

ONLINE SUPPLEMENT TO

What Enables a Chinese Firm to Create New-To-The-World Innovations?

A Historical Case Study of Intra-firm Coopetition in the Instant Messaging Service Sector

By Johann Peter Murmann and Zhijing Zhu

PART 1: INTERVIEW QUESTIONS

Questions to Interview Technical Department Managers in WeChat Group

I. The overview of questions:

1. What have been the five biggest challenges that you faced in developing WeChat into a leading product? How did you try to overcome them?
2. What are the key management techniques that you use to get team members to develop innovative features of WeChat in a timely fashion?
3. How has the relationship between WeChat and QQ (particularly Mobile QQ) changed over time?
4. What are the main reasons for WeChat's success in and out of China?
5. What characteristics of WeChat are most attractive to users?
6. How did you get information on user demands for WeChat?
7. Why has WeChat evolved from an IM app to a wireless Internet platform aiming to connect users with everything?

II. Breakdown of the above questions:

1. What have been the five biggest challenges that you faced in developing WeChat into a leading product? How did you try to overcome them?
Please tell me some stories about the difficulties and your solutions.
2. What are the key management techniques that you use to get the teams to develop innovative features of WeChat in time?
 - (1) What do you regard as the key challenges for creating innovative features?
 - (2) What have you done to overcome these challenges?
 - (3) Did you allow for high autonomy of R&D team members to experiment with new features of WeChat?
 - (4) Did you provide incentives for team members to encourage innovation?
 - (5) Most software projects always take a long time. How did you get your team to develop new versions on time?
 - (6) Did you set up competition between rival teams on purpose? How did you deal with the competitions?

- (7) Did you use particular procedures and criteria to recruit team members?
- (8) Did you have difficulties in keeping your best employees? If so, what did you do?

3. How has the relationship between WeChat and QQ (particularly Mobile QQ) changed over time?

- (1) WeChat did not differ much from Mobile QQ until V2.5 (offering features such as People Nearby and Voice Note), except the Hold to Talk feature in V2.0 and the Receive and Reply to QQ Messages in V2.2. Why did you insist on developing it rather than giving it up?
- (2) Why have WeChat and Mobile QQ continued to offer similar non-profitable features, such as Video/Audio Call, QQ Mail Notification, File Transfer between PC and Smartphones, Payment? Why does WeChat offer features that would reduce users' start-ups of Mobile QQ and effective time spent on Mobile QQ, e.g. receiving and replying to QQ messages? Why did this happen before WeChat gained a large user base? Why are the similar features unavailable in Mobile QQ, due to technical reasons or firm-level policies?
- (3) Why did this also happen to Tencent Weibo and QQ Mail from early on? E.g. together with the launch of the Hold to Talk feature in V2.0 that boosted the first user growth, WeChat offered the feature named Weibo Photo Assistant for beautifying and uploading photos to Tencent Weibo without logging onto Tencent Weibo, as well as the feature named QQ Mail Notification to receive and read QQ mails without logging onto QQ Mail.
- (4) Did WeChat team and Mobile QQ team share technologies with each to develop similar features, E.g. People Nearby in WeChat vs. Look Around in Mobile QQ?
- (5) Why was the Hold to Talk feature available in WeChat 4 months earlier than Mobile QQ, although the feature was said to be built on the voice-chat technology developed by Mobile QQ team early on? (May 10 2011 compared to Sept 20 2011)
- (6) In terms of Payment functions, Mobile QQ team seemed to have the technology a few years earlier than WeChat, but it offered similar features (e.g. Money Transfer) later than WeChat. Why did this happen? On the other hand, the integration of Balance and Money Transfer features seemed to be technically available for WeChat V5.0, but were not launched in WeChat until V5.3.1 (Jun 23 2014), which was three months later than Mobile QQ (Mar 21 2014). Why did this happen?
- (7) WeChat always launches new features first for iPhone, whereas Mobile QQ always does this for Android phones. What are the reasons for this difference?
- (8) Users can switch between WeChat's domestic version and international version by changing language settings from Chinese to English and vice versa, whereas users have to install a separate app QQ International to use the international version of Mobile QQ. What are the reasons for this difference?

