

A Perception Assessment On Security Awareness In Malaysian Government Agencies By Rasch Model

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ABSTRACT

The Chief Government Security Office (CGSO) in the Prime Minister's Department is responsible for protecting the country against potential threats to the national security. A number of other security and intelligence agencies work alongside CGSO to gather, analyse and utilise information on intelligence and national security matters. In order to protect national security and economic well-being, the CGSO collects and disseminates intelligence, investigates and assesses threats and works with others to counter them. They render advise on protective security and provide effective support of such tasks since 1957 as empowered in Arahan Keselamatan, (Pin.1984). The CGSO also provides protective security advice to multi-national corporations where it involves National Infrastructure Key Points (NIKeP), helping them reduce their vulnerability to possible threats. Eversince the CGSO has established highly competent quality service in discharging their statutory functions. However, the vital role of the CGSO in the government service has since diminished despite the rise of global terrorism. Subsequently, the CGSO has taken a concerted effort by vigorously carrying out workshops and seminars at various Government Agencies to improve the awareness and put security as being of utmost importance. It is aimed as preventive measures to frustrate sabotage, espionage, prevent damage to the country from subversion and other covert activity; frustrate proliferation of detrimental information, watch out for new or re-emerging types of threat; protect the Government's sensitive information and assets. This paper assessed feedback from Government Officers as participants in workshops and seminars

conducted by the CGSO on protective security. The evaluation shows there is a strong correlation between the number of courses conducted and level of security appreciation; hence, higher level of competency in taking protective security measures amongst the government officers.

Keywords: Protective security, threats, terrorism, intelligence, competency.

1. Introduction

“Prevention is better than cure”; and certainly is better now than sorry. Protective security is very well embedded in the Malaysian government administrative system being remnant of the British Security Service. The Chief Government Security Office (CGSO) in Prime Minister’s Department is responsible for protecting Malaysia against threats to national security. *Arahan Keselamatan* (Pin.1984) summarises the empowerment vested on CGSO and provision of Article 35, Official Secret Act (1972), sets out its constitution, functions, general powers and its relationship with the Ministers. CGSO is the Government authority which provides protective security advice to businesses and organisations across the national infrastructure. The advisory service aims to reduce the vulnerability of the national infrastructure to terrorism and other threats, keeping the Government’s essential services (delivered by the communications, energy, finance, food, government, health, transport and water sectors) safer. Without these services, Malaysia could suffer serious consequences, including severe economic damage, grave social disruption or even large-scale loss of life. CGSO advice is targeted primarily at National Infrastructure Key Points (NIKeP) - those key elements of the national infrastructure which are crucial to the continued delivery of essential services to Malaysia. Advice given includes the nature of threats, security planning, methods of attack, protecting the assets, products and services publications and research and development.

Intelligence operations rely on high quality record keeping and information management systems. Information and records management is a core business activity in the Service, supporting sustained, integrated research and analysis which underpins CGSO work. Records include both paper and electronic files. Paper files remain important to the

Service but CGSO have made extensive use of computer systems for the indexing and retrieval of records for many years. Electronic documents and data are of growing importance to CGSO and they continually improve and develop their electronic records management system.

The CGSO's most important role is the vetting of candidates; widely known as *Tapisan Kasar* and *Tapisan Halus*, for employment in sensitive government posts; which is based solely on checks against CGSO records. Information on any of such needs is now available on-line. CGSO conduct investigation; and may interview candidates on the respective agencies behalf. Decisions on employing staff are the responsibility of the Department or Agency concerned and *Arahan Keselamatan*, 1984 stipulates that CGSO may only disclose information for deciding whether someone should be employed in area of sensitive works; and if we do so, all in accordance with arrangements approved by the Chief Government Secretary. If, upon CGSO checking, the finding shows that they have significant and relevant security record on an applicant, CGSO may provide a summary assessment of such security information.

This is a vital process as earlier findings show attacks are easier to carry out if the terrorist is assisted either directly or indirectly by an 'insider' or by someone with specialist knowledge or access. The form of attacks on vital information or communication systems can cause disruption and economic damage. Such hoaxes designed to frighten and intimidate is defined as "national threats" within the ambit of *Arahan Keselamatan*; referring to actions that are «intended to overthrow or undermine parliamentary democracy by political, industrial or violent means». This concept of subversion, therefore, focuses on hostility to democratic processes.

