CONSIDERATIONS IN DESIGNING IS SERVICES QUALITY (ISSQ) ASSESSMENT

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Abstract: *This paper is divided into two major parts. The first part begins by introducing information system service quality (ISSQ) model. The model identifies components and elements that encompass ISSQ in an organization. The model is currently being developed by one of the authors based on fieldwork conducted in institutes of higher learning (IHLs) in Malaysia and surrounding region. Part two describes the use of ISSQ model as a basis for ISSQ assessment. This is done by identifying elements involved in the intricacies of establishing, deploying, and receiving information system services (ISS). Even though the ISSQ model is based on IHLs, the elements are generalized in order to fit all types of organizations. Part two ends with description of relationships among various elements involved in assessment of ISSQ.*

Keywords*: Information Systems Services, Information System Services Quality, Assessment Systems, System Design*

1. Introduction

This paper is based on a project being conducted under an IRPA grant. The project is about information systems service quality (ISSQ) assessment. The project focuses on developing a model for ISSQ and also instruments that can be utilized to assess ISS. An electronic assessment system prototype is currently being developed. It incorporates both web-based assessment and wireless assessment.

Literature is abound on service quality [1 - 13] and information system service quality [14 – 23], but the same can't be said about assessment of ISSQ. Thus, this paper explores the considerations involved in designing an assessment for ISSQ.

2. Part one

The ISSQ Model (Figure 1) represents the elements or attributes that are significant. The model is used for the assessment of IS services, defined as activities that facilitate and support customers in exploiting IS in organization. Like other services, IS service involves interaction between the service provider and the customer [24]. The model divides ISSQ into two major divisions: ***Service Quality Portfolio*** and ***Management Quality***. Each of the divisions is further sub-divided into few more levels. The lowest levels (right-hand side of figure) consist of the actual attributes that are the factors used to assess the items in higher levels (or parent levels).

The Service Quality Portfolio is divided into ***Content*** and ***Performance*** sub-divisions. Content sub-division is separated into two categories of services available: ***Use Service*** and ***Support Service*** [25]. Use Service refers to services that are used by the recipients as part of their transaction or work.

The types of services under Use Service are divided into three based on the service being served: (i) ***Application Services*** reflect on software applications used such as billing systems, accounting packages, online reservation systems and so on. The application may be developed in-house to fulfill the specific and divergent needs of the internal customers, (ii) ***Information Services*** are services involving dissemination of information such as websites, e-bulletins/e-magazines or even e-directories. The information is primarily used by recipients to improve work productivity, gain knowledge or to learn about latest developments in the organization, and (iii) ***Infrastructure Services*** consist of services that come in the form of infrastructure such as network capabilities and availability, IT policies and strategies, digital library and email services. This type of service is usually organization-wide rather than being individualized. The cost of setting up infrastructure services is high, thus it is necessary to ensure that it is beneficial to as many people as possible.

Support Service refers to services that help recipients with their transaction or work. Usually, recipients use these services when faced with difficulties or abnormalities using the other services. Support Service is divided into two: (i) ***Manual***

Service refers to services rendered by humans such PC repair and maintenance, help desk, and technical support teams, and (ii) ***Information Service***, which unlike the Information Service under Use Service, provides information for the purpose of solving problems, or answering inquiries that are related to IS services themselves. Example of such services are Frequently Asked Questions (FAQs) and troubleshooting guides, IT policies, and service level agreements (SLA). The information may be in soft copy or hard copy.

