Digital Connectivity

INDUSTRY PERFORMANCE REPORT 2016

Suruhanjaya Komunikasi dan Multimedia Malaysia
Malaysian Communications and Multimedia Commission

STATUTORY REQUIREMENTS

In accordance with Part V, Chapter 15, Sections 123 – 125 of the Communications and Multimedia Act 1998, and Part II, Section 6 of Postal Services Act 2012, Malaysian Communications and Multimedia Commission hereby publishes and has transmitted to the Minister of Communications and Multimedia a copy of this Industry Performance Report (IPR) for the year ended 31 December 2016.

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CHAIRMAN'S STATEMENT

Key mention for 2016

The communications & multimedia (C&M) industry market capitalisation of RM169.56 billion represents 10.2% of Bursa Malaysia total market capitalisation of RM1,667.37 billion. This represents more than three quarters of the Information and Communications Technology (ICT) companies listed on Bursa Malaysia which has market capitalisation totalling RM208 billion. Despite challenging operating environment due to intensive competition and growing Over-the-Top (OTT) services, the C&M industry's revenue grew at 5% to RM65.84 billion compared with RM62.76 billion in 2015. The telecommunications sector contributes more than three quarters of the revenue generated.

Capital expenditure (Capex) for telecommunications has increased by 17.5% to RM6.98 billion, wherein 53% was invested by the fixed service providers for submarine cables and broadband deployment. Overall, the Capex to revenue ratio is 20% compared to global ratio at 18%. Going forward, I believe the mobile service providers will accelerate their Capex, given the increasing demand for mobile broadband as well as technology development towards 5G.

In 2016, mobile service providers have invested in spectrum allocation. Efficient spectrum utilisation is fundamental for data services at higher speeds. The spectrum reallocation for bands 900MHz and 1800MHz is a move towards this effect. This reallocation brings about certainty in investments for major mobile service providers to plan ahead for the next fifteen years over the tenure of the Spectrum Assignment. To date, the mobile service providers have achieved 64% 4G LTE population coverage.

Malaysians are enjoying digital lifestyle with mobility. In Malaysia, 9 out of 10 users access the Internet via smartphone. This is demonstrated by our broadband penetration rate per 100 inhabitants of 99.8% in 2016.

Strategic investments are key as the C&M industry is a critical enabler in supporting digital initiatives in the move to digital economy and in preparation for the next frontier towards National Transformation 2050 (TN2050). It is inevitable that increasing ICT usage requires communications infrastructure and network capacity with exceptional quality of service.

Impact of Smart Community Programmes

MCMC continued its Smart Community initiative aimed at improving the quality of life and socio-economic status of local communities through use of ICT and faster access to information. Following the success of the first Smart Community programme in Kemaman (Terengganu) in 2015, the programme has since expanded to three other districts namely, Kota Belud (Sabah), Lundu (Sarawak) and Putrajaya.

To date, I am pleased to record that all Smart Communities are equipped with 4G LTE coverage, which widens 4G LTE coverage in districts. This was effected with the collaboration of stakeholders in the districts and service providers. The communities can use the facilities to perform digital services as well as value-added applications. Notably, the district officers have a significant role as district level broadband champions. Once fully tapped by all communities, the Smart Communities act as part of the building blocks for Smart Nation.

Overall, service providers have supported many initiatives together with the Government and MCMC. They have also expanded their business into adjacent markets as a result of convergence in the communications, content and the physical world including postal and courier. The converging markets provide conducive platforms for many businesses in e-commerce including SMEs and cross border transactions.

Need to intensify efforts for 2017

More strategic investments by the service providers are required to intensify ICT usage in our daily lives. Hence, it is critical to collaborate further in realising a solid foundation for digital expansion and sustainability in a globalising market.

In 2017 Budget, MCMC has allocated RM1 billion to increase coverage and quality of broadband nationwide with speed up to 20Mbps in suburban and rural areas. To date, High Speed Broadband Phase 2 (HSBB2) and Suburban Broadband Project (SUBB) have reached more than 400,000 premises and 300,000 premises respectively.

In efforts to address affordability, the Government also announced that effective January 2017, fixed service providers will offer broadband services at a higher speed for the same price. A subscriber of 5Mbps package at RM149 will enjoy twice the speed, at 10Mbps for the same price. Within the next two years, speed will be doubled with reduction in prices by 50%.

Way forward 2017 and beyond

Undoubtedly, with national objectives in preparation for the next frontier, there is more infrastructure needed to widen network connectivity. In this case, the critical role of state and local authorities is required to ensure smooth infrastructure deployment nationwide.

The Government envisaged more fibre infrastructure is needed to accelerate national digitalisation. Accordingly, in March 2017, the Government announced a 'Nationwide Fiberisation Plan' to enable fibre connection to premises. The fiberisation plan is critical to support backhaul connectivity and in turn provide leverage towards a digital economy for the country to remain competitive.

In summary, it has been a momentous year in 2016, with achievements in line with the National Policy Objectives of the Communications and Multimedia Act 1998 (CMA). In light of this, it is imperative for industry stakeholders to continue working with MCMC in achieving national competitiveness.

With that, it is my pleasure to present the 2016 Industry Performance Report.

Dato' Sri Dr. Halim Shafie
Chairman
Malaysian Communications and Multimedia Commission

EXECUTIVE SUMMARY

The C&M industry market capitalisation posted RM169.56 billion as at end 2016. This represents 10.2% of the Bursa Malaysia market capitalisation of RM1,667.37 billion. However, the industry posted decline in market capitalisation by 14% due to impact from volatile market and global economic factors such as lower oil price, US interest rates hike and fluctuating Ringgit.

In 2016, the C&M industry has recorded 4.9% growth in revenue to RM65.84 billion from RM62.76 billion in 2015. This performance of the C&M industry was contributed mainly by telecommunications with 75% revenue share, broadcasting 10% and the remaining from postal sector and others including ACE market and non-public listed licensees.

The mobile service providers recorded EBITDA margin ranged between 35% and 53% in 2016, despite intensifying competition. Meanwhile, the fixed service providers EBITDA margin averaged 35%.

Telecommunications capital expenditure (Capex) has increased 17.5% to RM6.98 billion in 2016 (2015: RM5.94 billion), translating into Capex to revenue ratio (capital intensity) of 20% (2015: 17%). Fixed service providers Capex totalled RM3.68 billion, with capital intensity of 29%, whilst mobile was at RM3.3 billion (capital intensity at 15%).

In 2016, total dividend payout by major public listed C&M companies declined 19% to RM5.66 billion from RM7.01 billion in 2015. The telecommunications sector contributed 86% or RM4.84 billion to the total dividend payout, with the remaining from broadcasting (13%) and postal (1%) sector. It is observed that this is a way to reserve cash for infrastructure development and spectrum investment.

The broadcasting sector posted stable revenue of RM6.48 billion, with 86% contribution from Pay TV. Free-to-Air TV revenue remained unchanged at RM0.9 billion due to competition from alternative platforms while Pay TV garnered higher revenue from advertising and home shopping segment.

Connectivity and digital access

Malaysian broadband subscriptions have reached 31.02 million, with penetration rate per 100 inhabitants at 99.8% in 2016 compared with 99.7% in 2015.

The broadband subscriptions totalled 1.18 million by fibre connections in 2016. This is an increase of 15.7% compared with 1.02 million in 2015. Increasing consumption of digital content and growing number of connected devices have led to demand for high speed broadband which provide better quality of service and user experience.

Total number of mobile broadband subscriptions at 28.53 million shows an increase of 2.8% in 2016, mainly driven by improved network coverage and demand for mobile data. Continuous investment by service providers have resulted in achieving 3G and 4G LTE population coverage at 91% and 64% respectively in 2016. This enables digital access for new services and a networked economy.

Fixed to mobile substitution continues, resulting in moderating fixed phone take up. The subscriptions for Direct Exchange Line (DEL) has declined to 3.3 million, equivalent to a penetration rate per 100 inhabitants at 10.6% in 2016. Such decline follows global trend in line with changing consumer behaviour.

On mobile subscriptions, the penetration rate is at 141.3% in 2016. The market share by service provider can be said to be "neck-to-neck"; varying by a few percentage points. Digi captured 28% share, while Maxis and Celcom garnered 26% and 24% market share respectively. U Mobile managed to disrupt the market, increasing its market share to 12% in 2016 from 8% in 2015. The balance 10% is from the mobile virtual network service providers.

In enhancing the Mobile Virtual Network (MVN) services, MCMC in January 2016 issued a Mandatory Standard for the Provision of Services through a Mobile Virtual Network which outlines obligations of relevant parties in providing MVN services. This Mandatory Standard particularly provides consumer protection tools in the event of termination of service.

In addition, MCMC in April 2016 issued a new Guideline on "Mobile Virtual Network Business Segment in Malaysia" to replace the 2005 Guideline. It guides existing and prospective service providers on market entry, negotiation process and roll out of services.

Progressing content industry

The Internet is redefining the broadcasting industry, making it convenient for audience to consume content anytime and anywhere. For instance, Internet users are increasingly streaming video or watching TV online.

In the changing content delivery landscape, FTA and Pay TV service providers have made their content available across multiple platforms including mobile video to gain more eyeballs. Notably, these service providers are providing their own Over-the-Top (OTT) platform over multiple device as well as enabling streaming of their local content on the go. Compelling content is key to remain relevant and achieve sustainable scale. Our service providers are also expanding to regional markets to garner greater audience reach for their content.

On radio development, major broadcasting companies continued to expand their radio reach in 2016. Media Prima launched its fourth radio station namely Kool FM, whilst ASTRO acquired two radio stations from Star Media Group. Additionally, new CASP licensee, Cense Media Sdn Bhd, launched two radio stations namely, Kupi-Kupi FM in Sabah and City Plus FM in Negeri Sembilan. Kupi-Kupi FM targets listeners from Kadazan, Dusun and Murut communities while City Plus FM focuses on urban residents living in Kuala Lumpur and Negeri Sembilan.

Apps development

MCMC has established relationship with private organisations in leveraging digital lifestyle tools to improve livelihood of community and society. In collaboration with National Council for the Blind, two mobile apps have been developed for the visually impaired namely, Money Reader for reading Ringgit Malaysia and Google Talkback Speech Engine in Bahasa Malaysia.

Also in the national language, mobile apps on "ITU EMF Guide" was developed to empower the public on safe use of mobile devices. Under its collaboration with Jabatan Kemajuan Islam Malaysia (JAKIM), two mobile apps, Digital Al-Quran and Halal Digital (MYeHALAL) are being developed.

Similarly, service providers have developed their own mobile apps for their customer relationship management and distribution channels.

Consumer protection and quality of service

Consumer centricity is a valuable approach to sustain competitive edge. Listening to customers improves customer relationships and provides feedback on network management and quality of service. MCMC takes consumer complaints seriously as input for redress and future policy development.

In 2016, total consumer complaints received by MCMC increased by 23% to 17,453 (2015: 14,156), partly due to network issues and SMS spam related complaints. Complaints related to telecommunications services comprised 67%, whilst the remainder are on content related issues and other services under the provisions of the CMA and investigated by MCMC.

In 2016, a total of 4,333 complaints were classified under new media complaint category, which is mainly related to social networking. New media complaints involved the Internet including email and website.

Security and trust

In providing secure and trustworthy online environment, MCMC introduced Parental Control Tool initiative aimed to enable parents and guardians to protect their children from online threats. Such parental control tool enables parents to monitor their children's online activities while providing a positive space for children to gain benefits from their online experience.

In efforts to eradicate suspicious websites, MCMC has blocked access to 2,407 websites in 2016. Out of these, 47% were phishing websites (fake pages created to acquire personal information) and the rest were on other websites found violating the CMA pertaining to obscene, offensive, menacing and false websites.

E-commerce boosting postal and courier services revenue

In 2016, the postal and courier services industry garnered an estimated revenue of RM4.78 billion, up 6.2% from RM4.5 billion in 2015. The postal services captured 39.3% or RM1.88 billion of the total industry revenue. Meanwhile, courier services contributed 60.7% or RM2.9 billion in revenue.

Pos Malaysia handled 1.11 million parcel for both domestic and international outbound, up 13% from 0.98 million in 2015. Courier services handled a total of 78.6 million documents and parcels in 2016 (2015: 58.15 million).

In 2016, the service providers have made strategic moves to expand into adjacent markets on the back of e-commerce growth in the country. Pos Malaysia has expanded into adjacent aviation logistics market on its acquisition of Pos Aviation Sdn Bhd (formerly known as Kuala Lumpur Services Sdn Bhd or KLAS). On the other hand, Lazada, an online marketplace via its subsidiary Lazada Express has obtained a Class A courier licence which allows domestic and international services.

Outlook 2017

The journey of convergence in the communications, content and the physical world including postal and courier is progressing. Malaysian service providers are diversifying their revenue streams by offering services in adjacent markets.

Over the years, service providers have been investing in upgrading and expanding their networks. Such efforts not only improve quality of connectivity but also extend network coverage. This is in line with current consumer lifestyle and business usage which demand higher bandwidth. Going forward, with additional spectrum bands allocated in 2016, mobile service providers are expected to further expand their network coverage and capacity to enhance quality of service.

Service providers are expected to deploy resources for fibre infrastructure in 2017. Such strategic infrastructure investment is expected to provide affordability for higher bandwidth. Affordable connectivity will enable consumers to streamline their subscriptions to optimise spending. In 2017, we anticipate churn from current plain data packages to consumers selecting innovative bundled packages. Hence, service providers are expected to compete at a level beyond pricing.

The C&M industry remains resilient to reap potentially higher returns on investment from their critical assets. The regulatory framework remains relevant in managing such progress. It is imperative that industry stakeholders and MCMC work together in full commitment towards achieving national competitiveness.

LICENSING UNDER CMA

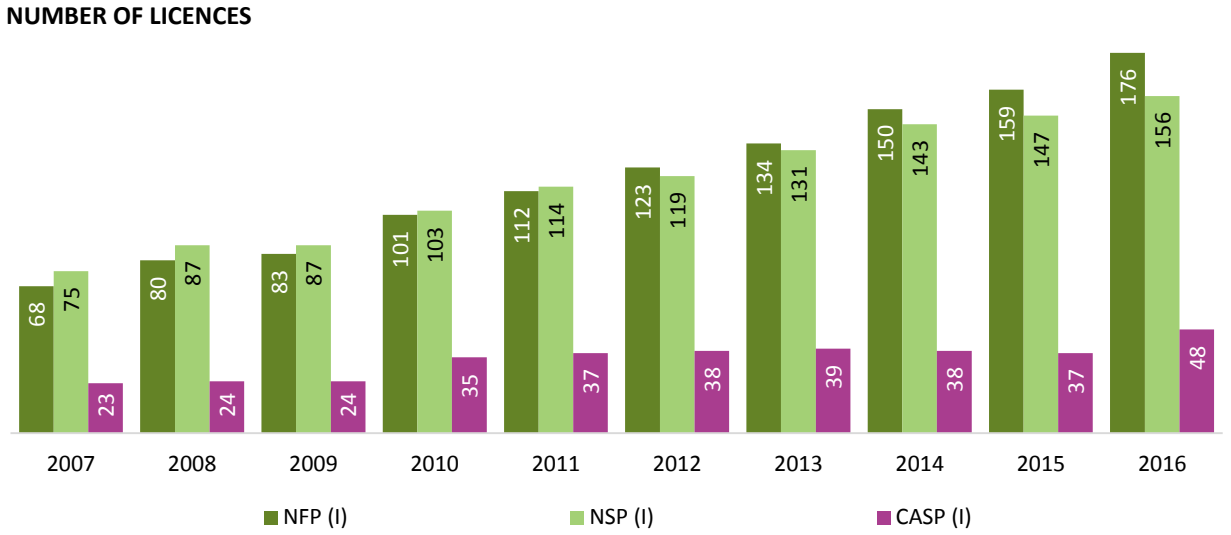
Under the Communications and Multimedia Act 1998 (CMA), there are four categories of licences namely, Network Facilities, Network Services, Applications Services (Class licence only) and Content Applications Service licences[1], which are divided into two types namely, Individual and Class. These licences under the CMA are technology neutral and designed to accommodate services in different and distinct markets.

Licensing Profile over the Years

As at end 2016, a total of 380 Individual licences were issued

The number of Individual licences has increased steadily over the years. As at end 2016, there were 380 Individual licences; increased by 29.7% particularly for CASP (I) licences. The total number of licences issued comprises 176 NFP (I), 156 NSP (I) and 48 CASP (I) licensees.

CMA Licences (Individual) 2007 – 2016



Source: MCMC

Figure i CMA Licences (Individual) 2007 – 2016

[1] NFP – Network Facilities Provider; NSP – Network Service Provider; CASP – Content Applications Service Provider; ASP – Applications Service Provider; I – Individual; C – Class.

There were a total of 11 CASP (I) licences approved in 2016. In light of the Digital Terrestrial Television Broadcasting (DTTB), more players can capitalise on digital TV platform compared with the limited analogue platform. The list is per Figure ii below:

CASP (I) Licensees		
No.	**Licensees**	**Genre**
1	Ansa Broadcast Sdn Bhd *(formerly known as U Television Sdn Bhd)*	Variety
2	Borneo Neo Vision Sdn Bhd	Variety
3	DNF Group Sdn Bhd (ACTV)	Variety
4	Mbits Digital Sdn Bhd (MVTV)	Variety
5	SNR Multi Tech Sdn Bhd (NAM TV)	Variety
6	En Media Sdn Bhd *(formerly known as Enmedia Ventures Sdn Bhd) (Bloomberg Malaysia)*	News
7	Enjoy TV Holding Sdn Bhd (Enjoy TV)	Variety & Home shopping
8	NAFAS Media Sdn Bhd (Agro Media)	Variety & Home shopping
9	Sky Elite Broadcasting Sdn Bhd *(formerly known as Sky Elite Sdn Bhd)*	Variety & Home shopping
10	Keluarga Communication Sdn Bhd (Sinar TV)	Variety & News
11	Neo Universe Sdn Bhd	Variety & News

**Variety consists of entertainment (animation, drama, movies, music & reality shows), documentaries and live show (talk show)*

Source: MCMC
Figure ii CASP (I) Licensees

In 2016, there were a total of 99 individual licences approved and renewed by the Minister of the Ministry of Communications and Multimedia Malaysia (KKMM). A total of 27 new NFP (I), 18 new NSP (I) and 12 new CASP (I) licences were issued, whilst, 20 NFP (I), 18 NSP (I) and 4 CASP (I) licences were renewed.

Additionally, details of the infrastructure and services offered by new and renewed licensed service providers in 2016 are shown in Figure iii.

New and Renewed Licences					
Infrastructure and Services	**Company**	**New (N)/ Renewed (R)**	**NFP (I)**	**NSP (I)**	**CASP (I)**
Deployment of Broadband Infrastructure and Towers	Ansa Broadcast Sdn Bhd *(formerly known as U Television Sdn Bhd)*	N	✓	✓	
	Artisan Communication Sdn Bhd	N	✓		
	ASN Satellites Sdn Bhd	N	✓	✓	
	Bangkit Setia Sdn Bhd	N	✓		
	Binasat Sdn Bhd	N	✓	✓	
	Borneo Global Connect Sdn Bhd	N	✓	✓	
	C & R Corporate Services Sdn Bhd	N	✓	✓	
	Compudyne Sdn Bhd	N	✓	✓	
	Global Forway Sdn Bhd	N	✓	✓	
	Grass2route Sdn Bhd	N	✓		
	Ha Megah Sdn Bhd	N	✓		

New and Renewed Licences					
Infrastructure and Services	**Company**	**New (N)/ Renewed (R)**	**NFP (I)**	**NSP (I)**	**CASP (I)**
	Intergrated Access Communication Sdn Bhd	N	✓	✓	
	Intra Streams Sdn Bhd	N	✓		
	ITMax Sdn Bhd	N	✓		
	Khadra Ventures Sdn Bhd	N	✓		
	Mass Rapid Transit Corporation Sdn Bhd	N	✓		
	Myren Network Sdn Bhd	N	✓	✓	
	Nasmudi Sdn Bhd	N	✓	✓	
	Nexgen Ventures Sdn Bhd	N	✓		
	OCK Telco Infra Sdn Bhd	N	✓		
	Omni-Glory Infotech Sdn Bhd	N	✓	✓	
	Orissa Wicomm (M) Sdn Bhd	N	✓		
	Privasat Sdn Bhd *(formerly known as IPSAT Sdn Bhd)*	N	✓	✓	
	Skyline Technology (M) Sdn Bhd	N	✓	✓	
	Verticom Sdn Bhd	N	✓		
	Vista Bumiria Sdn Bhd	N	✓		
	Xiddig Cellular Communications Sdn Bhd	N	✓		
	Alpha Orange Sdn Bhd	R	✓		
	DMD Fone Network Sdn Bhd	R	✓	✓	✓
	Electcom Wireless Sdn Bhd	R	✓	✓	
	Fiberail Sdn Bhd	R	✓	✓	
	Fibrecomm Network (M) Sdn Bhd	R	✓	✓	
	MYTV Broadcasting Sdn Bhd	R	✓	✓	
	Neutral Transmission Malaysia Sdn Bhd	R	✓	✓	
	OCK Setia Engineering Sdn Bhd	R	✓		
	Perlis Comm Sdn Bhd	R	✓		
	Privanet Sdn Bhd	R	✓	✓	
	Redtone Engineering & Network Services Sdn Bhd	R	✓		
	Sapura Research Sdn Bhd	R	✓	✓	
	Symphonet Sdn Bhd	R	✓	✓	
	Tele-Flow Corporation Sdn Bhd	R	✓		
	Teras Millenium Sdn Bhd	R	✓		
	Tungkus Sandad Sdn Bhd	R	✓		
	Visi Cenderawasih Sdn Bhd	R	✓		
	Webe Digital Sdn Bhd *(formerly known as Packet One Networks (Malaysia) Sdn Bhd)*	R	✓	✓	
Bandwidth Services and Management	Bullish Aim Sdn Bhd	N		✓	
	Jejak Semangat Sdn Bhd	N		✓	
	MSA Resources Sdn Bhd	N		✓	
	Stealth Solutions Sdn Bhd	N		✓	

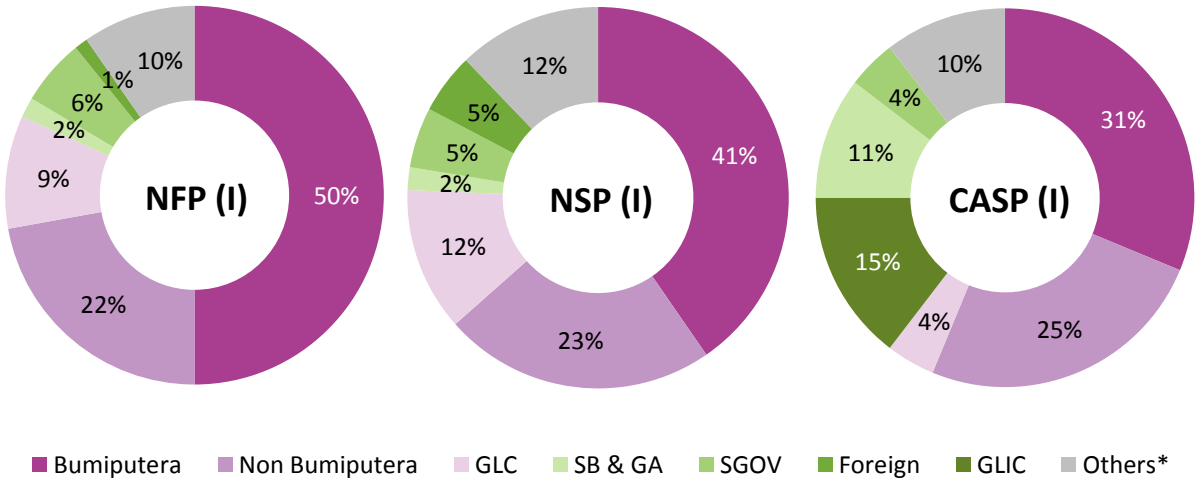
New and Renewed Licences					
Infrastructure and Services	**Company**	**New (N)/ Renewed (R)**	**NFP (I)**	**NSP (I)**	**CASP (I)**
	HeiTech Padu Bhd	R		✓	
	Infra Quest Sdn Bhd	R		✓	
	Konsortium Jaringan Selangor Sdn Bhd	R		✓	
	Setia Haruman Sdn Bhd	R		✓	
	TPM IT Sdn Bhd	R		✓	
MVN Service	SF Lyca Telecommunication Sdn Bhd	N		✓	
	Ceres Telecom Sdn Bhd	R		✓	
Content Applications Service	Arus Rentas Sdn Bhd	N			✓
	Borneo Neo Vision Sdn Bhd	N			✓
	DNF Group Sdn Bhd	N			✓
	En Media Sdn Bhd *(formerly known as Enmedia Ventures Sdn Bhd)*	N			✓
	Enjoy TV Holding Sdn Bhd	N			✓
	Keluarga Communication Sdn Bhd	N			✓
	Mbits Digital Sdn Bhd	N	✓	✓	✓
	Nafas Media Sdn Bhd	N			✓
	Neo Universe Sdn Bhd	N			✓
	Sarawak Information System Sdn Bhd	N			✓
	Sky Elite Broadcasting Sdn Bhd *(formerly known as Sky Elite Sdn Bhd)*	N			✓
	SNR Multi Tech Sdn Bhd	N			✓
	Asian Broadcasting Network (M) Sdn Bhd	R	✓	✓	✓
	Capital FM Sdn Bhd	R			✓
	Simfoni IDM Sdn Bhd	R			✓
Total			**47**	**36**	**16**

Source: MCMC

Figure iii New and Renewed Licences

An analysis on Individual licensees' shareholding shows that 44% of total Individual licences in 2016 are Bumiputera-owned companies. The shareholding composition by types of licence is shown as below.

Individual Licence – Shareholding Composition by Types of Licence 2016



Note:

Bumiputera-owned – company that has 51% or more Bumiputera ownership

Non-Bumiputera-owned – company that has 51% or more non-Bumiputera ownership

GLC – Government-linked company, that has a primary commercial objective and in which the Malaysian Government has a direct controlling stake. Controlling stake refers to the Government's ability (not just percentage ownership) to appoint Board of Director members, senior management, make major decisions (e.g contract awards, strategy, restructuring and financing, acquisitions and divestments etc.) for GLCs either directly or through GLICs (Source: www.khazanah.com.my)

GLIC – Government-linked Investment Company, is a Federal Government linked investment company that allocates some or all of their funds to GLC investments. Defined by the influence of the Federal Government in: appointing/approving Board members and senior management, and having these individuals report directly to the Government, as well as, in providing funds for operations and/or guaranteeing capital (and some income) placed by unit holders. The definition currently includes seven GLICs: Employees Provident Fund, Khazanah, Kumpulan Wang Persaraan (Diperbadankan), Lembaga Tabung Angkatan Tentera, Lembaga Tabung Haji, Menteri Kewangan Diperbadankan and Permodalan Nasional Bhd (Source: www.khazanah.com.my)

SB & GA – Ownership held directly by a Statutory Body or Government Agency

SGOV – Major shares held by a State Government

Foreign-owned – company that has 51% or more shares held by foreign entities or individuals

Others – mixed shareholding, with no particular type of shareholder having a controlling interest in the company

Source: MCMC

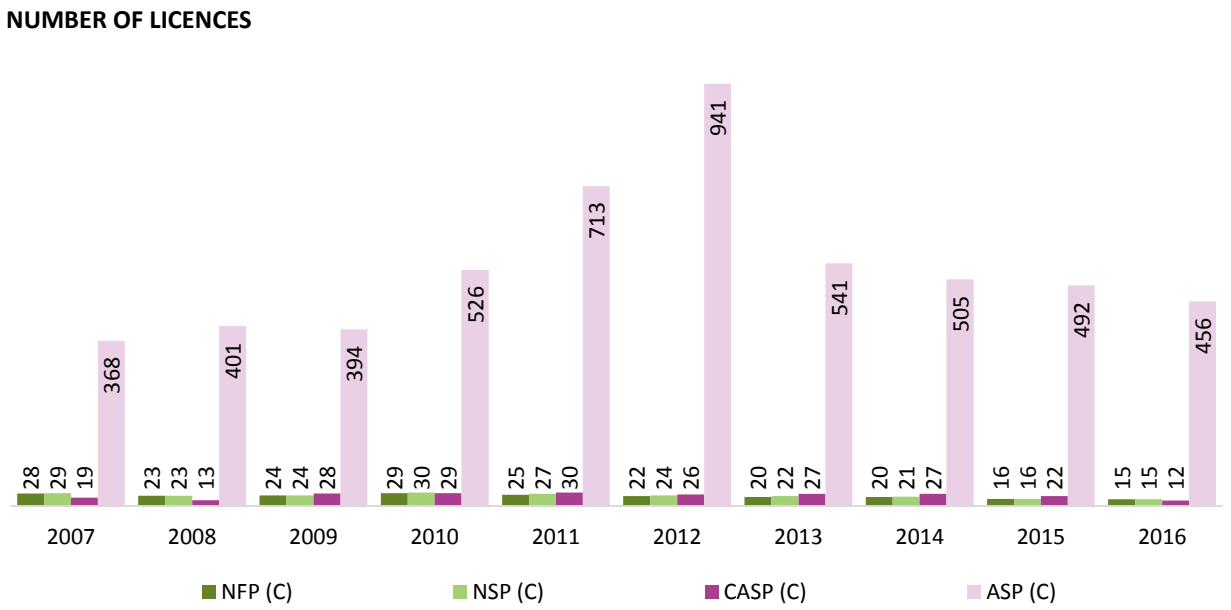
Figure iv Individual Licence – Shareholding Composition by Types of Licence 2016

A total of 498 Class licences were registered with MCMC as at end 2016

Class licence is a relatively light-handed form of regulation which is designed to promote industry growth and development with relatively easier market access, compared with Individual licence that requires high degree of regulatory control.

As at end 2016, there were 15 NFP (C), 15 NSP (C), 12 CASP (C) and 456 ASP (C) licences registered by MCMC. In 2016, there was a decline of 36 licences in terms of the total number of ASP (C) licences, that is, from 492 to 456.

CMA Licences (Class) 2007 – 2016



Source: MCMC

Figure v CMA Licences (Class) 2007 – 2016

Compliance with Roll Out Conditions

Licences granted are monitored for compliance with roll out conditions, that is, special licence condition Part B 1.2. Under this special licence condition, the compliance requirements include:

a) The licensee to commence the provision of facilities or services within 12 months from the date of licence issued;

b) However, the Minister may grant an extension of time to the licensee upon appeal and genuine progress being made towards the provision of facilities or services.

In 2016, seven service providers have complied with special licence condition and rolled out their facilities and services within the 12 months of licence granted (Figure v).

Facilities/Services Deployed within 12 Months of Licence Granted			
No.	**Company**	**Type of Licence**	**Facilities/Services Deployed**
1	Advanced Research Communication Sdn Bhd	NFP (I), NSP (I)	Tower
2	Datasonic Technologies Sdn Bhd	NFP (I), NSP (I)	CCTV Surveillances
3	Ohana Communications Sdn Bhd	NFP (I)	Bandwidth Services Tower
4	Navia Network Sdn Bhd	NFP (I)	Ducts
5	Prima Cell Sdn Bhd	NFP (I)	Tower
6	Red One Network Sdn Bhd	NSP (I)	MVN Services
7	Cense Media Sdn Bhd	CASP(I)	FM Radio Services

Source: MCMC

Figure v Facilities/Services Deployed within 12 Months of Licence Granted

As indicated by some service providers, in light of challenging economic environment, they have delayed roll out in 2016 as they had revised their commercial arrangements and business plans accordingly. As a result, three licensees have applied for extension of time.

In order to ensure licensees observe and implement necessary network coverage nationwide, MCMC's role to monitor licensees' roll out is pivotal. In turn, network roll out ensures enablement to deploy digital infrastructure and services to support national social economic development to 2020.

As at end 2015, a total of 19 new service providers were issued with Individual licence. (Figure vi).

Roll Out Monitoring on New Licensees/Service Providers				
No.	**Company**	**NFP (I)**	**NSP (I)**	**CASP (I)**
1	Pr1ma Communications Sdn Bhd	√	√	√
2	Advanced Research Communication Sdn Bhd	√	√	
3	Volksbahn Technologies Sdn Bhd	√	√	
4	Fenomena Majukaya Sdn Bhd	√	√	
5	Bullish Aim Sdn Bhd	√	√	
6	ASN Mobile Sdn Bhd	√	√	
7	Konsortium Infrastruktur W.P. Sdn Bhd	√	√	
8	XMT Technologies Sdn Bhd	√	√	
9	PP Telecommunication Sdn Bhd	√	√	
10	Datasonic Technologies Sdn Bhd	√	√	
11	Inforient Infrastructure Sdn Bhd	√		
12	Medini Iskandar Malaysia Sdn Bhd	√		
13	Ohana Communications Sdn Bhd	√		
14	Navia Network Sdn Bhd	√		
15	Prima Cell Sdn Bhd	√		
16	Red One Network Sdn Bhd		√	
17	Visi Cenderawasih Sdn Bhd		√	
18	Melaka ICT Holdings Sdn Bhd		√	
19	Cense Media Sdn Bhd			√
Total		**15**	**13**	**2**

Source: MCMC

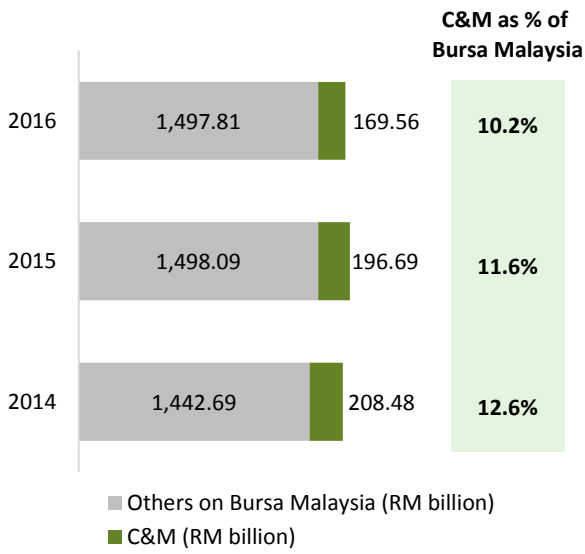
Figure vi Roll Out Monitoring on New Licensees/Service Providers

MODULE 1: ECONOMIC PERFORMANCE OF C&M INDUSTRY

C&M Industry Market Performance

C&M industry market capitalisation at RM170 billion in 2016

Contribution of C&M Industry to Bursa Malaysia Market Capitalisation 2014 – 2016



Source: Bloomberg, MCMC

Figure 1.1 Contribution of C&M Industry to Bursa Malaysia Market Capitalisation 2014 – 2016

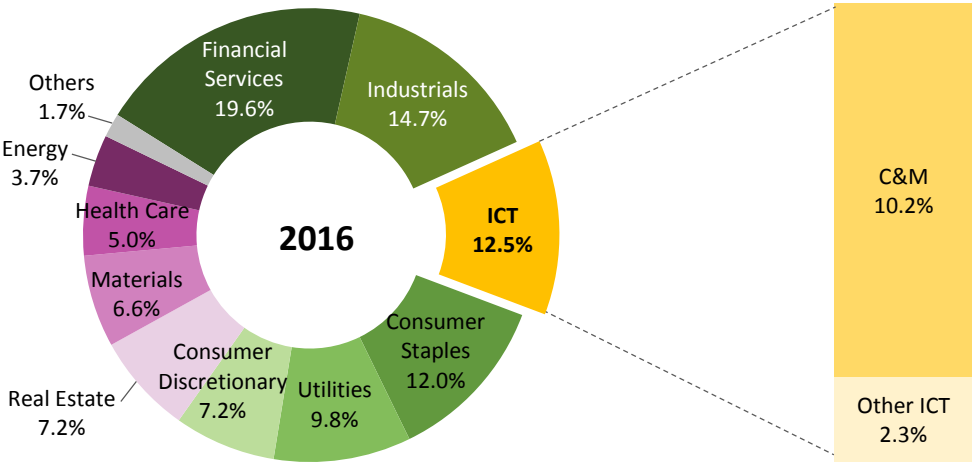
The C&M industry captured market capitalisation of RM169.56 billion in 2016.

The C&M industry market capitalisation was affected by volatile market sentiment and continued intense competition, slower revenue growth and financials such as higher gearing. Additionally, uncertain global economic factors such as lower oil price, potential US interest rate change and depreciation of Ringgit against US Dollar also exerted pressure on market performance.

In 2016, the telecommunications sector market capitalisation declined by 15.5% to RM151.68 billion from RM179.42 billion as at end 2015. Meanwhile, broadcasting sector market capitalisation declined 6.1% to RM14.82 billion (2015: RM15.78 billion).

The C&M industry market capitalisation represents 10.2% of Bursa Malaysia total market capitalisation of RM1,667.37 billion. This represents 82% of the ICT companies market capitalisation at RM208 billion on Bursa Malaysia.

Bursa Malaysia Market Capitalisation by Sector



Note: Consumer discretionary sector are businesses in manufacturing (automotive, household durable goods, textiles and apparel) and services (hotels, restaurants and leisure facilities). Consumer staples sector consist of manufacturers and distributors of food, beverages and tobacco, producers of non-durable household goods and personal products.

