

Chapter 4 Operational Highlights

Performance by Division

	Consumer Business Group	Enterprise Business Group	Home Business Group	Retail Business
Brand name	Taiwan Mobile	TWM Business Solution	TWM Broadband	momo
Services	<ul style="list-style-type: none"> ● Voice and data mobile services for consumers ● Mobile to international direct dialing (IDD) services 	<ul style="list-style-type: none"> ● Voice and data mobile services for enterprises ● Fixed-line services ● International simple resale (ISR) services ● Internet data center (IDC) and cloud (IaaS) 	<ul style="list-style-type: none"> ● Pay TV services ● Cable broadband services ● Others 	<ul style="list-style-type: none"> ● E-commerce ● TV home shopping ● Mail order

Unit: NT\$m

	Telecom business		Cable business	Retail business
	Mobile business	Fixed-line business		
Market position	Second-largest mobile operator in a five-player market, with a market share of around 29% in terms of mobile service revenue	A market share of 1.3% for ADSL/FTTx business. One of the top three internet service providers (ISP), with a market share of 4.5% (including cable broadband subscribers from its cable business)	Fourth-largest multisystem operator (MSO), covering about 11% of households in Taiwan	Ranked among the top two in B2C e-commerce and TV home shopping businesses
2016 revenue*	81,850		6,533	28,081
2016 EBITDA*	28,568		3,504	1,371

* Source: 2016 financial reports. The difference between the sum of each division and consolidated numbers was due to inter-division adjustments and eliminations.

Scope of Business

Business overview

Telecom Business

1. Telecom products and services

Consumer Business Group (CBG)

The Consumer Business Group is mainly engaged in providing mobile communication services to individual users.

The Company offers a wide range of products, including SIM cards for postpaid subscribers, as well as SIM and reloadable cards for prepaid subscribers that can be used for making/receiving calls and value-added services, such as short messaging service (SMS), data and multimedia.

Target customers	Service category	Description	Highlights
Individual consumers	Mobile	Voice	Basic telecommunication voice services, including making and receiving calls from fixed-line and mobile phones
		Data	Value-added services, including voice mail, call forwarding, call waiting, conferencing, SMS, roaming, call barring, video calls, multimedia and content (e.g., mobile TV, music, games, financial information, online bookstore, messaging apps, video clips, video streaming), and internet access using 4G/HSDPA/3G transmission
	IDD	International direct dialing services	

Enterprise Business Group (EBG)

The Enterprise Business Group offers enterprise customers integrated telecommunication and information services, and aims to become a partner in the areas of mobile application, IoT, big data, information security and smart industry solution to its enterprise customers.

Service category	Description
Mobility	<ul style="list-style-type: none"> ● Mobile virtual private network (MVPN) ● Mobile data virtual private network (MDVPN) ● Mobile broadband service ● Business mobility services, including customized apps, mobile device management, instant messaging (M+ Messages, enterprise edition), and enterprise mobility management (EMM) ● International roaming
Fixed-line voice	<ul style="list-style-type: none"> ● Integrated voice solutions, including multi-port residential gateway (MRG), local calls, long-distance calls, international calls and fixed mobile convergence (FMC) ● 080 domestic toll-free service, audio conference, intelligent network services (e.g., 0209 services) and international simple resale (ISR)
Fixed-line data	<ul style="list-style-type: none"> ● Domestic leased line, Metro Ethernet, IP virtual private network ● International private leased circuit (IPLC) and ADSL VPN
Internet	<ul style="list-style-type: none"> ● Internet access via leased line, Metro Ethernet, ADSL and FTTx
Cloud	<ul style="list-style-type: none"> ● The only Uptime Tier III certified cloud data center in Taiwan. ● Infrastructure as a service (IaaS) ● Software as a service (SaaS), including web hosting, mail hosting, domain name system (DNS) management, and video conference
Enterprise total solutions	<ul style="list-style-type: none"> ● Mobile communications, smart data center, smart network, information security and smart industry solutions

2. Telecom revenue breakdown (including CBG and EBG)

Unit: NT\$mn

Item \ Year	2016	
	Revenue	% of total
Service revenue	61,416	75%
Device sales	20,434	25%
Total	81,850	100%

3. New telecom products and services

Consumer Business Group

- (1) Voice services: Continue to roll out innovative rate plans to meet the calling preferences and personal demands of subscribers.
- (2) Value-added services: Focus on mainstream smart devices; develop a diverse range of services and digital content to meet consumers' mobile needs.