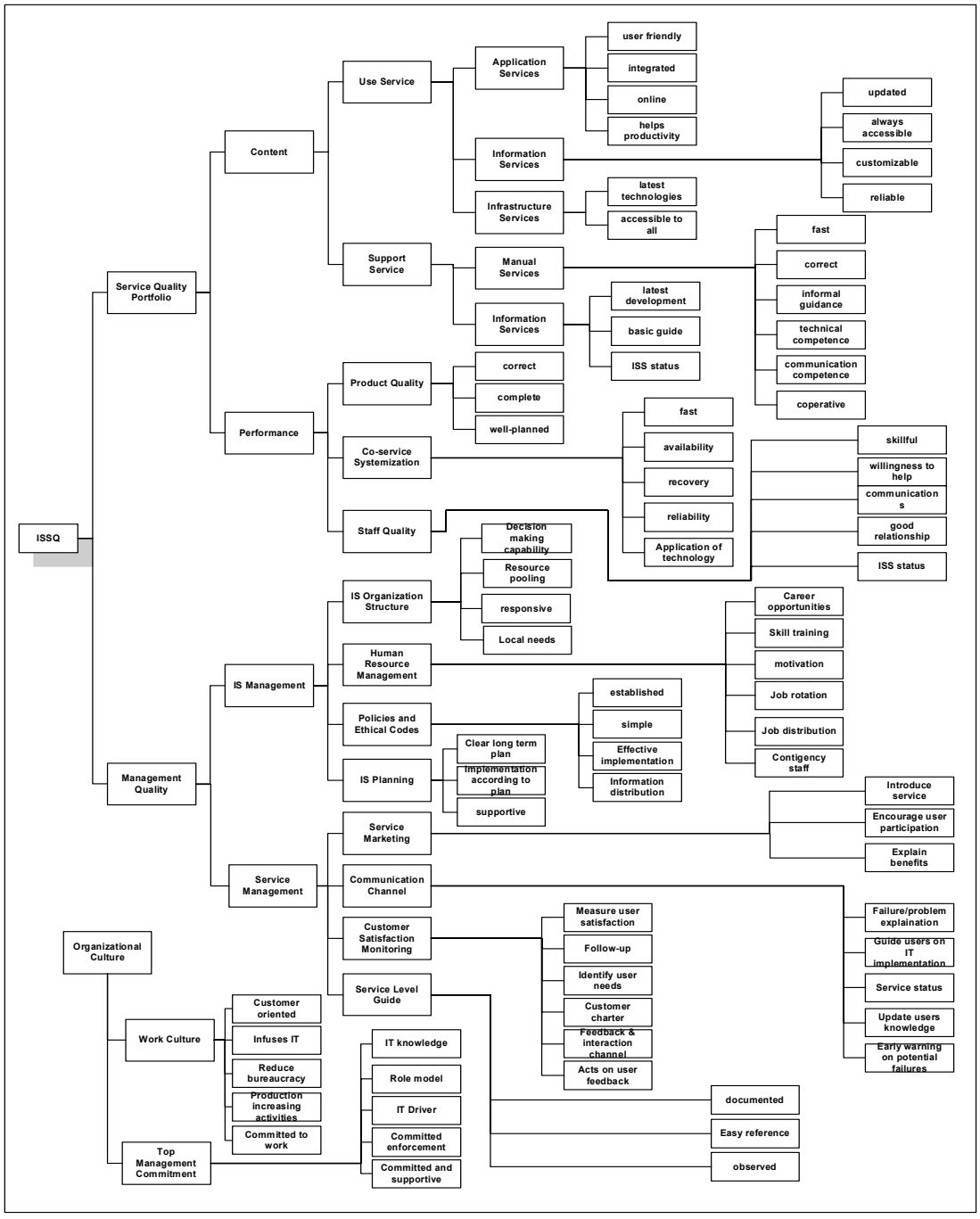

Fig. 1. ISSQ Model

For each of the services above, a non-exhaustive list of attributes (or factors) that determine the outcome of the service delivery, the perception of the recipients, and characterize the service is provided. One such example is application service, which has the attributes user friendly, integrated, online, and helps productivity.

It must be emphasized that for all services that falls under a service category, the attributes are same. In other words, all application services should be user friendly, integrated, online, and help in improving productivity.

The ***Performance*** sub-division contains three categories that apply to all types of services listed in the Content sub-division. Product Quality, Co-service Systemization and Staff Quality contain attributes that also influence recipients' perception of the services rendered.

The elements listed under Service Quality Portfolio may be used for assessment by both recipients and providers of services to obtain a comparison. However, elements under the Management Quality are meant to be used for assessment by decision-makers or top management of an organization. This is because the attributes under this sub-division imply the need for knowledge of organization's internal policies, strategies, work culture, and management style.