Source: Bloomberg, MCMC

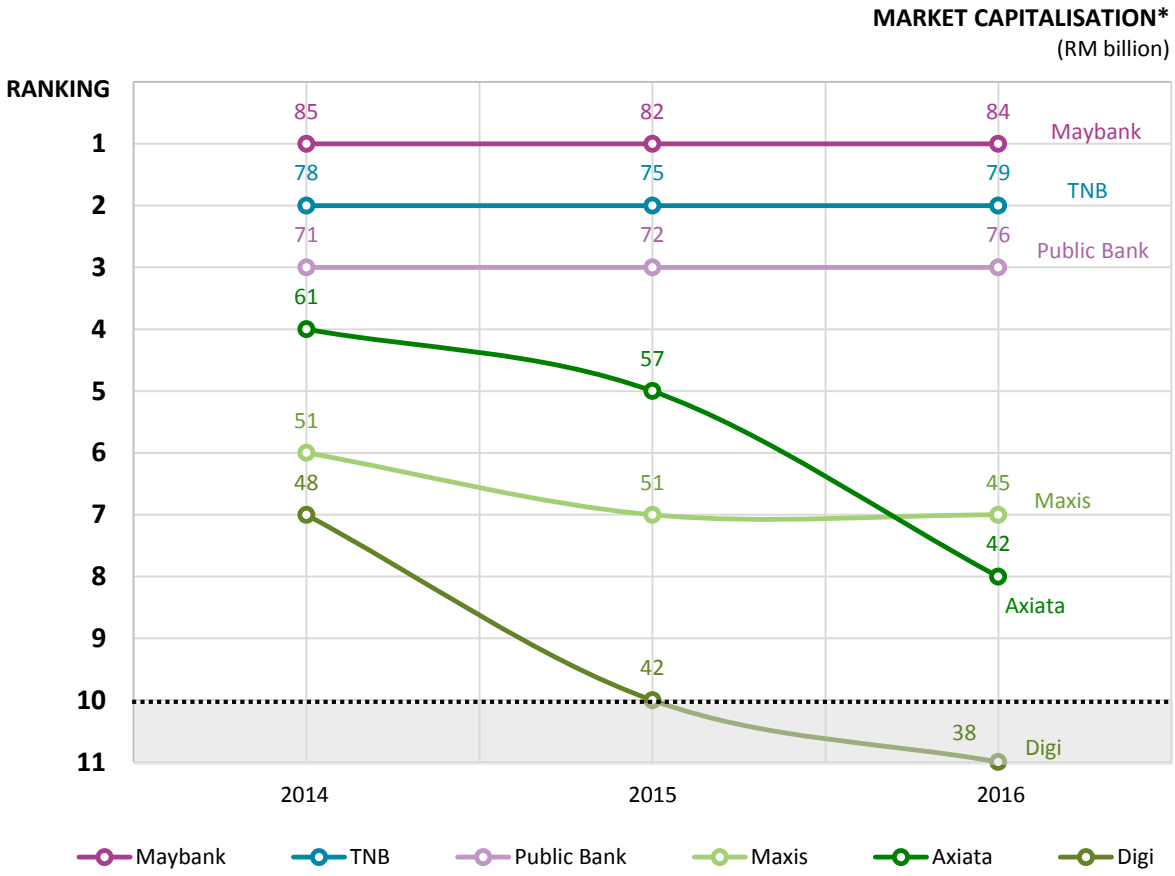
Figure 1.2 Bursa Malaysia Market Capitalisation by Sector

Maxis and Axiata in top 10 market capitalisation ranking, Digi at 11th

Maxis and Axiata remained in top 10 market capitalisation list in 2016, ranked at seventh and eighth respectively, while Digi ranked at 11th position.

These companies continue to benefit from growth of mobile, improved connectivity that stimulate telecommunications service consumption and spending. Thus, opportunities abound in developing digital services that generate new revenue streams while simultaneously improving quality of life in these markets.

Trend of Top 10 Market Capitalisation 2014 – 2016



**As at 31 December*

Note: 1. Top 10 largest stocks based on market capitalisation among the 30 stocks that comprise the FTSE Bursa Malaysia KLCI Index

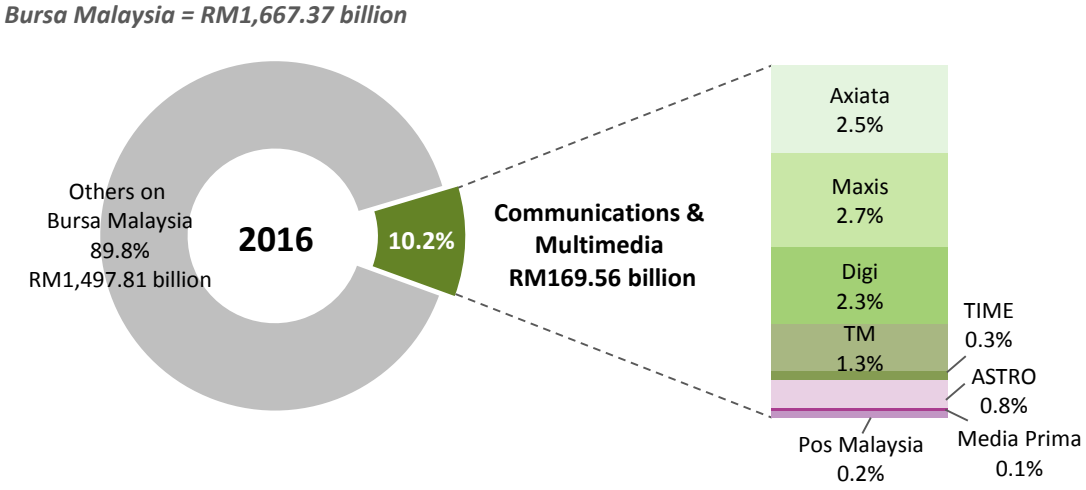
2. Malayan Banking Bhd (Maybank), Tenaga Nasional Bhd (TNB), Public Bank Bhd (Public Bank)

Source: Bloomberg, MCMC

Figure 1.3 Trend of Top 10 Market Capitalisation 2014 – 2016

As at end 2016, Maxis recorded the highest market capitalisation at RM44.91 billion or 2.7% of Bursa Malaysia market capitalisation. Axiata and Digi captured RM42.35 billion (2.5%) and RM37.55 billion (2.3%) market capitalisation respectively.

C&M Companies Contribution to Bursa Malaysia 2016



Source: Bloomberg, MCMC

Figure 1.4 C&M Companies Contribution to Bursa Malaysia 2016

C&M Companies Market Capitalisation 2014 – 2016					
Company	**Market Capitalisation (RM billion)**			**Change (%)**	
	2016	**2015**	**2014**	**2015 – 2016**	**2014 – 2015**
Axiata	42.35	56.51	60.50	-25.1	-6.6
Maxis	44.91	51.07	51.42	-12.1	-0.7
Digi	37.55	41.99	47.97	-10.6	-12.5
TM	22.36	25.48	25.59	-12.2	-0.4
TIME	4.51	4.37	2.80	3.2	56.1
Telecommunications	**151.68**	**179.42**	**188.28**	**-15.5**	**-4.7**
ASTRO	13.54	14.37	15.76	-5.8	-8.8
Media Prima	1.28	1.41	1.95	-9.2	-27.7
Broadcasting	**14.82**	**15.78**	**17.71**	**-6.1**	**-10.9**
Pos Malaysia	3.06	1.49	2.49	105.4	-40.2
Total C&M	**169.56**	**196.69**	**208.48**	**-13.8**	**-5.7**

Note: Axiata Group Bhd (Axiata), Maxis Bhd (Maxis), Digi.Com Bhd (Digi), Telekom Malaysia Bhd (TM), TIME dotCom Bhd (TIME), ASTRO Malaysia Holdings Bhd (ASTRO), Media Prima Bhd (Media Prima) and Pos Malaysia Bhd (Pos Malaysia)

Source: Bloomberg, MCMC

Figure 1.5 C&M Companies Market Capitalisation 2014 – 2016

TIME and Pos Malaysia share prices trended upward

As at end 2016, TIME share price gained 2.6% to RM7.80 compared with 2015 at RM7.60. This gain was supported by improved revenue and corporate development such as completion of submarine cables namely, FASTER submarine cable system that connects Asia and North America and Asia Pacific Gateway (APG) that connects Malaysia to Japan and South Korea.

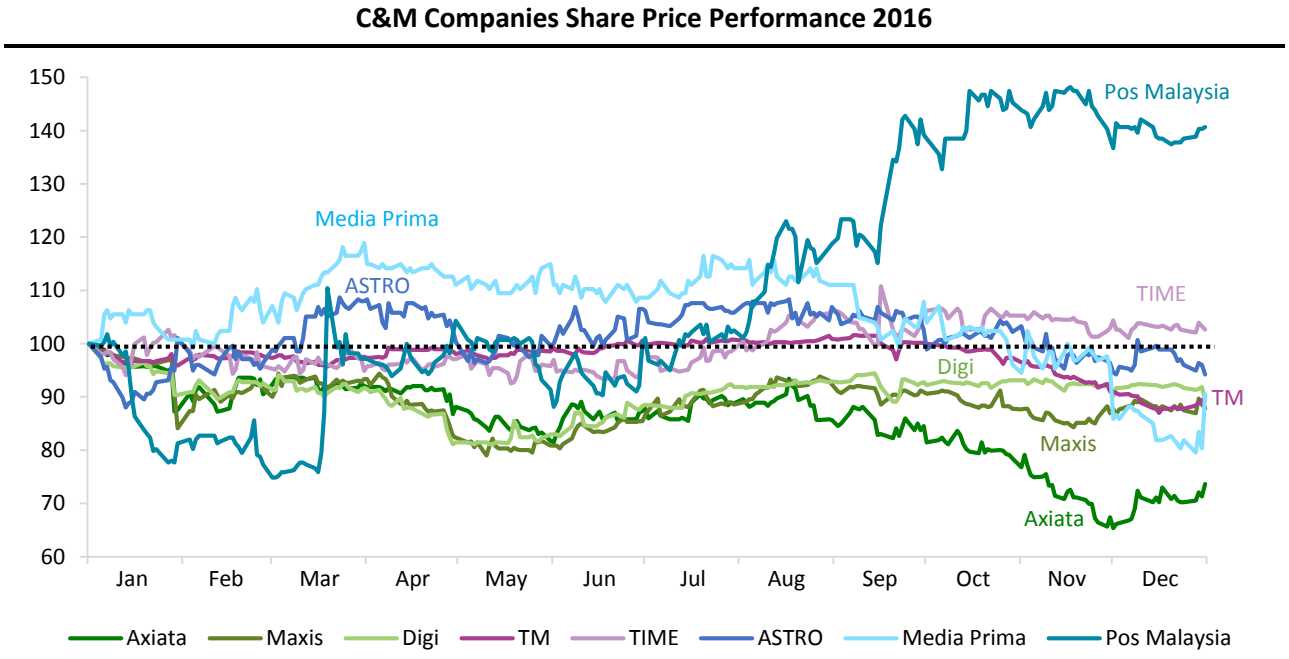
For the same period, Pos Malaysia share price gained 40.6% to reach RM3.91 as at end 2016 compared with RM2.78 in 2015. The gain was due to better financial performance and growing e-commerce services along with enhancement in their network.

C&M Companies Share Price 2014 – 2016					
Company	Share Price (RM)			Change (%)	
	2016	2015	2014	2015 – 2016	2014 – 2015
Axiata	4.72	6.41	7.05	-26.4	-9.1
Maxis	5.98	6.80	6.85	-12.1	-0.7
Digi	4.83	5.40	6.17	-10.6	-12.5
TM	5.95	6.78	6.88	-12.2	-1.5
TIME	7.80	7.60	4.88	2.6	55.7
ASTRO	2.60	2.76	3.03	-5.8	-8.9
Media Prima	1.15	1.27	1.76	-9.4	-27.8
Pos Malaysia	3.91	2.78	4.64	40.6	-40.1

Note: Share price stated is the closing price of last trading day of the year

Source: Bloomberg, MCMC

Figure 1.6 C&M Companies Share Price 2014 – 2016



Source: Bloomberg, MCMC

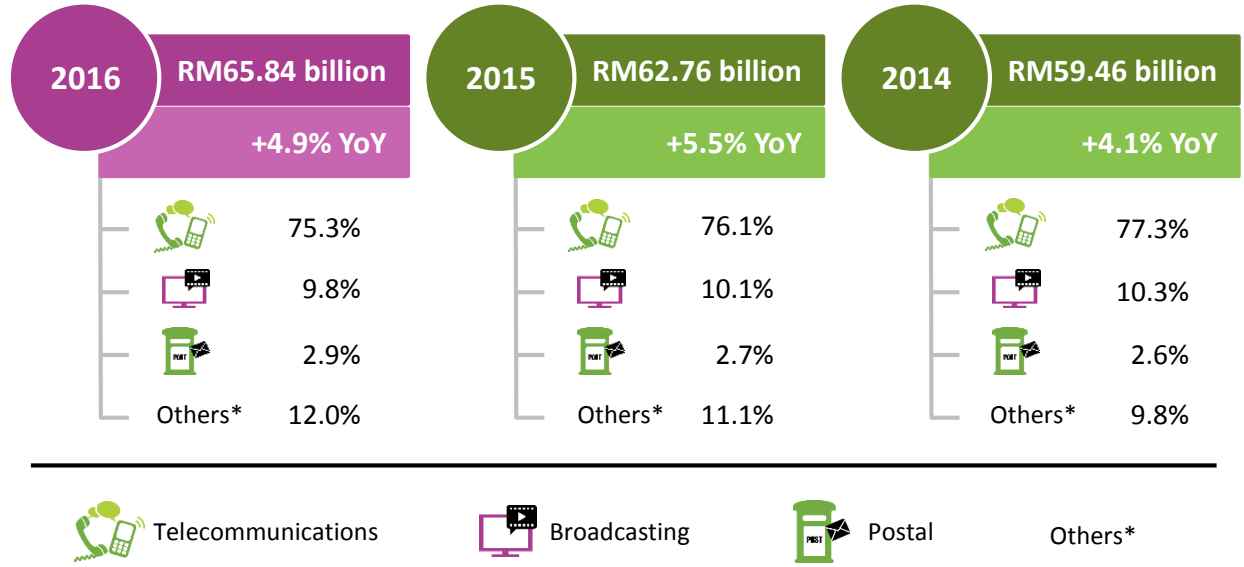
Figure 1.7 C&M Companies Share Price Performance 2016

C&M Industry Financial Performance

C&M industry revenue grew 4.9% to RM66 billion in 2016

The C&M industry aggregated revenue grew 4.9% to RM65.84 billion in 2016 despite challenging economic environment and weakening Ringgit. The breakdown of industry revenue by sector are shown in Figure 1.8.

C&M Industry Revenue 2014 – 2016



**Estimated*

Note 1. Media Prima excludes print revenue

2. ASTRO and Pos Malaysia revenue adjusted by calendar year

3. Others include non-public listed CMA licensees such as U Mobile Sdn Bhd, MVN service providers and ACE Market listed licensees (Figure 1.19)

Source: Industry, MCMC

Figure 1.8 C&M Industry Revenue 2014 – 2016

Specifically, for telecommunications sector, there was a growth of 3.8% to RM49.61 billion in 2016 from RM47.79 billion in 2015. The broadcasting sector grew by 2.2% to RM6.48 billion in 2016. Pay TV has continued to post growth by 2.6%, while the Free-To-Air TV (FTA TV) revenue was unchanged.

Interestingly, Pos Malaysia revenue saw double digit growth by 11.9% to RM1.88 billion in 2016. The increase was partly due to strong growth in courier segment driven by surge in demand from e-commerce.

Telecommunications Sector

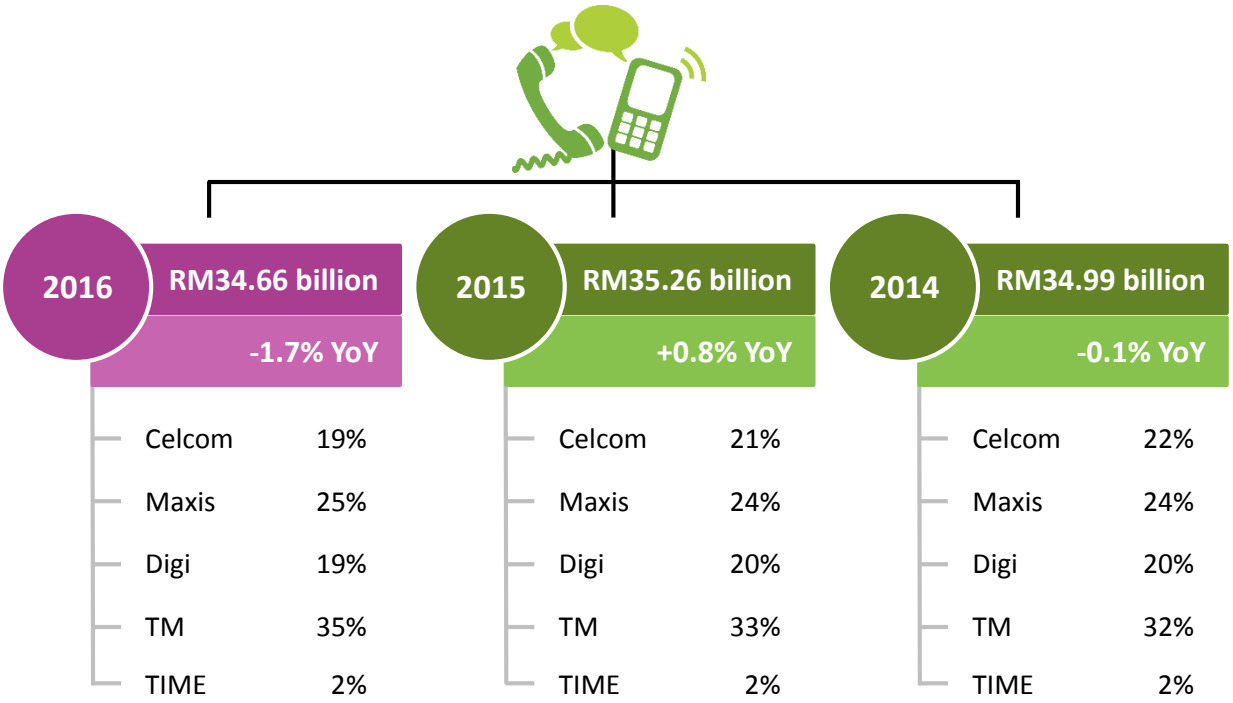
Telecommunications sector revenue declined 1.7% in 2016 to RM35 billion

Telecommunications sector continues to attract investors despite volatility in overall economy affected by external factors. In 2016, the telecommunications sector generated RM34.66 billion in revenue, declined by 1.7%.

The mobile service providers namely, Celcom, Maxis and Digi accounted for 63% of the total telecommunications sector revenue (2015: 65%). The mobile service providers revenue has declined by 4.5% to RM21.83 billion in 2016. The decline was due to intensifying competition and the increasing popularity of Over-the-Top (OTT) services that led to lower usage of voice and SMS.

Meanwhile, fixed service providers (TM and TIME) posted revenue growth of 3.5% to RM12.83 billion in 2016, supported by higher contribution from broadband take up.

Telecommunications Sector Revenue Share 2014 – 2016

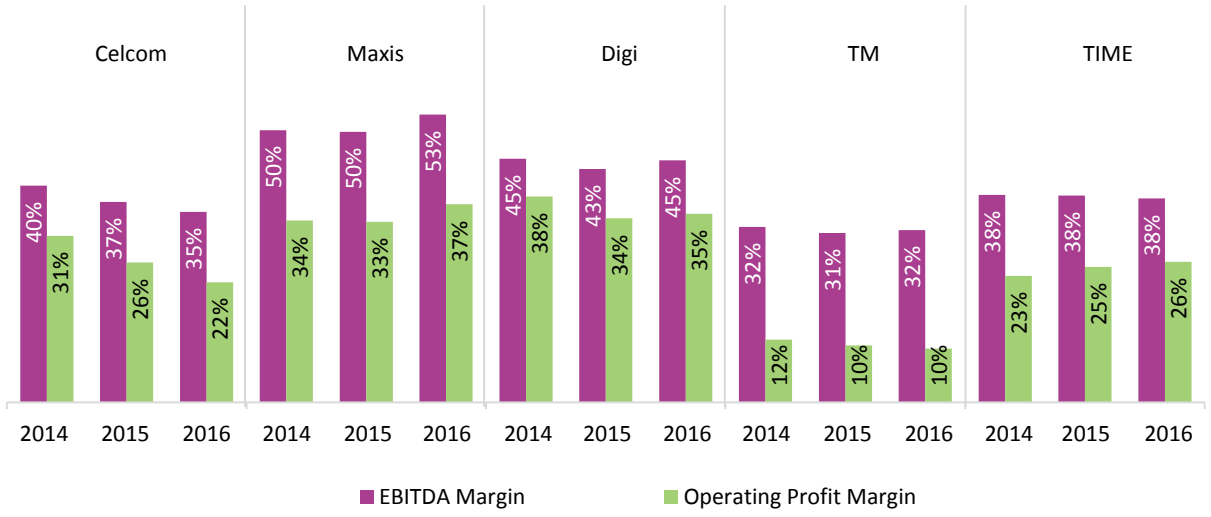


Source: Industry, MCMC

Figure 1.9 Telecommunications Sector Revenue Share 2014 – 2016

The mobile service providers recorded EBITDA[2] margin as high as 53% in 2016, despite intensifying competition. Meanwhile, the fixed service providers EBITDA margin averaged 35%, which is lower compared with mobile service providers.

Telecommunications Sector EBITDA Margin vis-à-vis Operating Profit Margin 2014 – 2016



Source: Industry, MCMC

Figure 1.10 Telecommunications Sector EBITDA Margin vis-à-vis Operating Profit Margin 2014 – 2016

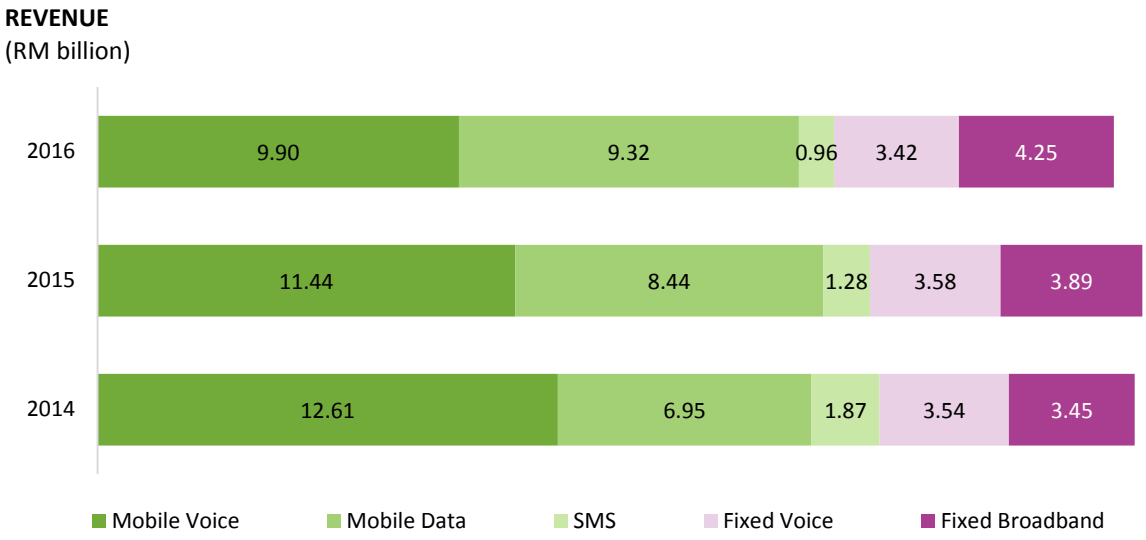
In 2016, mobile voice revenue posted decline by 13.5% to RM9.9 billion (2015: RM11.44 billion) while SMS revenue fell by 25% to RM0.96 billion (2015: RM1.28 billion). The decline was due to increasing smartphone take up, enabling users to access alternative communication methods such as email, instant messaging and social networking services.

Mobile data revenue stood at RM9.32 billion, an increase by 10.4% compared with RM8.44 billion in 2015. The growth in mobile data revenue is supported by the availability of affordable devices and attractive packages. Additionally, enhanced network coverage, wide choice of applications and digital content also spurred take up.

Meanwhile, fixed voice revenue declined by 4.5% to RM3.42 billion in 2016 from RM3.58 billion in 2015, due to mobile substitution. Fixed broadband revenue grew 9.3% to RM4.25 billion (2015: RM3.89 billion).

[2] EBITDA refers to Earnings Before Interest, Tax, Depreciation and Amortisation

Telecommunications Revenue by Service Category 2014 – 2016



Note 1. Mobile data includes Value Added Service (VAS)
2. Excludes Axiata foreign operations
3. Fixed voice and broadband revenue from TM and TIME only

Source: Industry, MCMC
Figure 1.11 Telecommunications Revenue by Service Category 2014 – 2016

In terms of Average Revenue Per User (ARPU), Maxis recorded higher ARPU of RM56 per month in 2016 (2015: RM53). The ARPU improved as a result of higher mobile Internet take up on the back of improved network coverage with 88% 4G population coverage[3]. Meanwhile, Digi's ARPU was at RM42 per month (2015: RM45) and Celcom at RM41 per month (2015: RM42).

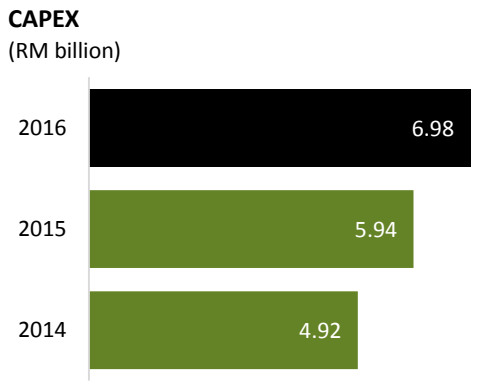
[3] Maxis Press Release, Maxis with solid 4Q and positive momentum into 2017, February 2017

Telecommunications capital expenditure rose 18% to RM7 billion in 2016

Telecommunications capital expenditure (Capex) has increased 17.5% to RM6.98 billion in 2016 (2015: RM5.94 billion), translating into Capex to revenue ratio (capital intensity) of 20% (2015: 17%). In contrast, global capital intensity was at 18%[4] in 2016.

In 2016, fixed service providers Capex has seen double digit growth of 29.1% to RM3.68 billion (29% of revenue). The investments were mainly for broadband and submarine cables.

Capex Trend 2014 – 2016



Note: Excludes Axiata foreign operations Capex

Source: Industry, MCMC

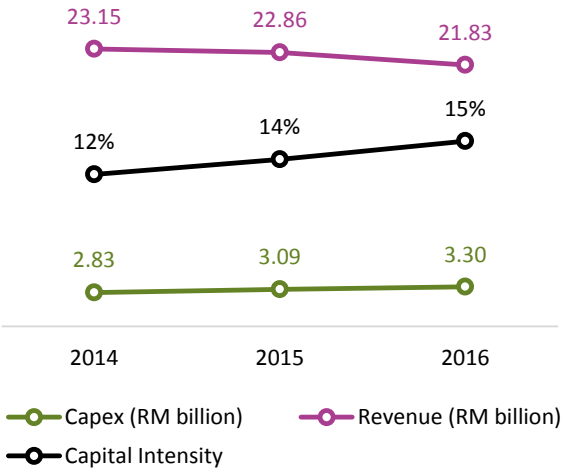
Figure 1.12 Capex Trend 2014 – 2016

At the same time, mobile service providers Capex grew 6.8% to RM3.3 billion (15% of revenue). Despite lower revenue, mobile service providers continued to invest in Capex.

Over the years, service providers have been investing in upgrading and expanding their networks. Such efforts not only improve quality of connectivity but also extend network coverage today.

This reflects service providers' strategy in maintaining or gaining market share beyond price competition. In the long term, it will benefit the end users.

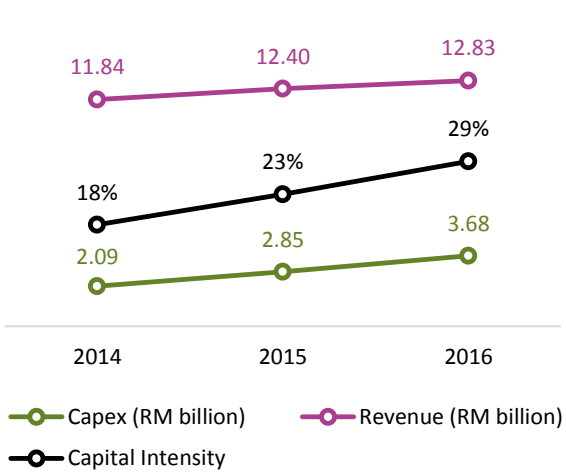
Mobile Capex vis-à-vis Revenue 2014 – 2016



Source: Industry, MCMC

Figure 1.13 Mobile Capex vis-à-vis Revenue 2014 – 2016

Fixed Capex vis-à-vis Revenue 2014 – 2016



Source: Industry, MCMC

Figure 1.14 Fixed Capex vis-à-vis Revenue 2014 – 2016

[4] OVUM, Communications Provider Revenue & Capex Tracker: 1Q17, June 2017.

OVUM research indicated global capital intensity for communications service providers in 2016 and selected countries as shown in Figure 1.15. Comparatively, Malaysian telecommunications companies' capital intensity at 20% is above global average including UK (13.6%) and Singapore (12.9%), but lower than Indonesia and Thailand capital intensity at 24.3% and 27.6% respectively.

Communications Service Provider Capital Intensity by Selected Countries 2014 – 2016			
Country	**2016 (%)**	**2015 (%)**	**2014 (%)**
GLOBAL	**17.9**	**18.8**	**17.9**
UK	13.6	14.3	13.4
Singapore	12.9	11.0	11.3
Indonesia	24.3	26.1	27.6
Thailand	27.6	23.5	24.1
Malaysia	20.0	17.0	14.0

Source: Industry, MCMC, OVUM, Communications Provider Revenue & Capex Tracker: 1Q17, June 2017
Figure 1.15 Communications Service Provider Capital Intensity by Selected Countries 2014 – 2016

Developed countries usually have lower capital intensity as they have near ubiquitous coverage compared with greenfield roll out in developing countries. Telecommunications companies in developed countries also focus on network upgrades to ensure efficiency upon technology advancement. On the other hand, developing countries tend to have higher capital intensity as there is requirement to widen coverage or upgrade 3G and expedite 4G LTE deployment.

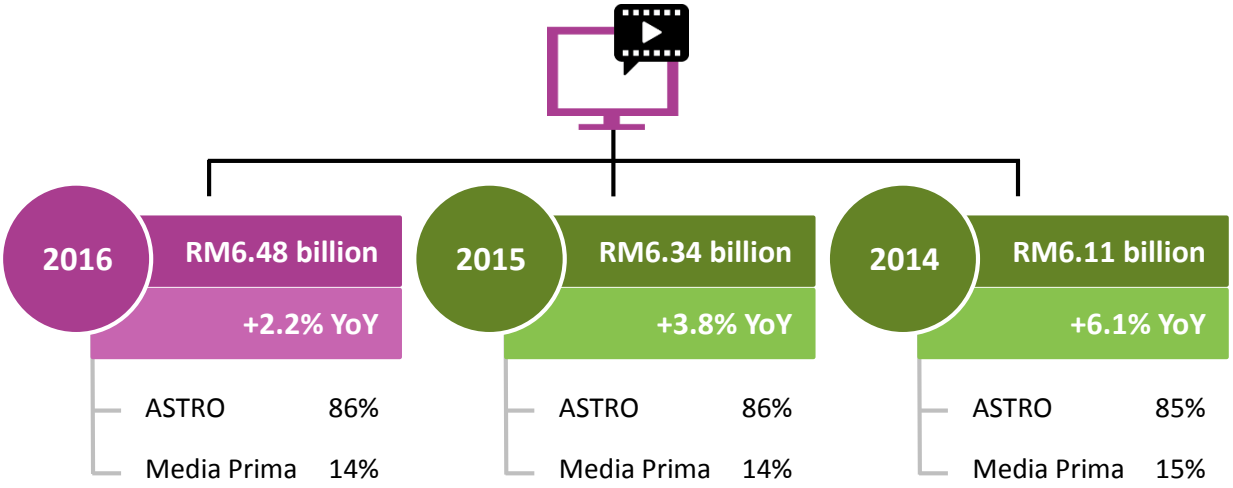
Broadcasting Sector

Broadcasting sector revenue grew 2% in 2016

Broadcasting sector revenue constituting Pay TV (ASTRO) and Free-to-Air (FTA) TV (Media Prima Group) has contributed RM6.48 billion to total C&M industry revenue in 2016. This reflects an increase of 2.2% from RM6.34 billion in 2015. Such growth was attributed to Pay TV, which posted higher contribution from its advertising and home shopping segment.

In 2016, FTA TV revenue remained unchanged at RM0.9 billion. FTA TV which derives revenue from advertising has experienced a dip since 2013 at RM1.01 billion. The decline is due to change in media consumption habits. This posed challenges to FTA TV service provider as advertisers have alternative advertising platform, offering target marketing and audience engagement.

Broadcasting Sector Revenue Share 2014 – 2016



Note: 1. ASTRO revenue adjusted by calendar year
2. Excludes Media Prima print revenue

Source: Industry, MCMC

Figure 1.16 Broadcasting Sector Revenue Share 2014 – 2016

Dividend strategy for future growth opportunities

In 2016, total dividend payout by major public listed C&M companies declined 19% to RM5.66 billion from RM7.01 billion in 2015. The telecommunications sector contributed 86% or RM4.84 billion to the total dividend payout, with the remaining from broadcasting (13%) and postal (1%) sector.

The decline in dividend payout was mainly due to Axiata, which was lower by 58.9% to RM0.72 billion compared with RM1.75 billion in 2015. It is observed that this is a way to reserve cash for infrastructure development and spectrum investment.

In summary, the lower dividend payout is essential to strengthen C&M companies' financial positions.

Dividend Payout 2014 – 2016

**Estimated*
Note: Includes special dividend

Source: Industry, MCMC
Figure 1.17 Dividend Payout 2014 – 2016

In comparison with other countries shown in Figure 1.18, most companies have lowered dividend payout ratio in 2016 compared with 2015. Among the reasons for this include necessity to retain profits for future expansion or debt reduction. By and large, companies pay dividend based on their dividend policy which are reviewed from time to time.

Malaysia's dividend payout profile is in line with other countries, which also shows decline in dividend payout in 2016. Telecommunications companies in developing countries usually retain profits for expansion while others tend to lower dividend payout as profits moderate.

Dividend Payout Ratio by Selected Countries and Companies 2014 – 2016			
Company	**2016**	**2015**	**2014**
United Kingdom	**90%**	**122%**	**109%**
BT Group*	80%	54%	50%
Talk Talk*	100%	190%	167%
Singapore	**85%**	**82%**	**89%**
Singtel*	73%	74%	74%
StarHub	101%	93%	93%
M1	80%	80%	100%
Malaysia	**78%**	**120%**	**93%**
Axiata	50%	85%	84%
Maxis	75%	86%	175%
Digi	100%	99%	100%
TM	95%	90%	90%
TIME	72%**	242%**	18%
Thailand	**73%**	**108%**	**126%**
Advanced Info Service (AIS)	98%	99%	99%
Total Access Communication (DTAC)	48%	118%	153%
True Corp	-	-	-
Indonesia	**60%**	**60%**	**60%**
XL Axiata	-	-	-
Indosat	-	-	-
Telekomunikasi Indonesia (Telkom)	60%	60%	60%

**FYE March*

***Payout in 2015 and 2016 include special dividend of 73.5 sen and 24 sen respectively.*

Note: Dividend payout ratio is calculated by dividing total dividend (includes special dividend) by the net profit; company and year with no dividend payout and negative net profit excluded.

Source: Industry, MCMC

Figure 1.18 Dividend Payout Ratio by Selected Countries and Companies 2014 – 2016

ACE Market Overview and Performance

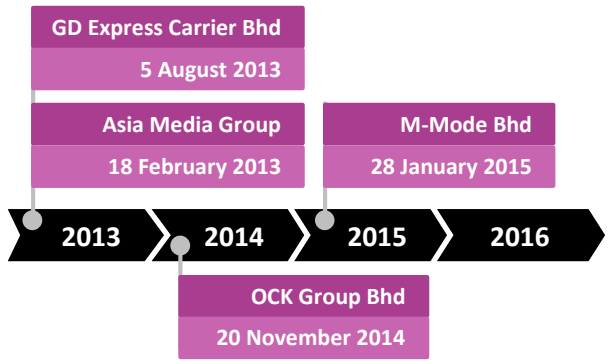
CMA licensees listed on Bursa Malaysia ACE Market posted market capitalisation of RM0.93 billion and revenue of RM0.71 billion

As at end 2016, there were 10 ACE listed licensees under the CMA. This represents 8.8% of the total 113 companies listed on Bursa Malaysia ACE Market. These licensees mostly hold an ASP licence.

