small sample, it was decided that organizations with more than 300 employees would be used, because they would be more likely to use HRIS rather than smaller firms. The questionnaire was mailed to 350 manufacturing firms in Peninsular Malaysia in June 1996. They were addressed either to the Human Resource Manager or HRIS manager/administrator.

## MAIN HYPOTHESIS

The main hypothesis are:

H1: Organizational factors determine the successful implementation of HRIS.

H2: Environmental factors determine the successful implementation of HRIS.

## MEASUREMENTS

### *Independent Variables*

The number of employees in the company measures the variable size. Planning is measured by the number of planning activities carried out by the company before implementing HRIS (11 yes/no items). Infrastructure for HRIS is measured by the availability of computing and networking capabilities (22 yes/no items). Top management involvement and user

involvement are both measured by their degree of involvement during the planning and implementation stages of HRIS (Likert scale). Control is measured in terms of systems and data control by departments (respondents are required to check the allocated space under each department, two categories for systems and four categories for data). Training is measured by the acknowledgement of the need for training for HRIS (yes/no items). The same type of measure is used for computer knowledge (yes/no items). Technology change is measured by rank order (1-5). Competition is measured by the aspects of product and resources competition (two Likert-like items, 1-5). Government is measured by two yes/no items.

### *Dependent Variables*

Implementation success is measured by satisfaction (21 Likert-like items 1-5) and utilization (four main questions). The four variables used to measure utilization are:

- a) The total number of HRIS modules utilized.
- b) HRIS utilization perception.
- c) Extent of use.
- d) Frequency of reports generated.

## DATA COLLECTION AND ANALYSIS

Data collection began in August 1996 and took about 6 months. From the total sample of 350, the number that responded was only 77 which accounted for 22% response rate. This paper will only discuss the preliminary findings on the successful utilization of HRIS from the analysis of data collected.

Most of the respondents were either HR/HRIS manager/administrators. Only two of

77 respondents were not HR/HRIS personnel. They were from MIS departments.

### SAMPLE CHARACTERISTICS

This paper reports preliminary results in terms of descriptive statistics and basic statistical analysis. The data was first treated to Cronbach alpha reliability analysis and the results are shown in table 1.

A Cronbach alpha score of 0.5000 or more is considered reliable. Table 1 shows that except for the government factor which has an alpha of 0.4657, all others are within acceptable reliability limits. The government is, thus excluded from further analysis.

Table 1. Reliability Test

<i>Factors</i>	<i>Cronbach alpha</i>
Satisfaction (21 items)	.9307
Utilization (4 main items)	.5746
Planning (11 items)	.6538
Infrastructure for HRIS (22 items)	.6665
Top management involvement (2 items)	.5855
User involvement (2 items)	.5688
Control (6 items)	.6338
Competition (2 items)	.7280
Government (2 items)	.4657

The size of the 77 organizations in the sample range from 300 to more than 5000 employees. The mean size is 1558 and mode between 1000 to 4999, which accounts for 42% of the sample.

The planning factor represents planning activities undertaken by the organization before implementing HRIS. Items require yes/no responses only. Responses of "yes" are added up to represent the value of planning. These activities include carrying

out need analysis, feasibility to be generated, and type of hardware and carry out the majority of the items. 48% of the organizations carry out between 11 to 16 of the items.

Infrastructure refers to the set-up of the HRIS in the organization which includes hardware and software availability and networking capabilities. About 90% of the respondents reported networking capabilities in their HRIS organizations. Table 2 shows the infrastructure for HRIS of the sample. Table 2 shows that about 90% of the organizations have HRIS which is networked throughout the organization or even internationally to their headquarters. Only 8 firms in the sample report that they have yet to be networked.

Table 2. Infrastructure for HRIS

<i>Item</i>	<i>Response</i>	<i>Frequency</i>	<i>%</i>
Extent of network	Department	9	11.7
	Organization	29	33.7
	National	1	1.3
	Corporate HQ	14	18.2
	International	16	20.8
	Not networked	8	10.4
Type of computer	Micro	56	72.7
	Mini	30	39.0
	Mainframe	29	37.7
	Workstation	31	40.3
	Others	5	6.5
Organizational computing System	Central processing	30	39.0
	Distributed proces	9	11.7
	Distr. data base	3	3.9
	Combination of CP & DI	35	45.4
Data Entry	Batch processing	40	51.9
	On-line entry	50	64.9
	Scanning	15	19.5
	Transaction	41	53.2

Most organizations state that they have a system of combining micros with either minis, mainframes or workstations for their hardware. In terms of computing system, the majority used either centralized processing or a combination of central processing and distributed processing. With regards to data processing most firms use a combination of either batch processing and on-line or batch processing and transaction processing for HRIS.