4. What are the main reasons for WeChat's success in and out of China?

- (1) What are the main domestic and foreign competitors of WeChat in the Chinese market?
- (2) What was the key to WeChat's success over Xiaomi's MiTalk, which was launched three months earlier than WeChat and attracted a large number of users quickly?
- (3) What are the main reasons for WeChat to win over domestic rivals even if they offer similar features, e.g. Alibaba's Laiwang?
- (4) Has the monthly active users of WeChat exceeded those of Mobile QQ up to now? If this happens someday, what are the main reasons?
- (5) What are the main reasons for WeChat's success in international markets?
- (6) Out of all the reasons for WeChat's success in and out of China, which are applicable to WeChat only but not its rivals?

5. What characteristics of WeChat are most attractive to users?

- (1) If he answers a large number of features, what features of WeChat are most often used per day? Can you provide us with the monthly data of how many minutes per month users spent on

different features of WeChat (e.g. games, online shopping, Moments, IM), how many messages were sent through WeChat?

(2) If he answers the innovativeness of WeChat, what are the main features of WeChat innovated by WeChat team? What are the main features learnt from foreign and domestic competing products, such as QQ (Computer-based QQ and Mobile QQ), Facebook, microblog apps, Instagram, etc.?

(3) If WeChat did not offer many features for the first time in the world, why do you believe WeChat is innovative?

(4) If it is the ease of use, how could you keep it simple to use such a large number of features? Does one person have the final authority of the user interface just as Steve Jobs at Apple had this authority?

(5) If it is the faster update of new versions, how did you control the intervals between every two versions of WeChat? Were the intervals always shorter than rivals? How could you achieve this?

(6) If it is earlier availability of new features than rivals, how could you always launch new features earlier than rivals?

6. How did you get information on user demands for WeChat?

(1) What role did the User Experience Department play?

(2) Which user group's demands did your team pay most attention to, high-end users or low-end users (more exactly, "losers", i.e. "Diao Si" in Chinese)? Which user group accounted for the biggest share of WeChat's monthly active users, high-end users or low-end users?

(3) WeChat always launched new features first for iPhone. Was this because iPhone users are viewed as high-end users?

(4) Did WeChat always have more iPhone users than Android users? Did iPhone users always increase at a faster rate than Android users? Did iPhone users run WeChat more times or spend more time per day on WeChat than Android users do?

Why were there fewer minor-update versions for Android than for iPhone? Was this simply because Android versions were later than iPhone versions?

7. Why has WeChat evolved from an IM app to a wireless Internet platform aiming to connect users with everything?

(1) WeChat features extend step by step from IM to SNS, media, OTO, and finally a wireless Internet platform to connect users with everything. When was this roadmap determined? What was the logic behind this roadmap? Was there a blueprint for this roadmap?

(2) How were WeChat's features determined? E.g. Though voice messages did not account for a large share of all the messages sent via WeChat after the Hold to Talk feature was launched, more voice/audio functions were added to WeChat over time (e.g. Audio call, Walkie-talkie). Why did you keep on investing in voice/audio functions? (To compete with Mobile QQ, YY, Skype, and others?)

(3) How did you decide to build into WeChat the features that were not available in IM apps before, e.g. shaking my phone to identify music?

(4) Did you recall any feature after launching it? Before the launch of new versions, how did you ensure that the features would be accepted by most users?

(5) How did you allocate features to different versions? In what order? E.g. People Nearby feature in V2.5, Walkie-talkie feature and Shaking to identify music feature in V4.5?

(6) How did you allocate the features serving the same purpose to different versions? E.g. for the purpose of voice/audio IM, you launched Hold to Talk feature in V2.0, Video/Audio Call in V4.2, and Walkie-talkie in 4.5. Why didn't you launch them in neighbouring versions?

(7) Why did you accomplish the WeChat payment function with a total of seven versions (nine versions from V5.0 on Aug 5 2013 to V6.0 on Sep 30 2014, excluding V5.2.1 and V5.3)?

(8) Why did you launch the feature of making payment via bank cards covertly in V5.0? I.e. it would not be available until users successfully made one payment in an official account, and only three or four official accounts allowed for payment then.

(8) How did the feature of following Official accounts emerge?

(9) Have you customized the international version of WeChat for different local markets? Can you give me some examples?