Enterprise Business Group

- (1) Information security solutions:
Comprehensive information security solutions, including multilayer anti-DDoS, managed security service, vulnerability assessment, intrusion prevention system, and integrated information security services and equipment.
- (2) Data center service:
Complete, non-stop data center service from design to construction, migration, operation and management.
- (3) Fleet management system (FMS) service:
FMS service provides work progress updates by locating on-duty vehicles. Should there be any abnormality, the system automatically sends out an alert to facilitate solutions and minimize delays.
- (4) Internet of Things (IoT):
In line with the government policy of promoting the IoT industry, TWM has developed smart electric/water meter services. Aside from automatically providing power consumption readings to the utility provider, smart electric meters allow users to monitor, analyze and manage power usage to maximize efficiency. Smart water meters likewise allow users to monitor and record water consumption to manage water usage efficiently.
- (5) Cloud storage service:
Large and flexible cloud storage space with fast download speeds.

4. Mobile business operating status

- (1) Postpaid products and services

In response to keen market competition and declines in voice minutes, the Company has focused on boosting handset sales and the migration of 3G/4G clients to raise its ARPU. As of January 2017, 3G/4G customer mix

was 99%.

The Company has excellent loyalty programs in place to secure its client base and minimize churn rates. With the aid of business intelligence tools and its direct marketing network, the Company uses market segmentation to target and provide customers with services that better match their needs. For high ARPU customers, the Company has an exclusive program called “myVIP.” The Company also offers a credit card program that allows customers to earn rebates based on their phone bills.

(2) Prepaid products and services

The Company provides diverse mobile internet services and was ahead of its peers in launching data roaming services in Japan in 2016.

Home Business Group (HBG)

1. CATV products and services

Leveraging off the group’s resources – from mobile and fixed-line to innovative cloud technology – HBG provides digital convergence services across “four screens and a cloud” to home users. TFN Media (TFNM), a subsidiary of the Company, holds a cable television system operator’s license and a Type II telecommunication license. Its subsidiary, TV production company Win TV Broadcasting, operates the “momo family channel” and owns distribution rights to a large number of outstanding domestic and foreign TV content, enabling it to provide subscribers with a wide range of digital audiovisual entertainment services.

Service category	Products / Services	Description
Pay TV	Digital TV	Uses high bandwidth coaxial cable to transmit a wide range of TV channels and programs to home TVs.
	High-definition digital TV	TWM Broadband’s CATV networks transmit domestic and international digital TV channels to subscribers’ homes; subscribers can use the set-top box provided by TWM Broadband to view high-definition digital video content.
Broadband internet access	Cable fiber-optic broadband internet access	Provides high-speed internet access service via a hybrid fiber/coaxial (HFC) network deployed by the CATV system operator, together with new-generation DOCSIS 3.0 broadband internet access technology.
Content distribution	Analog and digital TV channels	Distributes high-quality domestic and foreign TV content on both analog and digital TV services by licensing the broadcasting rights of these channels to other CATV system operators and video service platforms.
Digital home services	SuperMOD service	The first in Taiwan to provide high-definition on-demand video, audio and interactive applications/content by combining video on demand, internet TV and digital TV onto a single platform. Subscribers can access

Service category	Products / Services	Description
		SuperMOD content on their TVs, computers, smartphones and tablets anytime, anywhere.
	HomePlay service	A multi-screen sharing service that enables subscribers to share and watch TV programs, high-definition (HD) video on demand and internet video content across multiple screens, such as TVs, tablets and smartphones. Subscribers can access any content through any device via HomePlay's user-friendly application at home.
	Personal video recorder (PVR)	An interactive TV program recording device with 500G storage that enables subscribers to record TV programs through multiple devices, including computers, TVs and handsets.
	HomeSecurity service	Offers round-the-clock protection for households and small and medium-sized businesses by providing a multi-screen monitoring and cloud storage system that sends out alerts via apps for smart devices, SuperMOD, SMS and e-mails.