The involvement of top management during the planning and implementation stages of the HRIS are important to its success. The data suggest that on average, top management are only involved "sometimes" during planning (56%) and implementation (67.5%) stages. However, top management is found to be involved "most of the time" during the planning stages (44.2%).

The involvement of HRIS users are said to be important during the planning and implementation stages. While almost 99% of the respondents stated that users are involved most of the time of both stages, they are more involved in the implementation stage (61%) than the planning stage (50.6%).

Control refers to the degree of control for the systems as well as the data held by the Human Resources Departments, Information Systems and other departments with regards to HRIS. Systems control seems to be in the hands of the IS (32.5%) and a combination of IS and HR (32.5%) followed by HR only (22.1%). The situation is similar in application maintenance where most of the time it lies with Information Systems (IS) only (41.6%) or a combination of HR and IS (27.3%) or HR only (20.8%).

While IS departments seem to play a

prominent role in systems control, it is not the case with data control. Data control seems to be under the hands of HR departments. The responsibility for data entry and accuracy lie almost entirely with HR. Table 3 shows the responsible departments for data entry, data accuracy, editing and updating for HRIS.

**Table 3. Data Control for HRIS**

Responsible Dept.	Control Measurer			
	Data Control	Data Accuracy	Editing	Updating
HR only	66.0%	59.0%	63.6%	67.5%
IS only	—	—	1.3%	1.3%
HR & IS	6.5%	10.4%	14.3%	9.1%
HR & Finance	18.2%	20.8%	11.7%	14.3%
Other departments	9.1%	9.1%	9.1%	7.8%
Total	100	100	100	100

Most of sample admit the importance of training in the introduction of innovation especially in the area of HRIS. Almost 95% said they needed personnel with computer knowledge and skills in order to implement HRIS. But only 61% of the sample stated they provided allocation for training in their annual budgets.

## ENVIRONMENTAL FACTORS

Two environmental variables are used in this study namely technological change and competition. Technological change is measured by the perceived changes in technology in the industry as viewed by the respondents. Forty percent of the respondents report that they faced slow and steady change, while 36.4% said they faced fast and steady changes. To face these changes 97.4% of the organizations have automated their salary functions. Between 67.5% to 89.6% of the sample have

automated human resources, finance and accounting, purchasing, production and electronic mail functions. An encouraging point to note is that some 23% of the organizations are attempting to automate some aspects of their strategic planning functions. It must be appreciated that strategic planning functions are rather complex as compared to other functions like salaries. Table 4 shows the degree of automation in daily operations.

Competition is measured by the perceived level of competition in product markets and resources acquisition, using Likert scale 1 (little competition) to 5 (high competition).

While all respondents agreed they faced some degree of competition about two thirds (67.5%) admitted that they faced high competition in markets and resources.

**Table 4. Degree of Automation in Daily Operations**

Type of automation	Frequency	
	Frequency	%
Salary	75	97.5
Human resources	69	89.6
Word processing	67	87.0
Finance & accounting	65	84.4
Purchasing	62	80.5
Production	52	67.5
Electronic mail	50	64.9
Marketing	28	36.4
Desktop publishing	19	24.7
Strategic planning	18	23.4

## UTILIZATION

In this paper, the discussion will focus on successful implementation as operationalized by the utilization of HRIS by the organization only. The respondents

were asked about their perceptions of HRIS utilization. About 87% said that they often use HRIS as a common reference. About 62% said HRIS helps in strategic planning of human resource, while 39.9% said it sometimes helps. Their answers are similar when asked if HRIS fits the overall organizational needs. Utilization of HRIS is done by accessing the various modules that are made available. This study listed only 20 modules that are extracted and adapted from Oppedisano (1992), Kavanagh et al (1990) and Walker (1994). Table 5 shows the frequency of the 20 HRIS modules being utilized. The majority of respondents regard employee information, salary, employee status, attendance and turnover analysis modules as the most critical functions in their organizations.