Licensees on ACE Market 2016			
Company (ACE Listed)	**Listing Date**	**Licensee (Subsidiary of ACE listed company)**	**Type of Licences**
M3 Technologies (Asia) Bhd	27 Jan 2003	M3 Technologies (Asia) Bhd	ASP (C)
REDtone International Bhd	9 Jan 2004	REDtone Engineering and Network Services Sdn Bhd REDtone Mytel Sdn Bhd REDtone Telecommunications Sdn Bhd SEA Telco Engineering Services Sdn Bhd	ASP (C), NFP (I) & NSP (I) ASP (C) ASP (C) ASP (C), NFP (I) & NSP (I)
Mexter Technology Bhd	12 Apr 2005	EzyMobile International Sdn Bhd Mexcomm Sdn Bhd	ASP (C) ASP (C)
mTouche Technology Bhd	21 Jul 2005	Mobile Touchetek Sdn Bhd	ASP (C)
Nextgram Holdings Bhd *(formerly known as Nextnation Communication Bhd)*	26 Aug 2005	Dubaitech Marketing Sdn Bhd Nextnation Network Sdn Bhd	ASP (C) ASP (C)
MNC Wireless Bhd	25 Oct 2005	MNC Wireless Bhd Moblife.TV Sdn Bhd	ASP (C) ASP (C)
N2N Connect Bhd	28 Nov 2005	N2N Global Solution Sdn Bhd NGN Connection Sdn Bhd	ASP (C) ASP (C)
Privasia Technology Bhd	27 Apr 2006	Privasat Sdn Bhd Privanet Sdn Bhd	ASP (C), NFP (I) & NSP (I) ASP (C), NFP (I) & NSP (I)
Diversified Gateway Solutions Bhd	6 Jun 2007	Diversified Gateway Bhd	ASP (C)
XOX Bhd	10 Jun 2011	XOX Com Sdn Bhd XOX Media Sdn Bhd	ASP (C) & NSP (I) ASP (C)

Source: Bursa Malaysia ACE Market, Industry, MCMC
Figure 1.19 Licensees on ACE Market 2016

Licensees on ACE Market:
Transfer of Listing to Main Market



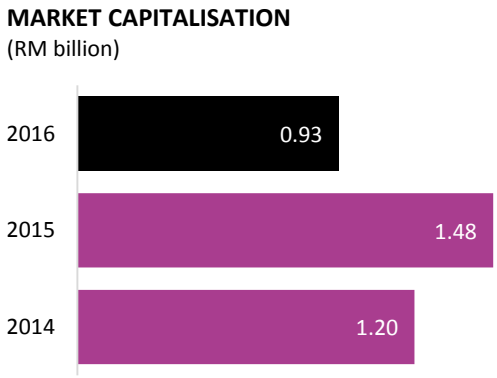
Source: Bursa Malaysia, MCMC
Figure 1.20 Licensees on ACE Market: Transfer of Listing to Main Market

Over the last few years, some ACE Market licensees have progressed to listing on the Main Market namely, M-Mode Bhd, OCK Group Bhd, GD Express Carrier Bhd and Asia Media Group Bhd (Figure 1.20).

Such transition marks a milestone for our licensees, and signifies their success in terms of the scale of business and financial performance. Additionally, such transfer further enhanced licensees credibility and reputation through its profile as a company listed on the Main Market. This provides an avenue for the companies to source funds for future expansion.

In 2016, market capitalisation for the 10 CMA licensees listed on ACE Market was about RM0.93 billion. This is a decline of 37% compared with 2015 due in part to weaker market sentiment and lower revenue recorded in 2016.

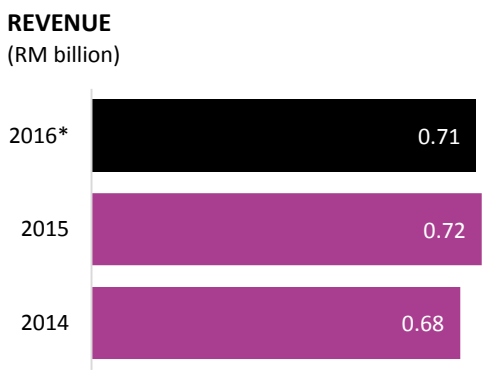
Licensees on ACE Market: Market Capitalisation
2014 – 2016



Note: The prior-year numbers restated based on list of licensees on ACE Market 2016, which was 10 companies

Source: Bloomberg, MCMC
Figure 1.21 Licensees on ACE Market: Market Capitalisation 2014 – 2016

Licensees on ACE Market: Revenue
2014 – 2016

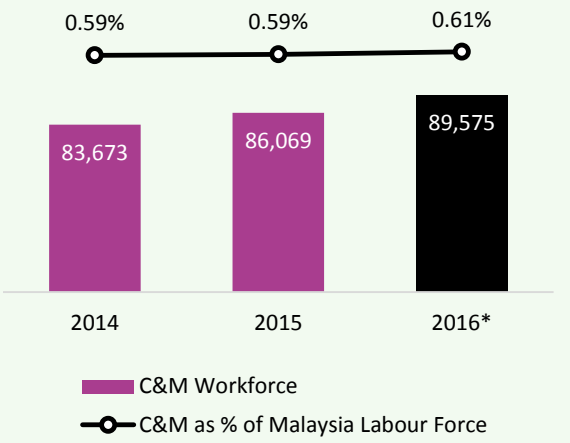


**Estimated*
Note: The prior-year numbers restated based on list of licensees on ACE Market 2016, which was 10 companies

Source: Industry, MCMC
Figure 1.22 Licensees on ACE Market: Revenue 2014 – 2016

CMA Licensees Workforce

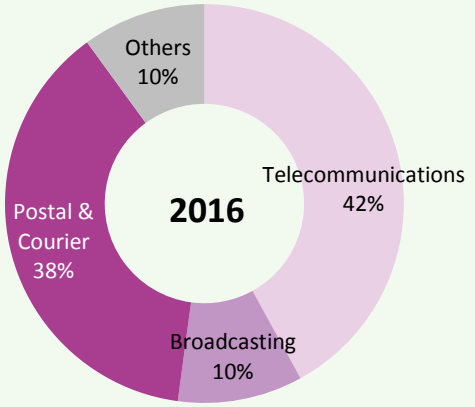
CMA Licensees Workforce 2014 – 2016



**Estimated*
Note: Excludes Axiata employees from foreign operations.

Source: Industry, MCMC
Figure 1.23 C&M Industry Workforce 2014 – 2016

CMA Licensees Workforce by Sector



Note: Number of employees are from major public listed companies, other CMA licensees, postal and courier service providers

Source: Industry, MCMC
Figure 1.24 CMA Licensees Workforce by Sector

Based on industry feedback [5], CMA licensees employed 89,575 workforce in 2016. This is about 0.6% of the Malaysian labour force of 14.7 million[6]. The number of employees is estimated to have increased by 4.1% or 3,506 in 2016.

The employment in broadcasting sector increased by 1.7% to 9,089, while postal and courier sector have increased by 9.6% to 33,902 in 2016.

The C&M industry spent more than RM40 million in training and development in 2016. These were in areas such as leadership and management development, soft skills, occupational safety and health, digital and technical fundamentals. There was also emphasis on integrity and governance.

Majority of the companies maintained consistent workforce size. They have been adding skilled talents as and when required to support new business ventures including new projects. Meanwhile, some of the companies adopted lean management to optimise resources by having strategic partners or outsourcing.

Going forward, C&M companies continue to seek skilled talents to serve expanding business needs and creating innovative new services. This is critical upon advancing technologies, increasing competitive pressures and rising consumer expectations.

[5] MCMC questionnaire to licensees on industry performance. More than 60 responses and submissions across the C&M segments were received.
[6] Department of Statistics Malaysia, Labour Force Survey Report 2016, April 2017.

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MODULE 2: SERVICES AND CONNECTIVITY

Broadband in Malaysia

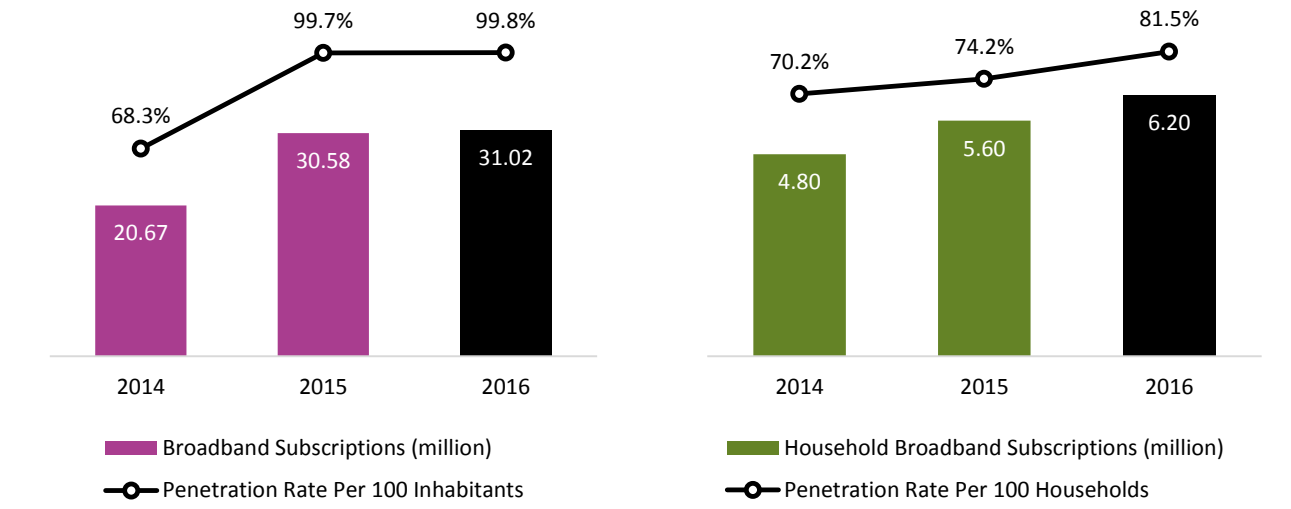
In 2016, Malaysia broadband penetration rate per 100 inhabitants was at 99.8%. Broadband subscriptions have increased 1.4% to 31.02 million from 30.58 million in 2015. The increase was driven by higher mobile broadband subscriptions of 28.53 million, a growth of 2.8% from 27.76 million in 2015. Mobile broadband market continues to gain momentum, driven by improved network coverage and demand for mobile data.

Meanwhile, fixed broadband subscriptions reached 2.49 million in 2016.

Since the implementation of the National Broadband Initiative (NBI) in 2010 with the aim to provide broadband access to all Malaysians, broadband take up has increased. Today, Malaysia has broadband penetration rate close to the 100% mark as a result of the NBI.

Broadband penetration rate per 100 households[7] increased by 11.6% to 6.2 million in 2016 from 5.5 million in 2015, contributed by substantial increase in mobile broadband. Notably, in the period from 2014 to 2016, broadband penetration rate per 100 households has increased steadily from 70.2% in 2014 to 81.5% in 2016.

Broadband Subscriptions and Penetration Rate 2014 – 2016



Note: 2015 and 2016 figures adjusted for fixed broadband subscriptions at speeds ≥ 1Mbps (Previously: ≥256Kbps)

Source: MCMC

Figure 2.1 Broadband Subscriptions and Penetration Rate 2014 – 2016

[7] The broadband penetration rate per 100 households is calculated by dividing the number of household subscriptions by the number of households and multiplied by 100, as follows:

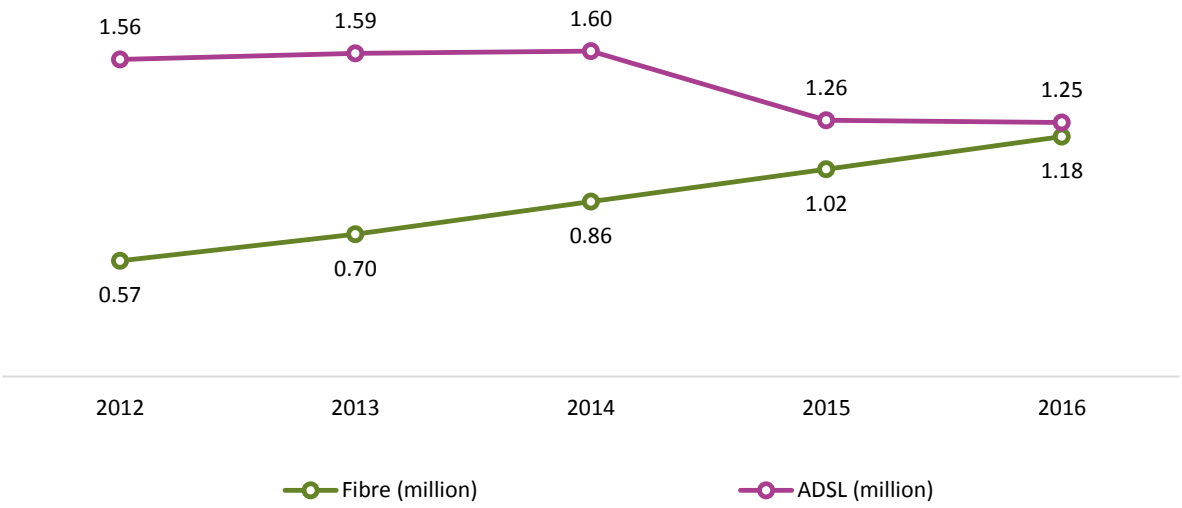
$$\frac{Household\ Subscriptions}{Number\ of\ Households} x100 = \%$$

Fixed Broadband

Increasing consumption of digital content and growing number of connected devices have led to demand for high speed broadband. Fibre subscriptions continue to trend higher with subscriptions recording 1.18 million in 2016, an increase of 15.7% from 1.02 million in 2015.

In comparison, Asymmetric Digital Subscriber Line (ADSL) subscriptions declined by 0.8% to 1.25 million in 2016 (2015: 1.26 million). ADSL remains the largest technology segment contributing more than half of total fixed broadband subscriptions. Since 2014, ADSL subscriptions have declined as subscribers migrate to fibre or mobile broadband for better quality of experience and engagement. It is expected that fibre subscriptions would overtake ADSL going forward.

ADSL and Fibre Subscriptions 2012 – 2016



Note: 2015 and 2016 figures adjusted for subscriptions at speeds ≥ 1Mbps (Previously: ≥256Kbps)

Source: MCMC

Figure 2.2 ADSL and Fibre Subscriptions 2012 – 2016

Development of broadband infrastructure for digital connectivity

In 2016, high speed broadband access has reached almost 3.7 million premises in urban and high impact areas through the roll out of High Speed Broadband (HSBB) and High Speed Broadband Phase 2 (HSBB2) projects. HSBB2 project encompasses the deployment of additional access and core capacity covering all state capitals and major towns with speeds of up to 100Mbps.

Under the Suburban Broadband (SUBB) project, 365,000 premises were covered for high speed connectivity in suburban and rural areas with speeds of up to 20Mbps with Fibre-to-the-Cabinet (FTTC) and copper technology for last mile. In some areas where Fibre-to-the-Home (FTTH) technology is deployed, it will have speeds of up to 100Mbps.

Out of RM3.4 billion allocated for a period of 10 years under the HSBB2 and SUBB, 833,000 premises were connected to high speed broadband in 2016. Both projects are key national infrastructure initiatives in enhancing Malaysia digital connectivity readiness towards a digital nation.

Commencing 2016, Rural Broadband (RBB) project is another initiative to provide broadband with speeds of up to 20Mbps in underserved rural areas. Figure 2.3 shows the premises passed for initiatives undertaken as at end 2016.

Broadband Initiatives				
	HSBB1	**HSBB2**	**SUBB**	**RBB**
Project Timeline	2008 – 2012	2015 – 2017	2015 – 2019	2015 – 2016
Speed	10Mbps and above	Up to 100Mbps	Up to 20Mbps	Up to 20Mbps
Premises Passed	3.2 million	468,000	365,000	28,000

Source: Industry, MCMC
Figure 2.3 Broadband Initiatives

Sistem Kabel Rakyat 1Malaysia or SKR1M project marked another milestone towards improving backhaul connectivity between Peninsular Malaysia and Sabah and Sarawak. In 2016, the main submarine cable with a distance of 2,800km of fibre span or 73% was completed. It is targeted that 4Tbps bandwidth will be available upon completion in 2017. This project was initiated in 2015.

A new international submarine cable namely, Bay of Bengal (BBG) cable system connecting South East Asia, Sri Lanka, India and the Middle East has been completed in 2016. With this cable completion, it has contributed additional 900Gbps design capacity to Malaysia specifically for South East Asia – Middle East route.

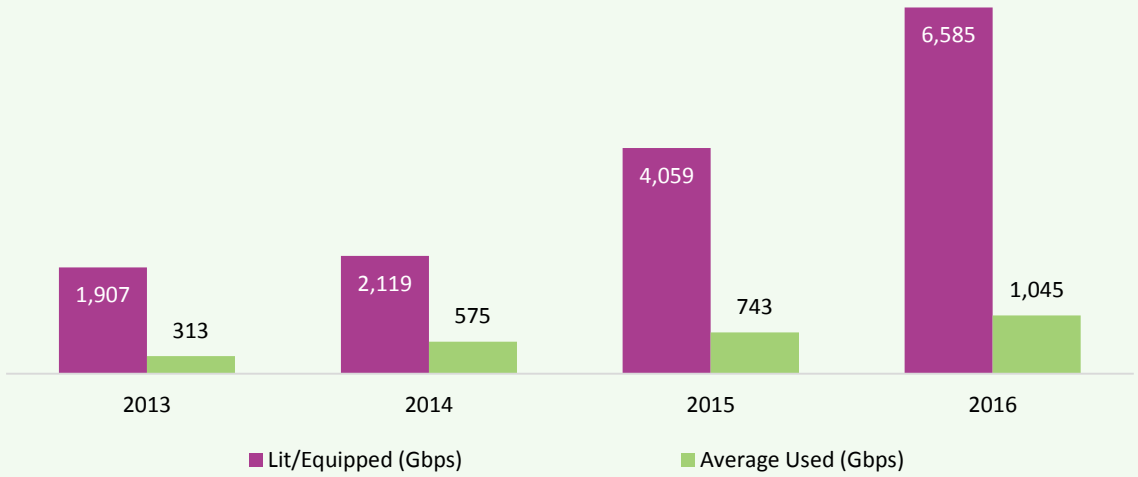
MCMC also focuses on new initiatives to bridge the digital divide in specific rural areas. For instance, MCMC, TM and Tenaga Nasional Bhd (TNB) collaborated to provide high speed broadband in Kampung Mat Daling, Jerantut Pahang. A total of 13 telecommunication towers were fiberised which enables high mobile broadband speed to be offered through 3G/HSDPA or 4G LTE technology. The project would enable the use of TNB's medium voltage poles to deliver high speed broadband to remote areas.

International Internet Bandwidth

Rich multimedia content, streaming and cloud services require reliable and higher bandwidth capacity. Increased popularity and adoption of bandwidth-intensive applications, as well as e-commerce transactions are spurring traffic.

To meet the increasing bandwidth demand, new submarine cables are deployed and upgraded to serve Malaysian users.

International Internet Bandwidth 2013 – 2016



Source: MCMC

Figure 2.4 International Internet Bandwidth 2013 – 2016

In 2016, lit or equipped international Internet bandwidth capacity[8] has soared 62.2% to 6,585Gbps from 4,059Gbps in 2015. In contrast, the international Internet bandwidth usage is less than one fifth of the capacity. In this case, Malaysia is able to reduce latency and improve quality of its Internet services.

Specifically, used international Internet bandwidth[9] increased 40.6% to 1,045Gbps in 2016 from 743Gbps in 2015. International Internet bandwidth is an indicator of the ICT Development Index (IDI) under the Measuring Information Society by ITU.

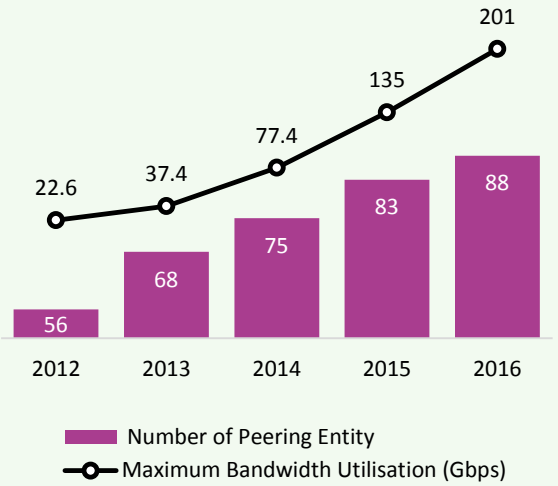
[8] Lit/Equipped international Internet bandwidth refers to the total capacity of international fibre-optic cables and radio links provisioned to carry Internet traffic.

[9] Used international Internet bandwidth refers to the average traffic load of international fibre-optic cables and radio links for carrying Internet traffic.

Malaysian Internet Exchange (MyIX)

MyIX was established on 15 December 2006. It is a non-profit and neutral Internet Exchange platform where Internet Service Providers (ISPs) and content providers connect and peer to exchange domestic Internet traffic locally.

MyIX Bandwidth Utilisation and Peering Trend 2012 – 2016 (As at December)



Source: MyIX, MCMC

Figure 2.5 MyIX Bandwidth Utilisation and Peering Trend 2012 – 2016 (As at December)

MyIX aim to keep domestic Internet traffic within the country by reducing boomerang effect – a scenario whereby domestic Internet traffic were routed through multiple international hops, via exchanges overseas, and back to Malaysia.

Over the past ten years, MyIX has continued to grow in terms of membership and traffic. In 2016, MyIX serves up to 88 peering members including International Content Providers such as Akamai, Facebook, Google, Twitter, Amazon and Microsoft with maximum traffic of 201Gbps recorded as at December 2016.

MyIX is operated by Persatuan Pengendali Internet Malaysia (Persatuan MyIX). To date, the following has been achieved:

- Improved the quality of consumer experience in accessing local Internet content by reducing the latency from 100ms – 400ms to 10ms – 60ms on average; and
- Assisted in reducing members reliance on international IP transit services for exchanging domestic Internet traffic which translates to reduction in Ringgit outflow.

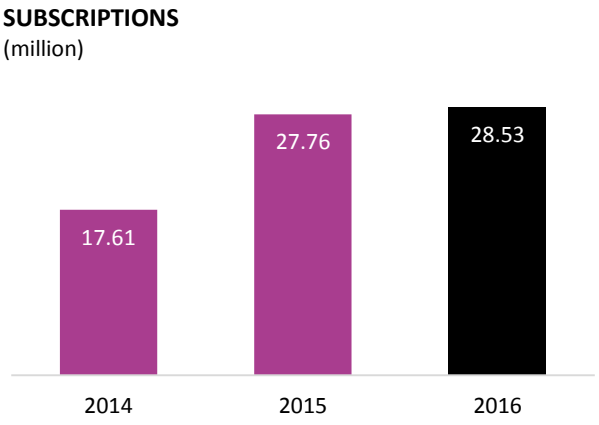
Going forward, MyIX continue to seek ways to reduce costs by increasing the number of peering partners.

Mobile Broadband

Mobile broadband subscriptions stood at 28.5 million, marking an increase of 2.8%

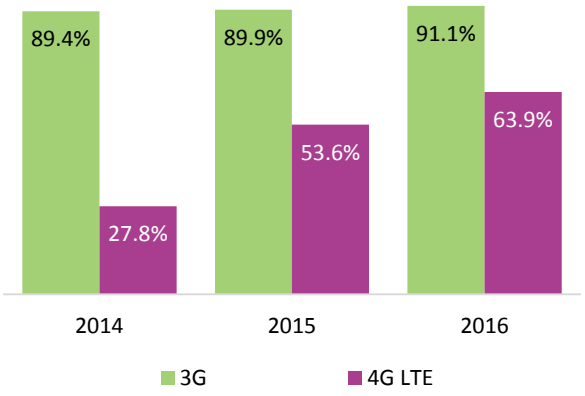
In 2016, total number of mobile broadband subscriptions stood at 28.53 million, an increase of 2.8% from 27.76 million in 2015. Mobile broadband market continues to gain momentum, driven by improved network coverage and demand for mobile data.

Mobile Broadband Subscriptions 2014 – 2016



Source: MCMC
Figure 2.6 Mobile Broadband Subscriptions 2014 – 2016

3G and 4G LTE Population Coverage 2014 – 2016



Source: MCMC
Figure 2.7 3G and 4G LTE Population Coverage 2014 – 2016

Wide choices and affordability of smartphones and other devices such as tablets contribute to increasing mobile broadband subscriptions and driving migration to 3G and 4G LTE mobile broadband networks. Continuous investment by service providers have resulted in achieving 3G and 4G LTE population coverage at 91% and 64% respectively in 2016. Such achievement provides digitally connected platform which accelerates progress towards a strong digital economy.

Mobile service providers are actively introducing innovative and competitively priced packages to attract subscribers and improve "stickiness[10]". For instance, Maxis upgraded their subscribers with more data allowances for free (25GB plan with additional 25GB for free during weekends).

In a competitive mobile market, attractive plans are also available from other service providers. Celcom aside from introducing free mobile Internet access during weekends also introduced NewPhone programme, with an option to switch to latest smartphone models for free every 12 months. The latter tends to keep customers subscribed as they intend to upgrade their subscriptions regularly.

Additionally, digital services are gaining traction as service providers strive to increase the take up of branded data services such as Video Freedom by Digi. This is a pay-as-you-use service to stream video without incurring data charges. Similarly, U Mobile offer prepaid and postpaid subscribers free data to access its Video Onz for streaming video.

[10] "Stickiness" refers to customer loyalty or the chance to continue to use a product or services as opposed to that of a competitor.

Spectrum Refarming: 900MHz and 1800MHz Bands

In 2016, MCMC has undertaken a spectrum refarming exercise of the 900MHz and 1800MHz bands. This was in line with the Government's decision to optimise the use of spectrum resources. With combination of 900MHz and 1800MHz bands, existing service providers will be able to expand their service coverage, wider penetration into the rural and remote areas while providing higher speeds to customers.

Spectrum refarming is the process of redeploying a range of spectrum from existing service and reallocating it for the same or different service. This initiative is essential to ensure efficient spectrum use and to facilitate the mobile service providers in Malaysia in keeping up with the increasing demand for mobile broadband service.

The spectrum refarming initiative has taken into account the development of C&M industry and the nation as a whole. Several key factors have contributed to the development of policies in relation to the principles of spectrum refarming.

In the interest of end users, high priority was placed on improving existing communications service coverage as well as quality of service. At the same time, affordability of communications services was given due consideration in the implementation of spectrum refarming.

Spectrum refarming is not something new and it has been done in the past. For instance, in 2012, MCMC reallocated the 2.6GHz band to service providers for the provision of mobile broadband service based on LTE technology with an objective to achieve 50% population coverage by 2017.

Prior to this spectrum reallocation exercise of 900MHz and 1800MHz bands, the spectrum is assigned by way of apparatus assignment, which is renewed on an annual basis. With the spectrum reallocation exercise, four mobile service providers are assigned with the two bands for a fee and are able to use the spectrum for a period of 15 years. A longer period to use spectrum provides certainty to these players in terms of investment and network expansion.

In implementing spectrum reallocation and ensuring costs are not passed down to subscribers, it is a condition of the allocation that players offer packages to their subscribers that are cheaper than current prices.

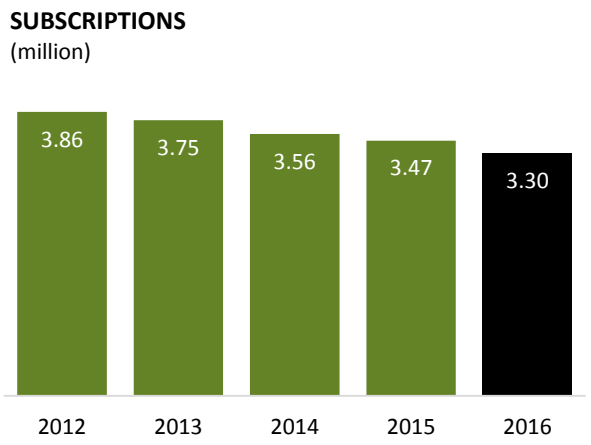
After the spectrum reallocation of these two bands, service providers are required to migrate and align into their 'new' spectrum blocks. The spectrum migration exercise has commenced in phases and is expected to complete by June 2017. This spectrum migration exercise will enable the service providers to provide subscribers with mobile services utilising latest technologies.

In future, more spectrum bands will be refarmed to enable service providers to provide better quality of service to consumers and to meet the increasing demand due to the proliferating use of devices which requires greater mobile broadband connectivity.

Fixed Services

Direct Exchange Line penetration rate per 100 inhabitants was at 10.6% or a total of 3.3 million subscriptions in 2016

DEL Subscriptions 2012 – 2016



Source: MCMC

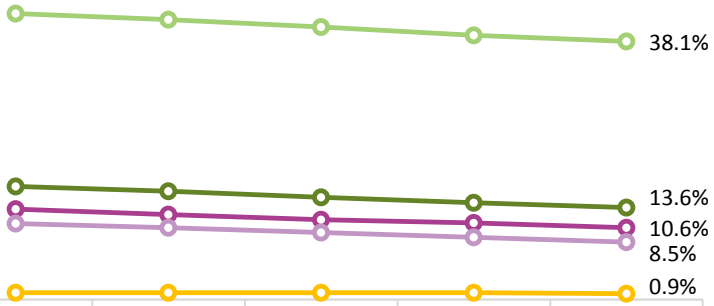
Figure 2.8 DEL Subscriptions 2012 – 2016

In 2016, Direct Exchange Line (DEL) subscriptions was 3.3 million, down 4.9% from 3.47 million in 2015. There has been a gradual decline in DEL subscriptions, due to substitution from fixed to mobile and changing user behaviour whereby mobile is preferred over fixed telephony. Such trend continues along with increasing use of other digital communication platforms such as VoIP, OTT messaging applications and social networking services, as well as increased take up of smartphones.

Malaysia DEL penetration rate per 100 inhabitants was at 10.6% in 2016, down 0.7% from 11.3% in 2015.

The decline is in line with global trend. According to ITU[11], DEL penetration rate has been moderating below 20% globally for the last few years. In 2016, global DEL penetration rate stood at 13.6%, with one billion subscriptions. This is a decrease by 0.7% compared with 2015. Notably, the rate of decrease is higher in developed countries (0.9%) than developing countries (0.7%) and least developed countries (0.1%).

Worldwide and Malaysia: DEL Penetration Rate Per 100 Inhabitants



	2012	2013	2014	2015	2016
Malaysia	13.3%	12.5%	11.8%	11.3%	10.6%
World	16.7%	16.0%	15.1%	14.3%	13.6%
Developed	42.2%	41.3%	40.2%	39.0%	38.1%
Developing	11.2%	10.6%	9.9%	9.2%	8.5%
Least Developed Countries (LDC)	1.0%	1.0%	1.0%	1.0%	0.9%

Note: The developed, developing and LDC country classifications are based on UN M49 which is a standard for area codes used by the United Nations; for more information refer to unstats.un.org

Source: International Telecommunication Union (ITU), MCMC

Figure 2.9 Worldwide and Malaysia: DEL Penetration Rate Per 100 Inhabitants

[11] ITU, Key ICT indicators for developed and developing countries and the world (totals and penetration rates), 2017.

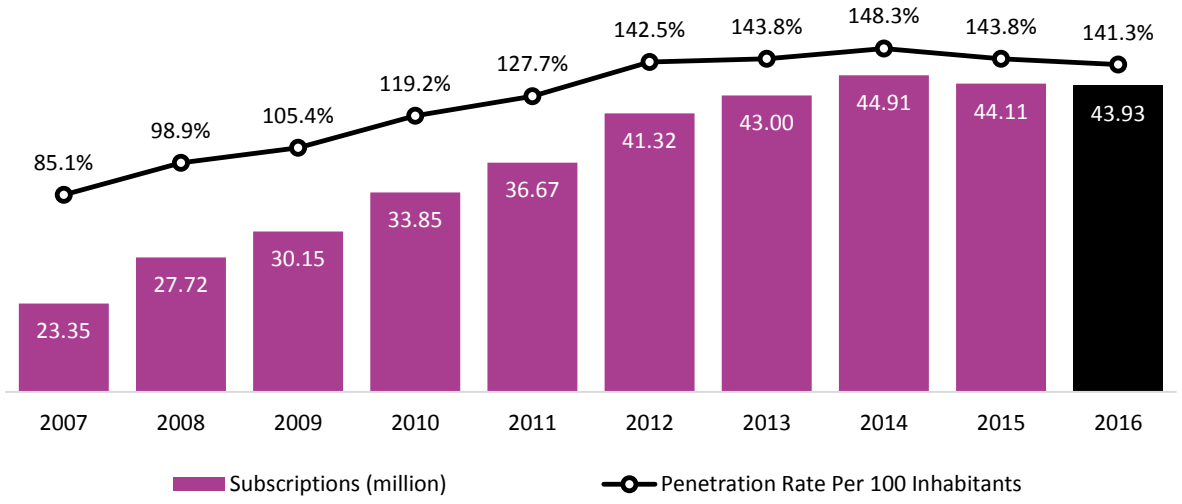
Mobile Services

Mobile penetration rate was at 141%, equivalent to 43.9 million subscriptions in 2016

Malaysia mobile penetration rate has long surpassed the 100% mark and currently hovering just above 140% mark, thus indicating that the mobile market has reached maturity. Nevertheless, the next wave of digital connectivity is expected to be supported by aggressive Machine-to-Machine (M2M) connections and eventually forming part of the IoT ecosystems.

Over the last 10 years, Malaysia has experienced tremendous growth in mobile subscriptions to 43.93 million in 2016 from only 23.35 million in 2007. Although mobile penetration is high, service providers are still able to tap opportunities in gaining subscriptions through migrating prepaid subscribers to postpaid and upgrading 2G to 3G and 4G LTE services. Notably, 2G subscriptions[12] signalled a reduction to nine million subscriptions in 2016 from more than 25 million subscriptions in 2012.

Mobile Subscriptions and Penetration Rate 2007 – 2016



Source: Industry, MCMC

Figure 2.10 Mobile Subscriptions and Penetration Rate 2007 – 2016

In Malaysia, mobile subscriptions fell marginally by 0.4% in 2016 compared with 44.11 million in 2015. The decline was due to changing user behaviour which resulted in reduction of multiple SIM usage. Multiple SIM is becoming less relevant as a result of better coverage, increasing smartphone take up and attractive packages. It is expected that subscribers will continue to move from multiple SIM to single SIM usage.

According to ITU[13], global mobile penetration rate stood at 101.5% in 2016, with eight billion subscriptions. This is an increase by 3.3% compared with 2015. At 141.3%, Malaysia's penetration rate is way above the global and developed country levels. However, Malaysia's rate has been experiencing decline over the last three years. This is mainly due to rationalisation as a result of consumer behaviour changing to single SIM on wider mobile network coverage and increase in smartphone usage where the consumer can perform various activities on a single device.

[12] OVUM, Mobile Subscription and Revenue Forecast: 2016 – 2021, December 2016.

[13] ITU, Key ICT indicators for developed and developing countries and the world (totals and penetration rates), 2017.

Worldwide and Malaysia: Mobile Penetration Rate Per 100 Inhabitants

	2012	2013	2014	2015	2016
Malaysia	142.5%	143.8%	148.3%	143.8%	141.3%
World	88.5%	93.1%	96.7%	98.2%	101.5%
Developed	115.7%	118.2%	122.0%	124.5%	127.3%
Developing	82.7%	87.8%	91.4%	92.7%	96.3%
Least Developed Countries (LDC)	48.6%	55.8%	63.1%	67.9%	67.7%

Note: The developed, developing and LDC country classifications are based on UN M49 which is a standard for area codes used by the United Nations; for more information refer to unstats.un.org

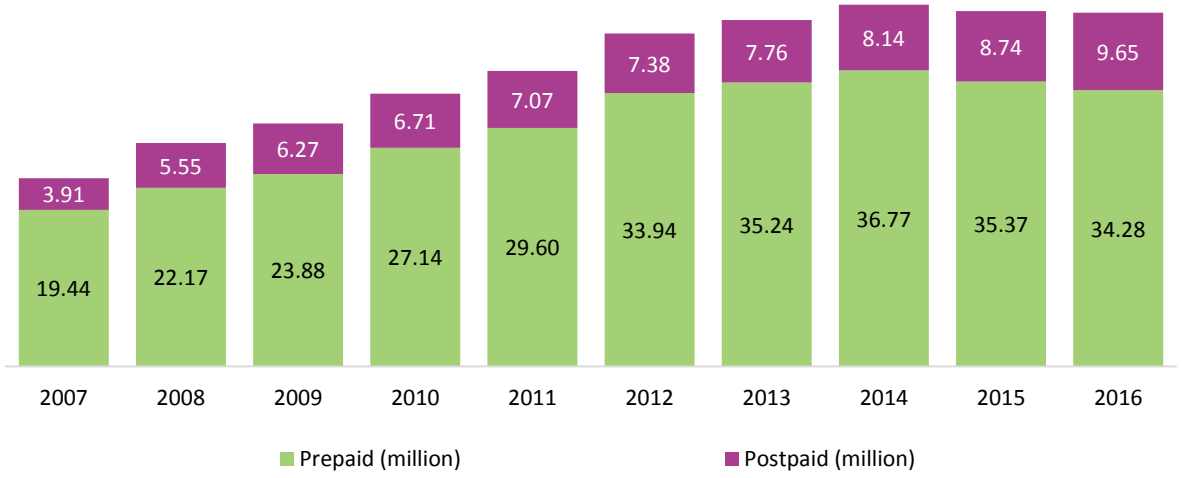
Source: International Telecommunication Union (ITU), MCMC

Figure 2.11 Worldwide and Malaysia: Mobile Penetration Rate Per 100 Inhabitants

Postpaid subscription is growing, supported by attractive packages

More attractive packages are encouraging subscribers to subscribe to postpaid plans. Hence, postpaid subscriptions have increased by 10.4% to 9.65 million. In contrast, prepaid subscriptions have declined by 3.1% to 34.28 million in 2016.

