

Regulatory Issues and Challenges on A2P SMS Communication in Malaysia

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Abstract

The article studies the regulatory issues and challenges raised by Content Aggregator Providers in Malaysia. Application-to-Person (A2P) has an important role to play in the mobile ecosystem through strengthening and deepening the process of competition and any-to-any connectivity subsequently to address the issues and challenges faced by the access seeker in the regulatory landscape. The main objective of regulation is to ensure a competitive market and provide the necessary protections for consumers. Communications and multimedia industry market should be determined primarily by market forces. Regulator intervention may be justified and clear demarcation between regulation to protect against market failure and regulation to ensure long term benefits to the end users. Finally, recommendations have been put forward at the end of this paper for the reference of future research.

Keywords: A2P SMS communication, access regulation.

1. Introduction

During the early introduction of mobile-cellular services in 1980s, in Malaysia the usage of these services was limited to voice only. However, the functionality of mobile devices increased and stimulated the demand for data communications. The Short Message Service (SMS) was introduced in 1992 as a replacement to the paging service. At the time it was proven to be widely popular for text messaging displays in alphanumeric or voice messages. Subsequently in 2000, 3G mobile network was introduced in Malaysia to cater the consumer's data requirements. 3G is the third generation of mobile phone standards and technology. It is based on the International Telecommunication Union (ITU) family of standards under the International Mobile Telecommunications programme, "IMT-2000" [1]. The emergence of smartphone in 2007 further increased demand on data usage including simple things among others are SMS peer-to-peer, SMS application to person, Multimedia Messaging Service, video and TV on mobile, OTT communications, mobile apps, e-wallet and other innovations. For mobile network operators (MNO) and mobile virtual network operators (MVNO), the total of subscribers surpassed 100% whereas in 2012 total subscribers were 37,028 million and it increased to 39,795 million subscribers in 2019 [2]. These billion-dollar additional revenues to both MNO and MVNO subsequently provide value-added services to users among them government agencies, enterprises, SMEs, banks, universities and service centers. This growth is also seen across the global market. Japan, the USA, and China are leading the pack in data usage [2], but other developing countries like Malaysia are not far behind. The Malaysian government introduced mySMS in 2010, also known as Government SMS Gateway, that unified all government agencies with the aim that the

public can easily obtain government services through a single short code number of 15888 via 2-way SMS flow.

In 2010, with the roll-out of 4G, also known as fourth-generation broadband cellular network technology, the data volumes in mobile networks greatly shifted from voice to data-dominated. Notwithstanding the emerging Over-The-Top (OTT) communication applications such as WhatsApp, Telegram and many others that were capable to replace the SMS, it was merely peer-to-peer (P2P) traffic. The Application to Person (A2P) were increasingly being used for a variety of services not limited to marketing and promotion, notification, pin code, one-time password, donation, ordering ringtones, reality TV program voting, polling, reminder and early natural disaster alert such as flood, earthquake and tsunami. On 9th January 2020, the Malaysian Communications and Multimedia Commission (MCMC) officially announced that the commercialization of the fifth-generation technology by the third quarter of 2020 would reposition Malaysia as one of the first movers in the region to deploy 5G technology [3]. 5G would further enhance speed and connectivity in particular to support next generation content such as Machine Type Communication (MTC) and Mobile Internet of Things (MIoT), the SMS could be a key technical enabler to interactive communication exchange with objects to support Malaysian smart living. Based on the abovementioned context, Figure 1 shows the 10-year cycle evolution of mobile communication between generations in Malaysia.

