

# **Statistical Profession: The Way Forward**

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## **Abstract**

This paper<sup>1</sup> highlights the basic requirements in being a statistician, the attributes of a competent statistician and the image of the profession. It also dwells on whether statisticians in the Malaysian civil service meet the competency criteria as expected by the public service, more so, in handling the unexpected and the unpredictable in today's world scenario. In terms of the relevancy of the service and strategies in making the service more relevant in the public services as well as the effectiveness in delivering excellent services, this paper delves further by explaining the role of statisticians in narrowing the gap of uncertainty in planning with providing the relevant information. By overcoming the challenges in the future direction of the statistician services, the need for the profession will always be there.

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## **1. Introduction**

The new era is characterised by globalisation, changes in economic structure, sophistication of consumer demand, advancements in ICT and the prominence of information related activities. The resulting changes in the nature and magnitude of demands for statistical products and services have created a new environment for national statistical services worldwide.

There is then a need to review the existing delivery mechanisms and align them to the requirements of the new environment. In Japan, for example, the Statistics Council of the Management and Coordination Agency has developed the strategic guidelines for the new directions in the development of the government statistical service in 1995 (Govt. of Japan 2003). On-going efforts are being undertaken to align Japan's Statistical Service to the said guidelines and to review the guidelines to suit the present environment.

Inevitably, the proposed changes to national statistical systems will have to directly address the challenges faced by the persons actually responsible for ensuring the fulfilment of the new set of expectations, namely the statisticians.

## **2. Who are the statisticians?**

The following questions are worth pondering:

- a. Who are the Statisticians?
- b. Are statistical services still relevant in this new era?
- c. Provider of Statistical Services: "Why Statisticians and not Lawyers, Architects, Doctors or System Analysts?"

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- d. Are Statisticians (especially from the National Statistical Office) expected to be involved in data analysis?
- e. What is the impact of ICT development on the services provided by Statisticians and are the statisticians equipped to face this new development?

The answers to the above are expected to provide the much needed insight and direction to members of the statistical fraternity in Malaysia, which would in turn lead to a more focused approach in promoting excellence in their professional endeavours in the new era.

### **3. Statisticians in the Malaysian civil service**

In 2003, there are 215 statisticians in the Malaysian public service. Although the majority of them work at the Department of Statistics (DOS), there are also those who are serving as cadre officers in the various ministries and government agencies in Malaysia.

Being public servants, statisticians are also obligated to observe the regulations and ethical guidelines of the public service. As a civil servant, it is the responsibility of the statistician to continuously improve the quality of the services provided. The issues pertaining to integrity and the implications on the promotion of excellence are not confined to the public service, and, as outlined in the government document on the National Integrity Plan (Government of Malaysia 2004), the success of the plan also requires the commitment of the private sector and the NGOs.

A candidate for the post of a statistician in the Malaysian public service is required to possess an honours degree in either statistics, mathematics, economic, sociology, geography, accounting or commerce. With this basic knowledge, statisticians are expected to carry out the tasks of collection, processing and dissemination of data. Due to their different academic backgrounds, statisticians will face an estranged situation where their perceptions based on the usually general job descriptions on the advertisement may not coincide with the actual tasks assigned to them. In the long term too, they may discover that their achievement targets and career goals may differ from the expectations of their employers.

### **4. Competency considerations**

In the context of this paper, a statistician refers specifically to a competent statistician. For statisticians, competency may be described in terms of professional performance in meeting users' requirements for statistical products and services, which among others, may include the notion of technical proficiency and communication skills. As a civil servant in the Professional and Management group, the statistician must be a person who is efficient in his job irrespective of where he is posted. As the statistician progresses in his career in the public service, besides the regular tasks of collecting and processing of data as well as interpreting and disseminating statistics, a statistician also needs to acquire knowledge in human resource management, finance and administration. As a statistician, it is important to know your customers and be always ready to fulfil their requests in a timely manner. Besides understanding the basic principles and the corresponding rationales associated with the statistical discipline, a statistician should over time acquire the skills to express problems into specific requests for information.

The question before us is to what extent have statisticians in the civil service met the competency criteria as expected by the public service. Given that in an ever changing environment, user satisfaction is a moving target, the next question is whether we have adequately planned to not only sustain previous successes but, hopefully to surpass future expectations of our stakeholders.