Prepaid and Postpaid Subscriptions of Mobile Services 2007 – 2016



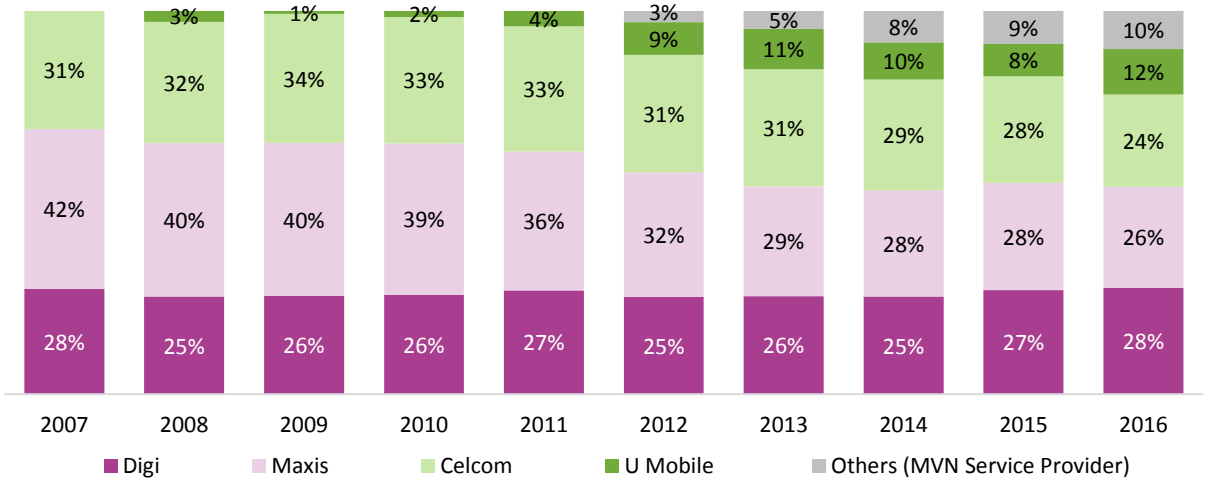
Source: Industry, MCMC

Figure 2.12 Prepaid and Postpaid Subscriptions of Mobile Services 2007 – 2016

In 2016, the major service providers have garnered almost equal market share, which translates into a level playing field. Digi has managed to maintain its trend of market share around 26% over the years. However, U Mobile has been competing aggressively for subscribers with a market share of 12% compared with 8% in 2015. Meanwhile, MVN service providers command 10% market share in 2016 compared with 9% in 2015.

Maxis and Celcom market shares have reduced to 26% and 24% respectively in 2016.

Mobile Subscriptions Market Share by Service Providers 2007 – 2016

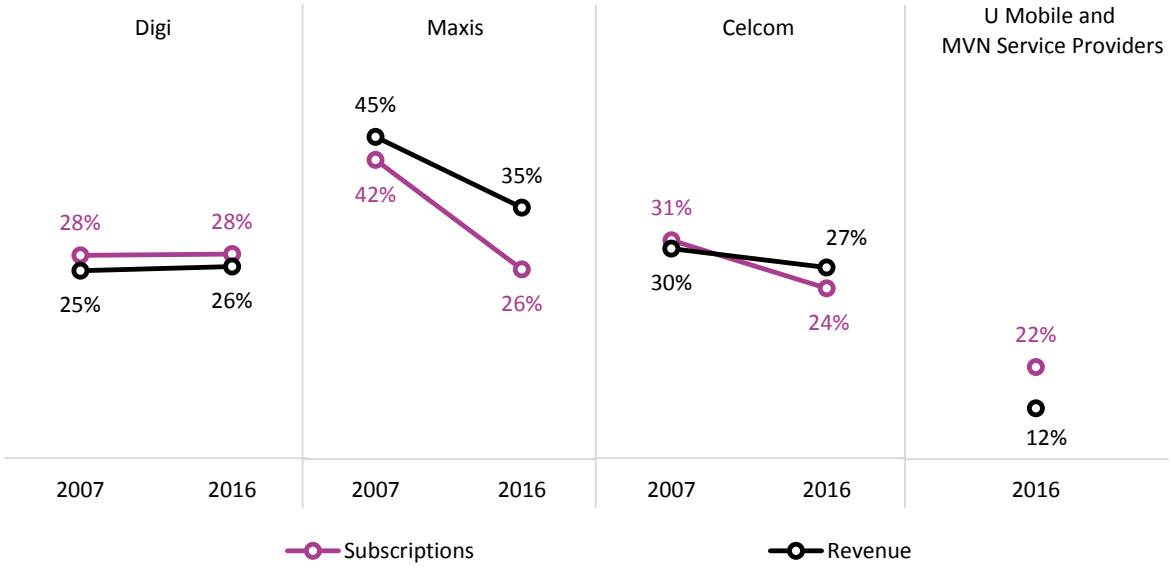


Source: Industry, MCMC

Figure 2.13 Mobile Subscriptions Market Share by Service Providers 2007 – 2016

Malaysian mobile market today has evolved to a four player market compared with a three player market in 2007. Over the last five years, the ecosystem of the mobile market has seen new entrants with participation from MVN service providers that serve niche markets.

Mobile Market Share by Subscription and Revenue



Source: Industry, MCMC

Figure 2.14 Mobile Market Share by Subscription and Revenue

Mobile service subscriptions have doubled over the last 10 years from 23.35 million in 2007 to 43.93 million in 2016. Revenue grew 45% to RM24.89 billion in 2016 from RM17.14 billion in 2007.

Notably, Maxis maintained its lead revenue market share at 35% in 2016 (2007: 45%) which reflects Maxis' strategy in capturing high value market segment. In contrast, Digi has maintained their subscriptions and revenue market share throughout the years.

Malaysian mobile service providers compete intensely by adopting the following strategies to sustain or gain market share:

- Forming partnerships with content providers (Spotify, YouTube, Facebook, WhatsApp, Waze) to provide attractive packages which include free data, music and video streaming.
- Migrating subscribers to higher speed services while expanding their 4G LTE network.
- Creating attractive bundles which include new services in addition to unlimited usage for voice, data and roaming.
- Offering more data at the same price or cheaper.

Beyond competing for market share, service providers are also focusing on profitability. Apart from introducing differentiated services, service providers are also expanding into adjacent markets for long term resilience and sustainability.

Mobile Virtual Network (MVN) Services

Subscriptions for MVN Services marked double digit growth of 14%

In 2016, MVN services subscriptions was at 4.2 million. This is a double digit growth of 13.5% compared with 3.7 million subscriptions in 2015. Notably, MVN service providers recorded market share of 10% out of total mobile subscriptions.

As at end 2016, there are 18 MVN service providers[14] operating in Malaysia.

List of MVN Service Providers 2016		
Mobile Network Operator (MNO)	**Thick MVN Service Provider[15]**	**Thin MVN Service Provider[16]**
Celcom Axiata	▪ Altel Communications Sdn Bhd (Altel) ▪ Red ONE Network Sdn Bhd (redONE) ▪ Tune Talk Sdn Bhd (Tune Talk) ▪ XOX Com Sdn Bhd (XOX) ▪ Webe Digital Sdn Bhd (Webe)	▪ Merchantrade Asia Sdn Bhd (Merchantrade Asia) ▪ PLDT Malaysia Sdn Bhd (Smart Pinoy)
U Mobile	▪ Ceres Telecom Sdn Bhd (FRiENDi Mobile) ▪ Telekomunikasi Indonesia (Malaysia) Sdn Bhd (Telin)	▪ ECI Communications Sdn Bhd (ECI) ▪ I Tel Mobile Network Sdn Sdn (Itel) ▪ Mobile 8 Telco Sdn Bhd (Buzz Me) ▪ MyAngkasa Holdings Sdn Bhd (MyAngkasa Mobile) ▪ Uni Comms International Sdn Bhd (UCSI)
Digi	▪ Talk Focus Sdn Bhd (Tron) ▪ Xiddig Cellular Communications Sdn Bhd (XiddiG)	▪ Pavo Communications Sdn Bhd (SpeakOut Wireless)
Maxis	-	▪ REDtone Engineering and Network Services Sdn Bhd (ANSAR Mobile)

Source: MCMC

Figure 2.15 List of MVN Service Providers 2016

[14] A MVN service provider fulfils at least one of the following criteria:
i. Requires radio access from another service provider;
ii. Requires infrastructures from another service provider to enable services to be provided to the subscribers; or
iii. Subscribes to the wholesale service(s) provided by another service provider.

[15] Thick MVN service provider is defined as a service provider who owns ASP (C) and NSP (I). They might have NFP(I) occasionally.

[16] Thin MVN service provider is defined as a service provider who owns ASP(C) licence only.

Competition drives MVN services innovation

Malaysian MVN services market remains dynamic and continues to grow. MVN service providers have successfully found market niches that target the no-frills and ethnic segment.

Opportunities in niche and segment markets require unique and integrated offerings rather than competing on price or bundles. For example, KarTuAS is a two in one SIM Card service that holds both Malaysian and Indonesian mobile numbers. It has U Mobile as its MNO and Telin Malaysia[17] as the MVN service provider. When one travels between Malaysia and Indonesia, there is no roaming charges and subscribers get to enjoy low rates like a local.

Notwithstanding the above, MVN service providers cited[18] the following as crucial to remain competitive:

MVN Services Key Success Factors	
Low operating costs	Ensure effective price strategy to retain customer and remain profitable.
Services differentiation	Develop unique value propositions to differentiate their products from competitors and other MVN service providers.
Customer service and engagement	Innovative in reaching out to customers and optimising customer experience through digital media platforms and self-care solutions such as FAQ, mobile self-care applications, social networking and live chats. Surveys are also conducted to gauge subscribers' preferences and obtain feedback. Hence, MVN service providers are able to respond to changing market demand and meet customer expectations.
Strong marketing and distribution channel	Leverage brand and distribution channel synergies with other companies to increase subscriber base by providing customer convenience.
Establish a mutually beneficial relationship with MNO	MVN service providers need to ensure continuous beneficial relationship by complementing MNOs in extending target market.

Source: MCMC

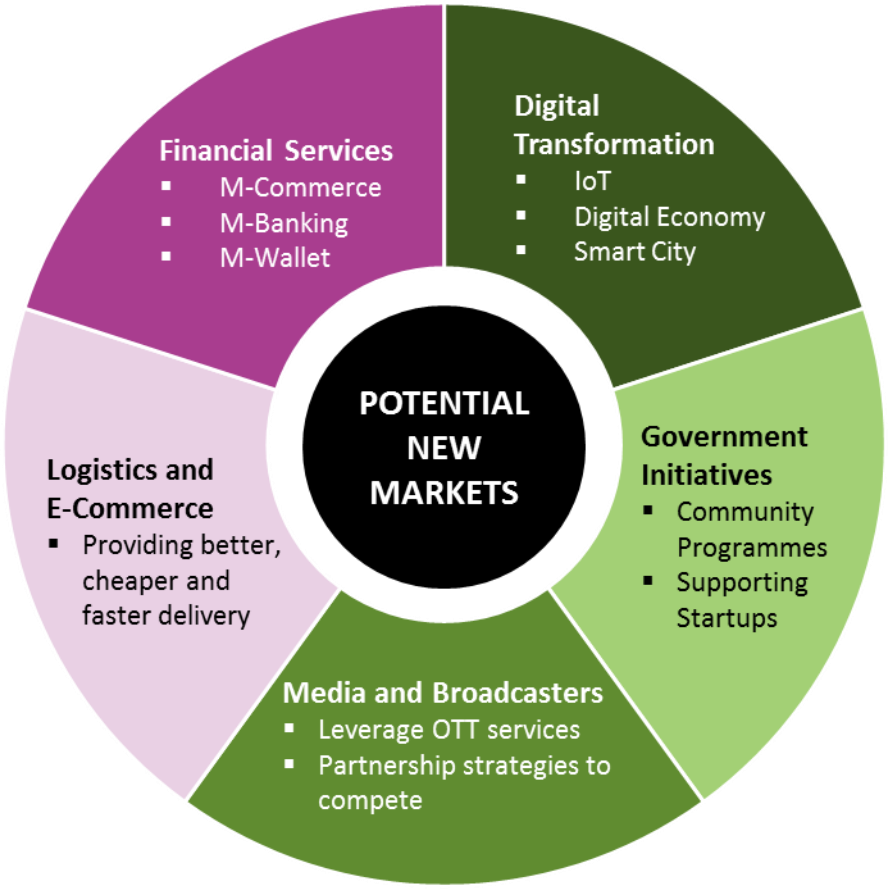
Figure 2.16 MVN Services Key Success Factors

[17] Telin Malaysia is a joint venture company between Compudyne Telecommunication Systems Sdn Bhd and PT Telin, a company fully owned by PT. Telekomunikasi Indonesia (Telkom).

[18] MCMC questionnaire to MVN service providers on their state of strategies for 2016 and plans for 2017.

Identifying unique value propositions in new markets require strong collaboration with MNOs as well as partnerships in various sectors such as content providers, retail outlets and financial institutions. There are many growth opportunities and drivers for MVN services which they will be able to tap from emerging technologies and continuing advancement in MNOs network. MVN service providers potential new markets are shown in Figure 2.17.

MVN Service Providers Opportunities



Source: Selected from Telecom World Asia 2017, "Trends in Asia Pacific's MVNO Market" presentation
Figure 2.17 MVN Service Providers Opportunities

Since the inception of MVN services in Malaysia, MCMC has developed guidelines which aim to lower barriers to entry, promote competition and provide service choices to the consumer. In addition, MCMC also issued a Mandatory Standard in January 2016 which outlines obligations of the relevant parties in the provisioning of the MVN services, particularly to provide consumer protection tools in the event of termination of service.

Subsequently in April 2016, MCMC issued a new Guideline on Mobile Virtual Network Business Segment in Malaysia to replace the 2005 Guideline. It provides relevant information to both existing and prospective service providers in areas such as market entry, negotiation process and roll out of services related to MVN business segment.

Figure 2.18 provides the list and summary of the aforesaid guidelines and mandatory standard.

MCMC MVN Instruments		
Date	**Instrument**	**Remarks**
16 February 2005	Guideline on Regulatory Framework for 3G Mobile Virtual Network Operators	▪ Provides an overview of the regulatory framework for interested parties who want to provide 3G MVN service.
15 January 2016	Commission Determination on the Mandatory Standard for the Provision of Services through a Mobile Virtual Network	▪ A risk-based approach to address potential issues in relation to services provided by MVN service providers. ▪ Consumer protection in the MVN business environment in the case of service termination by MVN service provider. ▪ Scopes of implementation include: 1. Commencement of service 2. MVN service termination 3. Refund to subscribers 4. Continuity of service
15 April 2016	Guideline on Mobile Virtual Network Business Segment in Malaysia	▪ The new Guideline replaces the document that was issued in 2005. ▪ Guides existing and prospective service providers on market entry, negotiation process and roll out of services. ▪ Other related information on regulatory requirements, such as licensing, access and roaming requirements, as well as compliance requirements.

Source: MCMC
Figure 2.18 MCMC MVN Instruments

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MODULE 3: CONTENT SERVICES

Media Landscape Overview

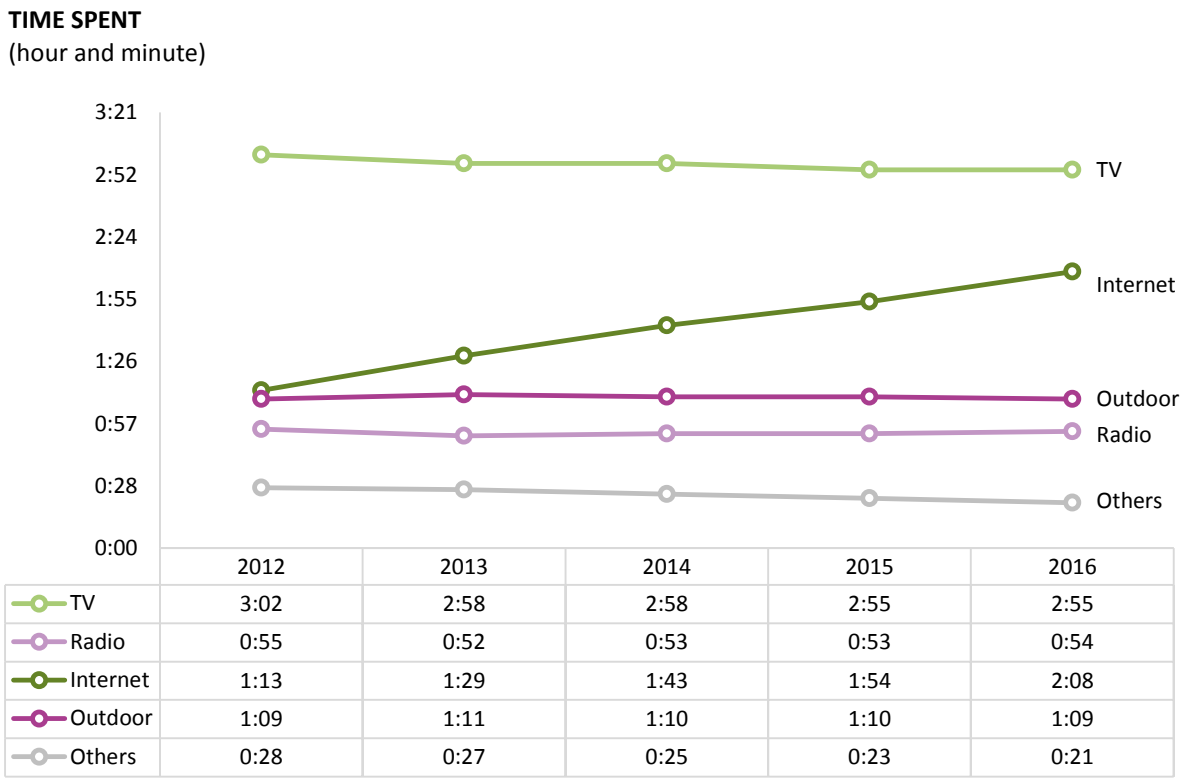
TV continues to dominate global media consumption

Globally, TV remains prevalent despite its average time spent a day decreased by 7 minutes, from 3 hours 2 minutes in 2012 to 2 hours 55 minutes in 2016 (Figure 3.1).

In contrast, Internet time spent is 2 hours 8 minutes a day and radio (54 minutes) in 2016. The Internet platform continues to gain traction and witnessed increase of 55 minutes on time spent a day over the last five years.

Internet time spent comprises all online activities such as browsing websites and watching video. Therefore, the time spent is also gradually shifting from traditional TV consumption to include online platform.

Worldwide: Average Media Consumption 2012 – 2016



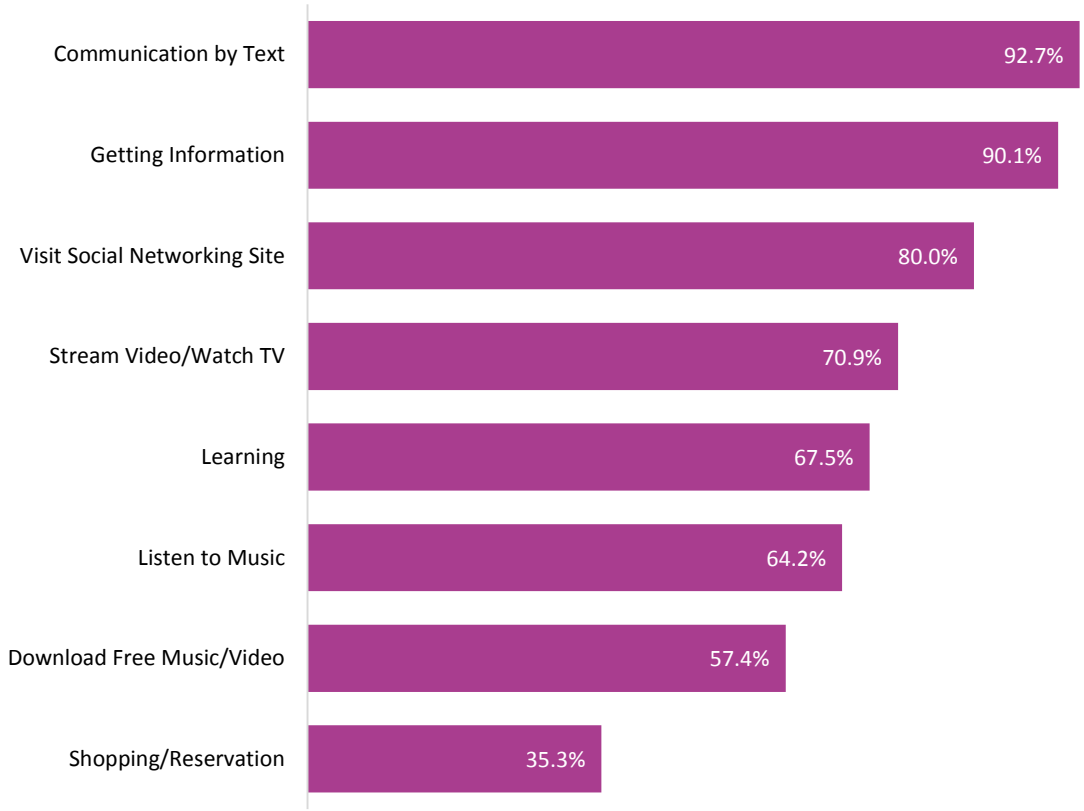
	2012	2013	2014	2015	2016
TV	3:02	2:58	2:58	2:55	2:55
Radio	0:55	0:52	0:53	0:53	0:54
Internet	1:13	1:29	1:43	1:54	2:08
Outdoor	1:09	1:11	1:10	1:10	1:09
Others	0:28	0:27	0:25	0:23	0:21

Note 1. The report measures media consumed in its traditional format and Internet consumption includes all online activities
2. Outdoor media is advertising such as billboards and in-transit vehicles
3. Others comprise Print and Cinema

Source: Zenith, Media Consumption Forecasts 2017, June 2017
Figure 3.1 Worldwide: Average Media Consumption 2012 – 2016

In Malaysia, Internet users are increasingly streaming video or watching TV online. Based on Internet Users Survey 2016, 70.9% of Internet users stream video or watch TV as part of their leisure activities when online, followed by listening to music (64.2%) and downloading free music or video (57.4%) (Figure 3.2).

Internet Users Survey 2016: Online Activities



Source: MCMC

Figure 3.2 Internet Users Survey 2016: Online Activities

The shift to multi-screen video content from traditional TV screen is inevitable. Broadcasters find that it is essential to provide OTT video or Internet video streaming services concurrently with linear services.

In addition, Internet video service providers are expanding their businesses across the globe, thus accelerating OTT service adoption. For example, Netflix, a US-based Internet video streaming service was made available in Malaysia effective January 2016. In contrast, other service providers offering streaming services are iflix, Viu and dimsum.my[19]. Consequently, local broadcasters have taken advantage of OTT platform to monetise their own content.

In 2016, Media Prima relaunched its OTT service, Tonton, to add subscription based Video on Demand (SVOD). Tonton features a premium subscription tier called Tonton VIP and content library with more foreign content. For reference, Tonton was introduced in 2010; capitalising on increasing online content consumption.

[19] iflix is a streaming video service for Southeast Asia offered by Catcha Group headquartered in Malaysia; Viu is a streaming video service provider based in Hong Kong operated by PCCW (Pacific Century CyberWorks) Media offering premium Asian content including top Korean shows in Malaysia. Meanwhile, dimsum.my is a home grown service provider operated by the Star Media Group of Malaysia, which was launched in November 2016.

For greater audience reach, Tonton has entered into partnership with mobile service providers such as Celcom, Digi, Maxis and U Mobile. Moving forward in 2017, Media Prima indicated that they will be launching its international service to expand Tonton to Singapore and Brunei.

Meanwhile, ASTRO has launched its OTT service called Tribe in Indonesia and Philippines in 2016. This is in partnership with XL Axiata and Globe Telecom respectively. The partnerships leverage on ASTRO's experience in the OTT space and content availability as well as the respective telco platforms and customer reach. As at January 2017, a total of one million downloads for Tribe has been recorded[20]. Accordingly, ASTRO continues to seek win-win partnerships to provide OTT viewing services across ASEAN.

FTA TV and Pay TV service providers have to be creative in providing their own OTT platform over multiple devices, enabling streaming of their local content on the go. There is a need to continue offering compelling content.

[20] ASTRO, Tribe Achieves 1 Million Downloads, March 2017.

Compelling Content

Content remains a major driver for broadcasters to attract audience as well as keep them engaged. According to industry experts, content remains a key asset even though viewing habits continue to evolve. Despite multi-screen viewing gaining traction, compelling content is a significant factor in attracting and retaining eyeballs[21].

FTA TV service providers are producing reality shows to capture and engage audience. For example, Media Prima has created a fresh format content, a reality quiz show in collaboration with Freemantle Media, a global content company based in the UK. The reality quiz show, Clever Girl Malaysia managed to capture four million audience on its finale.

Meantime, TV AlHijrah has formatted its programmes to include a new interactive segment. Programme Labbaikallah, which has entered its sixth season in 2016, offers daily reports on the happenings and development during Haj or pilgrimage season. This programme covers various recorded and live content from the studio as well as video talk via Skype and Q&A session with the audience.

ASTRO launched nine channels in 2016. This includes its first dedicated eSports[22] channel in Southeast Asia called eGG (stands for "Every Good Game"), and BOO, an Asian horror-only channel. ASTRO strategy is to invest in content for local and overseas market with a view to expand to regional platforms. For instance, the eGG channel is broadcast in Indonesia and Australia.

Major Broadcasting Rights in 2016

Sought-after content particularly on top sporting events such as badminton, football as well as International and Asian games attract viewership. Hence, broadcasters are prepared to invest on the broadcasting rights for these top sporting events[23].

Media Prima obtained broadcasting rights for Malaysia League (2016 – 2018) from Football Malaysia Limited Liability Partnership. Media Prima started the coverage in February 2016, aired on TV3 and TV9. Notably, the FA Cup aired on TV3 garnered an average of 2.3 million audience between April and May 2016[24].

On the other hand, ASTRO renewed the English Premier League (EPL) broadcast rights for three seasons (2016 – 2019). All 380 Premier League matches are available live on all ASTRO's platforms namely, TV and mobile. Winning the rights to EPL matches strengthens ASTRO's sports channels[25]. This retains viewers' subscriptions to ASTRO's range of both local and international sports content.

TM in August 2016, obtained the rights to broadcast sports content from Fox Sports Network, which includes four new Fox Sports channels in HD namely, Fox Sports, Fox Sports 2, Fox Sports 3 and Fox Sports News. The Fox Sports Network is the exclusive broadcaster for some of the compelling top sporting events around the globe such as Grand Slam Tennis, Masters Golf, Formula One, MotoGP and top football matches.

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[21] Asia-Pacific Broadcasting, Content still key asset in Asia, say ATF 2016 summit speakers, December 2016.
[22] eSport is a multiplayer video game played competitively for spectators, typically by professional gamers.
[23] World Intellectual Property Organization, Broadcasting & Media Rights in Sport, accessed in February 2017.
[24] Media Prima, Investor Presentation: Financial & Business Review for the Financial Period Ended 31st June 2016, August 2016.
[25] ASTRO, Astro wins English Premier League rights for Malaysia, February 2016.

Local Content Gains International Recognition

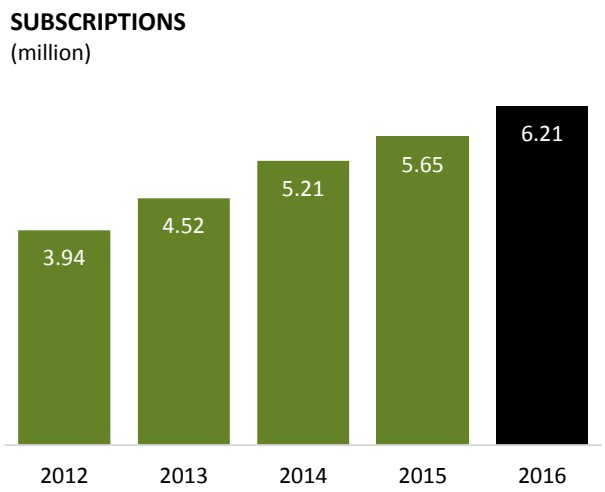
International recognition is vital for the broadcasters, particularly for those bringing their content across boundaries to reach wider audience. Such recognition demonstrates that broadcasters are capable of producing quality content at par with international content, and at the same time promote our local culture and values on the international stage.

At the World Media Festival held in Germany in May 2016, Media Prima won awards. Two intermedia-globe Gold awards were awarded to ntv7's Feel Good documentaries and for web events and live streaming of the Piala Malaysia finals. Meanwhile, two intermedia-globe Silver awards were for *Kita Juara* trailer and Bella Awards trailers.

Guinness World Records awarded ASTRO a record for the Longest Live Streamed Festival with 55 hours of non-stop live streaming of the Thaipusam festival. This programme attracted 119 million audience from US, UK, Canada, India, Sri Lanka and Singapore via Facebook. Also, ASTRO in December 2016 won "Best Drama or Telemovie" award at 21st Asian Television Award through its telemovie, *Tulus Ikhlas*.

Pay TV Subscriptions

Pay TV 2012 – 2016



Source: Industry, MCMC

Figure 3.3 Pay TV 2012 – 2016

Overall Pay TV subscriptions comprising ASTRO and TM HyppTV has been increasing for the past five years (Figure 3.3). As at end 2016, the Pay TV subscriptions increased by 9.9% to 6.21 million from 5.65 million in 2015.

ASTRO has 5.12 million subscribers as at January 2017, up 6.2% from 4.82 million in the previous year. ASTRO boosted its customer base due to non-subscription services namely, NJOI. By January 2017, NJOI has captured 1.65 million subscribers, up 29.9% from the previous year.

Nonetheless, ASTRO Pay TV residential subscribers declined 2.3% to 3.47 million from 3.55 million as at January 2016.

In 2016, TM HyppTV recorded more than one million subscriptions. TM launched HyppTV in March 2010 with 22 channels which has grown to over 100 channels. TM has also bundled HyppTV as part of its broadband offerings. Subscribers can opt to add on packages such as HyppTV Aneka, HyppTV Ruby or HyppTV Varnam as part of premium offerings.

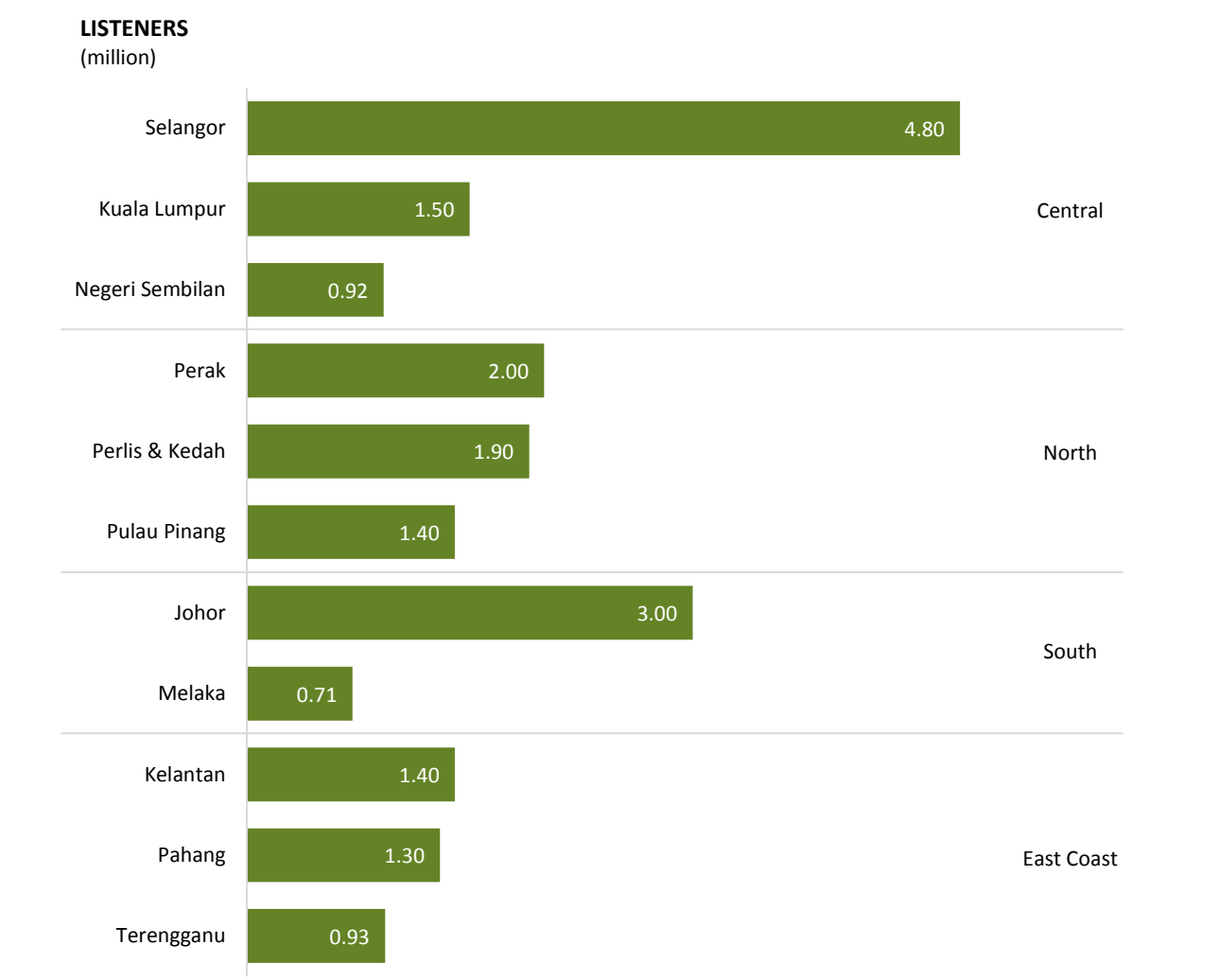
Radio Broadcasting

Radio remains highly relevant in the digital age. In Malaysia, traditional radio continues to effectively reach listeners, with 97.2% or 19.9 million listeners aged 10 years and above tuning in to their favourite radio stations. On average, a listener spends 2 hours 9 minutes a day tuning in to radio[26].

By region, the Central region has the most concentrated radio listeners across Peninsular Malaysia with 7.3 million listeners where Selangor has 4.8 million and Kuala Lumpur has 1.5 million. Northern region has the second highest radio listeners with 5.4 million of which 37% are from Perak. Southern and East Coast regions[27] recorded 3.7 and 3.6 million listeners respectively. In summary, Malaysian radio listeners are widespread as there is a wide variety of radio stations to meet their preferences.

Figure 3.4 shows number of listeners by region and state.

Radio Listeners 2016



Source: GfK Malaysia
Figure 3.4 Radio Listeners 2016

[26] GfK Malaysia, Harnessing the Power of Radio, October 2016.
[27] Ibid.

Broadening Reach of Listeners

Media Prima is targeting listeners who are active on social media. Consequently, they are using digital media platform such as Facebook, Twitter and Instagram to broadcast and share latest information and news.

To broaden their listenership, Media Prima acquired Copyright Laureate Sdn Bhd (which owned Ultra FM and Pi Mai FM). Consequently, they launched a new radio station, Kool FM, in March 2016. Kool FM broadcasts in Malay and targets listeners aged 25 to 44 years old.

As at end 2016, Media Prima has four radio stations namely, Fly FM, Hot FM, One FM and Kool FM.

Figure 3.5 shows the social media followers for Media Prima radio stations.

Social Media Radio Followers: Media Prima	
Platform	**Number of Followers (million)**
Facebook	4.83
Twitter	1.86
Instagram	1.32
YouTube	0.21
Total	**8.22**

Source: Industry, MCMC

Figure 3.5 Social Media Radio Followers: Media Prima

Media Prima also entered into joint venture as a measure to increase listener reach. In August 2016, Media Prima collaborated with Rapid KL[28] to launch Hot FM@LRT for commuters to enjoy customised Hot FM content at selected LRT stations. This is expected to generate additional revenue for Media Prima through advertising based on estimated 500,000 LRT commuters daily.

Similarly, MEASAT Broadcast Network Systems Sdn Bhd acquired Capital FM Sdn Bhd, which has two radio stations, Capital FM and Red FM, from The Star Media Group. This brings ASTRO total number of terrestrial radio stations to 11.

ASTRO also leverages on the social medial platforms towards broadening their coverage and increasing their listenership. As at end 2016, ASTRO managed to capture 12.49 million followers across all social media platforms.

[28] Rapid KL is a public transport service under Prasarana Malaysia Bhd.

Figure 3.6 shows the respective total numbers of followers by social media platform.

Social Media Radio Followers: ASTRO	
Platform	**Number of Followers (million)**
Facebook	8.88
Twitter	1.03
Instagram	2.22
YouTube	0.37
Total	**12.50**

Source: Industry, MCMC

Figure 3.6 Social Media Radio Followers: ASTRO

In 2016, a new CASP licensee Cense Media Sdn Bhd launched two radio stations namely, Kupi-Kupi FM in Kota Kinabalu and City Plus FM in Negeri Sembilan. Kupi-Kupi FM programmes are in local dialect and English which focuses on entertainment and education. Its target market is the local communities of Kadazan, Dusun and Murut.