PART 2: SUPPLEMENTARY TABLES AND FIGURES

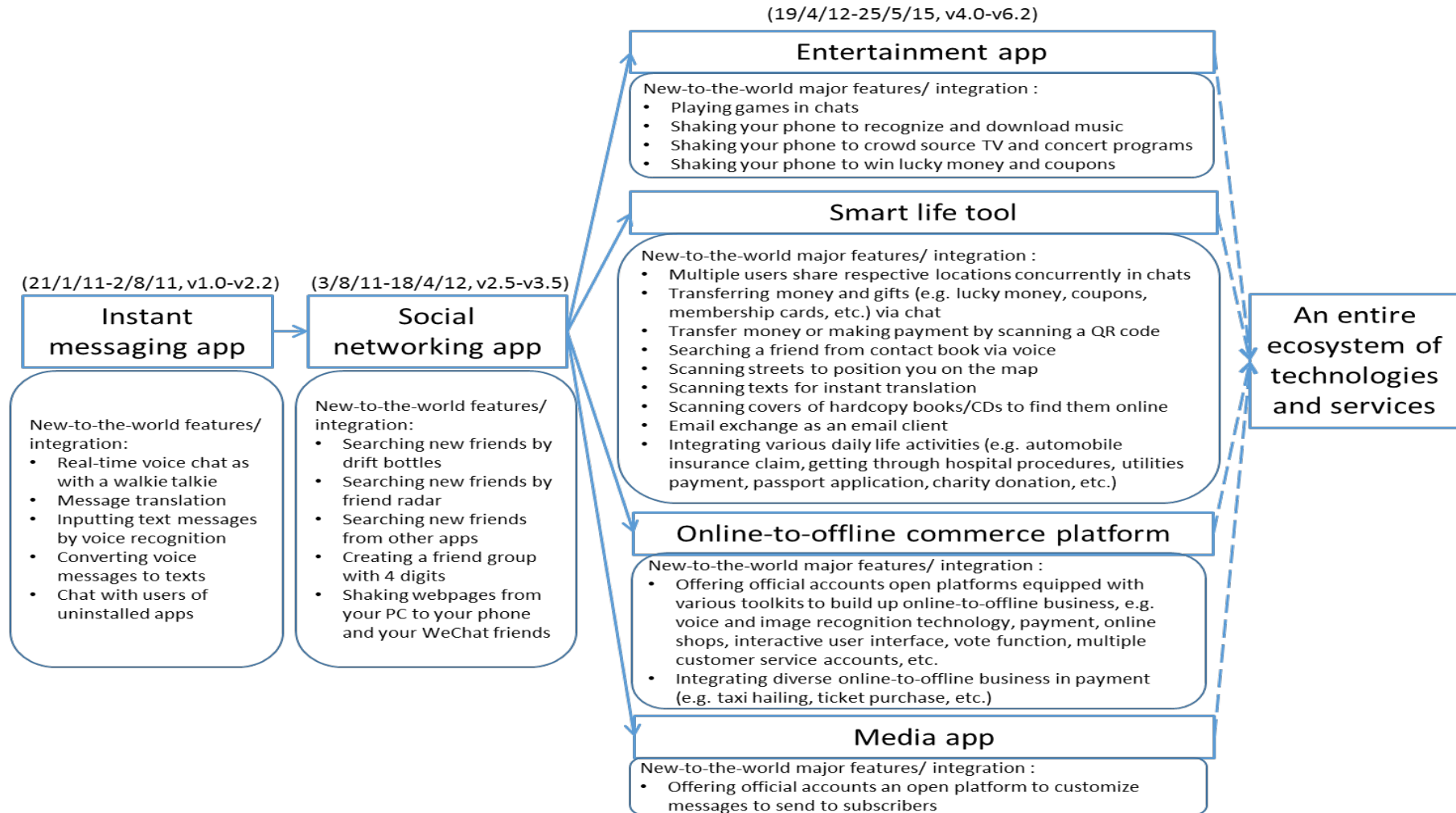


Figure A1. WeChat’s Functionality Change and Its Main new-to-the-world Features or Integration (Jan 2011-May 2015)

Data source: The author’s summary based on data as of May 2015.