2. CATV revenue breakdown

Unit: NT\$m

Item \ Year	2016	
	Revenue	% of total
Pay TV service	4,350	67%
Cable broadband service	1,306	20%
TV content agency and others	878	13%
Total	6,533	100%

3. New CATV products and services

(1) High-definition digital TV services:

In line with the government's push to achieve 100% digital cable TV penetration, TWM Broadband has positioned itself to maximize the opportunity by expanding the economies of scale of HDTV and digitizing audio-visual home entertainment. When the digitalization is completed in the end of 2017, CATV system operators can release more analog spectrum to increase the signal transmission capacity to offer a wider range of viewing options and more value-added services. Moreover, TWM Broadband is to offer more 4K content for consumers and to lead the industry into a whole new era of home entertainment.

(2) High-speed fiber-optic internet access services:

Consumer demand for high-speed internet access has soared with the fast-growing popularity of online videos and social media. TWM Broadband was ahead of the trend in upgrading its fiber-optic network, enabling it to provide 300Mbps & 500Mbps high-speed broadband access services. In the near future, DOCSIS 3.1 network

technology and infrastructure will be adopted to deliver speeds up to 1Gbps to customers.

(3) Digital home services:

In 2016, TWM Broadband turned its attention to OTT (Over the Top) and announced the digital home 4.0 by launching SuperMOD OTT service. It is the first platform in Taiwan to provide high-definition on-demand video, audio and interactive applications/content by combining video on demand, internet TV and digital TV onto a single platform. Subscribers can access SuperMOD content on their TVs, computers, smartphones and tablets anytime, anywhere. Furthermore, TWM Broadband will enter the market of healthcare and cooperate with medical institutions to provide remote home care services such as professional consultancy and health measurement equipment.

Retail Business (momo.com Inc. or “momo”)

1. Retail products and services

momo offers TV home shopping, e-commerce, mail order service, travel services, and property and life insurance sales.

Service category	Products / Services	Description
TV home shopping	Programing	Self-owned professional studio and filming team provides 24-hour momo TV programs for 5mn households nationwide.
	Product orders	Provides 0800 toll-free hotline and mobile app for consumers to purchase products featured on momo TV programs or momo TV app.
	Customer service	Customer service team works around the clock to answer questions about product features, purchase and return policy.
E-commerce	Supplier recruitment service	momoshop: Recruits suppliers across Taiwan to provide clients with premium products and the best service. momomall: Assists suppliers interested in e-commerce to establish and operate online platforms.
	Product orders	momoshop: Sells over 1.9mn stock keeping units (SKU) and provides express delivery for select products. momomall: Gathers over 3,000 suppliers with 14mn SKUs.
	Customer service	Provides 24-hour online customer service and supplier contact platform to satisfy customers' shopping needs.
Catalogue / Mail order	Merchandising	Selects prime products from momo's TV home shopping and B2C shopping platforms and highlights their selling points.
	Catalogue production	Designs catalogue layout and highlights product features for customers.
	Member service	Distributes 800K copies by mail to momo members.
	Product order and	0800 toll-free 24-hour hotline manned by a professional customer service

	customer service	team that answers questions about product features, purchase and return policy.
Travel	Domestic and international travel e-voucher sales	Works with leading travel agencies to sell domestic and international services, including tours, accommodations and amusement park tickets by e-vouchers.
Property/Life insurance	Property/life insurance products and services	Provides property/life insurance products and services.