On the other hand, City Plus FM, a Chinese business-oriented station provides information on entrepreneurial opportunities and business potential. This is targeted at urban residents living in Kuala Lumpur and Negeri Sembilan.

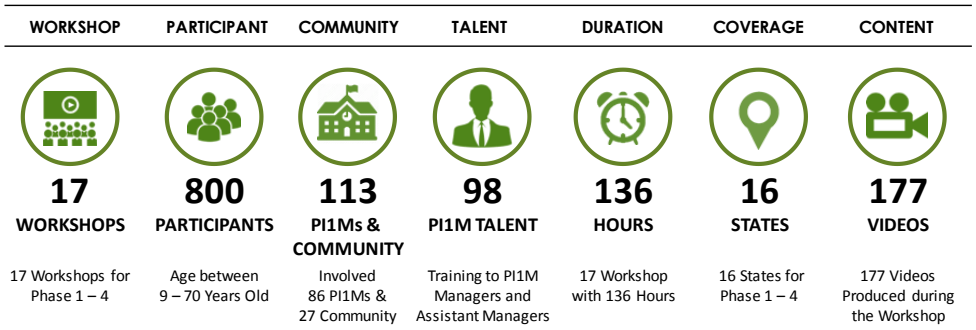
MODULE 4: CONTENT AND APPS DEVELOPMENT

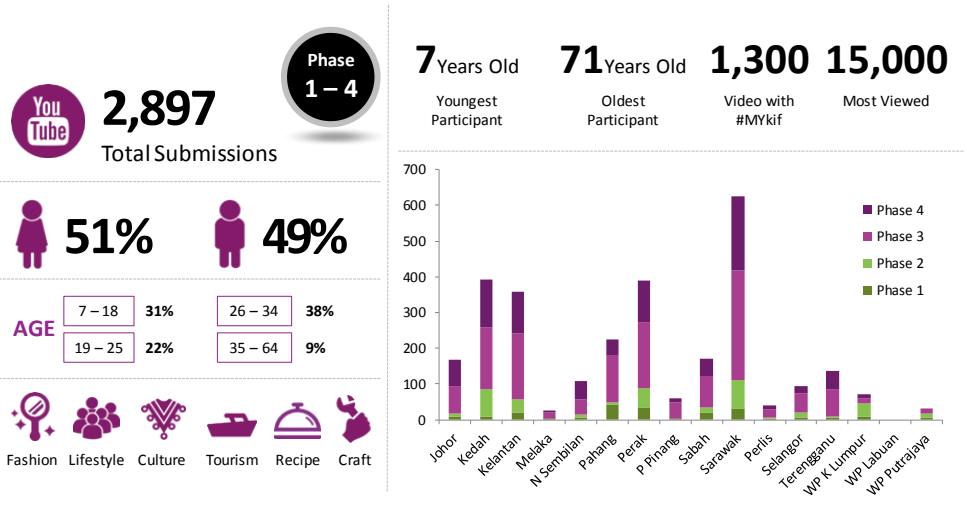
Content and Applications Development

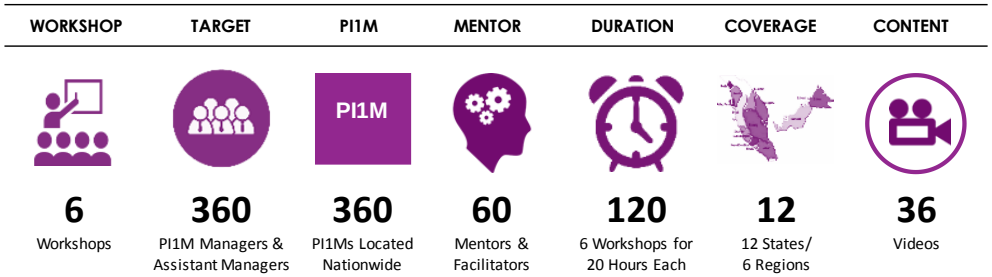
MCMC has increased efforts in outlining and implementing local creative content initiatives, aimed to build an ecosystem that continuously encourage the community to make use of ICT. This is in line with digital content development as one of the national key elements under C&M sector towards digital economy.

MCMC continues to support skills development and capacity building in the local content and applications industry through various initiatives which include workshops and community programmes.

<table>
<tr><th colspan="2">MCMC Initiatives 2016</th></tr>
<tr><th>Initiative</th><th>Description</th></tr>
<tr><td>#MYkomunitikreatif</td><td>A platform to encourage community at PI1M to produce and share creative video content about their community.


</td></tr>
<tr><td>#MYkomunitikreatif Video Competition</td><td>MCMC organised competition to encourage the community to produce creative and quality video content.


</td></tr>
</table>

MCMC Initiatives 2016	
Initiative	**Description**
Script to Screen Workshop (#SKS 2016)	Training programme to develop promotional video that promotes local products through YouTube and social media. 
Malaysia Developers' Day (MYDD2016)	A collaboration between MCMC and AT&T with an objective to have participation from 14 countries across ASEAN to develop mobile apps within 24 hours.

Source: MCMC
Figure 4.1 MCMC Initiatives 2016

Malaysia Documentary Pitch Trailer

In 2016, five documentaries were completed with four of these broadcasted on History Channel Malaysia while the other is expected to be on RTM in 2017.

Malaysia Documentary		
No.	**Documentary**	**Broadcasting Channel**
1	Programmed to Kill: Melioidosis	History Channel
2	The Fish Bomber	History Channel
3	10 Things We Love About Malaysians*	History Channel
4	Every Street Tells A Story: Kuala Lumpur	History Channel
5	Palm Weavers of Carey Island	Expected to be on RTM

**Recorded a good rating among viewers of History Channel*

Source: MCMC
Figure 4.2 Malaysia Documentary

The five documentaries were selected after a pitching session of their 3-minute trailers in 2014. MCMC in collaboration with History Channel and Malaysian Documentary Association (MyDocs) organised the Malaysia Documentary Pitch Trailer 2014 (DocsTrailer). This initiative is aimed to promote local content and talent development. These five best trailers received up to RM200,000 from the CIDF-MCMC grant.

Production of Documentary titled Malaysia's Flood Warriors

In line with creating documentaries in 2016, MCMC has collaborated with Pejabat Daerah dan Tanah Kemaman to produce a documentary titled "Malaysia's Flood Warriors". This is a 45-minute documentary that narrates the devastation brought by flood in Kemaman.

The documentary showcases the devastation and challenges that the community in Kemaman faced. They managed to overcome this as a close-knit community and persevered. Hence, this experience became a national role model in managing flood. In this way, ICT platform hosting the Flood Management System has been used to mitigate floods in Kemaman.

MCMC Bursary for Intellectual Property Creation

To nurture talents and skills, MCMC also collaborated with two academic institutions namely, KRU Academy and Point College to provide a partial bursary for qualified students. The bursary is to assist the students in attaining their multimedia diploma. As at end 2016, a total of RM1.12 million was disbursed to both the institutions from a total allocation of RM2 million.

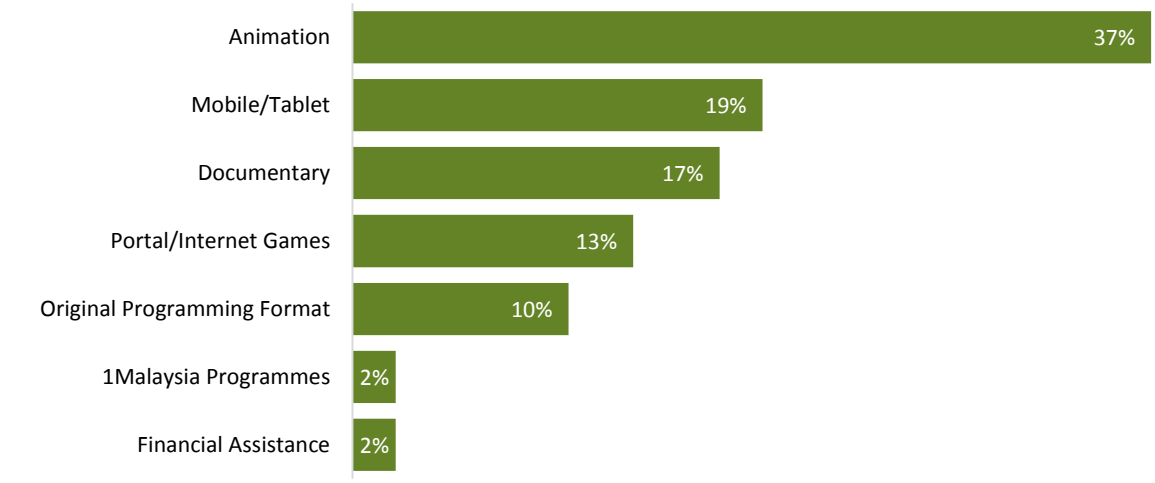
Creative Industry Development Fund

The establishment of the Creative Industry Development Fund (CIDF-MCMC) demonstrates MCMC's commitment towards content development. CIDF-MCMC encourages the development of original creative local content and marketable multimedia content for domestic and international markets.

MCMC allocated RM100 million for the CIDF-MCMC for a period of three years (2011 – 2013) to focus on the development of content for TV, mobile and the Internet. In 2013, the fund allocation period was extended with the aim to develop the local creative content industry as a global content development hub.

From January 2011 to 31 December 2015, a total of RM76.32 million was approved for development of 150 projects inclusive of eight projects under KKMM and 12 programmes approved. Out of 150 approved projects, 92 projects were completed while the remaining are being monitored by MCMC.

Project Approved by Focus Area



Source: MCMC

Figure 4.3 Project Approved by Focus Area

The list of completed projects in 2016 is shown in Figure 4.4.

Completed Projects by Company and Genre

No.	Company	Project	Genre	Commercial Platform
1	Esolved MSC Sdn Bhd	Fitness in My Pocket	Apps	App Store and Google Play
2	Gloson Sdn Bhd	Speed Mandarin e-Learning Apps	Apps	App Store and Google Play
3	Citaglobal Media Sdn Bhd	SenarioToons	Animation	Media Prima
4	Learning Port Sdn Bhd	Learning Port Online Learning Programme	e-Learning Portal	Portal
5	Astar Alpha Sdn Bhd	Cardpow!	Portal	Google Play and Portal
6	Megasap Sdn Bhd	SurvivalTravel	Apps	App Store and Google Play
7	Backbone Sdn Bhd	Sugar Pal Portal	Portal	Portal
8	Vision Works (M) Sdn Bhd	Boboi e-Comic	e-Comic	Portal, App Store and Google Play
9	Incitable Capital Partner Sdn Bhd	Sahabat Mandarin	Apps	App Store and Google Play
10	Ed-Online Sdn Bhd	Imran dan Rakan-rakan	Animation	IPTV
11	Saba Animations Sdn Bhd	Sirah Anbiya 25 Rasul	Animation	Astro Oasis
12	AVI Sdn Bhd	Portrait of Malaysia	Documentary	Bernama News Channel (Astro 502)
13	KRU Malaysia Sdn Bhd	Geckoman	Animation	Tanweer Films, UAE
14	Hud Hud Media Sdn Bhd	UMMI Apps	Apps	App Store and Google Play
15	Meatech Studios Sdn Bhd	Dato' Bahaman	Animation	Bernama News Channel (Astro 502)
16	3Line Media Sdn Bhd	Legasi 69 Komando: Pejuang Tegar	Documentary	RTM
17	Matavia Reka Sdn Bhd	Malaysia's Flood Warriors	Documentary	Discovery Channel
18	Factual TV Sdn Bhd	Tracking Asia's Fish Bomber	Documentary	History Channel

Completed Projects by Company and Genre				
No.	**Company**	**Project**	**Genre**	**Commercial Platform**
19	Code Computer Design Sdn Bhd	Programmed to Kill: Melioidosis	Documentary	History Channel
20	42nd Pictures Sdn Bhd	10 Things We love About Malaysian	Documentary	History Channel
21	Dos Fellas Sdn Bhd	Every Street Tells A Story: Kuala Lumpur	Documentary	History Channel
22	Platinum Unik Sdn Bhd	Palm weavers of Carey Island	Documentary	TBC

**List of the Completed Projects from 1 January 2016 to 31 December 2016*
Note: TBC, broadcasting channels to be confirmed

Source: MCMC
Figure 4.4 Completed Projects by Company and Genre

CIDF-MCMC Projects: International Awards and Recognition

A number of projects under CIDF-MCMC were acclaimed as achievements locally and internationally. For instance, Cardpow! mobile apps and portal won the Outstanding Brand Award in the Asia Youth Awards 2015 organised by YouthsToday.com[29].

Another mobile apps titled SurvivalLanguage was a finalist for the award on Organisation (Best Intellectual Property Management), under the National Intellectual Property Awards 2016. The system designed for SurvivalLanguage is pending patent approval from the Intellectual Property Corporation of Malaysia (MyIPO). This apps is available on AppStore and Google Play for free download.

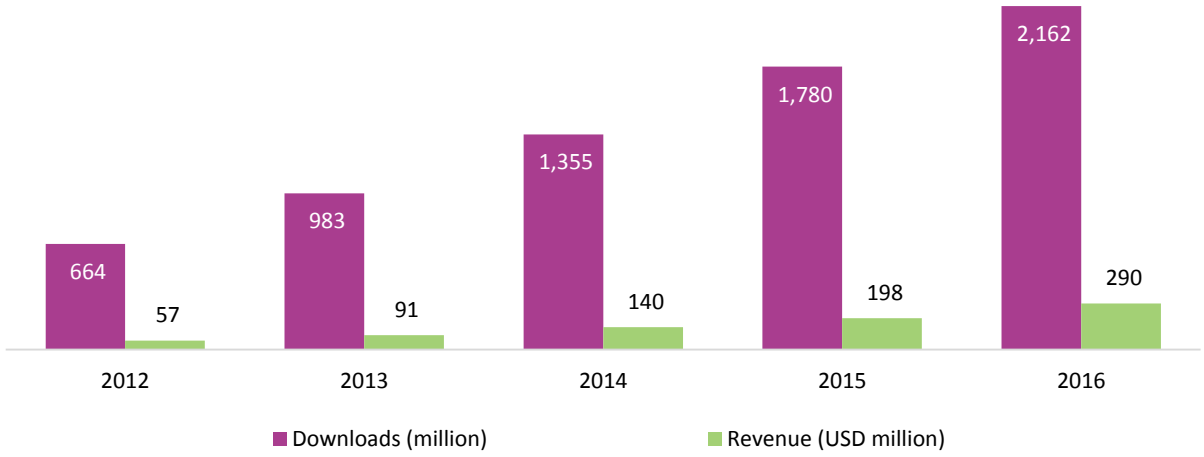
[29] YouthsToday.com is an event matching platform for youths and brand.

Opportunities Offered by Mobile Apps

Mobile apps offer opportunities for investment and growth. Globally, in 2016, mobile apps download are estimated to have reached 90 billion and revenue of USD30 billion[30]. Based on a study conducted by Nielsen, Facebook remains the highest downloaded apps with 146 million unique users, followed by Facebook messenger (130 million) and YouTube (114 million).

In 2016, total mobile apps in Malaysia is estimated to reach 2.16 billion downloads with revenue generated about USD300 million[31]. Out of this revenue generated, nearly 70% is from game apps while the remaining are from non-game apps[32].

Malaysia Mobile Apps Download and Revenue



Note: Revenue includes end user spending and in-apps advertising

Source: Ovum, Digital Content and Services: Apps Ecosystem Forecast 2016 – 2021

Figure 4.5 Malaysia Mobile Apps Download and Revenue

[30] Ovum, Digital Content and Services: App Ecosystem Forecast 2016 – 2021.

[31] Ibid.

[32] Ovum defines game apps as those more commonly for mobile games; non-game apps refer to apps for social networking, messaging, media, productivity and e-commerce.

Mobile Apps to Facilitate Digital Lifestyle

MCMC is working with Pos Malaysia to develop "Smart Postman" apps. By using the apps, an on-duty postman can report on community matters such as illegal dumping sites, abandoned vehicles as well as potholes along roads. Subsequently, local councils can respond and act on these matters promptly. Hence, such apps can serve as a catalyst for community improvement especially in rural areas.

Furthermore, MCMC has established relationship with private organisations in leveraging digital lifestyle tools to improve livelihood of community and society. MCMC is in collaboration with National Council for the Blind in developing two mobile apps for the visually impaired. These mobile apps are Money Reader for reading Ringgit Malaysia and Google Talkback Speech Engine in Bahasa Malaysia. Hence, usage of apps can empower and enhance their quality of life.

Other than that, MCMC together with Jabatan Kemajuan Islam Malaysia (JAKIM) are developing two mobile apps, Digital Al-Quran and Halal Digital (MYeHALAL). Currently, the Digital Al-Quran apps is being validated and approval is being sought from JAKIM and other Islamic bodies in Malaysia before it can be made available to the public.

In 2016, MCMC also developed a Bahasa Malaysia version of the mobile apps "ITU EMF Guide", which delivers authentic information regarding Electronic Magnetic Fields (EMF) emissions to the public. It contains an introduction to EMF and its relationship with health, as well as internationally agreed guidelines and standards on safety in the use of mobile devices. As reference, the English version of this mobile apps was launched by ITU and WHO in 2015.

Service providers also develop their own mobile apps for better customer engagement. For instance, Digi developed MyDigi as a one stop digital platform for customer self-care, customer support, rewards and distribution channel to customers. As at end 2016, MyDigi recorded 1.5 million active users out of its 12 million subscribers. Hence, service providers are seizing this opportunity to better engage with their subscribers as well as promote their new services.

With increasing apps usage, it is appropriate to highlight security risks associated with apps. Therefore, while downloading mobile apps, users need to be aware of security risks they might encounter such as malware.

It is also important for users to be aware of the need to protect personal data from third party. Hence, before apps download, users need to ensure that the apps is from a legitimate and reliable source. Users should read the terms and conditions carefully before apps download. Reading reviews or comments from previous and current users are also encouraged.

MODULE 5: SMART COMMUNITY

A Component to Achieve Smart Nation

Within the context of MCMC purview, Smart Community is an initiative aimed at improving the quality of life and socio-economic status of the local community through the use of ICT and faster access to information. Smart Community programme was first piloted in Kemaman, (a district in Terengganu) in 2015. Overall, the Smart Community programme was further expanded to three other districts Kota Belud (Sabah), Lundu (Sarawak) and Putrajaya.

Among the programmes in a Smart Community are Internet access centres, hackathon for locals to develop mobile apps and a successful Flood Management System. This was subsequently produced as a documentary and aired on Discovery Channel. The latter documentary highlighted how Kemaman Community came together during the devastation and overcome challenges by leveraging on ICT platform in managing flood disaster occurred in December 2016.

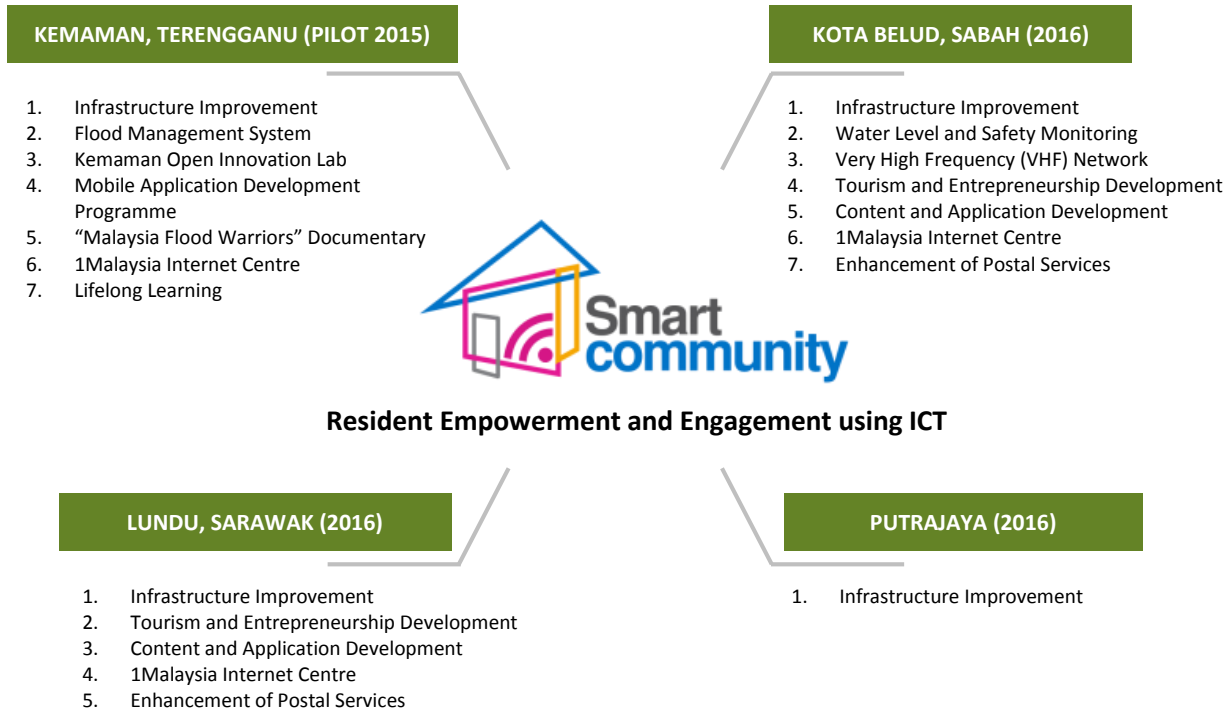
Supporting this initiative, the first requirement for a smart community is the communications infrastructure facilities. In this regard, MCMC is targeting 100% 4G LTE coverage in Smart Community major towns. So far, the enhancement in 3G and 4G LTE coverage can be seen in all Smart Communities to date.

To ensure sustainability of the Smart Community programme, strong public and private sector collaboration is a key success factor. The presence of institutional support at district, state and federal level is critical to implement early quick wins in improving communication service coverage and applications development.

The effective implementation of the planned smart programmes and initiatives is expected to eventually alleviate to realise the Smart Nation vision. Once a community and its residents are connected and digitally literate, they can take advantage of ICT to benefit in meaningful social and economically tangible ways. Community leaders in each of these areas working with the residents can best assess their own local strengths, needs and opportunities available.

In summary, the development of Smart Communities at each identified district is driven by the local requirement and enables the residents to address their own areas of concern. In short, Smart Communities concept mainly covers aspects that relate to community empowerment and engagement to improve the community's quality of life and economy.

Category of Flagship Programmes Under Smart Community Initiative



Source: MCMC

Figure 5.1 Category of Flagship Programmes Under Smart Community Initiative

The 1Malaysia Internet Centre (PI1M) is one of the initiatives under USP which has been identified as the flagship programmes under Smart Community. It is aimed to provide the community broadband access in rural and suburban areas as a platform supporting the Smart Community. PI1M centres operate as community learning touch points for ICT, multimedia and entrepreneurship.

The activities conducted at PI1M centres nationwide contribute to local communities' multiple engagements with strategic stakeholders such as the Government and non-government agencies as well institutions of higher learning. This has created impact in making PI1M a practical and essential community ICT enabled hub for the rural areas.

Smart Community: MCMC and Industry Activities

Several programmes and content development have been implemented with the involvement of local communities in the following areas:

<table>
<tr><th colspan="2">Flagship Programmes</th></tr>
<tr><th>Programme</th><th>Description</th></tr>
<tr><td rowspan="2">Education</td><td>

- Life long learning in entrepreneurship, Islamic studies, early childhood and English.

Life Long Learning

Entrepreneurship
(11 April – 11 October 2016)

Islamic Studies
(11 April – 11 October 2016)

Early Childhood
(15 June – 15 December 2016)

English
(30 May 2016 – 31 May 2017)

Participant: 300 from Government Agencies, Teachers, Librarians and Communities

</td></tr>
<tr><td>

- Exposure to elements of Science, Technology, Engineering and Mathematics (STEM) through LEGO education.

LEGO Education

Training Period: March 2015 – June 2016

Participant: Kids and Students aged 7-15 years, Communities, Teachers, Librarians, PI1M Manager & Assistant Manager

Activity: Design, Creativity, Competition, Fun & Play Concept

Achievements

First Lego League 2016 (FLL)
27 – 28 May 2016
4 Schools: SK Kerteh, SK Sultan Ismail, SMK Chukai, SMK Sultan Ismail
20 Students
2 Teams : Kemaman Warrior & UltraKemaman

International Islamic School Robot Olympiad (IISRO)
17 – 19 August 2016,
Lombok, Indonesia
School: SK Kerteh
Achievement: Second and Third Place

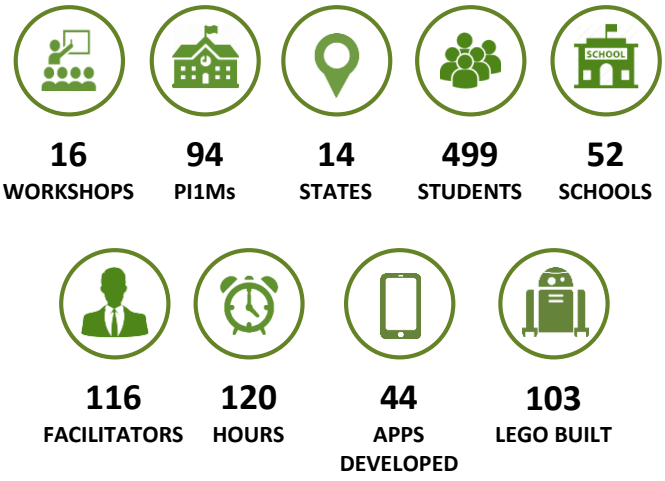
National Robotic Competition (NRC)
23 – 25 September 2016,
Universiti Teknologi Petronas (UTP)
School: SMK Sultan Ismail
Achievement: Second Place & Excellent Award

</td></tr>
</table>

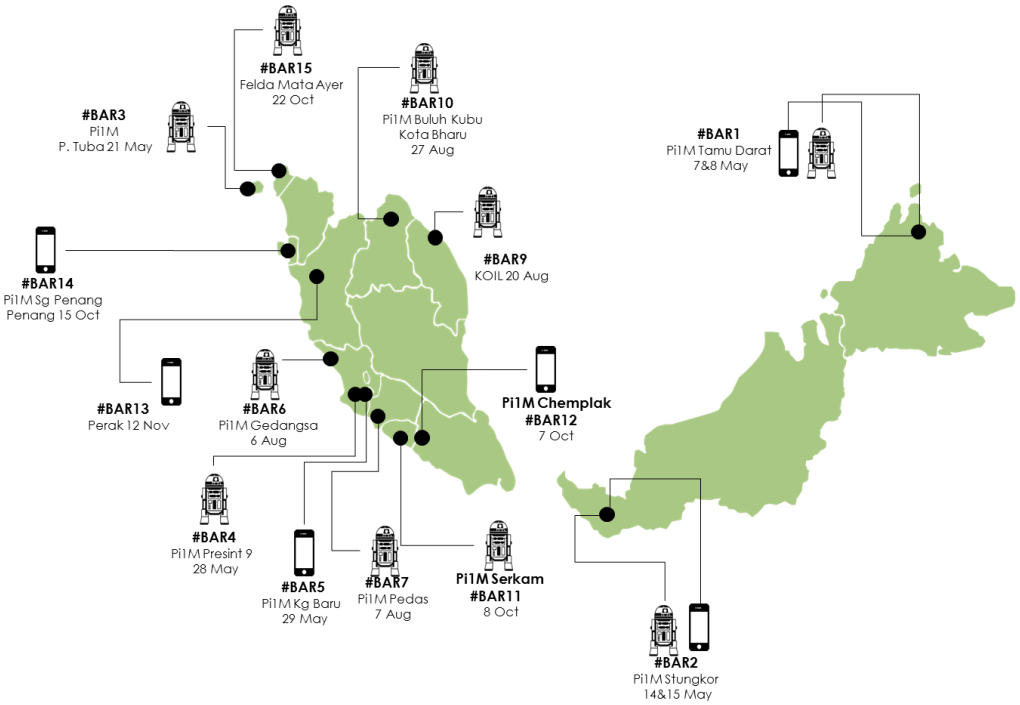
Flagship Programmes	
Programme	**Description**
Education	▪ E-Magazine to publish school yearbook through digital platform. **E-Magazine** **PHASE 1: 24 MAY 2015** 52 Schools 32 schools had produced their E-Magazine and uploaded in e-book database at www.esentral.com.my **PHASE 2: 21 & 22 SEPTEMBER 2016** 44 Primary Schools 21 Secondary Schools Introducing e-Bulletin Development
	▪ Software-based education to improve knowledge and skills on design work. **3D Printer** **PHASE 1: 8 & 9 JUNE 2015** 10 Librarians 2 Units 3D Printers **PHASE 2: 27 JANUARY 2016** 3 Librarians 20 Managers and Assistant Managers of PI1Ms from Smart Community districts
Interactive Community	▪ Creating robotic applications and sensors development to detect the water level during the flood. **Community Interest** 19 Students SK Seri Bandi SMK Rasau Kerteh SM Rantau Petronas SMK Seri Bandi Robotic applications and sensors development
	▪ Open Innovation Lab for startups and SMEs in building strategies, relationships and partnerships, investment in areas such as frozen food, surveillance, food delivery and apparels. **Kemaman Open Innovation Lab** 85 startups and SMEs Idea: Frozen food, surveillance, food delivery and apparels Module: Business strategy, building relationship and partnership, investment

Flagship Programmes	
Programme	**Description**
Interactive Community	▪ Science, Technology, Engineering and Mathematics (STEM) based training for students using latest software and tools such as MIT App Inventor and LEGO Mindstorm EV3.

Apps and LEGO Workshop (#BAL)



#BAL Workshops Nationwide



Source: Industry, MCMC

Figure 5.2 Flagship Programmes

MODULE 6: QUALITY ASSURANCE AND CONSUMER PROTECTION

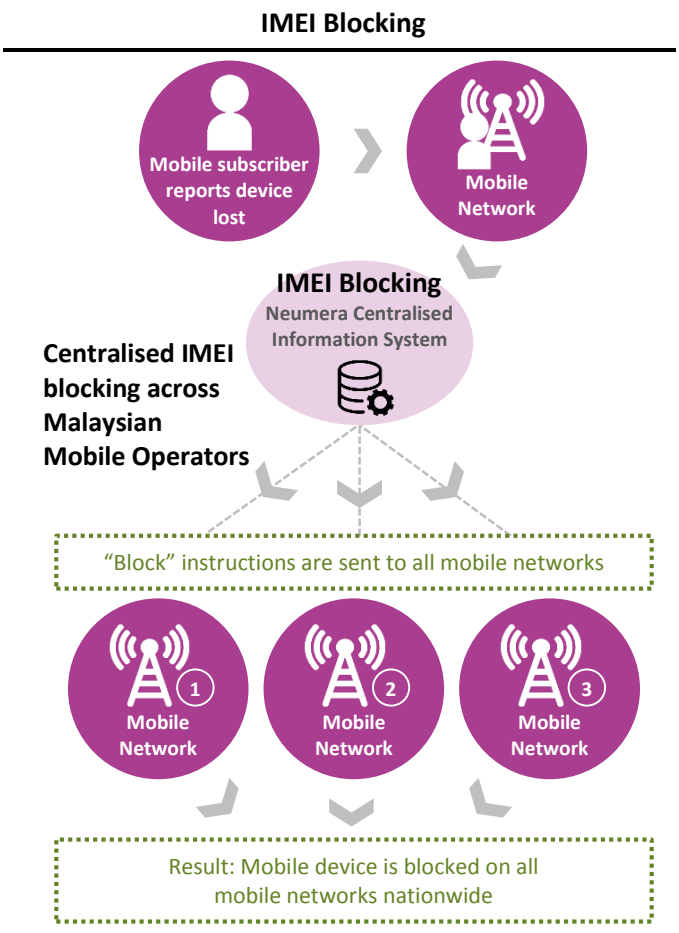
Consumer Protection

As C&M market develops, consumer protection is paramount. MCMC and the Industry Forums have conducted various campaigns and initiatives to promote awareness among consumers on C&M service offerings. Such engagement not only educate consumers about their rights, but also provide information about new services and options offered by the industry.

A consumer protection framework is developed to promote and protect consumer interests through ensuring C&M service providers' responsiveness to consumers. Hence, the latest and enhanced Mandatory Standards ensure service providers adhere to their commitments. Mandatory Standards are imposed on customer service Quality of Service (QoS) for Public Cellular Service, Wired Broadband Access Service and Wireless Broadband Access Service.

In short, the Mandatory Standards protect and empower consumers to be able to provide relevant feedback to service providers and other stakeholders.

Public cellular blocking services for consumer protection



Source: MCMC

Figure 6.1 IMEI Blocking

A recent report by the Malaysian Telecommunications Dealers Organisation (MTDO)[33] revealed that an estimated RM2 million worth of mobile phones and accessories were stolen in Malaysia over the past two years, with many cases not reported to the authorities. Hence, pro-active measures are taken to ensure that mobile phone users in the country have recourse in the case of theft or lost.

One of the measures introduced by the Government is Public Cellular Blocking Service (PCBS). This service blocks lost or stolen mobile phones access to the cellular network in Malaysia. PCBS uses International Mobile Equipment Identity (IMEI) numbers to block or unblock lost or stolen mobile phones. This service enables the IMEI blocking capabilities across service providers for any reported stolen mobile phone or device.

Subscribers can directly report stolen or lost mobile phones to their service providers.

Furthermore, PCBS also has the capability to block IMEI numbers of stolen phones which have yet to be registered with any service provider. This feature may deter theft, thus enhancing the safety and security of mobile users.

[33] Malaysian Digest, One Mobile Phone Stolen in Malaysia Every Day; Steps Being Taken to Protect Consumers, 6 February 2017.

In addition, a value-added service is offered to the public and to ensure clarity and awareness in case of mobile phone being stolen or lost. PCBS portal (www.blockmyphone.my) was introduced to provide end users to register ownership details of their mobile phones. This also prevents any use of the mobile phone with another SIM card across any network. Registration with the PCBS portal would increase the possibility of a lost or stolen mobile phone being recovered.

Registration of Prepaid Users

In 2005, the Government directed all prepaid mobile users in the country to be registered. This is aimed at curbing misuse of mobile services and at the same time to address national security concerns.

As at end 2016, a total of 43.9 million mobile phone users have been registered. Out of these, a total of 34.3 million users (78.1%) are registered under prepaid, while the remaining is postpaid.

MCMC has conducted several spot checks to audit and ensure the service providers and their representatives (dealers) adhere to the prepaid registration guidelines[34]. In 2016, two series of Mass Prepaid Audit were conducted in the Northern region (Perlis, Kedah, Penang and Perak) and Sabah region (Sandakan, Tawau, Semporna and Kota Kinabalu).

This prepaid registration audit on dealers and agents aims to verify the integrity of prepaid subscribers' database for public cellular services. Overall, a total of 236 dealers were audited and out of these, 84 dealers (35.6%) failed to comply with the procedures for prepaid registration. Subsequently, the relevant service providers are required to take necessary actions against these dealers.

In 2016, MCMC issued compound totalling RM3.2 million for non-compliance with the Guidelines on Registration of End Users of Prepaid Public Cellular Services.

Compound Issued for Breach of Section 127 of CMA			
No.	**Service Provider**	**Number of Compounds**	**Amount (RM)**
1.	Maxis Mobile Services Sdn Bhd	17	850,000
2.	Digi Telecommunications Sdn Bhd	14	700,000
3.	U Mobile Sdn Bhd	9	450,000
4.	Celcom Mobile Sdn Bhd	9	450,000
5.	Tune Talk Sdn Bhd	7	350,000
6.	XOX Com Sdn Bhd	3	150,000
7.	Merchantrade Asia Sdn Bhd	2	100,000
8.	Ceres Telecom Sdn Bhd	2	100,000
9.	Altel Communications Sdn Bhd	1	20,000
Total		**64**	**RM3,170,000**

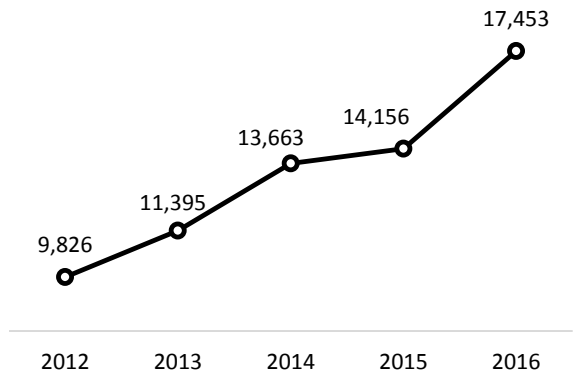
Source: MCMC

Figure 6.2 Compound Issued for Breach of Section 127 of CMA

[34] Guidelines on Registration of End Users of Prepaid Public Cellular Services (MCMC/G/07/06) http://www.mcmc.gov.my/skmmgovmy/files/attachments/GuidelinesRegEndUsersPrepaid0706.pdf

Consumer Complaints

Trend of Consumer Complaints Received by MCMC 2012 – 2016



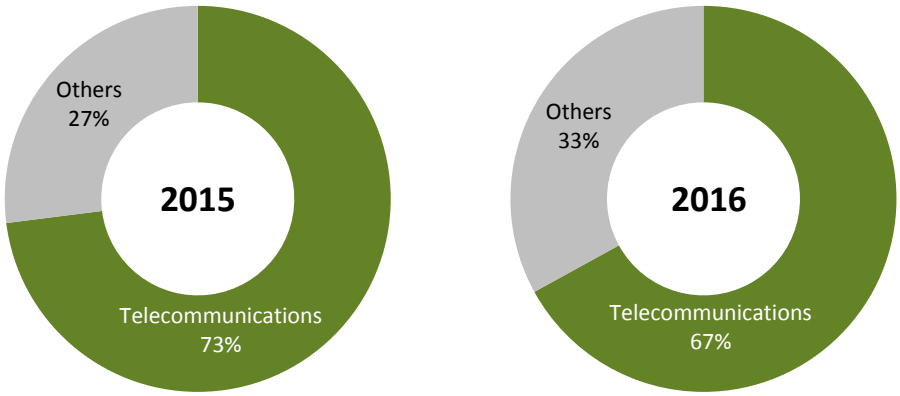
Source: MCMC

Figure 6.3 Trend of Consumer Complaints Received by MCMC 2012 – 2016

In 2016, a total of 17,453 complaints were received by MCMC compared with 14,156 complaints received in 2015. The increase of 23% was partly due to the significant increase in network issues and SMS related complaints for the telecommunications industry.