Table A1. Timelines of Selected Features of WeChat and Mobile QQ (as of 23/01/2017)

	WeChat	Mobile QQ	WeChat launched first	Mobile QQ launched first	Unavailable in Mobile QQ	Unavailable in WeChat
Chat functions						
Text	21/01/2011	2000/4/~		Yes		
Photos	21/01/2011	26/10/2010		Yes		
Send multiple photos at a time to chat	5/02/2013	3/07/2013	Yes			
Photos with a preset lifespan	N/A	24/09/2013				Yes
Voice (hold to talk)	10/05/2011	20/09/2011	Yes			
Chang chat voices	N/A	10/06/2015				Yes
Walki-talki voice chat	5/02/2013	Later	Yes			
Input texts via voice	5/08/2013	N/A			Yes	
Transfer chat voices to chat text	26/01/2014	N/A			Yes	
Videos	3/08/2011	12/09/2014	Yes			
Graffiti	N/A	20/09/2011				Yes
Anonymous chat	N/A	12/09/2014				Yes
Animated stickers	20/12/2011	26/10/2010		Yes		
Emoticons	6/04/2011	before 2008		Yes		
Emoticons automatically triggered while sending wishes in chat	19/01/2012	Later	Yes			
Customize stickers	20/12/2011	7/03/2011		Yes		
Audio stickers	N/A	24/09/2013				Yes
Stickers with your own face	N/A	10/01/2014				Yes
Recommend stickers while chatting with contacts	26/01/2014	Later	Yes			
Share sticker series to chat	26/01/2014	Later	Yes			
Frequently used phrases and sentences to choose from as chat response	N/A	25/08/2008				Yes
Auto response	N/A	30/03/2011				Yes
Location	19/04/2012	9/02/2012		Yes		
Real-time location sharing in chat	26/01/2014	N/A			Yes	
Navigation as per the location sent by another user via chat	5/02/2013	Later	Yes			
Contact (name card)	19/04/2012	Later	Yes			
Music	19/04/2012	2008 or earlier		Yes		
Hyperlinks	10/03/2011	2008 or earlier		Yes		
Screenshots	5/02/2013	before 2011/12/16		Yes		
Send screenshots directly to chat	5/02/2013	Later	Yes			
Send messages to multiple contacts simultaneously (not group chat)	19/01/2012	26/10/2012	Yes			
View unread chats	21/01/2011	Early on		Yes		
Play games in chat	14/12/2011	N/A			Yes	
Translate chat texts between Chinese and English	8/05/2014	29/09/2013		Yes		
Event reminder	N/A	27/06/2014				Yes
Chat with other SN app users	10/03/2011	N/A			Yes	
Voice note to yourself	3/08/2011	N/A			Yes	
Chat with yourself	5/02/2013	N/A			Yes	
Voice reminder to yourself	5/02/2013	N/A			Yes	
Transfer files in chat		8/05/2013				Yes
Transfer money in chat	23/06/2014	27/01/2015	Yes			
Send and receive red packets in chat	19/01/2015	27/01/2015	Yes			
Group chat	21/03/2011	25/08/2008		Yes		
Group live voice chat	5/02/2013	N/A			Yes	