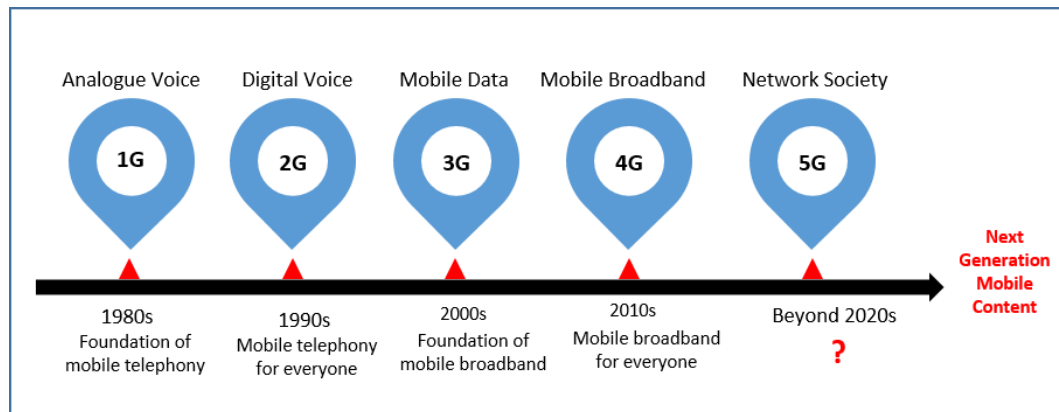


Figure 1: Evolution of mobile technology in Malaysia

Despite growth and evolution of mobile telecommunications, many previous studies in information systems have applied consumers perceived value in describing mobile service adoption [4]. This field rarely deals with regulatory issues and challenges that are faced by the access seeker that seek in particular mobile termination (MT) and mobile origination (MO). Therefore, the purpose of this paper is to address the gap in knowledge and subsequently to answer the research questions, by first enlightening the potential relationship between long term benefits to the end users (LTBE) and the bottleneck in services and facilities for A2P SMS platform service in Malaysia. The next section deliberates the type of SMS and purpose of use as well as key themes of A2P SMS platform service from an access regulation perspective.

Currently, only the assignment and the usage of 1 series and 9 series short codes are regulated by MCMC in line with the provisions stipulated under Part B, Section 6 of the Numbering Electronic and Addressing Plan [5] and details of assignees and purpose of usage described as per Table 1.

Table 1: Regulated Short Code

Series	Utilization	Assignee	Purpose
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1 series	Controlled by MCMC. Mainly for government and public interest utilization.	i. 100 - TM ii. 1060 - TM iii. 15454 - TM iv. 15888 - MAMPU v. 15999 - TM vi. 13999 - MCMC	i. TM Contact Centre (UniFi) ii. TM Contact Centre (TMOne) iii. TNB Careline iv. mySMS v. Talian Nur vi. Tabung Kemanusiaan & Multimedia Malaysia
9 series	Required Application Services (RAS)	999 - TM	Emergency calls number

In the year 2002, service providers had amongst themselves self-regulated the usage of level 3 series and level 6 series short codes as tabulated in Table 2. Short codes, the usage in terms of services offered to the masses are very much dependent on each respective service provider as further enunciated in the Table 2. However, the content is regulated as specified by MCMC in the Mandatory Standard of Mobile Content Services released in 2009 [6] as below.

Table 2: Non-regulated Short Code

Type of SMS	Purpose
Application-to-Person (A2P) also known as Advertiser-to-Person (A2P) 6 series (5 digit) Level 61XXX – TM Level 62XXX – Maxis Level 63XXX – Celcom Level 66XXX – Digi Level 67XXX – Maxis Level 68XXX – Umobile Level 69XXX - Celcom	SMS Broadcast (or Bulk SMS) which refers to the service of sending of one way free SMS to customers, usually for the purpose of promotion, notification and/or announcement
Mobile Premium Content 3 series (5 digit) Level 31XXX – TM Level 32XXX – Maxis Level 33XXX – Celcom Level 36XXX – Digi Level 37XXX – Maxis Level 38XXX – Umobile Level 39XXX - Celcom	used when the subscribers send an SMS in order to access different kind of services like weather information, ringtone/picture download, tele-voting.