**Table 5. HRIS Utilization**

HRIS Modules	Frequency	
	No.	%
1. Basic employee information	75	97.4
2. Salary	72	93.5
3. Employee status	67	87.0
4. Attendance & turnover analysis	59	76.6
5. Training & development	51	66.2
6. Internal Transfer	51	66.2
7. Job history & evaluation	50	64.2
8. Benefits administration	39	50.6
9. Location	35	45.5
10. Position control	33	42.9
11. Medical Insurance	33	42.9
12. HR planning	27	35.1
13. Performance evaluation	27	35.1
14. Skills	26	33.8
15. Compensation planning	25	32.5
16. Applicant tracking	15	19.5
17. Career planning	14	18.2
18. Collective bargaining	7	9.1
19. Pensions	6	7.8
20. Other modules	5	6.5

Most organizations agreed that they have to generate reports, sometimes daily on aspects especially on head-counts if there appears to be a critical turnover problem. From the aspect of report generation 69 firms or 90% stated that they do generate reports for external purposes. The external agencies which require reports from the organizations are listed in table 6.

**Table 6. External Organizations Receiving Reports**

<i>External Organizations</i>	<i>Frequency</i>
Employees Provident Fund	63 91.3%
SOCSSO (Social Security Organization)	62 89.9%
Internal Review Department	52 75.4%
Human Resources Development Council	51 73.9%
Statistics Department	49 71.0%
Human Resources Ministry	37 53.6%
Malaysian Industrial Development Authority	32 46.4%
International HQ	27 39.1%
National HQ	16 23.2%
Others	15 22.4%

**TENTATIVE FINDINGS**

Basic statistical tests such as Pearson correlation and two-tailed t-tests were used to show relationships and differences.

On organizational factors and HRIS Success, Hypothesis 1 states that organizational factors are related to the success of HRIS implementation. The correlation results are shown in table 7.

**Table 7. Pearson Correlation between Success and Organizational Variables**

	<i>Modules utilized</i>	<i>Utilization perception</i>	<i>Extent of use</i>	<i>Frequency of reports</i>
Size	.189	.311**	.258**	.164
Planning	.475**	.517**	.305**	.081
Infrastructure	.198	.288*	.172	.135
Management	.201	.102	.051	.133
User	.195	.181	.029	.079
Control	.134	.172	.041	.102

\*\*p≤.01 \*p≤.05

Table 7 shows that the modules utilized is significantly correlated with involvement in planning (r = .475, p ≤.000). It shows that involvement in planning increases that number of modules utilized.

On the measure of perception of modules utilization the correlation results show that utilization is significantly related to size (r = .31, p = .006), planning (r = .51, p = .000) and infrastructure, (r = .23, p = 0.1). Thus, on the success measure of perception of HRIS utilization, H1 is supported.

On the extent of HRIS usage the result show that HRIS usage is significantly related to planning (r = .305, p = .007) and size (r = .253, p = .023). H1 is partially supported using this criteria.

The success criteria of frequency of reports is not significantly related with any organizational factor. Therefore H1 can be rejected on this score.

These tests suggest that involvement in planning of all parties is very important for the success of HRIS.

## ENVIRONMENTAL FACTORS

Hypothesis 2 states that environmental factors influence the success of HRIS implementation. Table 8 shows that results correlation between environmental factors and utilization of HRIS. Technological change and competition are significantly positively correlated with HRIS utilization. ( $r = .281, p = .013, r = .270, p = .018$  respectively). Thus by the measure of HRIS modules utilization Hypothesis 2 is supported.

Table 8. Correlation between Utilization and Environmental Variables

	Modules utilized	Utilization perception	Extent of use	Fre- quency of reports
Technological Change	.281**	.268**	.020	.248**
Level of Competition	.270**	.134	.192	.121

\*\* $p \leq .01$ , \* $p \leq .05$

## CONCLUSION

The data lend support to the conclusion that size plays a major role in the decision to implement human resource information systems in the company. The bigger the size of employees, the more the functions of human resources are automated, and the higher the utilization of the human resources information systems. This supports Martinsons' (1992) findings that large companies are more inclined to use HRIS. The implications are quite obvious that large organizations need to automate their personnel information because of the volume of data. However, in this study, small organizations (< 500 personnel) use certain modules much more intensively than large organizations, in such functions as for salary administration, basic employee

information, attendance and turnover analysis.

Involvement in planning and the extent of planning of the implementation of HRIS have positive impacts on utilization and success of implementations of HRIS. This is expected as participation tends to lead to commitment. Presently, the overall utilization of HRIS in Malaysian industries is concentrated on the more routine functions of employee information, salary administration, employee attendance and turnover analysis. The more sophisticated uses of HRIS. Such as for employee development and strategic planning are still emerging.

The larger organizations appear to be more advanced in their use of HRIS. This could perhaps be explained by their availability of resources and nature of their origin. Most of them are of foreign origin and they have access to more advanced technology.

More in-depth studies would be required to fully understand this important and specialized area of human resource information systems. As organizations expand and operate across borders, HRIS becomes more and more challenging.

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