As technology becomes more sophisticated and potential threats get more complex, CGSO has the colossal task of improving the awareness of such security needs. Among others; CGSO protective security tips include but not limited to:

- a. assess the risks to the organisation
- b. consider security first when planning building works
- c. establish a security culture in the organisation
- d. keep premises clear and tidy
- e. control access points and use staff and visitor passes

- f. install physical measures e.g. locks, alarms, CCTV, lighting etc.
- g. establish good mail handling procedures
- h. recruit carefully, checking identities and following up references.
- i. take proper IT security precautions
- j. test business continuity plans regularly

This calls for highly specific skills, knowledge and capabilities of CGSO officers, their Cadres and the respective *Pegawai Keselamatan Jabatan* (Departmental Security Officers) as required by Arahan Keselamatan to assure significant impact on their presence. This paper deals with the evaluation of such officers' competency subsequent to the training given in the effort to improve security awareness in the Malaysian government services.

2. Background

An Overview of Competency Measurement

Competency measurement of government officers is relatively new, undeveloped and yet to be studied systematically. Although some of the functionally-based performance measurement i.e. *Laporan Penilaian Prestasi*, an annual rank ordered assessment of staff 'achievement' exist, little was understood on the purpose of such assessment. Raters vary across the board without realising the importance of such assessment. As such, meaningful correlation for evaluation is difficult to establish. Little written about the alignment of functional performance has been achievement to the overall planned organisational service outcomes; hence customer satisfaction.

Evaluation made thus far remain superficial without much regard to how either public service dimensions or attributes may be affected. This calls for the adoption of a more prudent performance measurements mechanism which would optimize the effectiveness of training given, thus benefitting the public domain.

The authors conducted a comprehensive review of literature pertaining to performance measurement system design and categorized it into three distinct areas [1, 3]:

1. individual performance measures;
2. performance measurement systems as an entity; and
3. relationships between performance measurement systems and the environment in which they operate.

Early researchers who focused on individual performance measures examined various dimensions of quality service, cost, time, and flexibility from a strategic management perspective. In an attempt to define the various attributes of a performance measurement system (PMS), researchers developed frameworks for relating functional performance to overall organisational service performance.

Then others examined the interaction between a performance measurement system and the quality of service rendered. Literature pertaining specifically to quality-focused performance measurement systems can be classified into three(3) broad categories:

1. quality measures;
2. quality measurement; and
3. frameworks for developing quality measurement systems.

CGSO subscribed to ISO9001:2000 since April 2005 and was duly certified by Lloyds Register Quality Assurance where meaningful data analysis is one of the important processes to be carried out. The use of statistically-based measures to monitor and control process and product quality was pioneered by Shewhart (1931), Juran (1951) and Deming (1975). In addition, Kane (1986) explored the use of capability indices as a measure of process quality. An attempt to measure the Learning Capability Index by the authors was presented in Sharjah, UAE (2006) and Taipei (2007) has received encouraging response. It provided some insight on the development for a more comprehensive evaluation system and assessment of the strategic impact of quality training initiatives.

It is good to note other research done in PMS which address the problems associated with the use of quality measures in isolation and highlight the need for a holistic approach to competency measurement. In the advent of internet and globalisation, it was asserted that information security is also an essential dimension for an excellent framework of a quality management system.

Competency assessment should generate accurate, meaningful information i.e., be reliable and valid. This allows further evaluation

that represents a vision which can shape the future direction of training assessment but it requires much additional scrutiny and development before it can fulfill its promise. There is a need to articulate the need for an organisation to adopt a “customer-driven” approach towards quality public service designed to avoid misalignments between the service; as a product, and the requirements of the targeted segment of the public domain. A good PMS for competency assessment can enhance the understanding of such alignment, and assist government administrators in developing and maintaining quality public service duly aligned between the organisation and the national interest; in this case protective security.

3. Measurement Methodology

This study addresses the three(3) following questions:

1. What are the attributes on which CGSO established for the training?
2. Are the competency measurement method used to evaluate progress on the training outcomes in CGSO applicable?
3. How are performance measurement system linkages accomplished on the trainings given ?

A method of defining the required metrics in CGSO competency measurement is set forth modelled on Azrilah, A. (2004) Plan – Implement – Control – Evaluate (P-I-C-E) assessment method to measure a system performance [1]. This model is found agreeable to Shewhart’s (1939) P-D-S-A Cycle which was subsequently developed into the infamous Deming’s (1957) P-D-C-A Cycle by the Japanese industrial community. Then, in year 2000 in Geneva, this fundamental concept was adopted by the international community in ISO9000 – Quality Management System. Section 6 deals in depth with regards to education, training, skills and competency of the human resources.