Nonetheless, this article aims to address the issues and challenges for A2P SMS only. A2P SMS is a submarket of the mobile industry. A2P SMS platform's functionality coordinates 1-way or 2-way short messaging communication between the organizations' contact center to their clients who are also subscribers to the public cellular service providers [7]. The messages sent through A2P SMS applications platform are not limited to confirmation of appointments, notifications, purchase status, booking confirmation and/or cancellation, PIN number, one-time-password, TAC number, technical support, or information on demand (IOD). It is clear that the use of the A2P platform among organizations are not limited to government agencies, municipalities, financial institutions,

utilities company, service center, and reach customers for purposes such as information transmission, service disruption, installation schedules, status updates, products updates and promotion etc.

On the other hand, for A2P services, the interconnection between MNOs and MVNOs is slightly different as compared to voice interconnection via point-of-interconnection (POI). First of all, the MNOs and MVNOs established the relationship base on mobile subscriptions which include voice, data and SMS. Secondly, MNOs and MVNOs open an access to content aggregator to the SMS A2P resource for service interconnection. Access is given through a technological IP interface. The MT and MO rates are not mandated in Mandatory Standard of Access Pricing (MSAP). Hence, the arrangement including pricing is all on commercial basis. Based on the abovementioned context, this study adopts and adapts the A2P SMS business model developed by [8] to explain the relationship between public cellular service providers, mobile subscribers, the organization and content aggregator in Malaysia. The relationships are illustrated in Figure 2 and demonstrate how resources are combined to create value, and the role of each stakeholder.

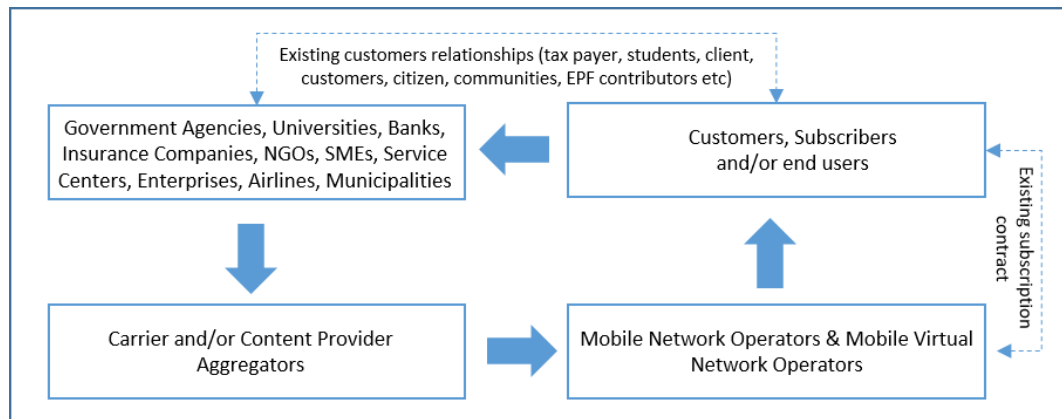


Figure 2: A2P SMS Business Model

Due to the A2P SMS being intertwined with the emergence of a working business model [8], normally the content provider aggregators will act as access seekers that seek access on MT and MO and subsequently integrate the A2P SMS platform between organization and public cellular service providers in order for end users to enjoy the service. Thus, two components are pivotal in providing the end-to-end service to the organization: (i) the A2P SMS platform and (ii) A2P interconnection with public cellular service providers.

2. Regulatory Issues and Challenges

In Malaysia, MCMC introduced the concept of access regulation that aimed to ensure long term benefits to the end users (LTBE) and to promote healthy competition as its guiding principles of assessment. Regulation can only necessitate under two sets of criteria. First of all, in states of market failure and second of all, in achieving LTBE. In MCMC assessment, the relationship between the LTBE and bottleneck to facilities and services in access is very crucial. MCMC defines "bottleneck" as the facilities and services that cannot feasibly be duplicated [9]. In the abovementioned context, the concept of access regulation requires the existence of two markets, namely "upstream" (wholesale market) and a "downstream" (retail market) market, and the existence of one firm serves in both markets. Malaysia, like any other countries, is now moving into the Digital Age where technology is a key element to stimulate the economy. As such,

information telecommunications infrastructures have become an issue of significant importance which is being addressed, discussed and decided in national development policy [10]-[11]. The role of the market is crucial in ensuring the development of infrastructure. Colin deliberated that the pace and direction of the development of information telecommunications infrastructures should be determined by the market as far as possible [12]. Telecommunications markets that practice open to competition are enjoying rapid growth, greater access, better service quality and lower prices. Subsequently, end users enjoy better service experience as compared to non-competitive ones.

