

Teleconsultation Service Utilization Key Issues in the Context of Malaysia: An Organizational Perspective

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Abstract - *The ultimate success of teleconsultation technology adoption and diffusion requires substantial multidisciplinary efforts and continuous commitment derived from all relevant stakeholders. The objective of this paper is to explore the key issues that possibly influence the utilization of teleconsultation from an organizational perspective in the context of public hospitals in Malaysia. The article is based on literature review and semi-structured interviews involving three key telehealth stakeholders who have been directly involved in teleconsultation project in Malaysia since the initial stage of pilot mode in 2000 to date. Our main finding highlighted that service demand is one of the important factors that hold a vital influence on the actual utilization of teleconsultation in Malaysia. The study suggests that in order to enhance teleconsultation utilization pattern, there should be an improvement in both service control and referral guidelines in regards to teleconsultation practice in order to stimulate the demand over the service. Further efforts should also be undertaken to reduce barriers related to organizational physical characteristics to ensure efficient adoption of teleconsultation technology.*

Keywords: Teleconsultation, Adoption, Organizational, Utilization, Service Needs and Demand.

1 Introduction

Telehealth is defined by Ministry of Health (MOH) Malaysia as the integration of information telecommunication, human-machine interface technologies and health technologies to deliver health care, to promote the health status of the people and to create health [1]. Teleconsultation is one of the main components of telehealth. The term telehealth and telemedicine are often used interchangeably. In fact toward the end of 1990s, the term telehealth is more popular and used as a synonym for telemedicine [2].

Teleconsultation consists of the communicational interaction of two or more health care professional at distant [3] and recently it has been more associated with information communication technology that links the secondary (or tertiary hospitals) with the primary care facilities, aimed to improve health outcomes [1]. In accordance with Malaysian MOH objectives at the initial stage teleconsultation implementation in Malaysia is regarded successful. This is because even in the early stage of implementation (pilot phase), teleconsultation in Malaysia has led to cost savings, efficient in allocating resources, enhanced diagnostic options and better health outcomes [4]. The service has existed for almost 10 years yet it has not been optimally adopted into routine practice by most MOH hospitals. This research aims to discover the key factors that shape the use of teleconsultation in MOH hospitals in Malaysia from an organizational perspective. The scope of literature review reported in this paper only focuses on particular issues that relate to teleconsultation innovation in hospital.

2 Overview of Literature

Studies in relation to identifying predictors of utilization of teleconsultation application operating throughout nationwide client server network in hospitals are scarce. For that reason, several relevant studies which are based on the original research have been identified bearing potential relevance to this paper. According to Kimberly et al. [5], characteristic of individual people (organizational leaders), characteristic of organization and characteristic of the context (in which it operates) were found very important in determining hospital innovativeness. This is in particular apparent when size, localization, and sub-units size are found as determinants of telehealth adoption [6] in hospitals. Generally, demand or need for the service as a predictor to technology utilization was hardly mentioned in the general technology acceptance studies. The perceived need or

service need has been mentioned [6-9] in a very few qualitative telemedicine studies. Based on triangulation of results involving nine case studies, Gagnon et al. [6] suggested that it is a necessity of taking into account the perceived need for the telehealth services being implemented. A change in organizational culture should also be considered in regards to implementation of telemedicine [8]. Other aspects of individual, technological, and implementation were also critically mentioned in determining the likelihood of telemedicine adoption and utilization [11]. Since telemedicine operates beyond one dimensional environment, the context where the telemedicine is intended to launch must be examined carefully first [12]. It is also found that lack of fundamental medical standards, policies and practice management guidelines [13] have also contributed to telemedicine failure or project discontinuation.

Based on the literature studies, we conclude that the ultimate success of teleconsultation adoption and diffusion requires substantial multidisciplinary efforts and continuous commitment derived from all relevant stakeholders from various dimensions. Subsequently, some elements derived from the literature were used to probe the key respondents during the interviews to unveil the actual issues of teleconsultation adoption from an organizational dimension in the context of Malaysia thus highlighting the aligned issues during the implementation of teleconsultation in Malaysia.

3 Materials and Methods

The finding presented here derived from a literature review together with semi-structured interviews with three relevant stakeholders (respondents). The respondents had considerable field experience and knowledge and have been directly involved in teleconsultation project and implementation in Malaysia since the initial pilot mode in 2000 to date. Hence, the interviews were carried with teleconsultation project manager (MOH officer), telehealth technical manager (MOH officer) and experienced vendor (project consultant) of teleconsultation implementation in MOH hospitals in Malaysia. Due to limited experts in the area of telehealth technology in Malaysia thus teleconsultation is only applicable in Malaysian MOH hospitals (not applicable in private hospitals) the inputs from these respondents certainly represent the relevancy and information sufficiency to this study. These interviews provide elementary view of the actual scenario of teleconsultation implementation and adoption in Malaysia. Each interview took approximately one hour. The interview sessions were audio-recorded and transcribed into text. Similar semi-structured questions were posed to all key respondents in order to establish themes and commonalities in the findings for data analysis thus to reach consensus on the issues. Further verifications were done through follow-up emails with the relevant officer in the MOH Malaysia.