## **5. Statisticians in the new environment**

This leads to the second issue that is to handle the unexpected and unpredictable in today's world scenario. The following factors influence the statistical service and affect the operation of any organisation including the Department:

### **a. Globalisation**

Commercial activities and relationships between the government, organisation and the public cut across national political boundaries; market forces are said to operate in a borderless world.

### **b. Convergence of information, technology and communication**

Advances in technology have accelerated the growth in communication and economic activities inter and intra country. This means that information must be made available quickly and transmitted to where it is required almost instantaneously, since, for example in the highly competitive commercial and financial sectors, delay means additional costs and missed opportunities.

### **c. Citizens' concern**

The public plays an increasingly important role where civil servants are expected to meet the demand for greater transparency in the delivery of their services. The public is now more knowledgeable and critical to the extent that DOS's Industrial Production Index is scrutinized and debated by the media.

### **d. Users' expectations**

To our stakeholders, speed of delivery of the latest statistics is of critical importance for economic planning and monitoring of development programs. Recently, the emphasis is on data at the micro level and for small areas, not just at the national level.

The factors mentioned above means that statisticians would be operating in a rapidly changing environment characterised by uncertainties.

What are the implications of these changes to statisticians? A good grasp of the following implications would provide the direction towards becoming an excellent statistician.

- a. Knowledge becomes an important asset and weapon to face the competitive environment.
- b. The ability to create order out of chaos will be a valuable asset.
- c. In the new era statisticians need to have extensive networking. Smart partnership and collaboration with the private sector/NGO/international agencies and the public need to be fostered. The wide network will enable statisticians to gain from the strengths of others, especially in areas where they are lacking on specific competencies.
- d. The new environment requires statisticians to continuously upgrade themselves with new skills, and this includes the skill to acquire new skills. By “asking the right questions” via the Internet, new information or knowledge could be obtained instantly.
- e. Statisticians need to have multiple skills. The dynamic environment and knowledgeable users lead to the demand for unique and customized data. Therefore, statisticians must possess multiple skills in order to perform the multiple tasks as required by the new level of sophistication. Besides the traditional tasks of collecting, processing and disseminating of data, including data analysis, statisticians are also expected to set the statistical standards based on their knowledge and training on the subject.
- f. There is a need to instil the importance of continuous learning as part of the statisticians’ career development. New sampling techniques and new packages are continuously introduced and made available. In terms of data collection, new approaches, facilities and equipments are introduced and promoted. As for statisticians, survival depends on how they are able to cope with and benefit from the advancements.
- g. Paradigm shift or the change in mindset is essential particularly with respect to the professional role of statisticians. The organisations, where the statisticians are assigned, are prepared to take different shapes and sizes in respect of organisational structure and scale of operations in tandem with the dynamic environment. The statisticians’ achievements as well as the recognition of the relevancy of their profession depend to a great extent on their adaptability and participation as effective members of such an organisation where hierarchical restrictions and adherence to narrow job specializations are no longer the norms, and statisticians are expected to assume the dual roles of “thinkers” and “doers”.

## **6. Relevancy of statistical services**

The issues to be considered in terms of the direction of the service of statisticians include the relevancy of the service and strategies in making the service more relevant in the public service as well as the effectiveness in delivering excellent services. The first question to be addressed is whether the service of a statistician is still relevant in the present context. The main task of statisticians is to provide statistical information for effective planning and administration of the country. Planning can be viewed as a creative process in building a connection between the unpredictable future with the present and the process requires quality statistical information. The role of statisticians

are to narrow the gap of uncertainty in planning by providing the relevant information. With their basic training, statisticians are expected to be able to provide the required information. Statisticians' objectivity in thinking will assist planners to make informed and accurate decisions based on facts and figures. In this aspect, statisticians have an advantage over other professionals such as singers, doctors and architects.

Should statisticians fail to live up to the expectations of the planners, due perhaps to their lack of understanding of user requirements or shortcomings in methodological objectivity, intervention or direct involvement of planners in the conduct of statistical activities and delivery of statistical products and services is not an unlikely prospect. Herein lies the need to increase networking and enhance the ability of statisticians in analysing the data at their disposal. The appropriate level of data analysis will enable statisticians to further assist users in gaining a proper understanding of the data. Similarly, the statisticians' expertise is required to analyse the data and interpret the findings taking into consideration the reality under which the data are generated. Without such value-added contribution from the statisticians, the data collected are of very limited use and lack the predictive interpretations of interest to planners.