For a long time in Malaysia, MCMC did not regulate the mobile rate for both voice and SMS for the retail market. For the wholesale market, MCMC only regulate the mobile voice rate through MSAP that is reviewed once every three years. However, for SMS rate mobile operators settle mobile interconnection rates through negotiation and commercial agreements, where the regulator is often only a mediator or arbiter, sometimes settling the interconnection charges in cases where the parties failed to agree [13]. This study discovered that only peer-to-peer SMS statistics are available on the MCMC website. It is puzzling why the market for A2P SMS in Malaysia has no available statistical data for inbound, outbound SMS and revenue recorded by MCMC. Having reviewed that the A2P SMS is not mandated, the authors are of the view that the data is not part of the reporting requirement including notices and notifications that are required to be sent to the Commission.

MCMC in its Public Inquiry on Access Review in 2008 stated that the growth of all mobile operators demonstrated highly competitive retail prices in both prepaid and postpaid mobile markets in Malaysia [9]. MCMC is of the view that the barrier to entry for public cellular service provider's infrastructure is the scarcity of spectrum, which has been allocated for both 2G and 3G services. On the other hand, entry barriers into the mobile market has also lessened since the introduction of MVNOs into the market in recent years that utilize the spectrum of existing operators. As time passed by, MCMC is planned to cease 2G in national infrastructure as stipulated in the Commission in improving the Draft National Fiberisation and Connectivity Plan ("NFCP") [14].

Regulation is commonly associated with the post market liberalization where the regulator has the power to supervise and regulate telecommunication activities subsequently to impose the relevant policies under the law. In real fact, regulation has been practiced in many developed countries for many decades [15]. However, the theory of regulation commonly occurs in countries that adopt a capitalist economic system [16]. Malaysia adopts a mixed economic system [17] where government intervention is intended to ensure economic activity is fair and stable. To materialize economic stability and fairness in communications and multimedia activities, the Malaysia Communications and Multimedia Act 1998 (CMA 1998) was passed in 1998 and gives the MCMC the power to monitor and enforce the laws in Malaysia including SMS services.

At this juncture, even though OTT voice communications such as WhatsApp and Telegram are increasingly being used by end-users in particular for consumer segment, their effectiveness as a substitute is limited due to both functionality and business-to-communication (B2C) requirements [18]. This article opines that there are still no effective substitutes for mobile communication in particular mobile SMS service inclusive of MT and MO as an essential input in A2P SMS platform communication. Therefore, in the absence of regulation on the mobile market [12], public cellular service providers may have the ability to abuse their market power in the wholesale markets such as denying the provision of this input not limited to unreasonable terms and conditions, creating bottlenecks, denying access with inadequate reasons, delaying service

interconnection or setting prices of access that are not economically viable to the access seeker. As such, in the course of preparing this article, we designed the key themes to address the purpose of the current study:

- a) Is the absence of regulation able to promote competition of mobile content SMS in the downstream market?
- b) How far does the absence of regulation promote the achievement of any-to-any connectivity?

3. Methodology

This study used a qualitative approach using in-depth interviews with senior commercial managers of Content Aggregator. Purposive sampling applied to the tier one A2P SMS of content aggregators. The comprehensive interview method is used to gain detailed information on the issues and challenges that are currently faced by content aggregators as the access seeker in establishing the A2P SMS platform. Each of the in-depth interviews was conducted for approximately one hour after receiving the consent of informants. The questions were designed to illuminate explanations suggested by regulation theory and if possible, to capture new aspects. The interviews were held in a semi-structured way and focused only on themes selected. Before the interview process, the informants were briefed on study purpose, study ethics and information confidentiality. Each interview was recorded, transcribed and subject to open coding and aligned with the theoretical framework. The transcribed text data was analyzed using NVivo according to the themes needed to answer the purpose of the study.