2. Retail revenue breakdown

Unit: NT\$mn

Item	Year	2016	
		Revenue	% of total
E-commerce		20,580	73%
TV home shopping, mail order service and others		7,501	27%
Total		28,081	100%

3. New retail products and services

- (1) Develop new product categories: Product variety is critical to maintaining viewership for TV home shopping and enable marketing campaigns to successfully engage with the target customer base. momo has successfully continued to explore and introduced new product categories, including essential oil and branded home appliances, to sustain buyers' interest. Additionally, momo has introduced an e-voucher system to expand its service offerings.
- (2) Introduce more brands: Backed by its prolific marketing resources and a stable supply chain, momo has attracted more and more quality brands to list products on its B2C platform (momoshop), including Dyson, Electrolux and Coach. Meanwhile, momomall, the company's B2B2c platform, which has already teamed up with many large and well-known merchants, such as HOLA, Test Rite and Qsquare, has added a few more – FNAC, Uni-Ustyle Department Stores and Sinya Digital Corp – and plans to continue seeking new partnership opportunities.
- (3) Expand business platforms: With CATV penetration nearing saturation, viewership of traditional TV falling, and the rise in popularity of digital TV and mobile platforms, TV home shopping is looking to adapt to changes in consumer's lifestyle and trends. momo is adapting mobile platforms through its TV app and leveraging social networks to promote its brand and products by leveraging its Facebook and Line groups to building up a fan base, including streaming live videos to enhance the engagement with its customer base in order to boost customer stickiness.

- (4) Build up mobile commerce: As sales from mobile devices continued to increase, momo aims to aggressively promote mobile commerce products by providing a better user experience to increase user stickiness and raise mobile commerce's share of total revenue.
- (5) Improve services: Logistics and IT play key roles in addressing the "last-mile" issue. momo aims to enhance suppliers' delivery capabilities and build up its logistics and warehousing facilities to provide fast, transparent and timely deliveries.

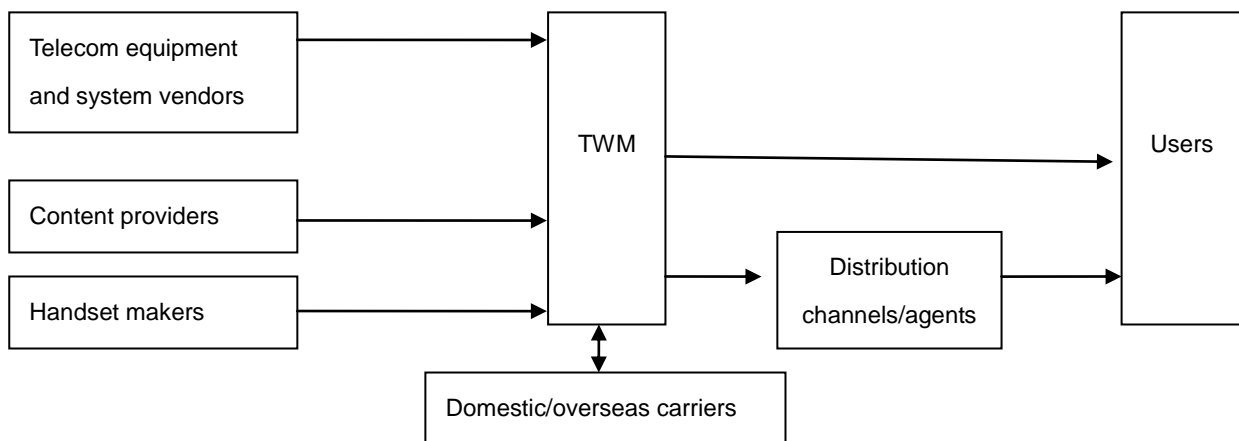
Industry overview

Consumer Business Group

1. Industry status and development

Though telecom operators have launched their 4G services one after the other since 2014, smaller players remain constrained by a lack of competent 4G network infrastructure and subscriber economies of scale. The three major operators will likely continue to dominate the market

2. Industry value chain



3. Product development trends and competitive landscape

The operators are seeking to further expand the mobile broadband market in the 4G era. A variety of new rate plans for data services, combined with new terminal devices and new value-added services, has been introduced to stimulate 4G subscriber take-up. This should be an important future revenue growth driver. As for the prepaid segment, pricing competition is intensifying.