Management Quality sub-division consist of ***Information System (IS) Management*** and ***Service Management***. IS Management is focused on the management of the information systems particularly in terms of organizational roles, human resources, IT policies ad planning. It is divided into ***IS Organization Structure***, ***Human Resource Management***, ***Policies and Ethical Codes***, and ***IS Planning***. Each of these elements has their own set of attributes, which is applicable in assessing the elements. ***IS Organization Structure*** is concerned with decision making capabilities, pooling of resources, responsiveness of the organization, and the ability to gauge and cater to localized needs. ***Human Resource Management*** focuses on providing career opportunities, skills training, staff motivation, job rotation and distribution, and provision for contingency staff. ***Policies and Ethical Codes*** need to be established, simple to understand, effectively implemented, and information regarding them are well – distributed. ***The IS Planning*** should have a clear long term plan that is implemented accordingly, and the plan should be supportive of the IS needs of the organization.

Service Management, which is concerned with the management of the services, consists of ***Service Marketing***, ***Communication Channel***, ***Customer Satisfaction Monitoring***, and ***Service Level Guide***. ***Service Marketing*** involves the need to introduce the service, encourage user participation, and explain the benefits or advantages of the services. ***Communication Channel*** needs to provide explanation of failures or problems, guide users on IT implementation, provide information on service status, update the users knowledge, and give early warning on potential failures. ***Customer Satisfaction Monitoring*** is another important element that involves measuring user satisfaction, doing follow – up, identifying user needs, providing customer charter, providing feedback and interaction channel, and acting on the feedback received from users. ***Service Level Guide*** should be provided by the organization. It must be well – documented, easily referenced, and fully observed by the staff and users.

All the elements discussed above make up ISSQ. But the ***Organizational Culture*** of the organization also influences ISSQ. Organizational Culture can be further categorized into ***Work Culture*** and ***Top Management Commitment***. ***Work Culture*** refers to the inherent beliefs, perceptions, and attitude that prevail throughout the organization. The Work Culture should be customer – oriented, infuses IT, reduces bureaucracy, have production increasing activities, and instill commitment to work among the staff. ***Top Management Commitment*** in terms of IT knowledge, as a role model and IT driver, through committed enforcement of policies, and commitment and support, is very important in an organization.

The ISSQ Model was developed through semi – structured interviews and questionnaires submitted to various stakeholders in selected IHLs [26,27].

3. Part two

The ISSQ Model lays the foundation for an assessment system since it provides a hierarchical view of ISSQ and also the attributes involved in each of the elements. A service transaction involves three major players: (i) the service itself, (ii) service provider and (iii) service recipients.

3.1 Service provider: the organization?

The ISSQ Model provides adequate description about service. But what about the other two players? Who is the service provider and recipients? What are their characteristics? We can easily summarize that the organization is the provider and its customers are the recipients. This may look agreeable in the beginning. But since our aim is to create a system that is generic and scalable, we found that the organization size and structure also comes into contention. A large organization will have many

divisions, logical and physically separated. There may also be branches distributed according to the business strategies. Thus an organization is divisible into smaller components such as branch and department. Information technology (IT) and/or IS based services are usually provided by a section of the organization that may be identified by terms such "IT Department", "Information Systems Division", Management Information System (MIS) Department", or other similar phrases. Thus our research drills further into an organization to identify the IS service provider right up to the department or division in charge. Since many branches may exist, it is unavoidable that the department in charge of IS service is also decentralized or divided to handle different regions. To summarize, it is clear that the IS service provider is actually one or many departments in the organization. The organization is merely the owner of the service products.

3.2 Service recipients: the customers?

The emphasis is that customers are the sole judgment of service quality [3]. We start off by asking: Are the IS Service recipients the organization's customers? It is easy to answer yes if we think of customers paying bills online, trading shares via phone banking, accessing web-based library database, and even checking on summons via websites. A customer may be a paid/privileged member, for example banking and financial services organizations serve people who have an account with them. On the other hand, potential customers may still be able to view demo application, visit websites and use other IS services provided by these organization to attract more customers. A student who uses online searching facilities provided by the library is also a customer. A person who visits the website of the parliament to get the some information is also a customer, even though he/she does not make any payments or obligations to the organization. We can say that a customer may not necessarily be a paying member. But this is only limits customer to those who are not part of the organization, in other words, external customers.