Out of the total complaints received, 67% (11,652 complaints) were related to issues pertaining to service providers while the remainder was related to the provisions under CMA and investigated by MCMC.

Complaints by Industry 2015 – 2016



Source: MCMC

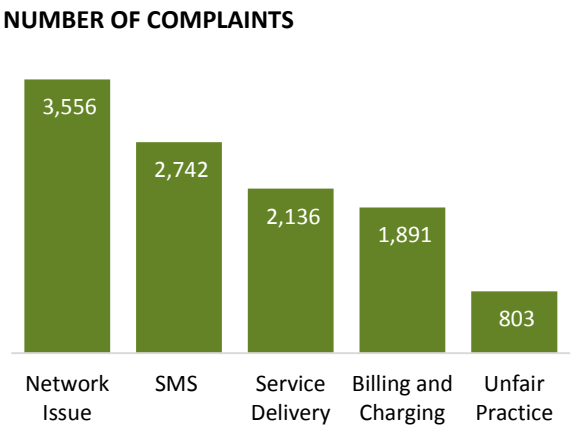
Figure 6.4 Complaints by Industry 2015 – 2016

The top five categories of complaints lodged with MCMC in 2016 are as follows:

1. Network related issues i.e. unavailability of service, intermittent call connection due to network congestion, poor service coverage particularly on cellular and broadband services.

2. SMS particularly on mobile content services such as unsubscribed or promotional SMS from external content provider or telco, SMS gambling and SMS spam peer to peer.

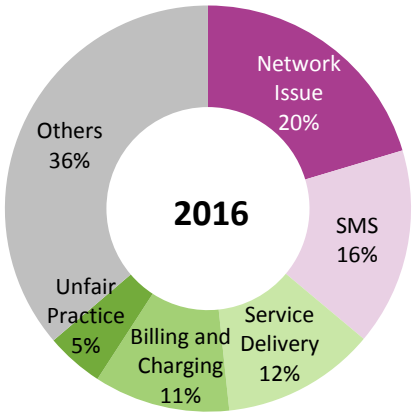
Top Five Complaints Received 2016



Source: MCMC

Figure 6.5 Top Five Complaints Received 2016

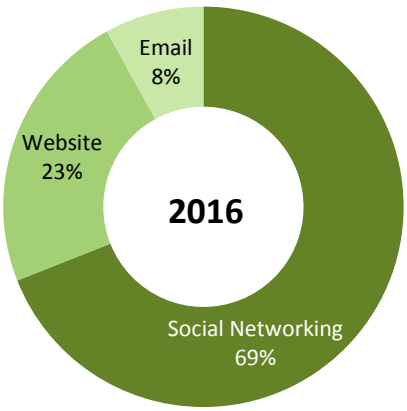
Types of Complaints Received



Source: MCMC

Figure 6.6 Types of Complaints Received

New Media Complaints



Source: MCMC

Figure 6.7 New Media Complaint

3. Poor service delivery mainly on Mobile Number Portability (MNP) reject or delay in request, service disruption, quality of Internet connection or speed, delayed installation or activation and service restoration.

4. Billing and charging mainly related to dispute of charges or rates for calls, SMS, roaming, data or GPRS and blacklisted complainant's name in Credit Tip-Off Service (CTOS) due to outstanding or default in payment.

5. Unfair practice particularly on auto migration whereby customer was not given an option but forced to migrate to new package or plan, and accept new terms and conditions. Others include general misconduct by service provider, that is, changes to the service or subscription without customer authorisation.

In 2016, a total of 4,333 complaints (25%) were classified under new media category. Out of this, complaints related to social networking recorded the highest number of 3,005 or 69%.

Based on analysis of the complaints received, most of the issues lodged were related to fake or false content, offensive, obscene or indecent content, sextortion and political issues.

All complaints received has undergone investigation and were directed to relevant service providers for their resolution.

As at end 2016, 97% of the complaints were resolved.

Consumer complaints as feedback mechanism

Consumer complaints on C&M services serve as part of feedback mechanism to enhance regulation and development of the industry. All issues raised through complaints lodged with service providers, Industry Forums or the MCMC are analysed for QoS implementation, and thus enables the C&M industry to improve their services provisioning and enhance consumer engagement.

MCMC also conducted survey[35] to gauge service providers on their views and actions taken towards resolving complaints. Listed below are some of the mitigation actions by service providers:

1. In dealing with network related issues, service providers have upgraded their existing infrastructure including fiberisation plan to address service availability and accessibility. Hence, bandwidth capacity has been increased to provide higher speed and better QoS which mitigates poor consumer browsing experience.

2. In addressing complaints on SMS or mobile content services, service providers proactively analyse call patterns of new customers to rule out any potential tele-marketing activities performed by gambling syndicate or spammers. In addition, anti-spam analytic tools are adopted to monitor keywords used by spammers.

3. As for increasing complaints received on billing and charging, service providers implemented real time barring mechanism once usage exceeds credit limit.

It is worthwhile to note that service providers have invested in advanced technologies to improve their customer service management. In addition, specific specialised training is provided to enhance skills of the frontline officers. Service providers also optimise social media platforms to reach out to their subscribers.

[35] MCMC IPR 2016 questionnaire.

Complaints to Industry Forums

Communications and Multimedia Content Forum

In accordance with CMA, MCMC in 2001, empowered Communications and Multimedia Content Forum (CMCF) as a designated industry body to facilitate and enhance industry self-regulation pursuant to the Malaysian Communications and Multimedia Content Code (Content Code).

As an independent body, CMCF represents all relevant parties, including the C&M industry to govern content and address issues pertaining to content which is disseminated by way of electronic networked medium. As at end 2016, CMCF has a membership of 47 organisations from various industry categories including broadcasters, advertisers and telcos.

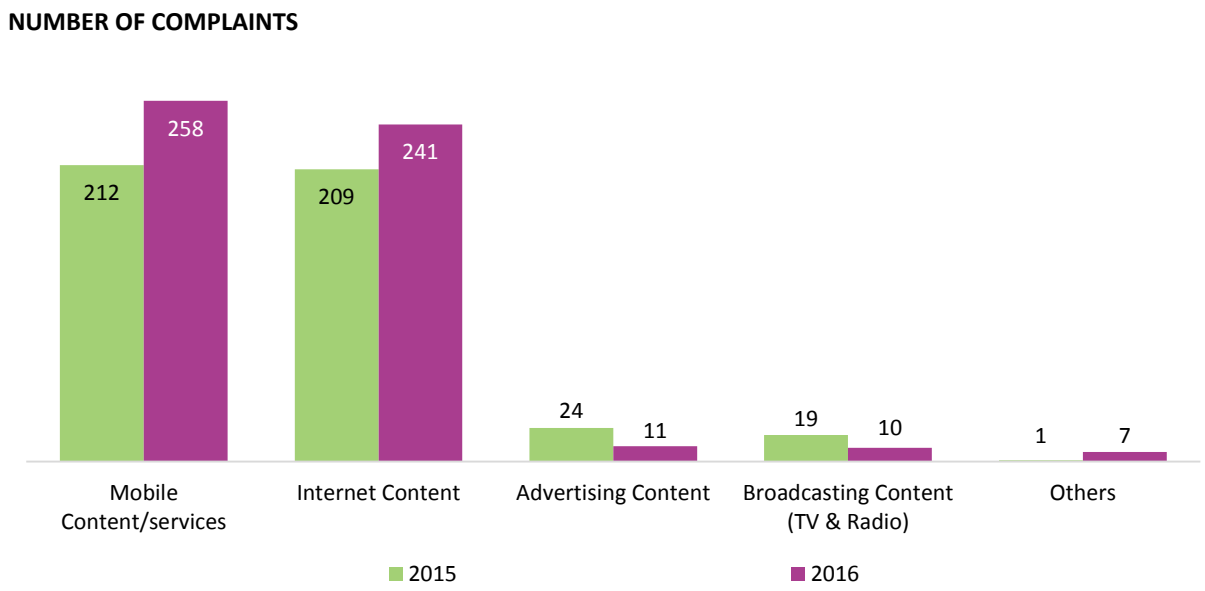
In 2016, the CMCF was involved in 97 public relation initiatives and awareness activities with their members. This includes collaboration with MCMC, KKMM, JAKIM, CyberSecurity Malaysia, institutions of higher learning, schools and the public. Figure 6.8 lists the types of such events held.

Activities of CMCF	
Types of Activity	**Number**
Roadshow, Exhibition	33
Seminar, Workshop, Conference	26
Self-initiated Workshop, Event	9
Media Interview	29
Total	**97**

Source: CMCF
Figure 6.8 Activities of CMCF

In 2016, CMCF received 527 complaints, an increase of 13% from 2015 (465 complaints). These comprised 524 complaints and three advisory enquiries. The largest portion of cases received was related to Mobile Content or Services which constitutes 49% (258 cases), followed by Internet content complaints (241 cases). Figure 6.9 depicts the types of complaint received by CMCF in 2015 and 2016 respectively.

Complaints Received by Category 2015 – 2016



Source: MCMC

Figure 6.9 Complaints Received by Category 2015 – 2016

Out of the 527 complaints received, 97% were resolved within the CMCF stipulated two-month timeline. By types of complainants, 95% or 502 complaints were received from members of the public, 18 complaints were from various bodies (MCMC, KKMM and others), four complaints were from the industry and three complaints were from the CMCF.

It is observed that there were more complaints on mobile content or services and Internet content compared with 2015. However, complaints on other established content channels such as advertising and broadcasting over TV and radio have declined by almost half. This is noted as a positive indication towards greater public awareness of content issues.

CMCF efforts in promoting Content Code and guideline such as Industry Guidelines for the Advertisement of Slimming Products and Services is done through various platforms including industry training, briefing to relevant stakeholders and through social media and mass media channels. For instance, the new policy in dealing with advertisements on slimming products and services has gained encouraging media coverage.

Communications and Multimedia Consumer Forum of Malaysia (CFM)

As a self-regulating body designated by MCMC under the CMA, CFM offers a platform for consumers to report complaints in relation to C&M services. This industry forum is also responsible to develop General Consumer Code of Practice for the Communications and Multimedia Industry Malaysia (GCC) that serves to promote high standards of services and protect consumer interests.

In 2016 and as part of its consumer empowerment initiatives, CFM launched its mobile apps called MY Mobile Rights (MMR) that offers one-stop consumers' (first level) complaint submission for all C&M service providers in Malaysia. Consumers can lodge their complaint directly through the apps regardless of service provider. Apart from submitting complaints, the MMR apps also comes with a list of service providers throughout Malaysia, tips and guides including a menu to assist consumers in making informed decisions on the various subscription plans available in the

market. In line with this, CFM has also upgraded its complaint portal for better responsiveness and accessibility to mobile users.

The number of complaints via mobile web accounted for 11% of the total complaints received (7,566 cases). CFM managed to resolve 77% of complaints within 15 business days which is an improvement by 5% as compared with 2015 at 72%.

CFM Complaints Resolution			
Year	**<15 Business Days**	**<30 Business Days**	**>30 Business Days**
2016	77%	90%	10%
2015	72%	90%	10%

Source: MCMC
Figure 6.10 CFM Complaints Resolution

Leveraging on the high number of Internet users in Malaysia, CFM increased its consumer awareness activities online. Understanding that the online population prefers catchy digital content, CFM has collaborated with UiTM Melaka as well as prominent online personalities to produce relevant bite sized shareable videos and comics to increase awareness among a wider audience.

The CFM's online initiatives have resulted in increased CFM followers on various social media platforms.

CFM Social Media Followers 2015 – 2016			
Platform	**2016**	**2015**	**% Change**
Facebook	54,543	15,380	255
Instagram	3,089	750	312
Twitter	745	540	38

Source: MCMC
Figure 6.11 CFM Social Media Followers 2015 – 2016

As at end 2016, CFM members stood at 46, an increase of seven members from the previous year.

MCMC Monitoring Activities

Monitoring of CASP (I) Licensees through Content Monitoring Centre

MCMC monitors licensees pursuant to their Licence Conditions under the CMA. MCMC ensure that licensees comply with the development of content reflecting Malaysia's culture, identity and customs.

As part of MCMC initiatives to strengthen content monitoring activities, Content Monitoring Centre was established in 2016 which aims to enable systematic monitoring of content broadcasted by CASP (I) licensees. The Content Monitoring Centre is capable of performing full-time recording (24/7), archiving, retrieval, real-time monitoring and reporting.

The information gathered assists MCMC to assess CASP (I) licensees' compliance with Special Licence Conditions on language, local content, duration or frequency of commercial and public service announcement.

MCMC received a total of 34 complaints on broadcast content in 2016. Of which 26 complaints were on programme content and eight were on commercial advertisements. Based on broadcast platform, there were 13 complaints on subscription TV, 15 on terrestrial FTA TV and six on radio.

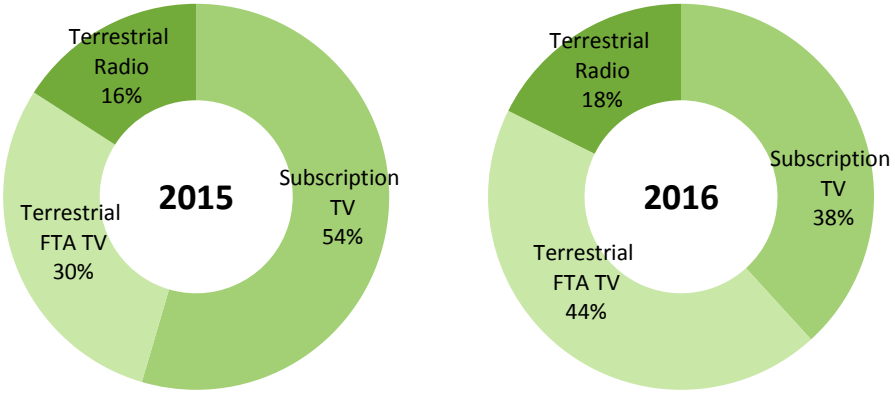
Complaints received on programme content were on indecent, obscene, false, offensive and menacing. Most of the complaints on commercial advertisement were related to unacceptable health products and services which were not approved by the Medicine Advertisement Board or food advertisement or promotion with false and misleading health benefits.

Complaints on Broadcast Content				
Category	**FTA TV**	**Subscription TV**	**Radio**	**Total by Category**
Advertisements	5	2	1	8
Programme Content	10	11	5	26
Total by Platform	**15**	**13**	**6**	**34**

Source: MCMC

Figure 6.12 Complaints on Broadcast Content

Complaints on Broadcast Content 2015 – 2016



Note: Subscription TV – ASTRO, HyppTV, ABNxcess; Terrestrial FTA TV – TV3, TV9, ntv7, 8TV and TV AlHijrah

Source: MCMC

Figure 6.13 Complaints on Broadcast Content 2015 – 2016

Overall, there was a 23% decrease in complaints received with 34 on broadcast content in 2016 compared with 44 complaints in 2015. Hence, continuing efforts in organising capacity building and compliance workshops that address existing issues by broadcasters and cooperation with relevant enforcement agencies are bearing positive impact.

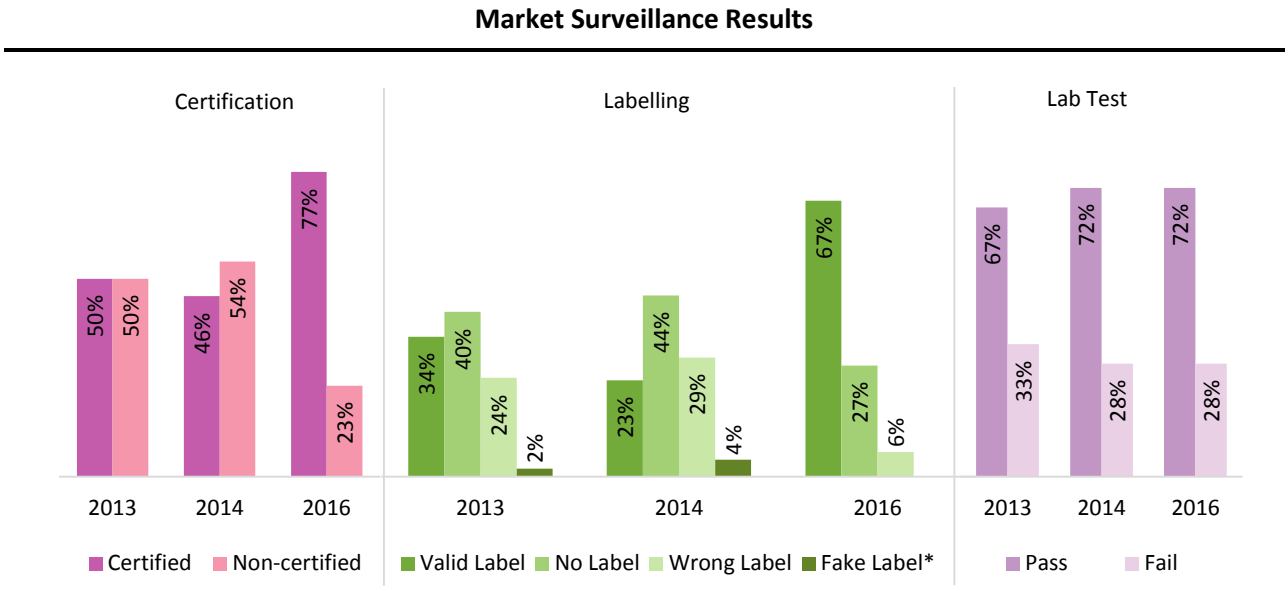
Monitoring for certification of communications equipment and devices

SIRIM QAS International Sdn Bhd (SQASI) is the designated certifying agency appointed by MCMC. SQASI conducts market surveillance programme which aims to protect consumers by ensuring that all communications equipment in the market complies with technical specifications registered by MCMC and are deemed safe to use.

This programme consists of a pre-market and an actual market surveillance. The pre-market sessions were held with major suppliers and distributors including online stores to discuss the non-compliance cases found in the previous year. Subsequently, the actual market surveillance was conducted on communications equipment and devices consisting of samples purchased from all over the country covering 15 categories.

The samples underwent evaluation and lab testing to determine the status of compliance with technical specifications and labeling requirements enforced by MCMC. Further action will be taken based on the results of the analysis carried out, including prosecution of identified suppliers and distributors.

The results of the evaluation are listed in Figure 6.14.



**No fake label for 2016*

Source: MCMC

Figure 6.14 Market Surveillance Results

The market surveillance exercises were conducted from the year 2012 with the exception for the year 2015 to give sufficient time to assess the effectiveness of the Self-Labelling Programme (SLP) and the amendment to the Customs Prohibition of Imports Order which were enforced in 2015. In 2016, there appears to be better compliance for the labelling and certification whereby there were no cases on fake labels.

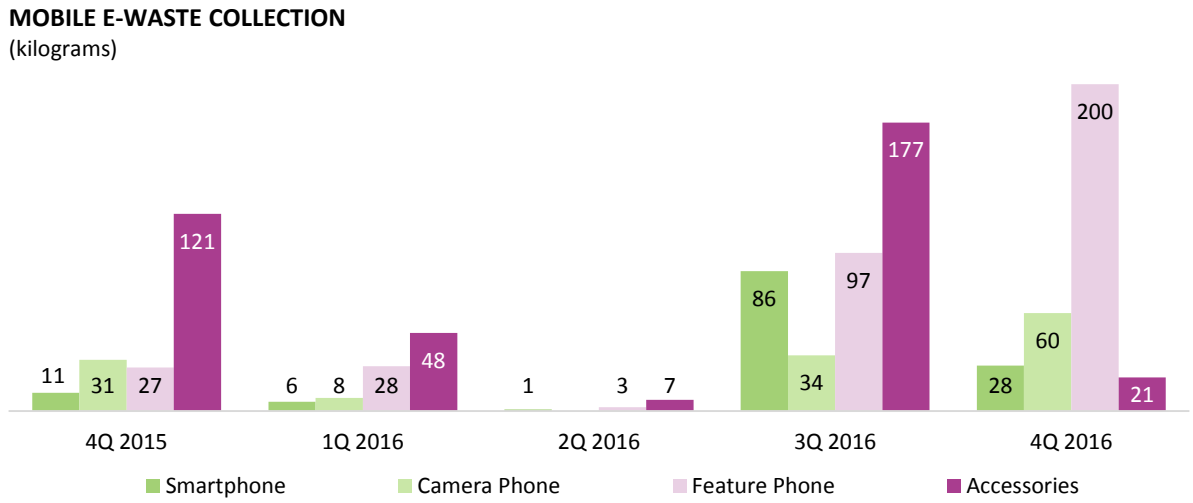
Mobile e-Waste Programme

In addressing electronic waste (e-Waste) issues, MCMC has initiated an industry-joint recycling programme on discarded mobile devices. "Mobile e-Waste: Old Phone, New Life" programme launched on August 2015 is MCMC's response to the Resolution 79 adopted by World Telecommunication Standardisation Assembly (WTSA 12) in November 2012. Resolution 79 invites its Member States to take necessary measures to handle and control e-Waste to mitigate hazards which arise from used telecommunication or ICT equipment.

Since then, various campaigns and awareness activities of Mobile e-Waste programme were held and joined by industry partners. Currently, there are six participating partners from the C&M industry contributing to this Mobile e-Waste programme. They are TM, Digi, Celcom, Maxis, U Mobile and Altel. Other than the industry, Mobile e-Waste programme also attracted participating partners from private companies, non-governmental organisations, institutions of higher learning as well as schools. More than 100 collection boxes were placed at selected locations in Malaysia.

These are aimed to raise public awareness on the importance of recycling their e-Waste in a safe and environmental friendly manner, in particular mobile phones. The effectiveness of the programme is seen from increase in the number of old mobile phones and accessories collected as follows:

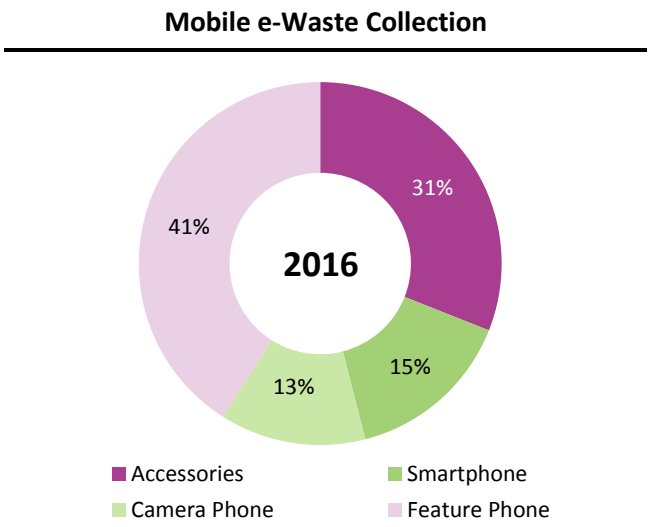
Mobile e-Waste Collection by Quarter



Source: MCMC

Figure 6.15 Mobile e-Waste Collection by Quarter

Since 4Q 2015, mobile phone accessories recorded the highest percentage of collection (in kilogram). In comparison, 4Q 2016 saw more feature phones being collected which increased from 96.8kg in 3Q 2016 to 200.1kg in 4Q 2016. This is in line with the increased use of smartphones along with awareness for e-Waste disposal.



Source: MCMC

Figure 6.16 Mobile e-Waste Collection

Specifically in 2016, feature phone recorded the highest percentage of collection at 41% followed by mobile phone accessories at 31%, smartphone at 15% and camera phone at 13%.

Quality of Service

On 1 January 2016, the Mandatory Standards for Quality of Service (Public Cellular Service) – Determination No. 1 of 2015 came into effect. The Mandatory Standards require service providers to maintain quality of service records and submit their service performance reports quarterly to MCMC.

In February 2016, MCMC issued a revised Mandatory Standard for QoS for Wired Broadband Access Service namely,

- Commission Determination on the Mandatory Standards for QoS (Wired Broadband Access Service) – Determination No. 2 of 2016.

In addition, a new Mandatory Standard for QoS was introduced for Wireless Broadband Access Service as follows:

- Commission Determination on the Mandatory Standards for QoS (Wireless Broadband Access Service) – Determination No. 1 of 2016.

The Mandatory Standards took effect on 1st February 2016 for Network Performance QoS, and 1st July 2016 for Customer Service QoS. The new standards on Customer Service Quality of Service reporting purposes are for Public Cellular Service, Wired Broadband Access Service and Wireless Broadband Access Service. The detailed requirements of each standard are shown in the tables below.

Mandatory Standards for QoS: Public Cellular Service – Customer Service	
Indicator	**Standard**
Percentage of billing related complaint	Not more than 1.0%
Non-billing related complaints per 1,000 customers	Not more than 6
Resolving customer complaints	Resolved within 3 business days – not less than 60.0% Resolved within 5 business days – not less than 90.0% Resolved within 15 business days – not less than 95.0%
Answering customer hotline calls	Answered within 20 seconds – at least 80.0% Answered within 40 seconds – at least 90.0%

Source: MCMC

Figure 6.17 Mandatory Standards for QoS: Public Cellular Service – Customer Service

Mandatory Standards for QoS: Wired Broadband Access Service – Customer Service	
Indicator	**Standard**
Service activation fulfilment	Fulfilled within 24 hours – not less than 95.0% Fulfilled within 72 hours – not less than 100.0%
Service restoration fulfilment	Fulfilled within 24 hours – not less than 95.0% Fulfilled within 48 hours – not less than 100.0%
Percentage of billing related complaint	Not more than 1.0%
Non-billing related complaints per 1,000 customers	Not more than 6
Resolving customer complaints – billing and non-billing related complaints	Resolved within 3 business days – not less than 60.0% Resolved within 5 business days – not less than 90.0% Resolved within 15 business days – not less than 95.0%
Answering customer hotline calls	Answered within 20 seconds – at least 80.0% Answered within 40 seconds – at least 90.0%

Source: MCMC

Figure 6.18 Mandatory Standards for QoS: Wired Broadband Access Service – Customer Service

Mandatory Standards for QoS: Wireless Broadband Access Service – Customer Service	
Indicator	**Standard**
Percentage of billing related complaint	Not more than 1.0%
Non-billing related complaints per 1,000 customers	Not more than 6
Resolving customer complaints – billing and non-billing related complaints	Resolved within 3 business days – not less than 60.0% Resolved within 5 business days – not less than 90.0% Resolved within 15 business days – not less than 95.0%
Answering customer hotline calls	Answered within 20 seconds – at least 80.0% Answered within 40 seconds – at least 90.0%

Source: MCMC

Figure 6.19 Mandatory Standards for QoS: Wireless Broadband Access Service – Customer Service

It is noteworthy that non-compliance with the Mandatory Standards is an offence under Section 105 (3) CMA and the offender is liable to a fine not exceeding RM100,000 or imprisonment not exceeding two years or both.

In 2016, eight licensees were compounded for non-compliance with the Mandatory Standards for timely reporting to MCMC in the required manner. The total amount of compound was RM160,000.

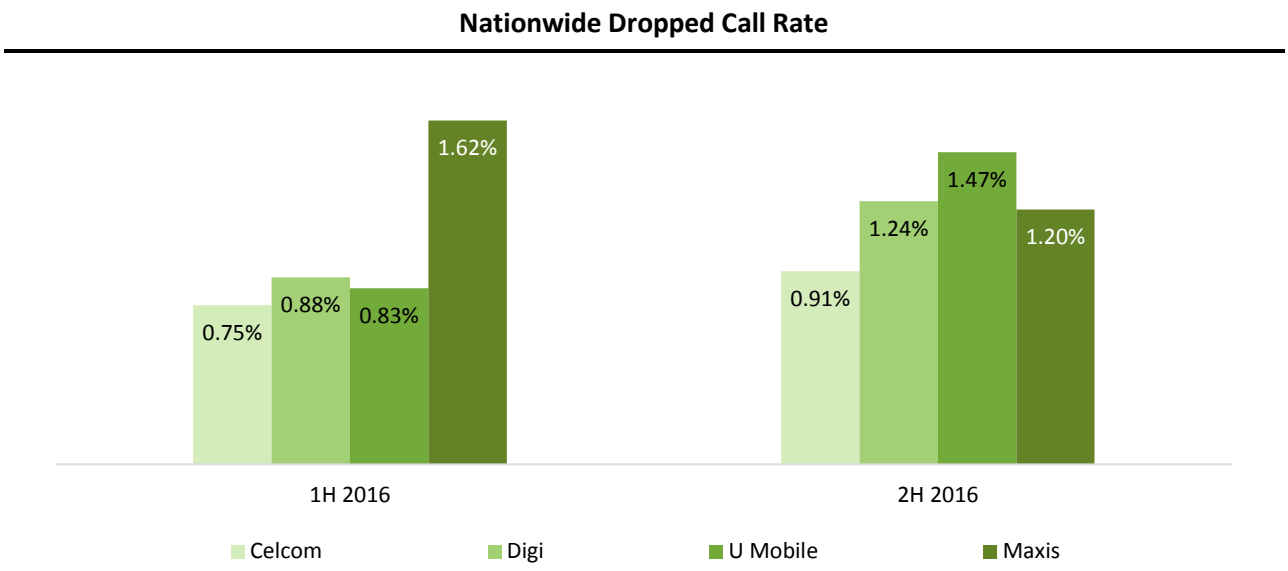
Network Performance Assessment

The increase in demand for seamless communication and digital integration prompts the need to evaluate and monitor existing and future services to ensure continuous connectivity. MCMC monitors and assesses the network performance of three main services which are public cellular service, wired broadband service and wireless broadband service.

In 2016, aside from ensuring service providers comply with the Mandatory Standards, MCMC also assists them to identify problem areas for immediate ratification. In maintaining voice connectivity, a certain level of dropped call rate must be observed.

In this assessment, dropped call rate is measured on a nationwide scale, by evaluating the same routes and location twice a year. This is for the purpose of progress trending. Based on the nationwide dropped call rate results, all service providers have complied with the Mandatory Standards[36] in 2016.

[36] Mandatory Standards for Public Cellular Services – Network Performance: the dropped call rate for Designated Routes and Areas must be not more than 2% for intra-network or inter-network calls, and the dropped call rate for areas other than Designated Routes and Areas must be not more than 3%, for intra-network or inter-network calls.



Source: MCMC

Figure 6.20 Nationwide Dropped Call Rate

From Figure 6.20, there is shown a slight decline in dropped call performance in 2H 2016, partly due to network modernisation and upgrade exercises being carried out by service providers. These modernisation activities are critical to better serve consumer needs. This is driven by popularity of smartphones and availability of content-rich services for consumers. However, during this period, consumers might experience temporary inconvenience such as drop in service quality. Hence, MCMC is monitoring to ensure that the requisite standards are complied with.

In summary, the results of MCMC assessments on network performance provide impact not only to consumers but the industry as well. It provides insights on consumer behaviour, public usage and how QoS on wireless broadband service could be further improved.

Result of QoS Network Performance Assessment for Wireless Broadband Services 2016

Service Provider	Throughput		Network Latency	
	Average Download Speed (Mbps)	Speeds > 650Kbps	% of time latency ≤ 250ms	Packet Loss (%)
Celcom	18.97	99.28%	94.08%	1.10
Digi	16.55	98.88%	88.18%	0.52
Maxis	22.89	99.76%	90.28%	0.49
U Mobile	11.74	98.56%	72.92%	3.95
Packet One	4.58	93.30%	88.28%	1.71
YES	5.62	89.37%	94.37%	0.34

Source: MCMC

Figure 6.21 Result of QoS Network Performance Assessment for Wireless Broadband Services 2016

In 2016, a number of tests were conducted at user premises on their home Internet subscribed connection. For subscribers to enjoy their Internet packages, a certain level of standards are required as stipulated in the Mandatory Standards for Wired (Fixed) Broadband – Network Performance as shown in Figure 6.22. These assessment results will assist consumers to make informed decisions in selecting a suitable Internet package for their household consumption.

Result of QoS Network Performance Assessment for Wired (Fixed) Broadband Services 2016						
Service Provider	Throughput (Copper)		Throughput (Fibre)		Network Latency	
	% of sample ≥ 70% subscribed speed		% of sample ≥ 90% subscribed speed		% of the time latency ≤ 85ms	Packet Loss (%)
	Upload	Download	Upload	Download		
TM	98.08	85.77	87.83	86.12	88.95	1.81
Maxis	93.87	94.23	95.58	94.04	96.36	0.48
TIME	-	-	62.19	82.84	100.00	3.28

Source: MCMC

Figure 6.22 Result of QoS Network Performance Assessment for Wired (Fixed) Broadband Services 2016

Digital Terrestrial Television (DTT) Signal Measurement

Towards convergence in the C&M digital connectivity, traditional analogue terrestrial TV will eventually be replaced by DTT. Under the DTT project, infrastructure and facilities are developed by MYTV which include digital multimedia hub and digital TV transmitters nationwide.

To ensure smooth transitions for the consumers, MCMC conducted DTT receive signal measurements at certain test points within the deployed coverage areas. For each transmitter coverage area, six to ten measurement locations were selected based on the following criteria:

- Fringe area;
- Densely populated area; and
- Locations within analogue TV coverage.

There were 14 transmitters involved in DTT project Phase 1, providing coverage to households in Peninsular Malaysia, Sabah and Sarawak. Out of these, 10 transmitter sites are located in Peninsular Malaysia with four others located in Sabah and Sarawak. However, one transmitter site at Gunung Ledang could not be measured as it has yet to be in operation.

As of December 2016, 71 measurement locations (test points) were identified based on coverage areas of the nine transmitters in Peninsular Malaysia. Five of these test points were not able to decode the received digital signal into digital audio and video output. The affected locations are as follows, and most blind spots will be covered under Phase 2 of the DTT project.

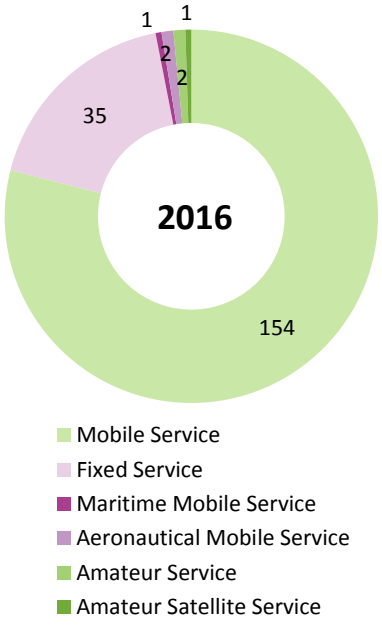
Blind Spot Locations Identified			
Location	**Transmitter**	**Area**	**Cause**
Pondok Polis Nami	Gunung Jerai	Kedah	Blind spot area
Dewan Kg Termas	Gunung Jerai	Kedah	Blind spot area
SMK Gedangsa	Gunung Ulu Kali	Lembah Klang Utara	Tree blockage
Stesen Bas Pekan Nenasi	Bukit Pelindung	Kuantan	Transmitter located too far from test location
Masjid Tokwan Linchang	Bukit Bakar	Kelantan	Blind spot area

Source: MCMC

Figure 6.23 Blind Spot Locations Identified

Spectrum Monitoring and Interference Resolution

Radio Frequency Interference Cases by Categories of Service



Source: MCMC

Figure 6.24 Radio Frequency Interference Cases by Categories of Service

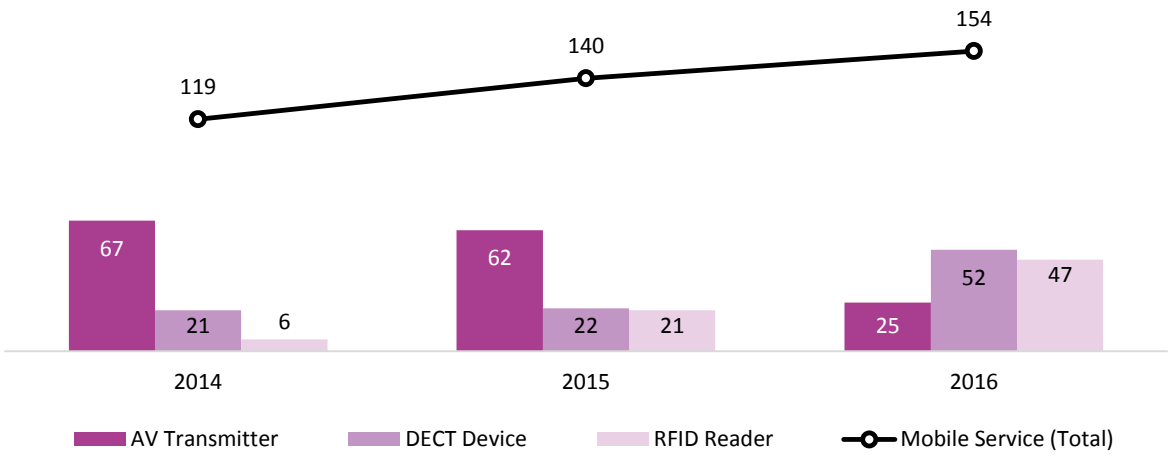
As at end 2016, a total of 195 radio frequency interference (RFI) cases were lodged with MCMC. Out of this, 154 cases involved mobile service, 35 cases for fixed service and six cases for other services.