Group anonymous chat	N/A	Available				Yes
Remind group chats pertaining to the user	26/01/2014	Later	Yes			
Forward chat messages	Available	1/11/2012	Yes			
Forward photos and videos in chat	19/04/2012	Later	Yes			
Forward multiple chat messages at a time	24/10/2013	12/09/2014	Yes			
Send multiple chat messages to email	24/10/2013	N/A			Yes	
Recall chat messages	23/06/2014	Later	Yes			
Add chats to favourites	5/08/2013	Later	Yes			
Stick a chat on the top of all chats	5/09/2012	10/06/2015	Yes			
Audio display of messages for visually disabled users	N/A	10/01/2014				Yes
Multiple chat windows	N/A	25/08/2008				Yes
Turn on or off speaker to listen to voice messages	15/08/2011	24/11/2011	Yes			
Change chat background	14/12/2011	16/07/2012	Yes			
Change styles of chat message frames	N/A	3/07/2013				Yes
Receive and send chat messages via SMS without installing the app in phones	N/A	1/12/2011				Yes
Flicker chat windows	N/A	10/05/2012				Yes
Set up words unpermitted to use in group chats	N/A	27/06/2014				Yes
Forward multiple chat messages to multiple friends at a time	1/02/2016	N/A			Yes	
Search chat history	5/02/2013	30/10/2015	Yes			
Backup chat history	5/02/2013	4/01/2008		Yes		
Export chat history	24/03/2014	7/06/2010		Yes		
Move chat history	5/02/2013	14/05/2008		Yes		
Call functions						
Audio	19/07/2012	10/01/2014	Yes			
Customize ringtones for audio call	N/A	9/12/2014				Yes
Video	19/07/2012	29/07/2011		Yes		
Switch between video and audio call	19/07/2012	16/08/2014	Yes			
Save video calls to make stickers with your own face	N/A	21/05/2016				Yes
Add emoticons, filter and special effects to the video call	N/A	16/09/2016				Yes
Group audio/ video call	19/10/2015	5/05/2014		Yes		
Anonymous group audio call	N/A	12/05/2015				Yes
Make appointments for group video call	N/A	10/06/2015				Yes
Switch between mobile phones and PC during audio/ video call	N/A	1/12/2014				Yes
Zoom out the video call window	20/12/2014	6/08/2015	Yes			
Beautify users' faces during video call	N/A	11/04/2015				Yes
Sharing screens during video call	N/A	12/05/2015				Yes
Screen child lock for video call	N/A	9/09/2015				Yes
Telephone Call functions						
Make phone calls directly to banks, hotels, hotlines etc.	N/A	12/05/2015				Yes
Find new contacts						
ID	21/01/2011	2000/4/~		Yes		
Other SN app IDs	10/03/2011	N/A			Yes	
Phone number	8/06/2011	10/01/2013	Yes			
People nearby	3/08/2011	10/11/2011	Yes			
Respond greetings from strangers and add remarks to strangers	5/02/2013	1/12/2014	Yes			
Interest tribes	N/A	10/01/2014				Yes
Nearby discussion groups	N/A	9/12/2014				Yes
Roaming on map to look for people nearby	N/A	9/12/2014				Yes

Add Charm value to people nearby	N/A	12/05/2015		Yes
Create a chatroom with people nearby	N/A	30/10/2015		Yes
Send flowers to people nearby and exchange received flowers for shopping cards	N/A	29/12/2015		Yes
Scan QR code	21/01/2011	8/05/2013	Yes	
Email address	21/03/2011	N/A		Yes
Recommendation by Interpersonal circles (employers, schools and friends)	6/04/2011	5/05/2014	Yes	
Recommendation	6/04/2011	10/11/2011	Yes	
Shake	1/10/2011	N/A		Yes
Friend radar	26/01/2014	11/04/2015	Yes	
Create a group by multiple users inputting the same 4 numerical figures	8/05/2014	N/A		Yes
Contact management				
Classify into different categories	10/03/2011	25/08/2008		Yes
Block contacts (blacklist)	21/03/2011	30/03/2011	Yes	
Search a contact from chat history or contact book via text	10/03/2011	3/08/2010		Yes
Search a contact from contact book via voice	5/09/2012	N/A		Yes
Add remarks to contacts	10/03/2011	7/06/2010		Yes
Add descriptions and photos to a contact's remark	26/01/2014	Later	Yes	
Chat group's name card	5/02/2013	4/01/2009		Yes
Revise remarks of chat groups	3/08/2011	Later	Yes	
A Favourite Friends category of contact	19/04/2012	5/05/2014	Yes	
Add frequently contacted friends to desktop	Later	25/07/2012		Yes
Personal profile				
Personal profile	21/01/2011	2000/4		Yes
Change profile	21/01/2011	14/01/2008		Yes
Upload avatars and photos to customize personal name card	21/01/2011	12/01/2012	Yes	
Put multiple photos in personal name card	N/A	16/07/2012		Yes
Use a short video as avatar	N/A	16/09/2016		Yes
Write and change What's up	3/08/2011	26/10/2010		Yes
QR-code name card	14/12/2011	8/05/2013	Yes	
Add audio introduction to personal profile	N/A	24/09/2013		Yes
Customize personal profile background	N/A	10/01/2014		Yes
Social page features				
Text	19/04/2012	2007 or earlier		Yes
Photos	19/04/2012	2007 or earlier		Yes
Videos	19/04/2012	2007 or earlier		Yes
Shoot a video clip and post it to personal page	30/09/2014	9/12/2014	Yes	
Hyperlinks	19/04/2012	2007 or earlier		Yes
Music	Early on	2007 or earlier		Yes
Location	21/03/2014	3/07/2013		Yes
Comment on yourself and friends' pages	19/07/2012	Available		Yes
Change pendants (e.g. weather forecast) of the page	N/A	24/09/2013		Yes
Quick view and comment on the updates of Contacts' social pages	19/04/2012	9/11/2010		Yes