4 Results

Consequently, the results presented here are described qualitatively. Based on the consensus of the interviews, success of teleconsultation project certainly cannot be solely assumed based on the volume of transactions. The respondents affirmed that the only way to measure success of teleconsultation is based on the number of successful consultation within cases that can only be conducted using teleconsultation. This is because not all medical cases can be referred through the telehealth network and certainly there are special organizational aspects deemed to merit further analysis and should be weighted differently. The respondents confirmed that the implementation of teleconsultation in Malaysia is widely influenced by multidimensional factors and in particular some significant aspects would have been derived from technical, implementation, individual and organizational dimensions. Correspondingly, all respondents regard organizational dimension as a salient determinant in regards to utilization issues of teleconsultation in Malaysia.

4.1 Service Needs and demand

Even though teleconsultation is primarily intended to be part and parcel of medical consultation service delivery in Malaysia, in a normal circumstance a teleconsultation case is created at the sending site (referring hospital) when there is an actual demand for the service required by the respective hospital. The finding gathered from these interviews confirmed that actual service demand is one of the important factors that hold a vital influence towards the actual utilization of teleconsultation in Malaysia. Since teleconsultation is an alternative mode to deliver the service, the doctors were likely to adopt and use the system if their organization expressed a clear need for the service. For example, Hospital Beluran and Hospital Kudat which are located remotely from other alternatives of medical access and therefore the population in the areas hugely depend on these hospitals for medical and specialist access. Besides, due to its limited road access it is inconvenient to refer a case physically to other hospital. This is in particular apparent during the emergency. Adding to that, there is insufficient radiology support in the hospital and certainly radiology reading service (film and digital) is needed from other tertiary hospital. Due to all these reasons, it appears very clear that both Hospital Beluran and Hospital Kudat have higher demand for teleconsultation services. This explains why both hospitals have relatively high number of cases sent through teleconsultation in particular for radiological cases. The following are the excerpts of three respondents when they were asked about the key influence of teleconsultation utilization in Malaysia:

- Respondent 1:
‘..actual demand for the service, because if there is no demand there is no point for the system to be developed’.
- Respondent 2:

'..the only way to enhance utilization is through having more demand for the service'.

- Respondent 3:

'..the system is used and further developed when there is a clear need for the system'.

Due to inconsistency in service needs and demand, sustainability has also been an issue of concern. Consequently, the transfer of teleconsultation equipment from several sites to 16 new sites was done between 4th August 2005 and 2nd September 2005 [14]. This is because some sites were not active and therefore reallocation of the sites had to be carried out in tandem with the needs. Overall it is evident that actual service demand is one of the important factors in regards to utilization of teleconsultation in Malaysia and this is certainly in parallel with some studies mentioning 'need' as an influence of telemedicine technology adoption. However it is important to distinguish that the need for the service in the context of Malaysia is not an individual (doctor) perception but rather an actual demand for the service (teleconsultation), in which this is clearly derived from an individual organization (hospital) itself.

4.2 Service Control

Based on the interview results, there is an actual service control within the teleconsultation network. However in the context of teleconsultation in Malaysia, the service control is not merely perceived by an individual but rather an actual control over the service in which comprises organizational guidelines and procedural of service for a user to be able to utilize the technology within the respective organization. Thus, this service control is hugely determined by service network parameters. The service network parameters are sets of guidelines predefined at the practice and system level which control how cases are sent using teleconsultation. Basically, the guidelines determine network priority which includes the direction on: (1) Where to send cases and (2) What type of cases can be sent through teleconsultation. All of the head of services (i.e. radiology and neurology) are responsible to establish those guidelines in accordance with the respective service network decisions; consequently the system service parameters were designed accordingly. The parameters are unique in each service network. Hence every medical doctor who requires teleconsultation will have to follow his or her individual discipline's service guidelines. For example in the case of cardiology, due to equipment and medical practice constraints only certain cases can be sent through teleconsultation service. In some cases the cardiologists themselves prefer the patients to be physically referred and in some other circumstances the specialists themselves want to visit the patients at the primary hospitals. For that reasons, all referral practices and processes have to follow the guidelines that have been predefined in each service network.