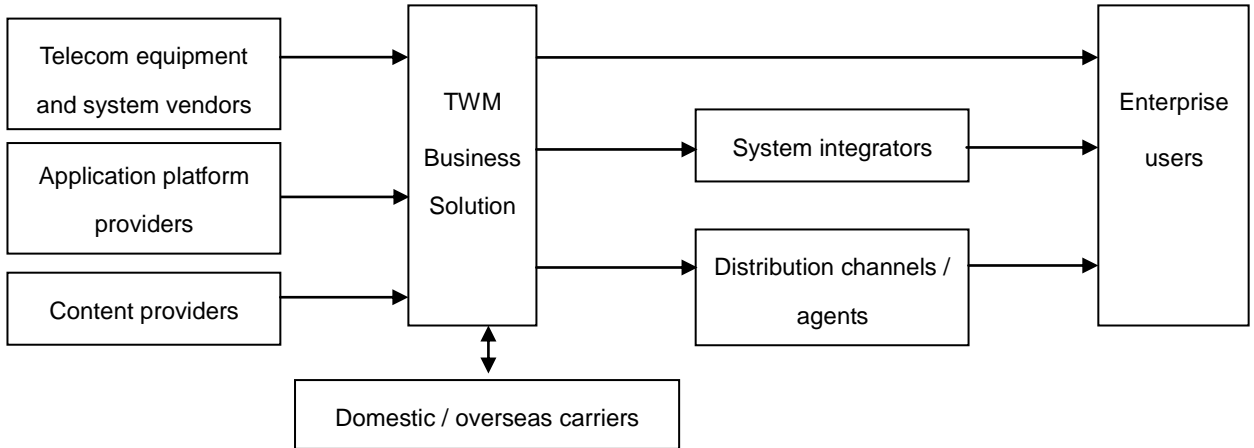
Enterprise Business Group

1. Industry status and development

According to statistics provided by the National Communications Commission (NCC), there were 82 Type I telecommunication providers, including four fixed-line operators, five mobile operators; and 410 Type II telecommunication providers, including ISR, ISP, VoIP and other value-added service providers. Given intense competition in the fixed-line market and the growing trend toward IP network and digital convergence,

telecommunication providers have to offer not only infrastructure, but also applications and total solutions.

2. Industry value chain



3. Product development trends and competitive landscape

Data provided by the NCC show that Chunghwa Telecom (CHT) has a virtual monopoly of the telecom market. It accounts for over 90% of local network service revenue, and about 50% of long-distance network service revenue and international network service revenue. Since CHT has the “last mile” advantage, other internet service providers find it hard to effectively compete with the carrier.

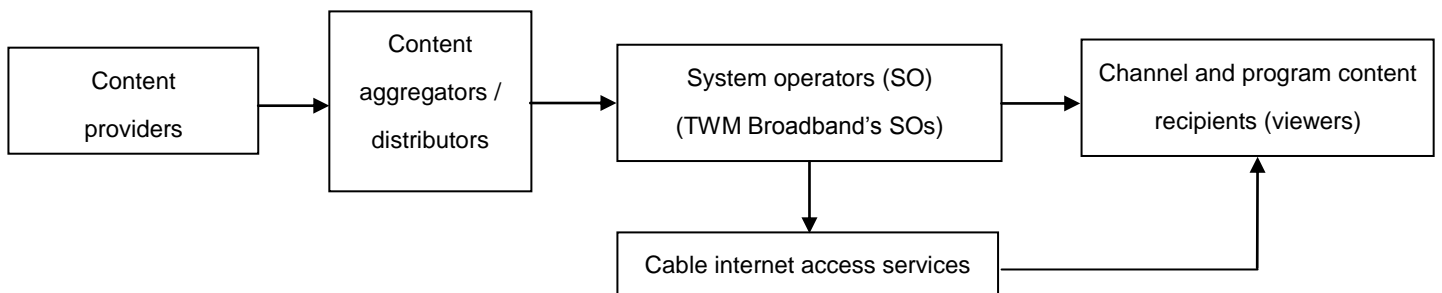
Cloud and enterprise mobility applications will be the main trends in the future. Carriers will provide various efficient and effective mobile commercial application services to enhance the competitiveness of enterprise clients.