Translate texts in the page between English and Chinese	25/05/2015	N/A		Yes
Edit a video clip after shooting it and before sending it to chat/personal page	N/A	14/07/2016		Yes
Social networking functions				
Drift bottle	1/10/2011	N/A		Yes
Invite other SN app users to use the app	6/04/2011	N/A		Yes
Invite email users to use the app	6/04/2011	N/A		Yes
Share photos to other SN apps	10/05/2011	9/11/2010	Yes	
Share ID to other SN apps (e.g. Sina Weibo)	8/06/2011	Available	Yes	
Receive and reply to chat messages of other IM apps	30/06/2011	N/A		Yes
Sharing QR code to other SN apps (e.g. Facebook, Sina Weibo)	14/12/2011	Available	Yes	
Integrate Tencent Weibo & News	19/01/2012	2006 or earlier		Yes
Game centre	5/08/2013	2006 or earlier		Yes
Prepay mobile phone charge for friends	20/12/2013	Later		Yes
Synchronize What's up to other SN apps	N/A	26/10/2010		Yes
Create shared albums to share photos with multiple contacts	21/03/2014	24/09/2013	Yes	
Chat group management				
Shared space management (documents, albums, notices, calendar, votes, etc.)	N/A	8/05/2013		Yes
Diverse group functions excluding payment (e.g. file transfer, sending and receiving gifts, voting, discussion topics, creating and joining in group activities, subscribing to interest tribes, playing games)	N/A	Functions increased over time		Yes
Teacher-student chat groups for homework assignment and feedback	N/A	6/08/2015		Yes
Preview compressed folders online	N/A	14/07/2016		Yes
My Favourites				
Edit contents saved in My Favourites	8/05/2014	9/12/2014	Yes	
Create own records with texts & images in My Favourites	1/09/2015	Available		
Save documents in your phone to My Favourites	Available	12/12/2016		
Payment				
Payment with bank card	5/08/2013	21/03/2014	Yes	Yes
Send and receive red packets in chat	28/01/2014	26/01/2015	Yes	
Payment by tapping bank IC card	N/A	26/01/2015		Yes
Payment with QQ Coins	N/A	21/03/2014		Yes
Payment with Balance	23/06/2014	21/03/2014		Yes
Transfer money	23/06/2014	26/01/2015	Yes	
Sellers receive payment by scanning a user's QR code	14/08/2014	Later	Yes	
Card wallet to put coupons, membership cards, movie tickets and air tickets etc.	30/09/2014	Later	Yes	
Set hand password for payment	30/09/2014	28/05/2016	Yes	
Give payment rewards to sticker creators	19/10/2015	Available		
Make payments in chat groups	25/10/2016	Available		
Send and receive red packets by scanning QR codes	23/01/2017	Available		
Entertainment, Media, Smart life, online-to-offline functions				