This paper is an attempt to apply Rasch Unidimensional Measurement Method (RUMM) where it can yield very accurate findings using a data-driven approach to analyse the root cause of each item difficulty encountered [3, 6] in building the required competency. It is a very disciplined approach for assessing competency or generic

skills development during a learning process for a given training. Communication skill, teamwork, leadership, life long learning etc. are prerequisite generic skills in security which we shall term as dimensions.

Within these dimensions, relevant skills related to competency in protective security are then identified but not limited to, viz; mentoring, networking, deductive powers, prioritising, etc. Collectively this is known as attributes which are all measurable. A consolidated meta-data table is established showing the linkages of the competency measurement for each identified skill in Table 1.

Table 1 : Summarised Metadata of Competency Dimensions & Attributes

Dimensions	Attributes
Knowledge & Understanding	Content of information resources
	Filtering information
	Specialized subject
Application & Analysis	3E (effective, efficient, economy)
	Coaching/training
	INA (information needs analysis)
	Marketing
	Information & IT tools
	Quality Management
Evaluation & Synthesis	Information use outcome
	Research
	Product development
	Continuous improvement
Problem solving	Resilient
	Visionary
	Consultative skill
	Create opportunity
Lifelong Learning	Service excellent
	Career development

Teamwork	Cooperative
	Networking
Strategic Thinking	Prioritize
	Adaptability
Leadership	Charisma
	Mentoring
Communication	Interpersonal skill
Ethics	Trust
	Copyright & intellectual properties, policies
	Balance work family obligation

The Rasch Model is used to test the data obtained subsequent to the training whether it fits into the model. “Misfit” data are outliers that need to be dealt with. Rasch Model helps us to construct a scale based on a set of survey items. It is a probabilistic model and differs from many other models that are commonly deterministic. Thus, Rasch offers an alternative to a common practice that people do, which is the use of simple means over several items; where the problem of this approach is famous. Survey items are ordinal variables and they are not linear measures, hence lack accuracy. In Rasch measurement, data is multi-dimensional but measurement is unidimensional, hence putting everything on the same scale. Rasch emphasises the shift of reliability and validity in traditional Cronbach - α and Factor Analysis to the reproducibility of measures rather than expressing the reproducibility of raw scores. By focusing on the reproducibility of the latent trait rather than forcing the expected generation of the same raw score, the concept of reliability takes its rightful place in supporting validity rather than being in tension with it.

Normally decisions have often focussed on reliability and measurement error rather exclusively, ignoring sampling error and sample size considerations. Rasch goes beyond Generability theory by providing a more comprehensive framework of measurement. In Rasch, the measure variance and measurement error of the subjects are continually estimated throughout the data analysis. It also evaluates and reports data quality (fit), identifies items and persons with competency performances meriting special attention, perhaps remediation, or even omission from the current analysis.

CGSO training assessment form is designed and developed for the attributes which is rated based on an even number scale of 1 – 4 dichotomously indicating **NO** – **YES** with 2 – 3 indicating their degree of inclination of agreement to an attribute. This assessment form now gathers the presumed empirical data as the main component of this study. Table 2 shows the conceptual format of the designed assessment form.

Table 2 : Training Assessment Form Template

CGSO TRAINING ASSESSMENT SCORE FORM					
Program Title:					
Participant Gender: M / F			Job Grade : DM45		
<i>Ratings</i>		Grades			
		1	2	3	4
Dimension A					
Attribute A1			✓		
Attribute A2				✓	
Attribute A _n					✓
Dimension B					
Attribute B1				✓	
Attribute B2					✓
Attribute B _n			✓		

Dimension A, B...n, are the items assessed; knowledge, evaluation, leadership etc. The attributes are finite skills within the dimensions. For instance in *evaluation*, it would be information use outcome, research or product development. Results of the respondent assessment were collected and tabulated in Excel .prn format as shown in Table 3.