In terms of organisation, DOS has developed rapidly from only three statisticians in the 1960's to the 215 statisticians in 2003. In fulfilling the requirements of data analysis, the Research and Development Division and also Analysis Unit Section at every state were established. Again, are statisticians ready to enter this new field so as to enhance their relevancy? Thus, this necessitates the readiness of the statisticians to learn and expose themselves to the other statistical fields other than the traditional tasks.

The Statistics Division of the United Nations (UNSD) standardises and co-ordinates statistics at the international level while at the regional level UNESCAP covers statistical activities among the Asia and Pacific countries. The ASEAN Secretariat performs a similar function for the ASEAN countries. Other agencies that are directly involved in statistical activities include the IMF, ADB and SIAP.

With globalisation, economic, commerce and management activities cut across political boundaries. Meeting the challenges of globalisation requires wider and closer relationship among statistical agencies; hence the importance of enhancing relationship and collaboration with other agencies at the global level. In 2001, an MOU was signed between DOS and the National Statistical Office (NSO) Uzbekistan whilst the MOU with the Central Bureau of Statistics of Syria was signed in August 2003.

At the regional level, the ASEAN Secretariat is very aggressive in its initiatives to co-ordinate statistical activities and promotes statistical standards for the region. An important forum for this purpose is the regular ASEAN Heads of Statistical Organisation Meeting (AHSOM) organised by the UNSD and the ASEAN Secretariat. These activities signify the importance or relevancy of the statistical service to the international community and the participation of DOS shows our national commitment to such activities. The active involvements at the international and regional levels, whether in providing the information or participation in the various forums, are appreciated by all concerned and the Department believes that the services provided would enhance the relevancy of the statistical service.

In future, demand for the service of a statistician may come from non-traditional users such as when DOS was invited by ADB to participate in developing the national

statistical office (NSO) of Timor Leste. Should such a situation arise, the question is whether statisticians in DOS are willing to participate in the endeavour. The next question to be addressed concerns the extent statisticians are prepared to effectively assume such a role. Although, it can be said that the service of statisticians is and will continue to be relevant, there are challenges to be addressed in gaining further recognitions particularly at the international level.

## **7. Good governance in the statistical service**

For business organisations or corporations, excellence is largely measured through the observance of good governance. Similarly, the statistical service should observe and embrace good governance in order to continue to be relevant and credible. One aspect of good governance that is expected from the public service is transparency. The following Fundamental Principle of Official Statistics adopted by the United Nations Statistical Commission should be observed:

- a. To retain the trust in Official statistics, the statistical agencies should make decisions strictly based on professional considerations, including scientific principles and professional ethics, on the methods and procedures for the collection, processing, storage and presentation of statistical data.
- b. To facilitate a correct interpretation of the data, the statistical agencies should present information according to scientific standards on the sources, methods and procedures used in generating the statistics.

Nowadays, users are more critical and require assurance on the data provided. A question arises as to the ability of statisticians to directly explain the procedure and methodology used with confidence and thus, regain the trust and respect of users. Hence, integrity, communication skills and expertise in subject matter are needed, besides knowledge on the application of statistical methods.

The practice of explaining the methodology or procedures of collecting data is being given greater emphasis by DOS not only to comply with the guidelines for good governance, but also to further improve the respective procedures. Information pertaining to methodology of data collection is continuously improved in the publications, the Department's website and also in the meta data for SDDS-IMF. Promotion of transparency is further intensified via increase in the Department's briefing sessions with various agencies, the private sector, higher learning institutions and International organisations.

One of the pertinent aspects of transparency is responsiveness. Responsiveness refers to the ability of the statistician to respond to the demand from users. The main users of data produced by DOS include governments, businesses and others. Due to their level of technical proficiency, users such as the World Bank, IMF and ADB, require continuous interaction with the statisticians to ensure that the methodology used is properly understood and accurately interpreted. Another important user is the media. Dealing with the media, however, poses a big challenge to the NSO. It is the duty of the statistician to report the actual facts whilst the media focuses on attracting the readers' attention, which sometimes may lead to misinterpretation of facts. As an example, an issue on the proportion of unmarried females was once highlighted in a local newspaper.