We find that these service providers (departments) serve not only external customers, but also their fellow colleagues who work in other departments and branches. Thus we have a situation where the IT Department provides helpdesk for Accounting Department staff who use accounting application packages. The situation becomes complex when we take into account that the Accounting Department exists in all the regional branches. So, the service provider has internal customers that may be spread out throughout the organization. We now have internal customers that may be categorized as inter-branch or intra-branch depending on their location in relation to the service provider.

So far, we have covered the actors in service transaction. Figure 2 summarizes interaction between these actors. The next step is merging of other components that encompass an ISSQ assessment system.

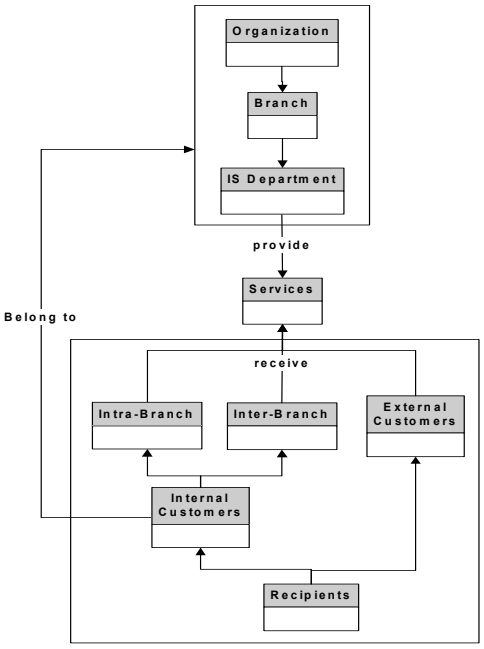

Fig. 2. Interaction Between Service Providers and Recipients

3.3 Key personnel

There is also a need to separate some of the internal staff based on their responsibility and seniority. The decision-making management level personnel are involved in assessing the Management Quality sub-division elements as shown in the ISSQ Model.

3.4 Assessment period

An assessment is done for a specific time period and it is usually periodic in nature. This is to allow comparisons along time-based dimension in order to place the subject of assessment on a continuum of progress or performance. The duration of an assessment is dependent on factors such as the assessment subject, the size of assessment sample, the assessors, and the objective of the assessment. An assessment may run for days, weeks or even months.

3.5 Elements

As explained earlier in Part I, the ISSQ Model provides elements that characterize services. The model also lists attributes that are used to assess the services. The elements and attributes are essential in the assessment as they form the factors by which the services are assessed.

3.6 Questions

How does one assess? Some primary tools used in assessment include questionnaires, interviews, focus groups, and observations that incorporate qualitative and quantitative measurement. The questions should be related with the factors that are to be assessed. There is also the issue of what kind of response is needed. If it is quantitative in nature, close-ended questions that require users to choose, arrange, quantify or number items are appropriate. On the other hand, if textual descriptive responses are expected, questions will be more subjective and open-ended such as asking for opinions, ideas, or comments. The determination of type of assessment instrument should also take into consideration (i) the ability, availability and types of respondents, (ii) the method of communication between the assessment system and the respondents, and (iii) the cost involved.

In the context of the ISSQ Model, the questions need to be mapped to the elements and also the attributes of the services. Since the Service Quality Portfolio sub-division is directly related to services rendered and imply quantifiable responses, questionnaires are more appropriate. The Management Quality sub-division is related to decision-makers and management level personnel. Here, a discussion-based instrument seems appropriate.

3.7 Assessment results

Finally, the assessment results must be processed and presented to the intended recipient. The owner or initiator of the assessment is the one that usually gets the results. But there are situation where even the respondent receive results of the assessment (two good examples are public examinations and employee appraisals). For the assessment system, it is set that the key personnel may receive the results of the assessment in the form of reports.