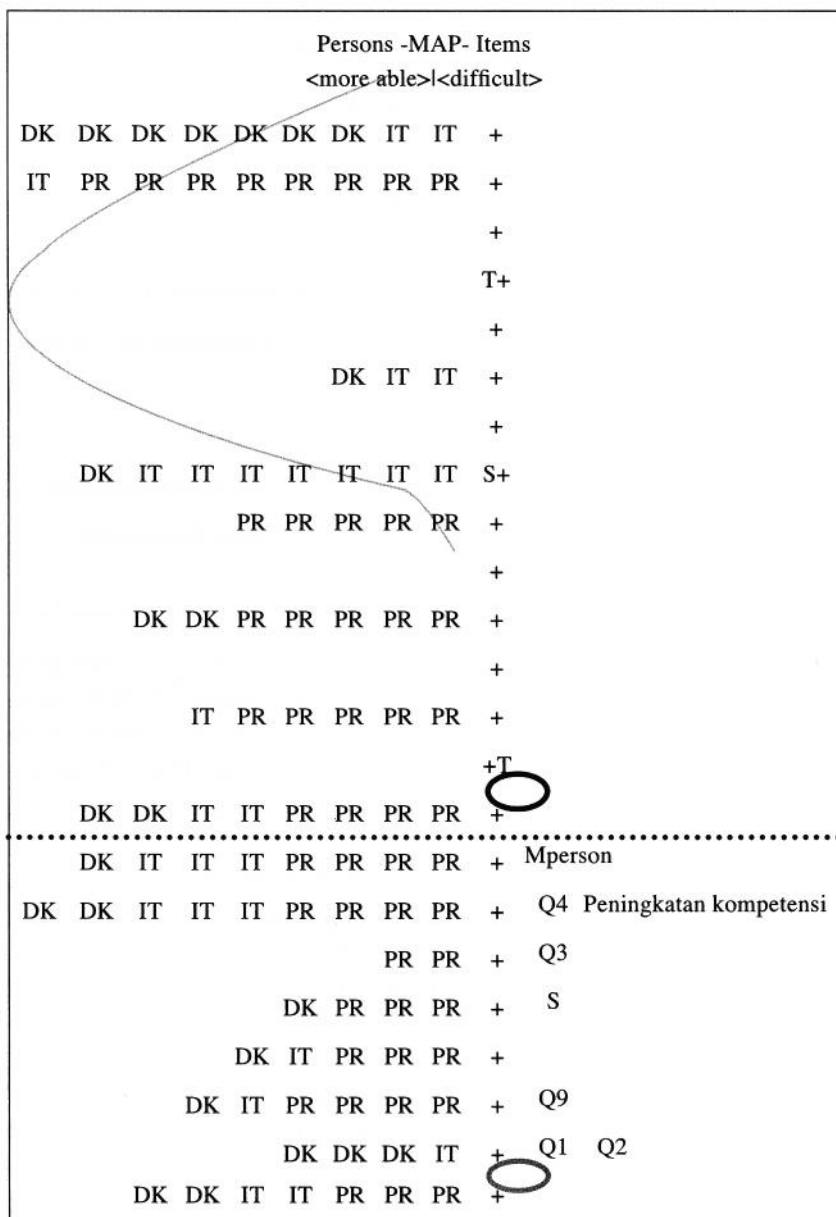
Table 3 : Respondent Assessment Result Tabulation .prn

Person	Item Ratings									
	DIF	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9
IT01	1	4	4	3	4	3	4	4	4	4
IT02	1	3	3	3	3	4	4	4	3	1
IT03	2	1	1	1	1	3	3	4	3	1
DK01	1	4	1	1	1	4	4	4	4	1
DK02	2	1	1	1	1	3	2	3	3	4
DK03	2	3	3	3	3	4	4	3	3	4
PR01	2	4	4	4	4	4	4	4	4	1
PR02	1	4	4	4	4	4	4	4	4	1
PR03	2	1	1	1	1	1	1	1	2	1
PR04	1	3	3	3	3	4	4	4	3	2

4. Discussion

The data is processed using RUMM-2020 software to conduct the necessary computation. First is to establish the Person-Item Distribution Map. Values in the map serves as an indicator; on the item easiness and gives a locii on the quality level of the respective item and person under scrutiny. Table 4 shows the Person-Item Distribution geographical position and kurtosis for evaluation.

Table 4 : Person-Item Distribution Map



DK PR PR S+ Mitem						
DK	DK	DK	IT	PR	PR	+ Q8
				PR		+
				IT		+
			IT	PR	PR	+ Q5
						+S
						+ Q6 Perubahan sikap terhadap
						+ Keselamatan Perlindungan
						T+
						+ Q7 Kesedaran tatacara dan
				DK	IT	+T amalan Keselamatan
<less able I <easy> Perlindungan						

It was observed that the $Mean_{item}$ is lower than $Mean_{person}$ indicating the officers are of high competence. Only 13 officers (10.92%) were found to be below $Mean_{item}$. However, 2 respondents (1.68%) were found to be grossly lack of awareness; DK14 and IT09. Now the management can take specific measures of corrective action on the respective staff.

All the respondents found the least problem understanding the practise of protective security (Q7) and observed that there has been very positive changes in attitude towards protective security (Q6). Nevertheless, a significant total number of 53 officers (45.38%) found little awareness of programs available to improve their competency in protective security (Q4).