A few days later on 21<sup>st</sup> July, 2003, a writer reminded that the relevant statistics must be examined according to the respective age groups and this led to the finding that the proportion of unmarried females was really a non-issue. As noted in the UN Handbook on the operation and Organisations of Statistical Agency (UNSD 2001), the press and other mass media play a special intermediary role in the relay of statistical information and therefore, it is the duty of the statistical agency to ensure that the right information gets to the right hands at the right time, properly described and imparted in the appropriate form to those who need it. Towards this end, the relevant in-house training programs are given greater emphasis, while selected statisticians are given the opportunity to attend external training programs.

## **8. Career development of statisticians**

The direction of the statistical service should take into consideration the promotion prospects and career development of the statisticians. Through the restructuring process of DOS and with the introduction of the new remuneration scheme for the civil service, *Sistem Saraan Malaysia (SSM)*, new posts are created and thus, provide better opportunity for promotions. This holds true not only to statisticians presently in DOS but also to all statisticians in the civil service.

Presently, DOS has three posts at the JUSA level compared to only one post prior to the restructuring exercise. Meanwhile, the number of posts of grade N54 (N1 in SSB) has increased from three posts to 15 posts and the number for grade N48 (N2) has increased from 17 to 39 posts. Through SSM, the Public Service Department (PSD) has agreed that 17 of the 39 posts of N48 be upgraded to N52. This statistics indicate that every statistician has the opportunity to progress through the ladder of promotion. However, it is noted that the rise in user requirements is not in tandem with the number of posts available. Therefore, it is in this respect that achievement, performance, acceptability, competence and desirable characteristics of a statistician will determine the promotion to the higher position.

There is also an increasing demand for statisticians to fill up cadre posts outside DOS. The upgrading of existing cadre posts for statisticians in other agencies is expected to further increase opportunities for promotion.

Besides promotion opportunities, aspects of career development that are given prominence are job satisfaction and the challenge that goes with the profession. With the restructuring, two new divisions were added to the organisational structure: the Research and Development Division and the Training Division. The establishment of these divisions were intended to provide the relevant exposures to statisticians in new fields. Hopefully, this will enable them to address challenges associated with the profession, encourage usage of statistical applications, bring about job satisfaction and provide a more conducive environment for statisticians to take their professional achievements to greater heights. With the availability of appropriate computer facilities, statisticians will be in a better position to effectively utilise the benefits of borderless learning and knowledge acquisition, even without going to the classroom.

Transparency in the management of the Department and suitable financial allocation will enable statisticians to be given the opportunity to attend training locally or overseas besides representing DOS in overseas conferences and seminars. Statisticians will also

be given the opportunity to give lectures in related subject matter areas at higher learning institutions or while organizing workshops or training programs for other NSOs.

In summary, it is apparent that statisticians nowadays can look forward to a better career prospect provided that they are committed and focused in performing their duties whether in DOS or as cadre officers in other agencies. Furthermore, it is more attractive to join as statistician in public service now with the better career development programme. To adequately address this career development aspect, the proposal to convert the service scheme of statisticians from the present N (Supporting) to E (Economic) group is being reviewed by the Public Services Department (PSD). These developments will hopefully provide further encouragements for them to excel in their career as statisticians. Nevertheless, these changes in service categories will only be meaningful if statisticians could fully comprehend what is required of a statistician taking into consideration the challenges posed by the new environment.

## **9. Information technology and training of statisticians**

40 years ago, tertiary education had witnessed rapid developments in theoretical statistics. Universities had succeeded in producing many graduates with strong background in theoretical statistics. However, questions arise as to whether this success was achieved at the expense of training in other aspects of statistics particularly in the interpretation and understanding of the statistical indicators. The following statement extracted from the International Statistical Review (2001) in the paper entitled: Future Directions For The Teaching And Learning Of Statistics At The Tertiary Level:

‘.... [in] the early 1960s tables of logarithms and slide rules were the tools used for calculation. This was followed by mechanical calculators, programming using punched cards, DOS based PCs, software requiring the writing of code, to the current menu driven software packages of today. Four years ago the World Wide Web was virtually unknown; four years on it is providing for network based statistical analyses.’

(Nicholls, 1999)

Dramatic changes in technology have transformed the type of statistics graduates produced, from those with strong basic background in mathematical theory but with little practical experience of the 1960s and 1970s to the present generation of graduates with exposure to the analysis of real data. The present graduates have the computing power to undertake technically difficult analysis but without the formal theoretical background to fully understand how the results are being derived. For example, by using specific packages, basic statistics such as mean, median, standard deviation, index and others could be easily churned out while interpretation is left to the user. The main challenge is for statisticians to strike the balance between theory and application.