Home Business Group

1. Industry status and development

Cable TV has become a must-have video platform, but it faces challenges from alternative services such as IPTV, digital terrestrial TV and other emerging media (e.g., OTT video streaming) that have successively entered the market. The cable TV industry must digitalize aggressively and continue to provide innovative digital TV value-added services to attract traditional cable TV subscribers to switch to digital TV.

2. Industry value chain



TWM Broadband has the advantage of controlling “last mile” access to customers. TWM Broadband aims to take the lead in vertical integration to build up its core competitiveness and explore new business opportunities in the age of digitalization.

3. Product development trends and competitive landscape

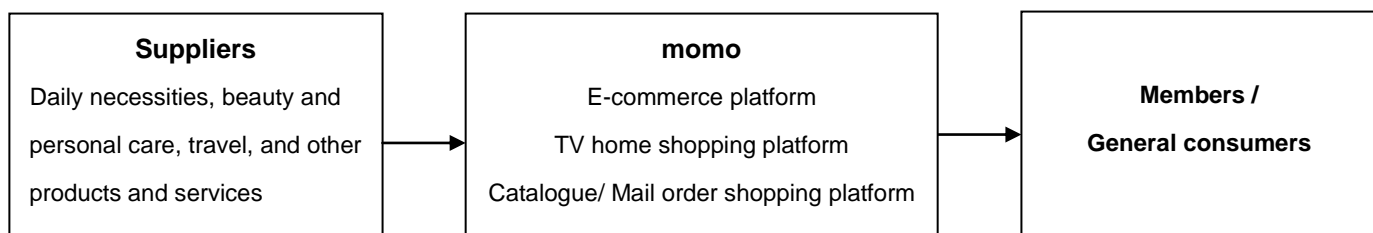
Despite a saturated market that is dominated by Chunghwa Telecom, TWM Broadband managed to grow its subscriber numbers in the cable internet business by bundling cable broadband products with HD DTV services in its cable TV service areas, following the example of leading global operators, such as PCCW in Hong Kong, as well as AT&T and Comcast in the US. To fend off competition, TWM Broadband provides not only high-speed broadband internet access service, but also an increasing number of HD programs and more innovative digital value-added services to let subscribers enjoy a whole new experience in home entertainment.

Retail Business

1. Industry status and development

The proliferation of cable TV, digital TV and smart devices has given rise to a new breed of home shoppers. Consumers can order by telephone or through virtual platforms, choosing from a plethora of convenient payment options and receive the product in a short amount of time.

2. Industry value chain



momo sources its products from suppliers of daily necessities, beauty and personal care, travel services, and other products and services, and sell them through its TV home shopping networks, online shopping sites and mail order catalogues for members and general consumers.

3. Product development trends and competitive landscape

- (1) E-commerce: Although momo entered the market later than industry peers such as Yahoo! Taiwan and PChome Online, it has made major strides as a comprehensive business-to-consumer (B2C) e-commerce player, growing rapidly by leveraging its know-how in TV home shopping.
- (2) TV home shopping: Aside from momo, leading players in the industry include Easter Home Shopping (EHS) and viva. The rise of virtual shopping platforms has intensified competition from e-commerce and mobile commerce. momo has countered this by launching its own mobile apps, and leverage social platform and its capabilities including live streaming to strengthen the engagement with its membership and customer base..