As the usage of mobile devices is booming, mobile service is fast becoming one of the most important type of communications for people to stay connected. Therefore, most of the cases involving this service must be investigated and resolved proactively.

Based on MCMC investigation, more than 80% of RFI cases for mobile service were on non-standard devices. Three types of non-standard devices were identified to cause interference to mobile service namely, AV transmitter, Digital Enhanced Cordless Technology (DECT) phone, and radio frequency identification (RFID) reader.

The increasing number of RFI cases in mobile service due to non-standard devices will impede digital connectivity. Investment has been made on coverage and quality to meet the demand for digital lifestyle. However, an inexpensive, low cost non-standard device could simply destroy the connectivity by interfering with wireless network. The public may not be aware of non-standard devices bought and used within their premises are affecting nearby mobile towers. Impact of interference varies from slow speed, no connectivity to dropped or blocked calls, depending on distance of the non-standard device to communication towers.

RFI Cases due to Non-Standard Device 2014 – 2016



Source: MCMC

Figure 6.25 RFI Cases due to Non-Standard Device 2014 – 2016

Hence, public must be cautious when purchasing wireless device. A standard device should come with a MCMC certification mark or label, which indicates that the device has been inspected for its radiated power and operating frequency to suitably work in the local environment. Figure 6.26 shows the current mark and old label for public guidance.

MCMC Certification Mark

Old Certification Label

Current Certification Mark

Source: MCMC
Figure 6.26 MCMC Certification Mark

National Spectrum Monitoring and Control System Network is now operational in 34 locations

National Spectrum Monitoring and Control System (NASMOC) is deployed to perform real-time frequency monitoring, frequency channel occupancy detection and field strength measurements for broadcast stations. It can also assist to determine the direction of signal transmissions.

As at end 2016, NASMOC network has been expanded and fully in operation at 34 locations throughout Malaysia. This automated spectrum usage monitoring system is able to assist in analysing the usage of spectrum holistically.

NASMOC Network			
Region	**Areas**	**Total NASMOC Sites Installed**	**NASMOC Models**
Northern	Kangar, Alor Setar, Butterworth, Ipoh, Taiping and Manjung	6	Three types of models being deployed nationwide: ▪ 737 with Hybrid technology (AOA and TDOA) ▪ 707 with TDOA technology only ▪ 715 with AOA technology only
Eastern	Kuantan, Kuala Terengganu, Kubang Kerian, Besut and Dungun	5	
Central	Sepang, Shah Alam, Seremban, Seremban 2, Kajang, Cyberjaya, Wangsa Maju, Klang, Kepong, Subang Jaya, KLIA and MAHB	12	
Southern	Johor Bahru, Pasir Gudang and Melaka	3	
Sabah	Kota Kinabalu, Tawau and Sandakan	3	
Sarawak	Kuching, Samarahan, Miri and Sibu	4	
Labuan	Labuan	1	

Source: MCMC
Figure 6.27 NASMOC Network

MODULE 7: SECURITY AND TRUST

Digital Signature

Rapid pace of technological advances and accessibility to the Internet have accelerated development of online services in many vertical markets such as communication, banking and commerce. These online services involve electronic transactions and exchange of information, sensitive personal data, via the Internet. If users are not mindful or aware of the risks while online, this creates avenue for exploitation by online criminals that can undermine public trust.

Digital signature is a security method to authenticate digital information to ensure secure electronic transaction. It ensures that the user is legitimate to perform the required online service and applications and acts as a substitution of handwritten signature on an electronic medium. Digital signature has features that offer security and confidence to deal with the Internet and other electronic communication systems.

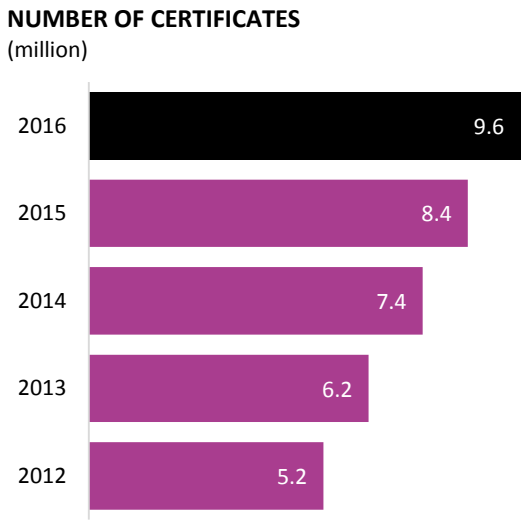
Figure 7.1 shows the list of new service offerings of digital signature in various digital environment.

New Services Offered by Certification Authorities	
Service	**Description**
IDWallet	An electronic credential contains vetted or verified identities stored in a trusted database
SignMe	A digital signing application for web, cloud-based and mobile application
Secure QR Code Solution	A solution to verify and validate the authenticity of physical documents
Date Time Stamping Service	A digital time stamp that verifies the content of any data existed at that time and have not changed since then

Source: Industry

Figure 7.1 New Services Offered by Certification Authorities

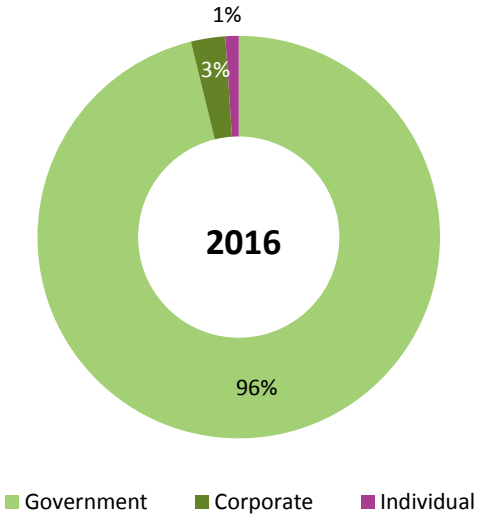
Digital Certificates Issuance 2012 – 2016



Source: Industry

Figure 7.2 Digital Certificates Issuance 2012 – 2016

Types of Certificate Issued



Source: Industry

Figure 7.3 Types of Certificate Issued

As at end 2016, digital certificates issued totalled 9.6 million compared with 8.4 million in 2015 (net adds of 1.2 million). Based on proportion issued by Certification Authorities (CAs), 92% of the certificates were issued by Digicert Sdn Bhd.

Digital certificate issuance is expected to grow. This is in line with a more discerning online community who are conscious about the security of their transactions.

The major contributor of digital certificates usage in Malaysia is the public sector which takes up 96% of total certificates issued.

The remaining 3% is issued to corporate sectors such as banking, healthcare and other industries, whilst 1% to individuals.

Measures for Security and Customer Protection

Technology convergence is increasingly prevalent and enabling diverse experiences in services and applications such as e-health, e-commerce, e-government, financial services and cloud computing services. Nonetheless, these innovations could still be vulnerable to security threats or cyber related criminal activities.

In efforts to reduce suspicious websites, MCMC has blocked access to 1,129 phishing websites in 2016, which include fake pages created to acquire personal information such as username, password, banking information and credit card details. MCMC also blocked access to some other 1,113 obscene content websites, 90 offensive and 72 menacing and three false websites that were found to be in breach of the CMA.

In September 2016, Malaysia Cyber Court was set up to address the increasing number of civil and criminal cyber offences[37]. This initiative aims to enhance confidence and provide an avenue for victims of cybercrime to protect their interests and seek redress. The Cyber Court specialises in hearing cybercriminal cases such as banking fraud, hacking, falsifying documents, defamation, spying, online gambling and cases related to pornography.

Concurrently, service providers must play an important role in ensuring network security is reliable, safe from intrusions and customer information is safeguarded. This not only increases trust and confidence of consumers to the network but also allows service providers to brand themselves as a differentiation strategy to provide competitive advantage.

Based on industry feedback, to date, service providers have taken measures to ensure security of their network and customer information as shown in Figure 7.4.

Measures Taken by Service Providers
Deploy dedicated security system
Impose strict IT security policies and practices
Regularly evaluate new industry policies, best practices and guidelines to be incorporated into existing policies
Implement initiatives and programmes for improvements based on international cyber security risk register
Conduct training and security awareness campaigns to ensure employees are well informed and trained
Introduce procedures to access customer information on a need-to-know basis
Install security tools such as Intrusion Prevention System (IPS), firewall and anti-virus
Conduct audit programmes to ensure independent review and compliance management

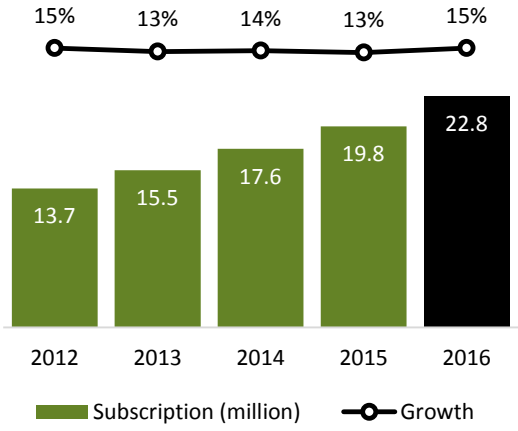
Source: Industry

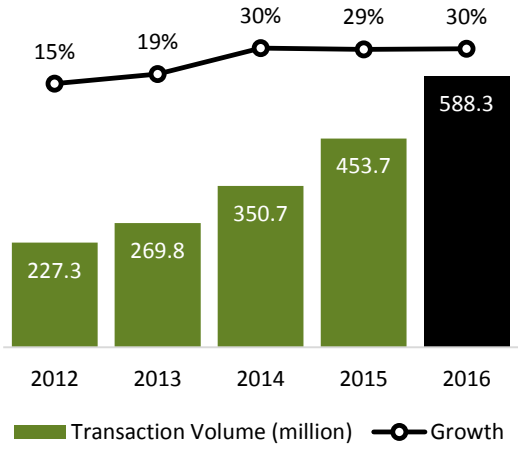
Figure 7.4 Measures Taken by Service Providers

[37] New Straits Times, Malaysia's first cyber court begins operations today, September 2016.

Consumer trust in online transactions is increasing over the years as represented by growing subscriptions and transaction volume for Internet and mobile banking. Mobile banking subscriptions have been increasing faster at 23% in 2016 compared with Internet banking subscriptions at 15%. This profile has been consistent as confidence in mobile banking increased and banks use the mobile platform to reach customers.

Internet Banking in Malaysia

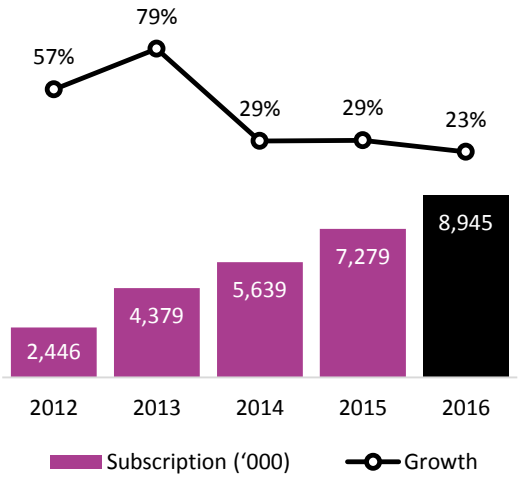


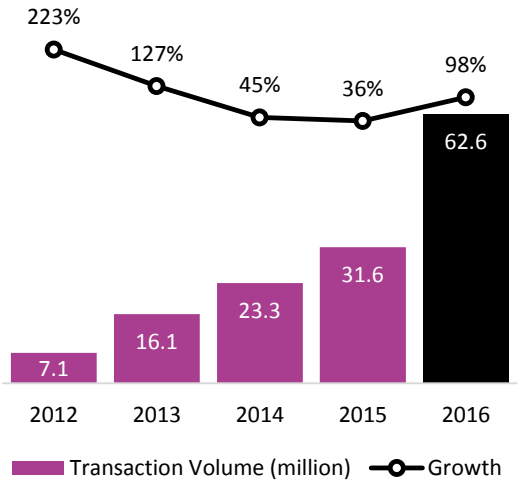


Source: BNM

Figure 7.5 Internet Banking in Malaysia

Mobile Banking in Malaysia





Source: BNM

Figure 7.6 Mobile Banking in Malaysia

Online Content Monitoring and Filtering using Parental Control Tool

Technological devices and the Internet are already a necessity for many, especially young people in their social, recreational and educational context. However, online activities bring along a variety of risks. Thus, parents should play an important role by monitoring and filtering content accessed by their children on the Internet.

Based on a 2016 focus group study conducted by ISPs, 74% of Malaysian parents think that there is a need for their children to be protected online, which indicates a general concern for children's safety on the Internet[38]. Therefore, in order to promote self-regulation and towards providing effective and balance guidance on Internet use for children, MCMC with the cooperation of six ISPs namely, Celcom, Digi, Maxis, TIME, TM and U Mobile have launched the Parental Control Tool initiative on 1 October 2016.

The Parental Control Tools may be subscribed or activated by Malaysians for free or for fees depending on the package, features and solutions offered by their respective ISPs. As of 31st December 2016, there are total of 115,757 subscriptions or activations by Malaysians to the Parental Control Tools provided by ISPs.

[38] The Malay Mail, Keeping children safe on the Internet, November 2016.

MODULE 8: POSTAL AND COURIER

Postal and Courier Services Industry Performance

Improving the postal and courier service efficiency is one of the initiatives under the Government's National E-Commerce Strategic Roadmap. In 2016, the postal and courier services industry revenue was estimated at RM4.78 billion.

Notably, MCMC is committed towards enhancing the postal and courier services industry. This extends from the institution of fundamental regulatory instruments such as the new Postal Services Act 2012 and new licensing scheme. These are to ensure the law and licensing framework keeps up with the changing landscape of the industry due to the technology advancement and digital transformation of retail trend.

Major activities and achievement by MCMC together with the postal and courier industry in 2016 include innovative development activities, universal services and regulatory.

Major Achievements for Postal and Courier Services Industry	
Indicator	**Details**
Regulatory	▪ New licence conditions for universal service licensee (Pos Malaysia Bhd) and migration of licensing scheme to the Postal Services Act 2012
Development/ Innovation	▪ Conducted Road Safety Championship and Carnival for the third year ▪ Developed and enhanced postal concept tourism in Malaysia – installed Post Box at the Southern-most Tip of Mainland Asia Tanjung Piai and the first Underwater Royal Mail Box at Pulau Mensirip, Johor ▪ Readiness of access to Smart Postman system to improve postal services programme
International	▪ Malaysia is a council member of Universal Postal Union (UPU) ▪ Conducted and co-hosted Asian–Pacific Postal Union Executive Council (APPU-EC) Meeting 2016
Universal Services	▪ Completed 20,000 premises for the Address for All project ▪ Six centres appointed as Rural e-commerce Fulfilment Centre (pilot project)

Source: MCMC

Figure 8.1 Major Achievements for Postal and Courier Services Industry

Postal Services

Pos Malaysia has a total of 1,162 access which includes post offices, mini post offices, Pos Automated Machines, postal agents and Pos-On-Wheels throughout Malaysia, with an average of 198 million transactions annually[39]. Today, Pos Malaysia continues to leverage on changing technology to meet customer demand in digitalising environment, in addition to being designated provider of the postal universal service.

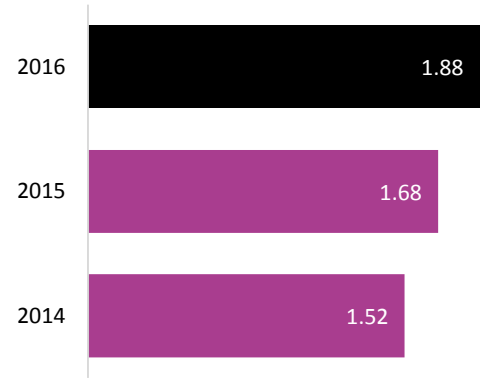
In 2016, Pos Malaysia posted revenue of RM1.88 billion, a double digit growth of 11.9%, compared with RM1.68 billion in 2015 (Figure 8.2). This was due to the acquisition of KL Airport Services Sdn Bhd (subsequently renamed as Pos Aviation Sdn Bhd), a logistics business which contributed 9% of total revenue. Going forward, it provides business synergy to Pos Malaysia.

The courier services segment for Pos Malaysia registered revenue of RM0.66 billion in 2016 or 22.2% growth compared with RM0.54 billion in 2015. The improved performance was driven by increase in demand for fulfilment services.

In 2016, operating profit grew 50% to RM0.12 billion, which translates to operating profit margin of 6.4% (2015: 4.8%). The increase was mainly on the back of higher revenue from courier services segment, effective cost management and contribution from logistics business acquired in September 2016.

The improvement is in contrast to a dip in operating profit to RM0.08 billion in 2015 (2014: RM0.21 billion), which was due to significant increase in transportation and staff costs.

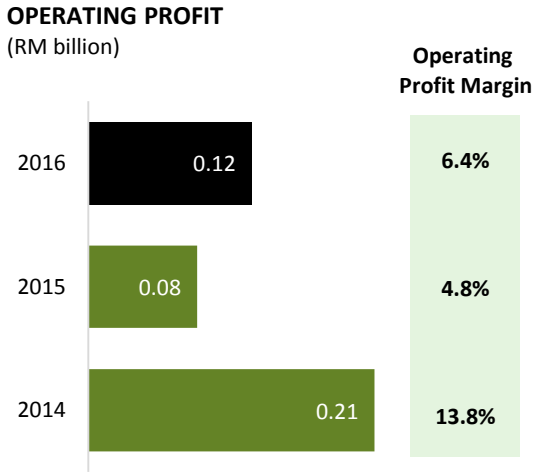
Pos Malaysia Revenue
2014 – 2016



Note: Pos Malaysia revenue adjusted by calendar year

Source: Industry, MCMC
Figure 8.2 Pos Malaysia Revenue 2014 – 2016

Pos Malaysia Operating Profit and Margin
2014 – 2016

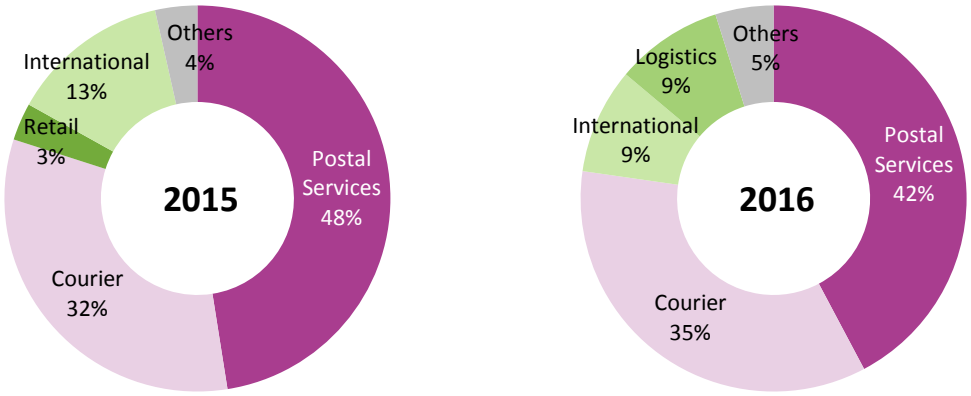


Note: Pos Malaysia operating profit adjusted by calendar year

Source: Industry, MCMC
Figure 8.3 Pos Malaysia Operating Profit and Margin 2014 – 2016

[39] As at 31 March 2017.

Pos Malaysia Revenue by Segment 2015 – 2016



Note: Pos Malaysia operating profit adjusted by calendar year

Source: Industry, MCMC

Figure 8.4 Pos Malaysia Revenue by Segment 2015 – 2016

In 2016, Pos Malaysia introduced its second five-year strategic plan which is aimed to strengthen its operations as well as develop e-commerce offerings, especially in e-fulfilment logistics.

Pos Malaysia tapped on technology to improve service quality and customer convenience. For instance, in 2016, introducing 24/7 parcel locker services enabled customers to collect and drop items at secure automated lockers at their convenience.

Other service enhancements include drive-through Pos Laju outlets and mobile apps for real-time tracking to improve user experience and facilitate customers' growing e-commerce needs.

Postal Services Development Highlights 2016

Address For All – Enabling e-Commerce Fulfilment for Everyone

There is one million or 12% from a total of 8.5 million households or premises without addresses or with incomplete addresses. In the era of e-commerce, it is important to have a correct and complete address because it reveals the information of a building location, generally to enable e-fulfilment services. Hence, in 2016, MCMC together with Pos Malaysia has provided more than 40,000 households with addresses (Figure 8.5). It is targeted by 2020, there will be 200,000 households assigned with their own addresses.

List of Districts and Number of Households		
No.	**District/State**	**Total Number of Households with Addresses Assigned**
1	Hulu Terengganu, Terengganu	9,015
2	Kemaman, Terengganu	7,809
3	Tanjung Piai, Johor	172
4	Mersing, Johor	223
5	Lundu, Sarawak	6,853
6	Kota Belud, Sabah	20,222
	Total	**44,294**

Source: Industry, MCMC
Figure 8.5 List of Districts and Number of Households

Postal Tourism – Boosting Economic Value and Preserving National Treasures

Beyond their traditional roles as collection points of mail, post boxes have been installed at strategic locations for tourists. Such convenience enables tourists to share their exciting and unique visits by sending postcards or letters from these places.

In 2016, two post boxes were installed at Tanjung Piai and Pulau Mensirip, in addition to Mount Kinabalu and Pulau Layang-Layang. This innovative service was recorded in the Malaysian History Book of Records (Figure 8.6). The installation of the post boxes were done in collaboration with Pos Malaysia, MCMC and State Governments.

Post Boxes in Postal Tourism 2016		
No.	**District/State**	**National Treasure**
1	Taman Negara, Tanjung Piai, Pontian, Johor	The Southern Most Tip of Mainland Asia
2	Pulau Mensirip, Taman Laut Sultan Iskandar, Mersing, Johor	Underwater Royal Mailbox

Source: Industry, MCMC
Figure 8.6 Post Boxes in Postal Tourism 2016

Smart Postman

Smart Postman is an initiative by MCMC and Pos Malaysia to promote and empower the postman as a catalyst of improvement for the local community.

Smart Postman

Catalyst for digital economy

Champion for rural community

- Collect information on telco data coverage from rural communities
- Relay community issues to the relevant authorities
- Provide community information to local and regional businesses including Government

Catalyst for connected services

Transformation agent linking rural communities with connected services

- e-commerce
- Digital Payment
- Data Supplier to improve Community Services

Source: Industry, MCMC
Figure 8.7 Smart Postman

Smart Postman is a project that involves the deployment of mobile apps and corresponding smartphones for use by postman in rural and urban areas. This will enable the postman to report on any community issues arising while delivering mail.

This pilot project kicked off at Kota Belud, Sabah with eight postmen and 12 postmen in Lundu, Sarawak, who are equipped with the apps in their smartphones. The data collected will be analysed and used for future improvement and development planning.

Postal Services Access

As at end 2016, there are a total of 930 operational postal outlets in Malaysia including 700 post offices, 198 mini post offices (a single counter post office by third party appointed by Pos Malaysia) and 32 Pos on Wheels. It is a mobile post office equipped with VSAT to allow online transactions, hence extending the postal access to rural areas. There are also 1,162 stamp agents nationwide.

Pos on Wheels

Source: Industry
Figure 8.8 Pos on Wheels

Postal Outlets in 2016			
States	**Post Office**	**Mini Post Office**	**Pos on Wheels**
Perlis	9	1	-
Kedah	48	15	2
Pulau Pinang	40	8	1
Perak	87	12	1
Selangor	98	36	1
Negeri Sembilan	39	3	1
Melaka	28	6	1
Johor	79	15	1
Pahang	43	32	2
Terengganu	28	16	1
Kelantan	29	16	1
Sarawak	61	28	9
Sabah	47	7	9
Wilayah Persekutuan	64	3	2
Total	**700**	**198**	**32**

Source: Industry
Figure 8.9 Postal Outlets 2016

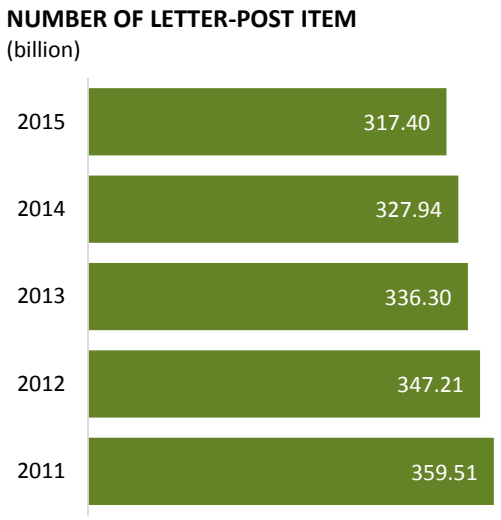
Postal Services Traffic

Globally, Universal Postal Union (UPU) estimated that total traffic from letter-post was 320.44 billion in 2015, down 3.3% compared with 2014. The letter-post volume comprised 317.4 billion (99%) from domestic service (Figure 8.10) and three billion (1%) from international service (Figure 8.11).

The moderating use of letter-post reflects users changing behaviour particularly in today's fast moving digital world. Technology advancement such as email, social networking and other electronic means of communications have partially offset the use of letter-post options.

For the past five years between 2011 and 2015, most of the postal services activities have generated domestic postal services traffic rather than international. The letter-post items delivered are still above the 300 billion mark.

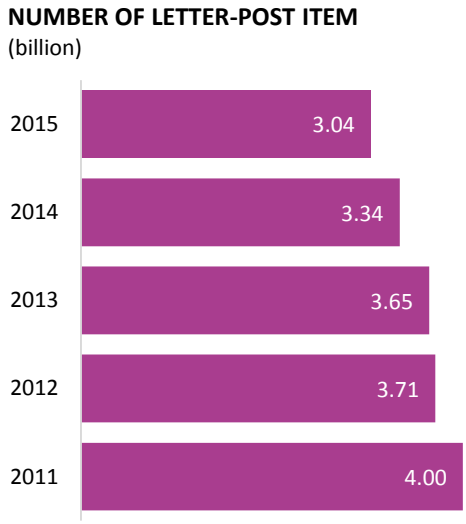
World Estimate: Letter-Post 2011 – 2015 (Domestic Service)



Source: UPU

Figure 8.10 World Estimate: Letter-Post 2011 – 2015 (Domestic Service)

World Estimate: Letter-Post 2011 – 2015 (International Service)



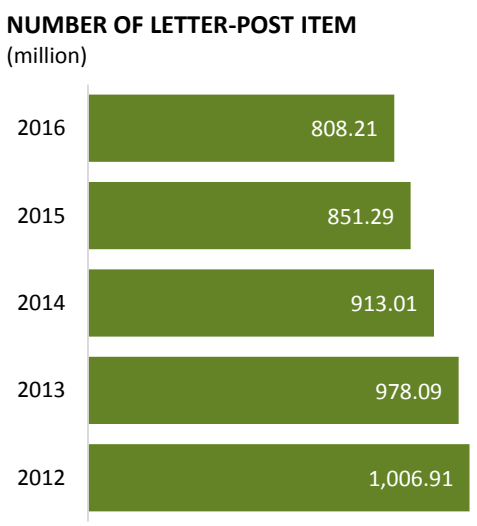
Source: UPU

Figure 8.11 World Estimate: Letter-Post 2011 – 2015 (International Service)

The declining trend in the number of letter-post items is also happening in Malaysia for domestic service. According to Pos Malaysia, 808.2 million letter-post items for domestic service were recorded in 2016, a decline of 5% compared with 851.3 million in 2015.

For international service, a total of 7.9 million letter-post items were issued, while 22.2 million were received across border in 2016. Note that the letter-post items received increased remarkably in 2016 by 71% from 12.99 million items recorded in 2015. It is as a result of online business player from China, which use Pos Malaysia as the distributor for their items. This is in contrast to a declining trend in cross border items received over three consecutive years since 2013.

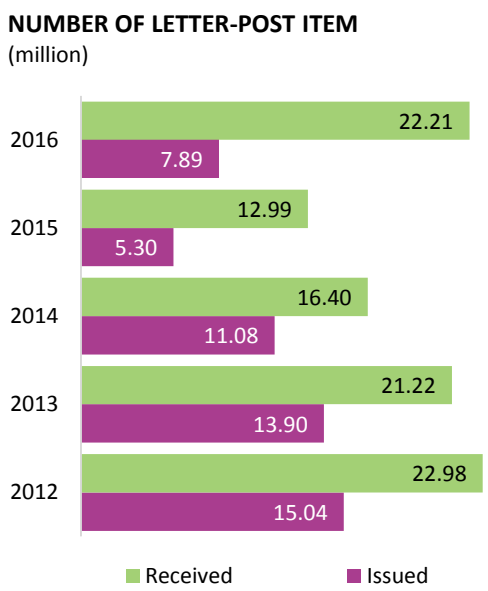
Pos Malaysia: Letter-Post 2012 – 2016: (Domestic Service)



Source: Pos Malaysia, MCMC

Figure 8.12 Pos Malaysia: Letter-Post 2012 – 2016 (Domestic Service)

Pos Malaysia: Letter-Post 2012 – 2016: (International Service)

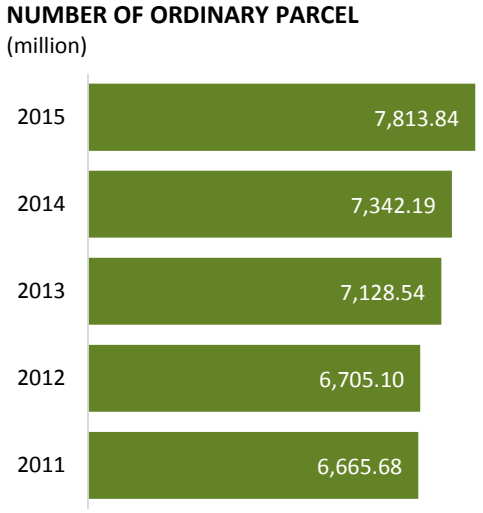


Source: Pos Malaysia, MCMC

Figure 8.13 Pos Malaysia: Letter-Post 2012 – 2016 (International Service)

In the meantime, the declining number of letter-post items globally was partially offset by soaring ordinary parcels market due to growing online shopping. The volume of parcels delivered has grown steadily for the past five years since 2011 (Figure 8.14 and Figure 8.15).

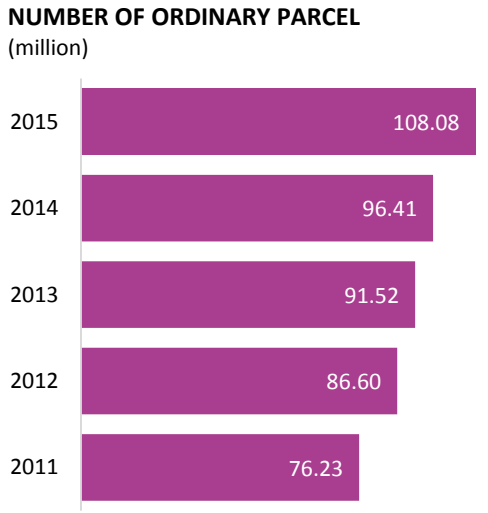
World Estimate: Parcel 2011 – 2015 (Domestic Service)



Source: UPU

Figure 8.14 World Estimate: Parcel 2011 – 2015 (Domestic Service)

World Estimate: Parcel 2011 – 2015 (International Service)



Source: UPU

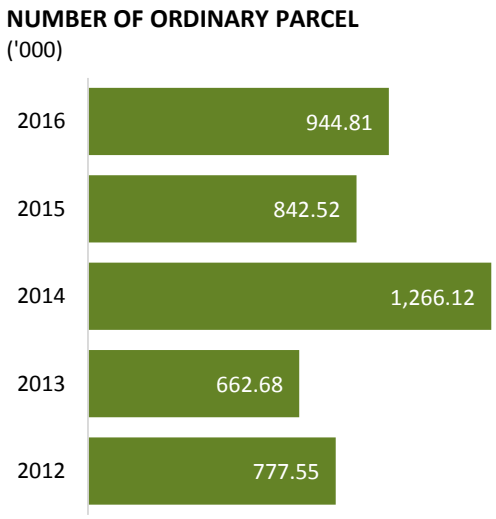
Figure 8.15 World Estimate: Parcel 2011 – 2015 (International Service)

A report by International Post Corporation noted that the rise of e-commerce boosts parcels volume worldwide. Majority of postal service providers reported higher parcels and express volume with an increase of 7.2% in 2015 (2014: 4.8%). As a result, postal service providers are leveraging their core assets such as existing physical network of postal facilities and fleet of vehicles. They are developing a strong focus on innovation to increase their share of the growing parcels market[40].

In Malaysia, ordinary parcels volume for both domestic and international service increased marginally in 2016 vis-à-vis 2015 (Figure 8.16 and Figure 8.17). The number of ordinary parcels stood at 944,810 in 2016, up 12.1% from 842,520 in 2015. In contrast, the number of international parcels issued increased to 161,020 in 2016 from 141,160 in 2015. On the other hand, parcels received stood at 186,950, down from 190,510 recorded in the previous year.

Overall, the higher number of parcels handled in 2016 is good indication for Pos Malaysia wherein they should also market further their parcel services.

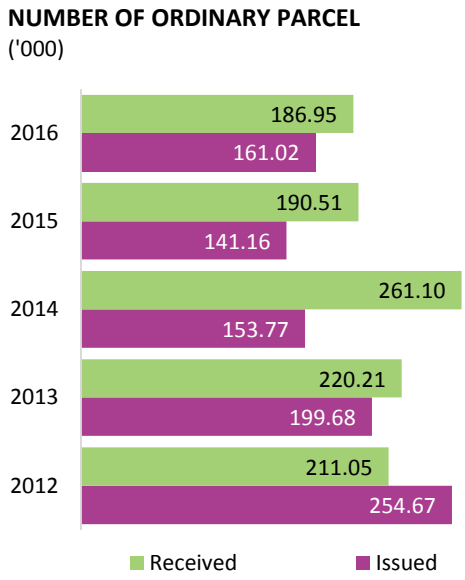
Pos Malaysia: Parcel 2012 – 2016: (Domestic Service)



Source: Pos Malaysia, MCMC

Figure 8.16 Pos Malaysia: Parcel 2012 – 2016 (Domestic Service)

Pos Malaysia: Parcel 2012 – 2016: (International Service)



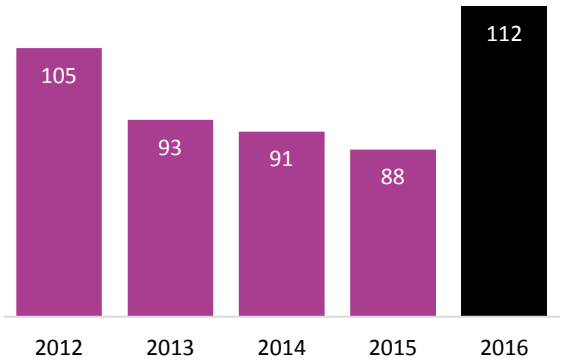
Source: Pos Malaysia, MCMC

Figure 8.17 Pos Malaysia: Parcel 2012 – 2016 (International Service)

[40] International Post Corporation, 2016 Key Findings, Global Postal Industry Report, December 2016.

Courier Services

Number of Courier Licences 2012 – 2016



Source: Industry, MCMC

Figure 8.18 Number of Courier Licences 2012 – 2016

As at end 2016, over 20 courier service licences were approved, making a total of 112 courier service licenses comprising local and multinational companies.

The shift towards this new licensing regime by classifying courier licences into class in 2013 is intended to upgrade the industry, raising the bar for courier services and attracting additional capital investment.

The total number of courier licences by class in 2016 were 33 Class A, 41 Class B and 38 Class C licensees [41]. For the record, all licensees have migrated to the class licenses in 2015.

For instance, Class A licensees are allowed to provide courier services for both international and domestic. However, they are required to provide track and trace system within a year and at least five outlets locally within a period of two years of operations. Meanwhile, Class B and Class C licensees are allowed to operate businesses nationwide or within a state respectively.

On the contrary, the former licensing regime had only one scheme which applies to all players with no specific requirements.

Year 2016 saw the entry of more new players from various businesses going into the courier service market. MCMC has granted courier service licences to Lazada Express (M) Sdn Bhd (Lazada Express), a logistics company under Lazada Group, an online marketplace retailer; My EG Services Bhd (MyEG) which operates and owns an electronic channel to deliver services of various Government agencies; and CJ Korea Express Malaysia Sdn Bhd (CJ Korea Express), a delivery partner for a home shopping joint venture between Media Prima and CJ O Shopping.

In addition, there are also a number of new players such as logistics and transportation companies taking advantage of rapid e-commerce growth by applying courier service licences.