In conjunction with that, a workshop was conducted in each sending hospital aimed to inform about these

guidelines to the end-users and as a result the users at each referring hospital were mostly well-informed about type of cases that would fit the teleconsultation parameter requirements within their disciplinary domain. Even though there are more potential cases can be created and sent through teleconsultation service but the user will refer a case which only complies with these service parameters. This explains why teleconsultation utilization success cannot be measured by volume of transactions since types of cases that satisfy the teleconsultation service parameters are generally limited.

4.3 Regional Referral Guidelines

In the case of Malaysia, there is no such official policy concerning teleconsultation referral practice. Regional referral guidelines are the base procedures being used for conventional consultation within the regional domain. According to these guidelines, a referred case should be managed regionally. Subsequently, these guidelines are also being used to determine the service control; in particular in setting up service network priority for teleconsultation. However, based on the regional guidelines, even though the referring and receiving sites are located within the same region, conventionally a referred case should only be sent to a dedicated hospital that has been selected within regional domain. For example if Hospital Gerik requires sending a case via teleconsultation, the first level of pick-up will be carried out by Hospital Ipoh. This is because both of the hospitals are located in the same state (state of Perak) and conventionally it has been a usual referring practice to send cases physically to Hospital Ipoh. In this case if the specialists in Hospital Ipoh declared that they will not be able to accept the case, the case would then be released to other available receiving sites to respond. The following excerpt explains one of the reasons why teleconsultation need to follow these regional guidelines:

'..Once teleconsultation was installed in Hospital Beluran (Sabah region), now their radiology cases can be sent to Hospital Queen Elizabeth (Sabah region) that has more experts. However, since conventionally a radiological film from Hospital Beluran is transported by ambulance to Hospital Sandakan (Sabah region) which is nearer, therefore if a teleconsultation case were to be sent to Hospital Queen Elizabeth, it would create an obvious conflict within the regional referral practice and guidelines. So if a patient were to be referred physically to Hospital Sandakan, a teleconsultation case would need to be sent to the similar respective hospital to maintain regional practice and avoid guidelines conflict..'

For that reason, even though the service caters nationwide but by the default (of service control which is determined by regional guidelines) the system will direct the teleconsultation case to the first level of priority setting which usually located within regional domain. Indirectly, these regional referral guidelines represent a

policy that influences the practice of teleconsultation in Malaysia.

4.4 Organizational Referral Guidelines

Organizational referral practice is another form of guidelines being implemented in individual hospitals as to guide teleconsultation practice and it varies in between hospitals. For example, Hospital Melaka has come to an agreement that teleconsultation should be used in order for the doctors to refer particular cases to receiving hospitals (i.e to Hospital Kuala Lumpur). Hospital Klang is another example where the hospital has made special arrangement with Hospital Kuala Lumpur in regards to neurology referral. This special arrangement has been established into hospital referral guideline that is in order for Hospital Klang to send a neurology case to Hospital Kuala Lumpur, it has to be made through teleconsultation. As a result, teleconsultation has become part of routine practice in these hospitals. This explains why both hospitals (Hospital Melaka and Hospital Klang) are found to be the most active referring hospitals in terms of teleconsultation utilization and has relatively high number of cases sent through teleconsultation. Conclusively, organizational referral guidelines have shown tremendous effect on the overall pattern of utilization and adoption of teleconsultation.

4.5 Organizational Physical Characteristics

Based on the interview results, hospital characteristics are found important in determining how technology is adopted in the hospital. The respondents revealed that some hospital characteristics have made a major distinct in determining likelihood of teleconsultation adoption. Amongst hospital characteristics being addressed as factors of teleconsultation adoptions in Malaysia are size of hospital, location of tertiary hospital (receiving), location of teleconsultation workstation and the presence of visiting specialist.

4.5.1 Size of Hospital

The number of doctors who work in a big hospital certainly makes substantial demands for the service. In practice, a big hospital has wide range of expertise to manage different varieties of patients. However, teleconsultation system is designed and meant to support the patients of hospitals that do not have certain disciplines. Teleconsultation also supports the disciplines that are not represented by a resident specialist, thus this remote consultation allows doctors at the sending hospital (normally located in rural and remote areas) to consult their colleagues at the receiving hospital (normally located in big cities). Even though primary hospital operates in smaller capacity of doctors and resources, the doctors are able to perform patient care using teleconsultation technology. However, smaller hospital has lesser cases to be referred due to relatively smaller population that may seek for the medical service. Moreover among these cases only small number of them

could fit the service control parameters which allow them to use teleconsultation. Therefore, it would be apparent that a smaller hospital may have utilized the teleconsultation service lesser than a bigger hospital. However, this is somewhat contradictory with the findings revealed by Gagnon et al. [6] that smaller hospitals which are located in rural areas are more likely to adopt telehealth. This issue certainly needs further attention and studies as to determine the relationship between size of hospital and teleconsultation utilization and adoption