(3) Catalogue / Mail order: The mail order business attracts different types of players, from TV home shopping operators (e.g., momo, EHS, U-Life and viva) to direct marketing players (e.g., Amway, Avon, Herbalife and Nu Skin), and Japanese mail order companies (e.g., DHC and Orbis). momo's main rivals in this business are direct marketing players and Japanese mail order companies.

Research and development expenditure

Investment in research and development and its ratio as a percentage of total revenue are shown in the table below. For 2017, the Company plans to spend NT\$832.7mn on the research and development of more advanced technologies to increase customer satisfaction, which in turn should boost value-added service revenue and overall operations growth.

Year	2016	2017 (As of January 31)
R&D expense (NT\$'000)	743,639	56,245
As a % of total revenue	0.64%	0.57%

Major research and development achievements

Project name	Description
5G green communication technologies	<ul style="list-style-type: none"> • Energy harvesting and low-power transmission technologies to extend the battery life of wireless IoT devices. • Cloud-radio access network (C-RAN) to minimize network delays, optimize power consumption, and reduce deployment costs. • Cell zooming, which adaptively adjusts cell size according to traffic load to save energy.
4G LTE customer experience management	Collect customer experience records from network probes to support better customer service, network optimization and user behavior analyses.
Call center PBX system – SS7 equipment upgrade	In line with the government policy to terminate 2G services, TWM upgraded its call center PBX and phased in voice gateway products and technology to build an IP-based service platform.
M+ Messenger	Provided video conference, video/audio/photo upload and answering machine functions to improve communication efficiency and productivity.
TAMedia mobile advertisement platform	Developed a new interactive ad – floating ad, and improved advertising performance by enriching video tracking mechanism.
myVideo	Renewed user interface and experience; enriched big screen interactive video playback; and provided multi-language video playback.
Mobile payment	Integrated a variety of transport payment cards and parking fee payment services for Taipei/New Taipei City.
myBook	Developed an end-to-end mechanism to enhance the experience of reading magazines on mobile devices. Provided a new mobile reading app to support interactive multimedia e-books. In addition, provided a one click button to allow users to switch between text and graphics modes while reading magazines.

Sales development plans

Consumer Business Group

1. Short-term plan

- (1) Leverage 4G LTE services to extend value-added services, including digital music, video and mobile commerce. Integrate virtual and physical channels to offer more instant and convenient consumption options.
- (2) Develop various rate plans to meet the needs of different types of customers and introduce a new store concept that provides optimal service processes and quality in order to give customers the best service experience.
- (3) Strengthen channel performance and competitiveness through management and deployment.

2. Long-term plan

The Company aims to provide subscribers with a variety of digital convergence services through 4G's faster transmission speed. The focus will be on the following:

- (1) Establishing a "quadruple-play" platform that integrates mobile communication, fixed line, broadband internet access and cable TV services to give the Company a lead over its competitors in offering digital convergence services in Taiwan.
- (2) Developing and introducing Internet of Things (IoT) technologies and platforms, e.g. Connectivity Management Platform, embedded Universal Integrated Circuit Card (eUICC) and Narrowband IoT. The initial focus will be on developing a connected car solution to provide global automakers with local connectivity and value-added services. The goal is to define and develop innovative and profitable business models in the IoT field.

Enterprise Business Group

1. Short-term plan

- (1) Develop comprehensive information security services.
- (2) Complete phase III construction of the cloud data center and promote it abroad.
- (3) Enhance Fleet Management System (FMS) in response to the rapid development of Internet of Vehicles (IoV) and usage-based insurance (UBI).
- (4) Develop unified communications (UC) service to satisfy clients' communication integration needs. Enterprise efficiency can be improved by integrating information receiving and sending in a single platform where the user can log in through a unified interface and device.

2. Long-term plan

EBG's vision is to expand enterprise services from network-centric to IP solutions, mobile applications and cloud services. The Company plans to:

- (1) Continue investing in cloud computing and enterprise integrated solutions.
- (2) Develop IoT integrated solutions for enterprise clients.
- (3) Raise sales productivity and expand the small-and-medium enterprise market through channel integration.