Evaluation of Person-Item Correlation Order was done next. Table 5 shows interesting statistical relationship where the equivalent Cronbach- α ; Rasch reliability for the respondent = 0.55 is acceptable and excellent 0.95 for the items. The Rasch separation index; equivalent to factor analysis is a good 1.12 and acceptable 4.32 respectively.

Table 5 : Consolidated CGSO Latihan 2006 Participant Awareness
Assessment: Persons Item Statistics : Correlation Order

INPUT: 119 Persons 9 Items MEASURED: 119

Person:	REAL SEP: .1.12				REL: .55 Item:				REAL SEP: 4.22				REL: .95						

ENTRY RAW				MODEL		IN FIT		OUT FIT		PTMFA		EXACT MATCH							
INo. SCORE COUNT MEASURE S.E				MNSQ ZSTD		MNSQ ZSTD		CORR		OBS%		EXP%		Item					

	9	282	105	53.39	.86		1.86	5.1		2.85	6.5		.35		21.0	38.0		Q9	
	7	380	105	41.82	1.56		1.19	.8		1.10	.5		.36		70.5	67.8		Q7	
	6	372	105	43.57	1.41		.98	.0		1.02	.2		.41		66.7	63.8		Q6	
	8	336	105	48.72	1.04		.80	-1.1		1.30	1.3		.42		41.9	50.0		Q8	
	5	360	105	45.66	1.24		.83	-.7		1.02	.2		.44		62.9	59.0		Q5	
	1	306	105	51.53	.91		.73	-1.9		.55	-2.5		.57		56.2	43.1		Q1	
	2	296	105	52.33	.88		.72	-2.1		.61	-2.2		.59		52.4	41.1		Q2	
	3	242	105	56.16	.81		.80	-1.6		.74	-1.5		.66		31.4	31.7		Q3	
	4	232	105	56.81	.81		.83	-1.4		.79	-1.2		.67		23.8	30.0		Q4	

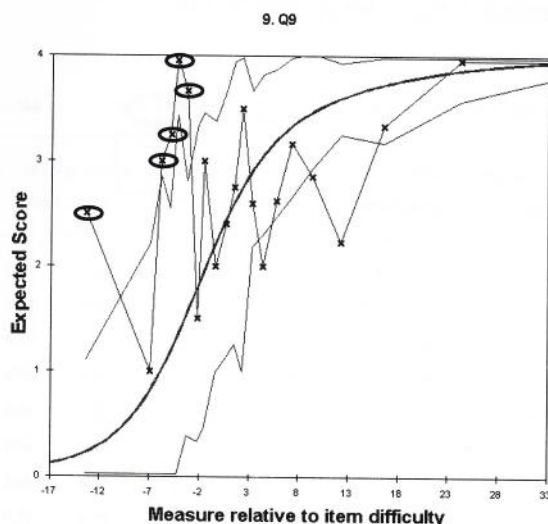
	MEAN			311.8	105.0	50.00	1.06		.97	-.3		1.11	.1		47.4	47.2			
	S.D.			51.2	.0	5.08	.26		.34	2.1		.66	2.6		17.6	13.0			

Subsequently, a check of Point Measure Correlation (PMC) gives the construct validity of the items. Q9 has a poor PMCoF 0.35 with an unexpected t-MNSQ=2.85 needs further evaluation. The other item which lies between PMC score of 0.4–0.8 is acceptable

Q9 was further evaluated by Item Characteristic Curve technique to check the misfit data. Table 6 shows the

Table 6 : Item Characteristic Curve of

Q9: Aware significance of training given



spread of respondents against item difficulty. It was found that Q9 is over-discriminating. The less able respondents were unexpectedly found to have scored very high beyond the 95% confidence interval whilst the more able did not score as expected, hence a misfit data.

5. Conclusion And Recommendations

Rasch modelling can be used to form valid measures on different dimensions of training achievement. The respective officers' ability development may be tracked over their service period and training methods and styles may be improved to facilitate such latent development. Symptoms of officers' weaknesses in certain generic skill trait can be traced more effectively and easily. This simple but prudent conceptual theoretical framework of measurement is capable of examining training effectiveness in great depth and width.

Rasch measurement uses empirical data directly from the respondent assessment for a given training. This PMS result in more accurately classified examinees. It enables each item to be evaluated discretely.

Though Rasch measurement is able to show reliably accurate result with small numbers of respondent, the dimensions affecting the respondent performance shall be subjected to further study.

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