The initial diagram (Figure 2) is now updated by adding Key Personnel, Assessment Period, Elements, and Questions and is shown in Figure 3. The service recipients and the key personnel are now considered as respondents of the assessment. The top-level interaction is between components of the assessment system is shown in Figure 4 (modified from [24]).

Conclusion

This paper has described a model being developed for ISSQ and the use of the model in designing an assessment system that is dynamic and scalable. The prototype of the system is under development using Java programming language and Microsoft SQL Server database and tools.

The authors appreciate any feedback on the design of the system and can be contacted via the addresses given above.

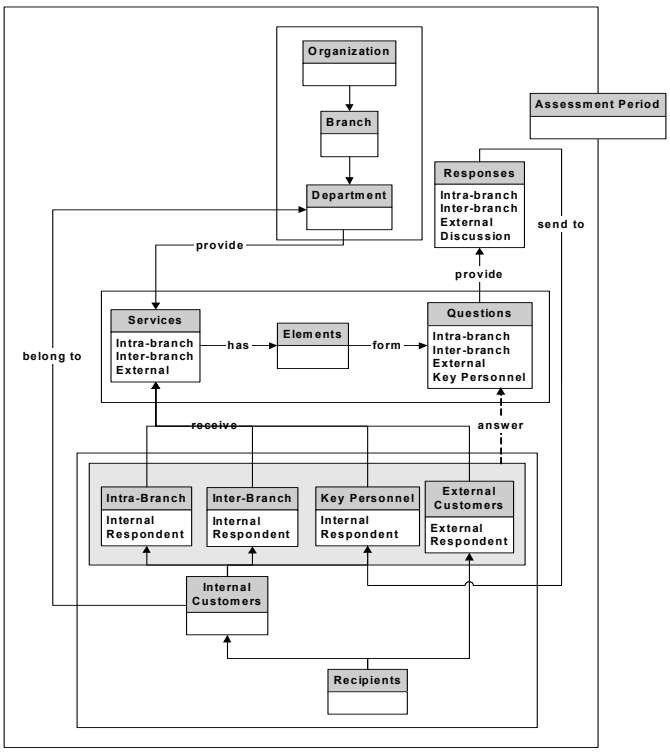

Fig. 3. Interaction Between Components of the Assessment System

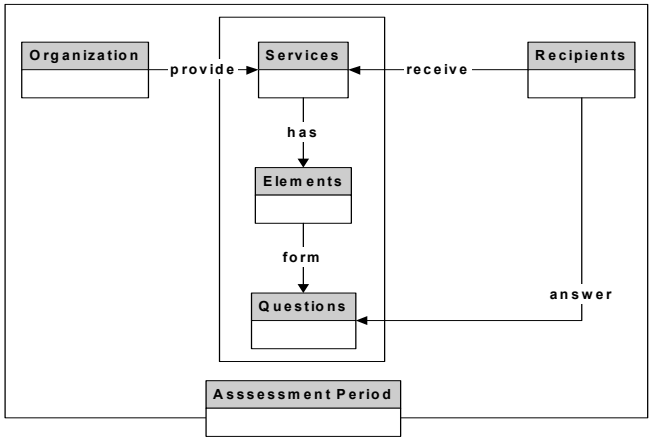

Fig. 4. Top – Level Interaction Between Major Components

References

[1] Babakus E. and Boller G. W., "An Empirical Assessment of the SERVQUAL Scale", Journal of Business Research 24, 253- 268 (1992).

[2] Cronin, Jr. and Taylor, S. A., "Measuring Service Quality: A Reexamination and Extension", Journal of Marketing 56(3), 55-69, (1992).

[3] Donnelly, Mike, Wisniewski, Mike, Dalrymple, John F., and Curry, Adrienne C,. "Measuring Service Quality in Local Government: The SERVQUAL Approach." International Journal of Public Sector Management 8 (7) (1997).

[4] Edvardsson B., Thomasson B., Ovretveit, John. *Quality of Service: Making It Really Work* (Mc-Graw-Hill, 1994).

[5] Gronroos,C., "A Service Quality Model and Its Marketing Implications", European Journal of Marketing 18(4), 36-44, (1984).