Home Business Group

1. Short-term plan

- (1) TWM Broadband will continue to optimize its network infrastructure in regions where it is already operating cable TV systems, and provide HD digital content and video on demand to set the foundation for its digital services.
- (2) TWM Broadband plans to launch its 500Mbps super high-speed internet access service bundled with HD digital TV to boost its cable broadband and digital TV service penetration rates in the hope of raising its subscriber mix of high-speed broadband service users and DTV customer numbers.

2. Long-term plan

In line with the National Communications Commission's goal of raising the digital TV penetration rate to 100% by the end of 2017, TWM Broadband aims to become a one-stop shop for home digital services by integrating high-definition digital content, multiple-viewing terminal devices, high-speed fiber-optic broadband services and cloud technology, allowing families and individual subscribers to enjoy the benefits of "four screens and a cloud" (i.e., mobile phones, PCs, tablets and TVs).

Retail Business

1. Short-term plan

- (1) E-commerce: Provide differentiated value-added services, further enhance competitive advantages in the mobile platforms, leverage big data analytics and recommend more personalized products to clients. Leverage various social shopping platforms and profit-sharing mechanisms to create a more significant revenue contribution from community shopping websites. Develop a B2B2C business model to introduce more leading brands, as well as mid-and-big physical suppliers, to provide customers with more diverse choices.
- (2) TV home shopping: Enhance product differentiation by listing more branded products from overseas, cultivating fan base on social platforms such as Facebook and Line, and cooperate with suppliers from E-commerce business to expand product offerings.
- (3) Catalogue / Mail order: Strengthen visual editing to refine the design of momo catalogs and develop e-catalog services to strengthen tractions with the customer base.

2. Long-term plan

Take a pro-active approach in increasing momo's brand image, further expand into Southeast Asia's TV shopping market,, export best-selling products across multiple countries, leverage the Group's marketing resources and sales channels to enhance efficiency of operation, and provide innovative services through mobile and cloud platforms.

Customer satisfaction

To create the best experience for customers, TWM conducts annual customer satisfaction surveys by telephone to better understand their needs and expectations. Customers are asked to evaluate call quality, rates, bills, customer hotline

service, store service, value-added services, and the Company's website among others. The findings from these polls are used as a reference to set new objectives and improve service quality.

Customer satisfaction key indicators	2014	2015	2016
Overall rating	3.7	3.7	3.8
Call quality	3.7	3.7	3.8
Customer hotline service	4.3	4.4	4.3
Store service	4.1	4.2	4.2
Note: Customer satisfaction is rated based on the following scores: Very satisfied (5), Satisfied (4), Neither satisfied nor dissatisfied (3), Dissatisfied (2) and Very dissatisfied (1).			

Market and Sales Overview

Market analysis

Consumer Business Group

1. Main products and service areas

The Company provides mobile services nationwide, covering Taiwan and the outlying islands of Kinmen and Matsu.

2. Market status

As of the end of 2016, the penetration rate for mobile subscribers had reached 123%, implying a saturated market. However, along with the fast-increasing adoption of 4G services, rapid innovations in mobile devices and rising demand for mobile internet and value-added services suggest a growing market, encouraging new entrants to venture into the market.

3. Competitive advantages

(1) Better customer mix

The Company has further improved its subscriber base structure, with 3G/4G subscribers accounting for 99% of the total as of January 2017.

(2) Market leader in wireless broadband

In 2005, the Company became the first mobile communication operator in Taiwan to launch 3G services, and in 2007, it rolled out the nation's first 3.5G services. In 2014, 4G services were launched. By the end of 2016, the Company had a 3G/4G subscriber base of more than 7.35 million users, who contributed more significantly to value-added service ARPU than 2G subscribers and have become the main driver of VAS revenue growth.

4. Opportunities and challenges

Positive factors