At this juncture it is interesting to note that the UNESCAP Manual on Training of Statisticians (UN 1988) has avoided the mathematical aspects of probability and gives emphasis on manual processing rather than electronics processing. Considering that the course materials are designed for statisticians, the balance is perhaps achieved by reducing both the practical and theoretical aspects. Of course, there are more specialized publications such as those on the measuring and reporting sources of error in surveys (Federal Committee on Survey Methodology 2001).

The newly established Training Division is expected to aggressively undertake the function of imparting practical skills to the staff of the Department in order for them to provide the best statistical service. Here too, it is important to strike a balance between theory and application in statistics. In this matter, the training programme should encourage collaboration between experienced senior and junior statisticians.

#### **10. The statistician image**

The image of a statistician can be viewed from either the individual or the professional perspective. As an individual, the first impression will be based on the following:

|            |          |                      |
|------------|----------|----------------------|
| <b>55%</b> | <b>-</b> | <b>HOW YOU LOOK</b>  |
| <b>38%</b> | <b>-</b> | <b>HOW YOU SPEAK</b> |
| <b>7%</b>  | <b>-</b> | <b>WHAT YOU SAY</b>  |

These are only the external impressions. Nonetheless, one should think of internal impressions too. In this case, the career prospect of a statistician not only lies on the outputs that are delivered, but also on how well the statistician works with his/her colleagues and how the colleagues observe him/her, whether as a leader, manager or just as a follower.

Statisticians also have to fulfill their obligations towards their profession. Having understood who they are, their role in addressing the issue of relevancy in the changing environment, and the challenges ahead, statisticians have to safeguard the image of the profession in the society. The said image is not based solely on the expertise of its members, but is intimately linked to the contribution of statisticians to the society. It is in this context that it is important for statisticians to uphold their objectivity and ethical standards by using appropriate statistical procedures in serving the needs of their users.

To earn respect and recognition from the society, statisticians have to fulfil the following:

- a. As professionals, statisticians should show that they always respect each other; this will in turn earn them the respect from the society.
- b. It is the responsibility of each statistician to co-operate and contribute in fulfilling their common social obligation, particularly the sharing of the latest information and new procedures for the overall improvement of the statistical service.

Enriching knowledge and upgrading of skills of statisticians, whether done formally or otherwise, will help improve their 'internal impressions'. The knowledge gained after pursuing post-graduate programs at the diploma, masters or doctor of philosophy (PhD) levels in the related fields, are shared and put into practice at their place of work, thus further enhancing the image of statisticians in general as knowledgeable public servants. Opportunities exist for statisticians to undertake research, where UNSIAP Japan, for example, encourages statisticians from Asia-Pacific countries to participate in research programs under the ambit of UNSIAP.

The image of statisticians and the respect for the statistical profession should not be rigidly tied to the size of the statistical service. In fact, the existing statisticians are capable of projecting a distinguished and respectable image provided that they attain the aforementioned competency criteria, fulfill their professional obligations, maintain a strong professional bond among themselves and establish effective networking with societies/groups, organisations and individuals associated with the statistical profession.

## **11. Conclusion**

In looking ahead towards the future direction of the statistical profession, particularly with reference to the government statistical services in Malaysia, it is apparent that statisticians inevitably have to meet the increasingly high expectation of their users and stakeholders. The challenges are in developing the group of people in the statistical service into:

- a. Competent statisticians who are knowledgeable, skilled and are capable of fulfilling the requirements of stakeholders and users.**

Hence, the service of statisticians will always be relevant and appreciated. Towards this end, statisticians have to continuously upgrade their knowledge and skills and widen their networking.

- b. Statisticians with a high level of professional integrity; possess expertise in various specializations of the statistical profession; and are open-minded and ready to deliver excellent services irrespective of where they are posted.**

This points to the strategies towards enhancing the image of the individual as a statistician as well as the image of the statistical profession.

- c. Statisticians who are determined to deliver the best services in spite of a dynamically changing and uncertain environment, and possess effective communication and language skills to deliver excellent service particularly in the dynamic environment locally and internationally.**

- d. Statisticians who are able to lead and unify the mindset of all levels so as to work together as a big team in achieving the common objective in the statistical service.**

The above serves as guidelines for all statisticians in the public services and the success depends on how they are understood, embraced, upheld and put into practice.

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