Receive and read QQ emails	10/05/2011	2007 or earlier		Yes		
Send emails with attachments	19/01/2012	3/07/2013	Yes			
Shake webpages from PC to your smartphone and shake the webpages to your contacts	5/09/2012	N/A			Yes	
Transfer files between PC and phone	19/07/2012	28/01/2013	Yes			
Short-distance high-speed file transfer via Wifi or Wifi hotspot	N/A	5/05/2014				Yes
5M/B face-to-face file transfer	N/A	12/09/2014				Yes
2GB file transfer to offline friends per day	N/A	Available				Yes
Upload files to Cloud	N/A	Available				Yes
Synchronize voice notes to QQ Mail	27/10/2011	N/A			Yes	
Transfer chat data to email	24/10/2013	N/A			Yes	
Transfer chat data to SD card	Available	9/11/2010		Yes		
Capture phone screenshots	5/02/2013	16/12/2011		Yes		
Switch between landscape and portrait display	Later	27/04/2010		Yes		
Edit photos	8/06/2011	3/07/2013	Yes			
Add locations to photos	Later	3/07/2013		Yes		
After taking a photo, edit it before sending to chat or posting to Moments	20/12/2016	14/07/2016		Yes		
Search restaurants	19/01/2015	22/03/2012		Yes		
E-book reading	N/A	24/09/2013				Yes
Scan any QR code	5/09/2012	Later	Yes			
Scan barcodes	5/08/2013	N/A			Yes	
Scan book covers	5/08/2013	N/A			Yes	
Scan streets	5/08/2013	N/A			Yes	
Scan words and translate between Chinese and English	5/08/2013	N/A			Yes	
Scan and save business cards	N/A	1/04/2016				Yes
Scan augmented-reality (to win lucky money)	N/A	17/01/2017				Yes
Shake to search music	5/02/2013	N/A			Yes	
Shake to win red packets	19/01/2015	N/A			Yes	
Shake to search TV programs	19/01/2015	N/A			Yes	
Shake to plot a concert programs	2015/~	N/A			Yes	
Identify QR codes in pictures	14/08/2014	N/A			Yes	
Recognize QR codes in pictures to scan QR codes without saving them first into phones	14/08/2014	Later	Yes			
Official account	19/07/2012	3/07/2013	Yes			
Official accounts push messages to subscribers	20/07/2012	N/A			Yes	
Customize the app theme	N/A	3/07/2013				Yes
Sticker store	5/08/2013	3/07/2013		Yes		
Integrate payment with multiple daily life services	26/01/2014	21/03/2014	Yes			
Record health status	30/03/2015	12/09/2014		Yes		
Walk ranking and donating walk distance	21/03/2016	Available				
The Internet of things	5/09/2015	26/01/2015		Yes		
Mini App allowing users to use various services, goods, devices but not install the corresponding apps	9/01/2017	N/A			Yes	
Versions for wearable devices (e.g. Apple Watch)	30/03/2015	12/05/2015	Yes			
Web-based version	19/07/2012	2009/9/~		Yes		
SUM			57	51	36	54

Note: The table is built on various public resources, mainly on Tencent's official information (e.g. Mobile QQ Team, 1998-2017; WeChat Group, 2011-2017).

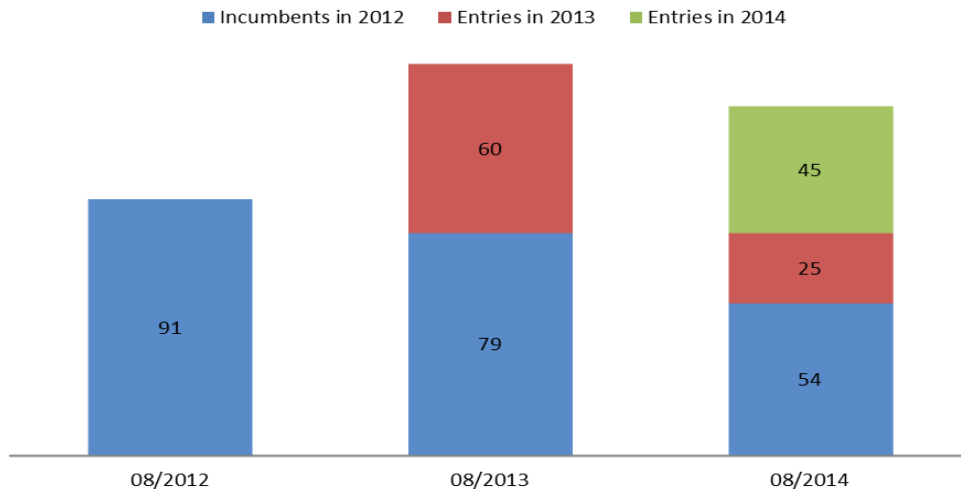


Figure A2. Entries and exits of smartphone-based IM apps in the Chinese market (Aug 2012-Aug 2014)

Note: The diagram is built on iResearch Inc. (2012), which is a database tracking the real-time usage of smartphone-based apps of Chinese smartphone users aged between 18 and 60 years around the clock day by day. The available data starts from Aug 2012. We collected data till Oct 2014 in Dec 2014. Names and monthly unique users of specific apps are listed in Table A1.