4. Results and Discussion

In the context of this research, we explore the relevance of field A2P SMS communication on content aggregators' perceptions for conducting evaluation based on the themes of access regulation policy. Today, the A2P SMS platform plays a central role in B2C communications between organization and the general population within which key regulation debates on bottleneck access take place and may require MCMC intervention. Two informants were interviewed from two different Content Aggregators companies. We named them as Informant 1 and 2 respectively. Due to their professional capacity and expertise in the mobile content market, in particular the A2P SMS platform, they were particularly critical in responding to our questions during the interview.

4.1. Promoting Competition in Markets for Communication Services

One aspect of the current study is concerning whether or not the MCMC needs to review its current policy on the mobile market. Under current commercial arrangements between Content Aggregators and the public cellular service providers act as network owners that originate and terminate the transmission of SMS. In general, as access seekers, Content Aggregators need to purchase the MT and MO access from the public cellular service providers in order to complete the SMS transaction. The argument here is that the absence of appropriate policy can really promote the competition among the players on A2P SMS. Informant 1 commented that the regulator should play a pivotal role as primer source to ensure healthy competition in the market.

“We are new entrant in the market. For your info, at this moment we are facing resistance from MNOs to edit their Service Agreement. MNOs blocked our SMS via POI which is currently using a long code a normal geographic number. Because they said that A2P SMS cannot be sent via POI. Now, we have to migrate the SMS delivered via POI into A2P SMS platform. They cannot be pushing us towards A2P and yet refuse to negotiate

anything in the service agreement. Hence, it would also be of great assistance if regulator can have a look into this matter”, [Informant 1].

When we further asked the informants about the grounds of amendment in the MNOs Service Agreement, the informant responded:

“The terms and conditions stated in their agreement merely one-sided agreement. That is why we wish to amend or revoke the relevant clauses. For instance, the agreement stated that MNOs can upgrade their network. It is absolutely true. They have a right to upgrade their own network, but at least they give us notification in advance prior to the migration process. Reason being is that we have a customer at the back that subscribing to our A2P platform. We need an ample time to properly inform our customers that during that particular migration time, they may experience service interruption. The migration process should be less impact to the end users” [Informant 1].

The informants’ explanations of their current industry practices revealed unexpected elements. These elements tended to reveal the dark side of the A2P SMS platform which is a sub set of the mobile market. The reason being that the current access instrument is not sufficient to address the bottleneck issues. In particular, mobile SMS rates are not regulated.

“I think, most importantly MCMC need to see that there is complete dominance and bottleneck where the mobile operators are free to charge the rates and set the rules as they see fit”. [Informant 2].

“Regardless how big is our volume of SMS, no tier prices have been offered by mobile providers. Thus, we think the high volume is not intensifies the business whereas the SMS terminate at their own subscribers. Furthermore, why is voice being regulated by MCMC and not SMS?”. [Informant 1].

One of our discussants had informed that the public cellular service providers also demonstrated similar traits where a price-fixing cartel occurred. This behavior is prohibited under the CMA 1998 where collusive agreements are disallowed. They frequently share detailed information on SMS pricing schedules in order to protect their business’ eco-system. It is clearly indicated that their behaviour contributes substantially to the lessening of competition for the downstream market.

“We attended the meeting with one of mobile operator recently which during the negotiation, this mobile operator “slip of tongue” that he had to reaffirm with other mobile operator on their price offered to us”. [Informant 2].

Based on the abovementioned input, first of all, consistent with MCMC’s aspiration to promote competition [19], we are opined that mobile SMS should be regulated because each public cellular service provider has a legitimate monopoly in controlling access to its subscribers. This is because, when a sender sends a text message to the recipient, the Content Aggregator has no option other than to pay the MT cost from the recipient’s public cellular service provider in order to complete the end-to-end communication via SMS text messaging. Second of all, to ensure that the LTBE is achievable, MCMC should monitor the agreement entered between Content Aggregators as access seekers and mobile operators as access providers in accordance with the terms that protect the end users best interest.