4.5.2 Location of Tertiary Hospital (Receiving)

Appropriateness of the service is another huge issue addressed by doctors in primary hospital to these telehealth stakeholders when teleconsultation was about to be used as the alternative means to deliver the service. For example in these two cases of: (1) Hospital Gua Musang (sending) and Hospital Kota Bharu (receiving) and (2) Hospital Alor Gajah (sending) and Hospital Melaka (receiving); in both cases, the sending and receiving hospital are located less than 2 hours away from each other. This characteristic (location of tertiary hospital) might affect the doctors' perception over appropriateness of how to refer a patient. Patients would also like to go to larger hospital as they also at times have a perception that the facilities in a larger hospital are better. As a result, some of the doctors (at times at the behest of the patients themselves) would merely choose to physically refer the patient rather than using teleconsultation.

4.5.3 Placement of Teleconsultation Workstation

MOH at times can only provide lesser teleconsultation workstations (due to budget constraints) in one hospital. This workstation will then be shared among 4 major departments (radiology, cardiology, dermatology and neurosurgery). In a large hospital the placement of the workstation will have its attendant problems and logistics.

4.5.4 Presence of Visiting Specialist

The increase in the supply of doctors and specialist would be still insufficient to meet the increasing needs of the nation [14]. Therefore instead of providing teleconsultation service to rural hospital, MOH Malaysia created a visiting specialist service. Previously in some sites for example in Hospital Manjung, there was no visiting radiology service. Initially, the doctors at Hospital Manjung were utilizing teleconsultation system fairly consistently thus the system was being regarded as an alternative to deliver the patient care. However, once the visiting specialist service was introduced the level of teleconsultation utilization dropped. Due to this, this site is now being considered inactive. Consequently, the availability of visiting specialist in certain remote hospitals does contribute to the dramatic effect in adopting the technology and this issue needs to be further analyzed.

5 Discussion

Almost inevitably, organizational dimension represents such an important component in explaining the likelihood of teleconsultation innovativeness in hospitals. Indeed, this is comparable in the case of Malaysia. As a whole teleconsultation service in Malaysia has shown its potential to become an essential tool in health. However, due to some organizational issues teleconsultation diffusion is slow to come into mainstream of medical care. As uncovered from the results, the key issue concerning the uptake of teleconsultation in Malaysia is related to the service needs and demand and which is in parallel with few prior literatures concerning telemedicine implementation [6-9]. However, the findings from this study reveal that these needs and demand are clearly associated with organizational (hospital) rather than individual (doctors). Due to that, it is a necessity for a need analysis to be performed prior to teleconsultation implementation in each hospital because every hospital may have different need for different service. In addition, this prerequisite analysis is in particular critical to estimate the potential demand over a particular teleconsultation service (i.e. neurosurgery, radiology, cardiology and dermatology) before upgrading the existing system or performing sites expansion thus to ensure higher service sustainability. This is also very useful in order for the management to plan on providing more services to more sites over time.

Two factors that are associated with service needs and demand are found to be service control and referral guidelines (on the regional and organizational basis). The study found that due to some service limitation (since not all types of cases can be sent via teleconsultation), the volume of teleconsultation transaction has not reached its full potential. Therefore, the study suggests that in order to enhance teleconsultation utilization capacity, there should be further analysis to measure the effect of service control and referral practice guidelines on teleconsultation utilization thus perform necessary change management programs. Understanding change management is always a necessity to run the hospital as the program may help the doctors to efficiently incorporate teleconsultation into work process. This is also particularly important as to decide on necessary adjustment in both of the service control and referral practice guidelines which may plausibly increase the number of potential cases that can be sent via teleconsultation, stimulating demand over the service thus encouraging teleconsultation utilization into routine use. Based on the interviews it is also evident that hospital physical characteristics deserve to receive more research attention from the domain of technology adoption in hospitals. Therefore, further studies are urged to be undertaken to explore their significance in relation with teleconsultation utilization. Moreover, additional studies should be carried out to broaden the scope of teleconsultation adoption from other perspectives; for example behavioral, culture and technological and

analyze its relation to the needs and demand over the teleconsultation service.

6 Conclusions

Overall, this study is based on the literature review together with relevant interviews with key telehealth stakeholders in Malaysia. This study helped to identify the main issues of teleconsultation adoption from an organizational (hospital) dimension. Consequently, the main findings were described qualitatively. The key issues from the findings can be used to conceptualize teleconsultation utilization framework for future studies that can be further quantitatively validated. The paper highlighted the relevance of considering the service needs and demand for teleconsultation service as part of the central determinants in shaping the teleconsultation utilization pattern. Based on issues being addressed, some critical aspects were discussed as recommendation in order to improve the quality of teleconsultation implementation and adoption which can also be considered in other applicable setting and contexts.

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