[6] Nitecki D. and Hernon P, "Measuring Service Quality at Yale Unversity's Libraries", Journal of Academic Librarianship 26(4), 259-274. (2000).

[7] Parasuraman, A., Zeithaml, V.A. and Berry, L.L., "A Conceptual Model of Service Quality and Its Implications for Future Research", Journal of Marketing 49, 41-50, (1985).

[8] Parasuraman, A., Zeithaml, V.A. and Berry, L.L., "SERVQUAL: A Multiple Scale for Measuring Consumer Perceptions of Service quality", Journal of Retailing 64(1), 12-40, (1988).

[9] Parasuraman, A., Zeithaml, V.A. and Berry, L.L., "Refinement and Reassess of the SERVQUAL Scale", Journal of Retailing 67(4), 420-450, (1991).

[10] Philip, G. and Hazlett, S., "The Measurement of Service Quality: A new P-C-P attributes Model", International Journal of Quality and Reliability Management 14 (3), 260-286, (1997).

[11] Sureshchandar G. S., Rajendran C. & Kamalanabhan T. J., "Customer Perceptions Of Service Quality: A Critique", Total Quality Management 12 (1), 111-124, (2001).

[12] Teas, R.K., "Expectation, Performance Evaluation and Consumers' Perceptions of Quality", Journal of Marketing 57(4), 18- 34, (1993).

[13] Townsend P. and Gebhardt, J, "The Policy Is Still Quality", Best Review, June, (1988).

[14] Berry, L.L. and Parasuraman, A., "Listening to the Customer - The Concept of A Service-Quality Information System", Sloan Management Review 38(3), 65-79. (1997).

[15] Bryson, J., *Managing information Services: An Integrated Approach* (Mc-Graw-Hill, 1997).

[16] Fitzsimmons J. and Fitzsimmons M., *Service Management: Operations, Strategy, and Information Technology* (Mc-Graw-Hill, 1997).

[17] Kettinger W.J. and Lee C.C., "Perceived Service Quality and User Satisfaction with the Information Services Function", Decision Sciences 25(5/6), 737-766, (1994).

[18] Kettinger, W. J. and Lee, C. C., "Pragmatic Perspectives On The Measurement Of IS Service Quality", MIS Quarterly 21(2), 223-241 (1997).

[19] Pitt, L. F. and Watson, R. T., "Service Quality: A Measure of Information Systems Effectiveness", MIS Quarterly 19(2), 173-190, (1995).

[20] Rand, T., "Information Technology As A Service Operation", Journal of Information Technology 7, 189-201, (1992).

[21] Richardson, T.A., "Measuring Customer Satisfaction with IS services", Capacity Management Review 22(9), 1-6, (1994).

[22] Robinson, S., "Measuring Service Quality: Current Thinking and Future Requirements", Marketing Intelligence and Planning 17(1), 21-32, (1999).

[23] Van Dyke, T. and Kappelman, L. A. (1997). "Measuring Information Systems Service Quality: Concerns on the Use of the SERVQUAL Questionnaire", MIS Quarterly. 21(2). 195-209.

[24] ICIMU: Rose Alinda Alias, Azizah Abdul Rahman, and M.Poobalan M.Masilamani., "Understanding IS Services" in Proc. of the International Conference on Information Technology and Multimedia 2001: Recent Advances and Future Trends in Information Technology and Multimedia. Malaysia. (2001).

[25] IEEE: Saaksjarvi, M. and Saarinen, T., "Evaluation of Service Quality of Information Systems" in IEEE 7 (Institute of Electrical and Electronics Engineers, New York, 1900), pp. 84-94, (1994).

[26] Rose Alinda Alias and Azizah Abdul Rahman, "Persepsi Kualiti Servis Sistem Maklumat di IPTA: Kajian Kes Universiti Teknologi Malaysia", Seminar Sosio-Ekonomi & IT, (2001).

[27] Rose Alinda, Azizah, M.Poobalan and Nik Suraini, *Laporan Kajian Kualiti Servis Sistem Maklumat Pusat Komputer UTM*, Universiti Teknologi Malaysia: Laporan TNCA. (2001).