4.2. Achieving Any-to-Any Connectivity

Surprisingly, the informants all of whom had been involved in the A2P SMS mobile market at some point during their professional tenure, revealed that bottleneck any-to-any connectivity for mobile network end-users in particular SMS service does occur. Any-to-any connectivity is crucial and it is highly recommended that the Commission should

undertake a study on wholesale SMS rates. The capacity of public cellular service providers to provide end-to-end services is crucial to promoting a flourishing and competitive mobile market and also in improving the end users interest and confidence.

It is a known fact that prior MT and MO services started in an analogue circuit and gradually switched to NGN network to facilitate any-to-any connectivity in order to connect the end users to any network regardless of the type of technology. However, public cellular service providers collusively deployed the A2P SMS platform via IP and connect to the Content Aggregator's platform. Subsequently, public cellular service providers prohibit bulk SMS via POI.

"The mobile operators imposed peer-to-peer clause in Access Agreement to reflect segregation between A2P and P2P SMS subsequently prohibits us to send bulk SMS via POI. This is not consistent with the spirit any-to-any connectivity. Furthermore, it is against the MCMC's aspiration to promote technology neutral in deploying the service infrastructure". [Informant 1].

An interesting point that draws the authors' attention is that the any-to-any connectivity via OTT communications typically offer voice, text messaging services and video call services such as WhatsApp, Viber and Telegram. Most regulators consider there are to be competition between OTT services and mobile services [20] despite some differences in Quality of Service (QoS) in which OTT service providers do not control the access network. On the other hand, MCMC commented that proponents of OTT marvel open up new opportunities in different markets at different playing fields as compared to the traditional telecommunication players [21]. Thus, no regulation is needed as at this juncture OTT communication offers "freemium" costs to the consumers.

However, it should be noted that OTT services currently suffer technical limitations, particularly with any-to-any connectivity, such as the inability to call toll-free numbers such as 1300 and 1800 numbers and the inability to make emergency calls to the 999 contact center. As such, the authors consider OTT communications service is not a fully substitute for services offered by the traditional telecommunication service providers.

"OTT services are unable to connect the end users to the critical services for example 999 or to communicate to the bank institutions' contact centre if they have any inquiry".
[Informant 2]

"WhatsApp and Telegram for instant have a limitation in term of connectivity. For the utilities company like TNB 15454 or Syabas 15300, the end users still need to use normal voice or text SMS to communicate to the respective utility companies". [Informant 1].

The authors are of the view that rather than being separate services, OTT services intersect with mobile SMS service in a different dimension. The A2P SMS applies particularly to organizational users that require the service to communicate to mobile subscribers. The key message is that the OTT communication is not a substitute to the traditional service offered by telecommunication service providers even though the end-users' use their mobile phone number.

5. Conclusion

This paper revealed issues and challenges faced by Carrier and Content Aggregators that seek access of A2P service, in particular SMS mobile termination and mobile origination in Malaysia. Content Aggregators play an important role in creating the values in integrating organizations such as government agencies, utilities companies, banks and financial institution's system into the public cellular service providers SMS Centre (SMSC) to deliver short messaging to the end user.

First, the existence of content aggregators in the eco-system is important for economic growth. With the advent of new 5G technology, the authors anticipate that the latest innovations should support content such as Machine-to-Machine communication and Machine-to-Internet of Things via legitimate A2P SMS platforms. Second, the relationships between clients such as government agencies and/or business entities, content aggregators, public cellular service providers and the mobile subscribers are important for the regulators to take necessary steps of action to (i) address the bottleneck issues faced by content aggregators and/or new entrants in the mobile market that may lead to market failure; and (ii) to ensure long-term benefits to the end user. The collaboration between content aggregators and public cellular service providers is based on commercial basis that may require Commission intervention (i) to ensure the promotion of competition in markets for communication services; and (ii) to achieve any-to-any connectivity. The authors suggest that future studies focus on the content aggregators, public cellular service providers and the regulator and co-joint efforts to curb SMS from spam perceptions, and enable even more value created with the A2P SMS platform.

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