On a separate development, GD Express Carrier Bhd (GDEx) and Yamato Transport (M) Sdn Bhd (Yamato), have entered into a memorandum of business collaboration to explore growth opportunities in the ASEAN region by both parties in January 2016. In this win-win strategy, Yamato is said to also leverage on GDEx's extensive network to offer wider coverage for Yamato's customers in Malaysia.

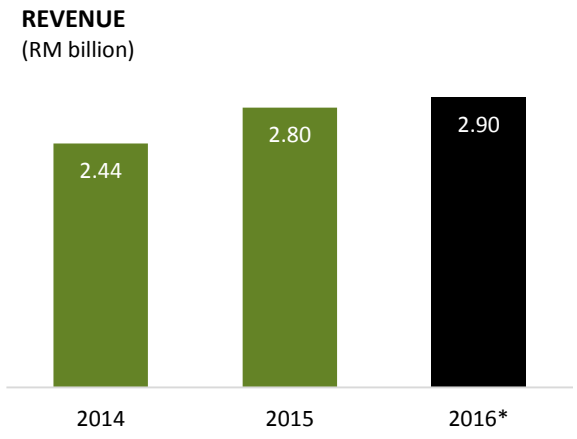
In summary, the entrance of e-commerce companies or Internet retailers and other businesses into courier industry is a good indicator for growth of e-commerce. As of today, despite major e-commerce companies establishing their own delivery network, they are also going into partnership with local postal and courier service providers to optimise their business operations. Hence, the services offered such as pickup and delivery are expected to be improved further as a result of competition between new and existing competitors to better serve the customers.

[41] Starting 2013, MCMC classified courier service providers under three types of licence class based on their business models. Details of this licensing framework can be referred from IPR 2013, page 133-134.

Courier Services Revenue

In 2016, courier service providers have made strategic decisions to expand their network to cater for the growing business, locally as well as internationally. Several service providers have set up more branches to improve accessibility as well as relocated branches to manage the growing volume from the market.

Courier Service Providers: Revenue 2014 – 2016



**Estimated*

Source: Industry, MCMC

Figure 8.19 Courier Service Providers: Revenue 2014 – 2016

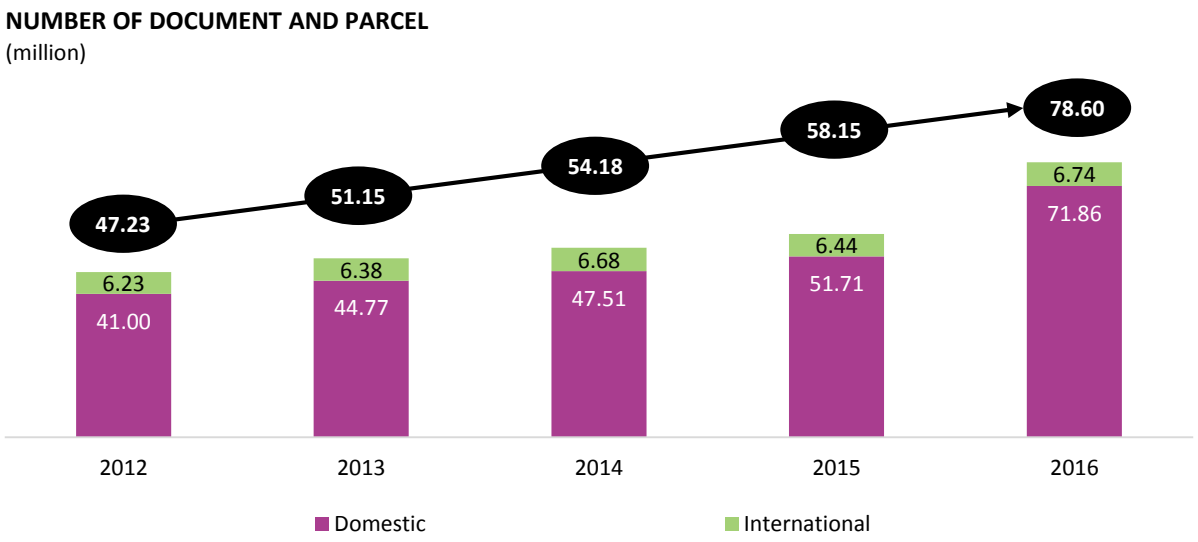
The courier services industry revenue in the year 2016 is estimated at RM2.9 billion, which is comparable to the revenue generated in 2015 (Figure 8.19).

Courier service providers have enhanced their delivery services by offering Same Day Delivery as customers are demanding speedier or faster delivery. In addition, courier service providers also partnered with retailers to offer Cash on Delivery payment mode which facilitates purchasing transactions. These value added services retain customers in light of increasing competition.

Courier Services Traffic

In 2016, a total of 78.6 million items (documents and parcels) were handled, up 35% from 58.15 million items in 2015. Both documents and parcels increased significantly compared to the previous years as shown in Figure 8.20.

Courier Services Total Traffic 2012 – 2016

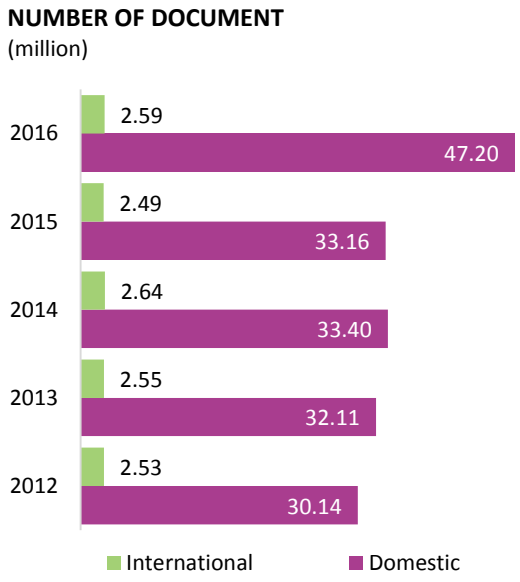


Source: Industry, MCMC

Figure 8.20 Courier Service Total Traffic 2012 – 2016

There were 49.79 million documents handled in 2016, up from 35.65 million in 2015. Out of these, a total of 47.2 million (94.8% of total delivery) documents was for domestic and 2.59 million (5.2%) for international outbound.

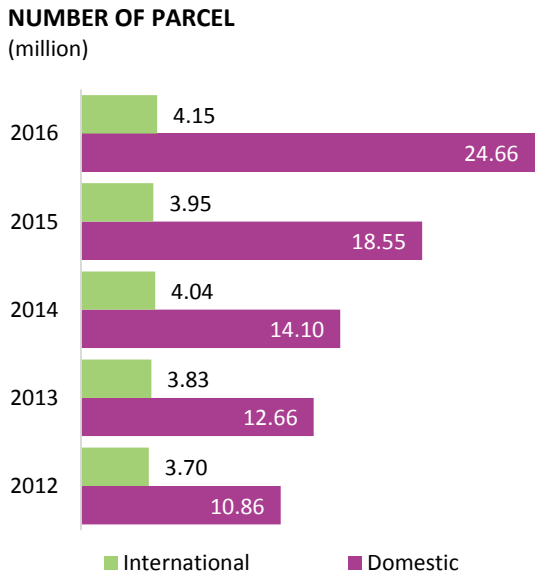
Courier Services Traffic 2012 – 2016 (Document)



Source: MCMC

Figure 8.21 Courier Services Traffic 2012 – 2016 (Document)

Courier Services Traffic 2012 – 2016 (Parcel)



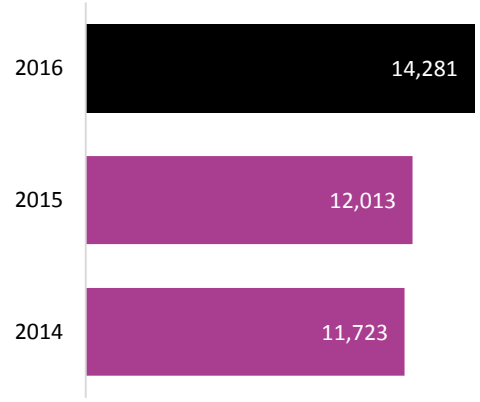
Source: MCMC

Figure 8.22 Courier Services Traffic 2012 – 2016 (Parcel)

Growing e-commerce has contributed to the steady growth of parcels between 2012 and 2016. Of the 28.81 million parcels delivered in 2016, 24.66 million (85.6%) was domestic and 4.15 million (14.4%) international.

Based on industry feedback[42], electronic devices were identified as the most in demand products purchased online, followed by clothing and apparels. Also, healthcare, beauty products, baby products, kitchenware and household products were sought after amongst shoppers in 2016. On the other hand, MyEG entered into the courier service business to deliver foreign workers' permit as well as renewal of road tax and driver licence.

Employees in Courier Services Industry 2014 – 2016



Source: Industry, MCMC

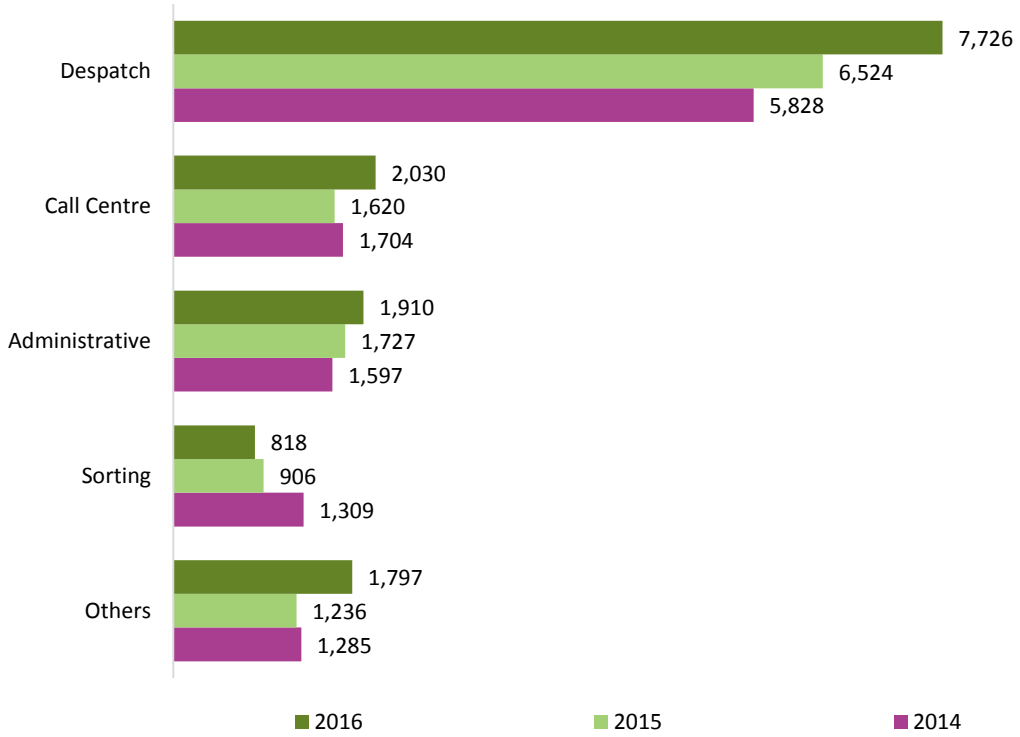
Figure 8.23 Employees in Courier Services Industry 2014 – 2016

The surging volume of courier items in 2016 vis-à-vis 2015 has required increased number of employees to meet fulfilment demand. In 2016, there were 14,281 employees, up 18.9% from 12,013 employees recorded in the previous year.

Employees in courier services industry by job function is shown in Figure 8.24. The despatch and call centre categories constitute 68% of the total number of employees. In 2016, despatch and call centre employees increased by 18.4% and 25.3% respectively.

[42] Responses received from IPR 2016 questionnaire.

Employees in Courier Services Industry by Job Function 2012 – 2016



Note: Others include operation centre, sales, financial and customer service

Source: Industry, MCMC

Figure 8.24 Employees in Courier Services Industry by Job Function 2012 – 2016

Specifically on salary, employees in courier services industry are earning between RM900 and RM5,400 a month. The range of salary by job function is shown as follows:

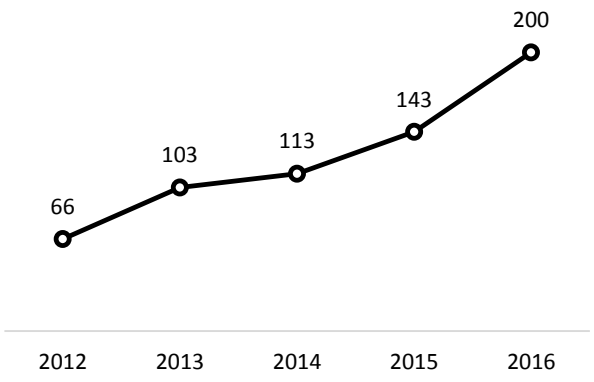
Salaries in Courier Services Industry		
Job Function	**Minimum (RM)**	**Maximum (RM)**
Administrative	1,000	5,400
Call Centre	1,000	4,700
Despatch	900	4,700

Source: Industry, MCMC

Figure 8.25 Salaries in Courier Services Industry

Postal and Courier Services Industry Consumer Complaints

Total Complaints Received by MCMC 2012 – 2016



Source: MCMC

Figure 8.26 Total Complaints Received by MCMC 2012 – 2016

In 2016, MCMC received a total of 200 complaints on the postal and courier services industry, an increase of 40% from 143 complaints in 2015. The trend shows increase for the past five years which directly influences the number of parcels and small packets delivered (Figure 8.26).

It is observed that the total complaints received are relatively small (less than 0.01%) as compared to the postal and courier services traffic a year.

Figure 8.27 shows the types of complaint received by MCMC between 2014 and 2016. Poor service and late delivery are the major issues raised by customers, constituting 67% of total 200 complaints received in 2016.

Types of Complaint Received by MCMC 2014 – 2016			
Type	**2014**	**2015**	**2016**
Poor service	16	34	70
Late delivery	58	65	64
Lost item	23	25	22
Not satisfied with customer service	11	10	17
Others	2	4	14
Not satisfied with service price or refund	1	1	10
Behaviour of delivery personnel	2	4	3
Total	**113**	**143**	**200**

Source: MCMC

Figure 8.27 Number of Complaints Received by MCMC 2014 – 2016

For the record, poor service comprises items received in poor conditions such as damage or broken due to mishandling of items. Late delivery happens when a service provider fails to deliver items within a stipulated time frame such as next day delivery or two-day delivery.

Based on industry feedback[43], the service providers are closely monitoring the operations report to address on the lost or non-receipt of items issued. Specifically for Pos Malaysia, they have imposed strict enforcement on staff to scan and update status of items in their tracking system in a timely manner. To mitigate such issues, Pos Malaysia has also deployed a new back-end system involving real time scanning.

A number of courier service providers have implemented or are exploring real time tracking systems to improve delivery service and prompt responses to their customers. They are also

[43] IPR 2016 questionnaire to postal and courier service providers.

leveraging social media to receive complaints and feedback as well as provide responses to customers.

During peak periods such as holiday season, service providers plan accordingly by outsourcing to third-party or provide incentives to employees to mitigate delay in delivery. They are also increasing the number of employees to cater for the surging volume handled.

On the aspect of trust, majority of courier service providers have indicated that their customers have ranked them relatively high. However, there are areas of improvement which can be made. For example, MyEG believes that customers trust their services because they capture biometrics thumbprint upon delivery.

In summary, with the increased competition and pressure on service efficiency, postal and courier service providers have managed to enhance the service offerings with options of delivery time and payment as well as providing real-time tracking systems.

Growing E-Commerce in Malaysia

With broadband penetration rate per 100 inhabitants at 99.8%, it is paramount for advanced infrastructure for higher broadband speeds to be built to support e-commerce and digital services in Malaysia.

Internet users in Malaysia are relatively savvy and pervasive as shown in Figure 8.28.

Internet Users in Malaysia			
	2015	**2014**	**Remarks**
Internet users as % of Population	77.6%	66.6%	Translating into 24.1 million or 3/4 of Malaysian population in 2016
Smartphone used to access Internet (% of Internet users)	89.3%	74.3%	Mobile broadband is increasingly popular; at users' convenience
On-the-go users (have mobile broadband)	85.5%	65.1%	
Adoption of e-banking (% of Internet users)	36.2%	35.1%	Users concerns were security issues and hesitance to learn complex systems
Adoption of online shopping (% of Internet users)	35.3%	38.0%	

Source: MCMC Internet Users Survey
Figure 8.28 Internet Users in Malaysia

In line with increasing demand, the Government in 2016 has identified e-commerce as one of the transformation platforms to spur the national economy. The Government has launched Malaysia's National e-Commerce Strategic Roadmap which aims to double the country's e-commerce growth to 20.8% by 2020 from the current 10.8% in 2016. This is to boost e-commerce gross domestic product (GDP) contribution to RM170 billion by 2020 from RM68 billion[44] in 2016.

Under the Roadmap, MCMC is tasked to transform Malaysia's last-mile delivery network with best-in-class capabilities. With increasing e-commerce transactions, the range of delivery services provided are required to meet customer expectations which include same day delivery, choice of delivery hours, cash on delivery and real time parcel tracking.

Major global e-commerce companies or Internet retailers such as Lazada are investing or creating their own delivery supply chain either by themselves or through partnership. Hence, domestic courier service providers are required to offer more comprehensive domestic delivery networks.

With the relevant capabilities and widespread digital connectivity, local businesses can reach global consumers via the Internet. This facilitates SMEs to market their products abroad and improve trade. Thus, online platform is one of the key business channels to boost their products and businesses at comparatively reduced cost and time. Also, online marketplaces provide knowledge on online selling, including web hosting services, customer care and digital marketing. This is a win-win proposition to local businesses.

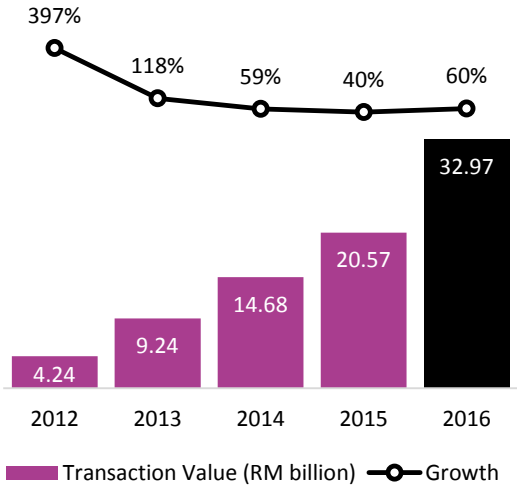
[44] MITI, National e-Commerce Strategic Roadmap Overview, 2016.

Furthermore, online platform can provide a trustworthy and convenient shopping experience. Such online marketplaces also play an important role in meeting the growing demand for cross border purchases.

In Malaysia, financial institutions have introduced apps to accelerate the use of the mobile platform. This has also contributed to facilitate e-commerce activities. Mobile banking generated transaction value of RM32.97 billion in 2016, increased 60% from RM20.57 billion in 2015. This level of significant growth has been consistent as shown in Figure 8.29.

Over the last three years the growth of mobile banking transactions is higher than the Internet banking. This has been made possible by the availability of wider and higher speeds digital connectivity to support the use of smart devices.

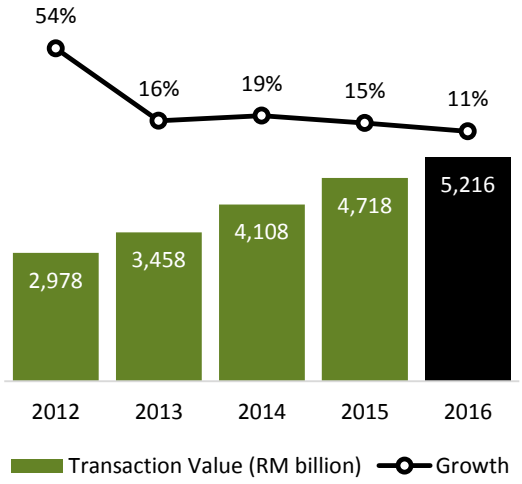
Mobile Banking in Malaysia



Source: BNM

Figure 8.29 Mobile Banking in Malaysia

Internet Banking in Malaysia



Source: BNM

Figure 8.30 Internet Banking in Malaysia

Shopping and Selling via TV and Mobile Platforms

Our C&M service providers, both broadcasters and telcos, have also invested and embarked to tap this wave of e-commerce. For instance, Pay TV and FTA TV launched their own TV shopping platforms including online shopping website respectively in 2015 and 2016, to increase and diversify revenue streams.

As part of innovative service offerings to its subscribers, ASTRO launched home shopping platform (Go Shop) over its network in 2015. As at January 2017, Go Shop garnered RM261 million in sales (January 2016: RM189 million) and captured more than 900,000 registered customers. Going cross border, in November 2016, ASTRO launched Go Shop Singapore by leveraging on StarHub Cable Vision Ltd network. Such partnership extends Go Shop's reach and scale as well as reinforcing ASTRO's regional presence.

Go Shop offers a differentiated shopping experience that gives customers choice, convenience and peace of mind through entertaining and informative product demonstrations. Hence, reputable and trusted international brands enable great value through innovative product bundling. Products offered range from home and living, apparels, health and beauty.

FTA TV service provider, Media Prima invested in home shopping business, CJ WOW Shop to diversify their revenue streams. CJ WOW Shop is a joint venture between Media Prima and Korean-based CJ O Shopping Co. Ltd, was launched in April 2016.

The shopping platform is available across all four Media Prima FTA TV channels as well as accessible via its website and mobile apps. Within its first 100 days of launch, CJ WOW Shop received an overwhelming response with close to RM20 million sales. As at end 2016, CJ WOW Shop generated RM61.4 million net sales involving over 250,000 customers.

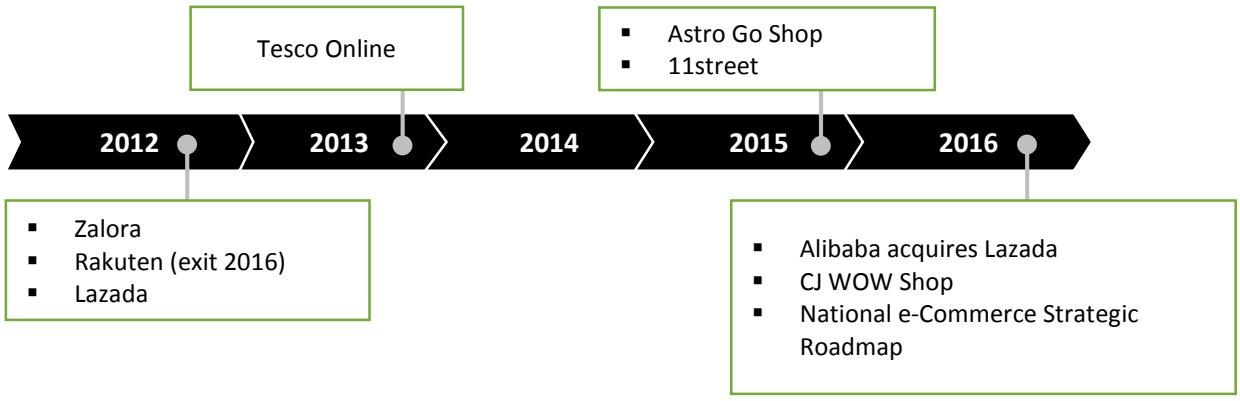
On the other hand, TM has a 24-hour dedicated home shopping channel (TV Direct Showcase) on its Hypp TV platform that showcases products spanning from fitness, household, beauty, fashion, auto accessories and others.

Such traditional broadcast platforms for online shopping demonstrates converging content and commerce over TV, online and mobile platforms. The extended reach offers shopping and entertainment direct to homes.

Mobile service provider, Celcom launched 11street.my marketplace in 2015. As at end 2016, 11street provides over eight million product listings with more than 28,000 sellers (2015: 11,000 product listings).

Overall, the Internet retailers in Malaysia since 2012 is shown in Figure 8.31.

Internet Retailers Development Highlights 2012 – 2016



Source: Industry
Figure 8.31 Internet Retailers Development Highlights 2012 – 2016

Investment by Internet retailers started back in 2012 and continues to attract overseas investment. As at end 2016, Lazada emerged as one of the largest online marketplaces with a wide range of products offered in Malaysia. China's e-commerce player, Alibaba, has forked out USD1 billion to acquire a 51% stake in Lazada Southeast Asia[45] including Lazada Malaysia.

In summary, online shopping platforms are being tapped in partnership by broadcasters, telcos and retailers. Therefore, extensive digital connectivity over high speed broadband is a critical enabler.

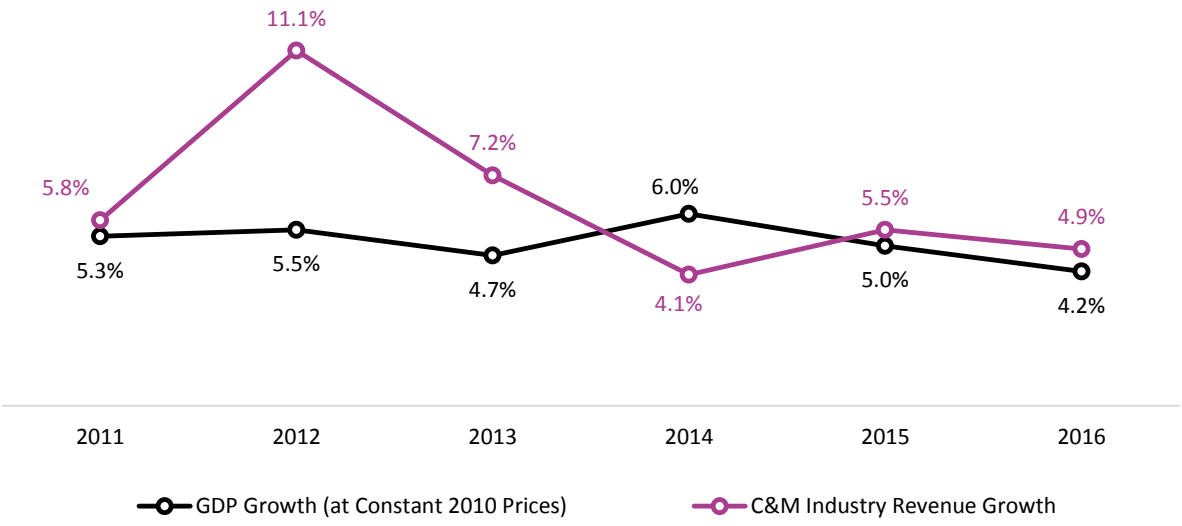
[45] Alibaba Group, Strategic M&A and Investments, 2016, http://www.alibabagroup.com/en/ir/pdf/160614/15.pdf.

MODULE 9: OUTLOOK 2017

C&M Industry Outlook

In 2016, the C&M industry growth at 4.9% was slightly higher than GDP growth of 4.2%[46]. The C&M industry has remained resilient at average growth of 4.8% in the last three years. This is despite economic conditions affected by fluctuating commodity prices and currency including geo-political pressures. In 2017, the C&M industry growth is expected to track the GDP growth of the country, which is estimated at between 4.3% and 4.8%[47]. The growth in the communications sector is expected to be driven by strong demand for data services.

Malaysia GDP vis-à-vis Industry 2011 – 2016



Note: In 2014, the GDP growth is relatively higher boosted by improvement in external trade performance and expansion in the domestic oriented industries, mainly in the services, manufacturing and construction sectors.

Source: Department of Statistics Malaysia, Industry, MCMC
Figure 9.1 Malaysia GDP vis-à-vis Industry 2011 – 2016

Diversifying C&M Business

Similar to the global trend, the Malaysian market is experiencing a decline in traditional revenue from voice and SMS. Thus, service providers are moving towards monetising data by offering innovative services and applications.

Malaysian service providers are indeed diversifying their revenue streams by offering services in adjacent markets. For instance, service providers offer online marketplaces, online streaming and connected ecosystems. Service providers are also expanding beyond "business as usual" to navigate themselves innovatively with partners in a fast changing landscape.

The C&M industry remains resilient in recent volatile market conditions. Nonetheless, the industry remains attractive for investors in the fast pace of C&M business development which can generate potentially higher returns on investment from their critical assets.

[46] Department of Statistics Malaysia, Real GDP Growth (at constant 2010 Prices).
[47] BNM, Economic and Financial Development in the Malaysian Economy in the 1Q of 2017, May 2017.

Connectivity and Affordability

The Government recognises that connectivity and affordability act as among key enablers as Malaysia embarks on its digital transformation. In Budget 2017, for faster connectivity at an affordable price, fixed line broadband service providers will offer services at a higher speed for the same price, effective January 2017.

For example, a subscriber of 5Mbps package at RM149 will enjoy a package with twice the speed, which is 10Mbps. Higher broadband speeds are expected to have an impact on national socio-economy as it can lead to increased productivity and enhance access to new services.

Innovative Packages

Affordable connectivity will enable consumers to streamline their subscriptions to optimise spending. In 2017, we anticipate churn from current plain data packages to consumers selecting innovative bundled packages. Hence, service providers are expected to compete at a level beyond pricing.

Network Capacity Building

Service providers will need to allocate resources to ensure that customers can benefit from the Government's vision to provide affordability for higher bandwidth. This will facilitate the growing digital economy.

At the moment, fixed service providers face technical constraints due to legacy copper network which limits higher bandwidth. In order to address the gaps in fibre infrastructure coverage, the service providers are encouraged to invest in fibre. Hence, we foresee further strategic infrastructure investment especially at the core network in 2017.

With the additional spectrum bands allocated in 2016, mobile service providers are expected to expand their network coverage and capacity to enhance quality of service. Service providers are also expected to offer better prices for their packages.

Content Development

With DTTB platform to be ready in operation in 2018, we expect more content players entering the market. This will see more channels available to grow the market. Investments are also channelled to spur creative content development.

Talent Development

Capacity building in talent and expertise are also key areas to be developed and nurtured. Further investment should be allocated for human resource development in line with the skill sets necessary in keeping with industry innovations to come.

Security

While digitalisation is transforming the way companies operate, security cannot be compromised and should remain a key focus. This is critical in tandem with more complex security concerns and threats.

Conclusion

Moving forward, the use of ICT and advancing telecommunications technology will enable industries to embrace digitalisation for increasingly connected business ecosystems. This will increase productivity and industry effectiveness for economic growth.

The journey of convergence in the communications, content and the physical world including postal and courier is progressing. In light of this, the regulatory framework remains relevant in managing such progress. Hence, it is imperative that the industry stakeholders and MCMC continue to work together in full commitment towards achieving national competitiveness.

LIST OF FIGURES

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LIST OF ABBREVIATIONS

3G	3rd Generation
4G LTE	4th Generation Long Term Evolution
	A
ACE	"Access", "Certainty", "Efficiency"
Adex	Advertising Expenditure
ADSL	Asymmetric Digital Subscriber Line
AOA	Angle of Arrival
APG	Asia Pacific Gateway
APPU-EC	Asian–Pacific Postal Union Executive Council
ARPU	Average Revenue Per User
ASP	Applications Service Provider
ASEAN	Association of Southeast Asian Nations
	B
B2B	Business-to-Business
	C
C&M	Communications and Multimedia
CA	Certification Authority
CASP	Content Applications Service Provider
CFM	Communications and Multimedia Consumer Forum of Malaysia
CIDF	Creative Industry Development Fund
CMA	Communications and Multimedia Act 1998
CMCF	Communications and Multimedia Content Forum of Malaysia
CTOS	Credit Tip-Off Service
	D
DECT	Digital Enhanced Cordless Technology
DEL	Direct Exchange Line
DTH	Direct To Home
DTTB	Digital Terrestrial Television Broadcasting
	E
EPL	English Premier League
EMF	Electronic Magnetic Fields
	F
FAQ	Frequently Asked Questions
FIR	First Information Report
FLL	First Lego League 2016
FTA	Free-to-Air
FTTC	Fibre-to-the-Cabinet
FTTH	Fibre-to-the-Home
	G
GA	Government Agency
GCC	General Consumer Code of Practice for the Communications and Multimedia Industry Malaysia
GDP	Gross Domestic Product
GLC	Government-linked Company
GLIC	Government-linked Investment Company
	H
HSDPA	High-Speed Downlink Packet Access
HSBB	High Speed Broadband

	I
ICT	Information and Communications Technology
IISRO	International Islamic School Robot Olympiad
IMEI	International Mobile Equipment Identity
IoT	Internet of Things
IP	Internet Protocol
IPS	Intrusion Prevention System
IPTV	Internet Protocol Television
ISP	Internet Service Provider
ITU	International Telecommunication Union
	K
KKMM	Ministry of Communications and Multimedia
Kbps	kilobits per second
KLIA	Kuala Lumpur International Airport
	L
LTE	Long Term Evolution
LRT	Light Rail Transit
	M
M2M	Machine-to-Machine
Mbps	Megabits Per Second
MMR	MY Mobile Rights
MNO	Mobile Network Operator
MTDO	Malaysian Telecommunications Dealers Organisation
MVN	Mobile Virtual Network
MyIX	Malaysian Internet Exchange
	N
NASMOC	National Spectrum Monitoring and Control System
NBI	National Broadband Initiative
NFP	Network Facilities Provider
NSP	Network Services Provider
NRC	National Robotic Competition
	O
OTT	Over-the-Top
	P
PCBS	Public Cellular Blocking Service
PCS	Public Cellular Service
PI1M	1Malaysia Internet Centre
	Q
Q&A	Questions and Answers
QoS	Quality of Service
	R
RBB	Rural Broadband
RFI	Radio Frequency Interference
RFID	Radio Frequency Identification
	S
SA	Statutory Agency
SGOV	State Government
SKR1M	*Sistem Kabel Rakyat 1Malaysia*
SIM	Subscriber Identity Module
SLP	Self-Labelling Programme
SME	Small and Medium Enterprises
SMS	Short Messaging Service
SQASI	SIRIM QAS International Sdn Bhd
STEM	Science, Technology, Engineering and Mathematics
SUBB	Suburban Broadband
SVOD	Subscription Video On Demand

	T
TDOA	Time Difference of Arrival
	U
UN	United Nations
UPU	Universal Postal Union
USD	United States Dollar
	V
VAS	Value Added Services
VHF	Very High Frequency
VOD	Video On Demand
VoIP	Voice over Internet Protocol
VSAT	Very Small Aperture Terminal
	Y
YoY	Year on Year

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CENTRAL REGIONAL OFFICE
Malaysian Communications and Multimedia Commission (MCMC) (Old Building)
Off Persiaran Multimedia
63000 Cyberjaya
Selangor
Tel: +60 3 8688 7800
Fax: +60 3 8688 1001

EASTERN REGIONAL OFFICE
B8004 Level 1
Sri Kuantan Square
Jalan Telok Sisek
25200 Kuantan
Pahang Darul Makmur
Tel: +60 9 515 4800
Fax: +60 9 515 4900

KELANTAN BRANCH OF THE EASTERN REGIONAL OFFICE
PT400, Bandar Baru Tunjong
Jalan Kuala Krai
15100 Kota Bharu
Kelantan Darul Naim
Tel: +60 9 745 4800
Fax: +60 9 745 4900

SOUTHERN REGIONAL OFFICE
Suite 7A, Level 7
Menara Ansar
Jalan Trus
80000 Johor Bahru
Johor Darul Takzim
Tel: +60 7 208 7600
Fax: +60 7 208 7700

SABAH REGIONAL OFFICE
6-10-10, 10th Floor
No. 6 Menara MAA
Lorong Api-Api 1, Api Api Centre
88000 Kota Kinabalu
Sabah
Tel: +60 88 355 000
Fax: +60 88 355 100

SANDAKAN BRANCH OF THE SABAH REGIONAL OFFICE
Level 3, Menara Rickoh Indah
Commercial Complex
Bandar Indah, Batu 4, Jalan Utara
90000 Sandakan
Sabah
Tel: +60 89 241 400
Fax: +60 89 241 500

SARAWAK REGIONAL OFFICE
Block D, i-Com Square
Jalan Pending
93450 Kuching
Sarawak
Tel: +60 82 388 000
Fax: +60 82 388 100

SIBU BRANCH OF THE SARAWAK REGIONAL OFFICE
GF, 1st & 2nd Floor
No. 2 Lorong Kwong Ann 8
Brooke Drive
96000 Sibu
Sarawak
Tel: +60 84 365 600
Fax: +60 84 365 700

MELAKA BRANCH OF THE SOUTHERN REGIONAL OFFICE
No. 26-3, Level 3,
Bangunan Kota Cemerlang
Hang Tuah Jaya
75450 Lebuh Ayer Keroh
Melaka
Tel: +60 6 235 9200
Fax: +60 6 235 9300

KENINGAU BRANCH OF THE SABAH REGIONAL OFFICE
Lot 42, GF, 1st and 2nd Floor,
Datun Commercial Centre
89008 Keningau
Sabah
Tel: +60 87 340 000
Fax: +60 87 340 100

TAWAU BRANCH OF THE SABAH REGIONAL OFFICE
Level 2, Wisma Great Eastern,
No. 163 & 164, Jalan Belian,
91000 Tawau
Sabah
Tel: +60 89 984 000
Fax: +60 89 984 100

MIRI BRANCH OF THE SARAWAK REGIONAL OFFICE
Lot 1385 (1st Floor), Block 10
Centre Point Commercial Centre Phase II
98000 Miri
Sarawak
Tel: +60 85 461 800
Fax: +60 85 461 900

Numbers and percentages may not add up due to rounding practices. Information is correct at the time of printing.

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