Table A2. The number of monthly unique users of smartphone-based IM apps in China (Aug 2012-Aug 2014) (Unit: 10 thousand)

SN	App name	Aug 2012	Aug 2013	Aug 2014
1	WeChat	8,288.67	18,982.68	29,857.03
2	Mobile QQ	12,056.79	19,829.76	26,636.11
3	Wangxin	778.63	2,501.68	5,550.34
4	Laiwang	#N/A	56.03	4,435.83
5	Yixin	#N/A	1,883.87	3,867.59
6	Uxin	488.41	2,874.60	2,939.11
7	Fetion	2,530.43	2,458.80	1,389.77
8	Uwewe	227.71	810.81	1,271.33
9	YY Voice	428.27	696.84	1,088.02
10	QQ Lite	#N/A	#N/A	686.35
11	Ailiao	429.31	1,032.36	684.67
12	Youni	806.17	855.97	600.99
13	Laidiantong	931.01	646.86	594.78
14	Line	31.74	658.67	467.83
15	CloudCall Free VoIP	52.15	451.85	457.29
16	Wemeet	#N/A	#N/A	422.88
17	Xiaohuoban	#N/A	#N/A	364.5
18	Google Talk	295.03	201.01	356.01
19	Tiantianliao	38.65	103.64	350.27
20	Fetion lite	245.12	247.17	349.58
21	Yudian	124.2	254.41	337.16
22	MiTalk	1,022.37	705.14	327.86
23	Skype	211.35	230.08	315.89
24	Samsung ChatON	#N/A	144.43	306.67
25	IShow	#N/A	#N/A	306.17
26	Jijia	#N/A	#N/A	301.33
27	GO	336.98	303.3	247.33
28	bangbang zhanggui	#N/A	#N/A	220.4
29	vhua	#N/A	#N/A	220.06
30	yxhuying	#N/A	#N/A	216.03
31	Weihui	#N/A	#N/A	203.29
32	Tonghualuyin	46.54	78.38	197.99
33	3Gdh	#N/A	#N/A	187.2
34	Feiin	70.89	271.44	164.1
35	Whatsapp messenger	84.51	91.24	159.29
36	SKY	98.28	123.56	150.94
37	Kcshengqian	51.98	271.18	149.14
38	Handbb	19.15	177.42	134.6
39	AliCall	14.57	8.96	123.4
40	Callme	#N/A	77.39	120.59
41	Bitesms	122.3	88.74	111.74
42	51375	77.69	125.87	106.87
43	4Gdh	#N/A	100.94	101.65
44	Viber	62.91	91.59	98.26
45	Tuotuo	#N/A	93.07	93.39
46	Kcwangluo	35.3	384.53	91.45
47	Ipaychat	30.82	#N/A	90.53
48	Alitongxin	#N/A	#N/A	85.67
49	italk24	#N/A	119.77	79.73
50	hcsql	#N/A	79.26	73.98
51	Maike	#N/A	#N/A	73.54
52	Inbilin	#N/A	179.02	70.38
53	Kakao Talk	17.32	46.15	60.63
54	UU	54.27	195.21	56.14
55	Duoliao	#N/A	32.21	54.69
56	Tianxiatong	#N/A	#N/A	53.01
57	V3	#N/A	#N/A	52.87
58	Fscall	#N/A	133.22	46.3
59	Yiliao	414.5	486.6	44.39
60	Savecall	#N/A	24.05	41.48
61	Mianfeiquanqitong	#N/A	189.83	40.87
62	Wali SMS	87.25	26.29	40.59
63	Moca	#N/A	#N/A	40.47

64	Baidu Hi	#N/A	#N/A	39.24
65	4Gdh	#N/A	#N/A	37.93
66	Feiliao	422.21	265.22	37.05
67	eliaowldh	31.2	89.33	36.09
68	Callda	#N/A	6.62	35
69	Xunliao	#N/A	#N/A	34.98
70	365anycall	#N/A	#N/A	34.76
71	Yibeicall	#N/A	10.24	34.18
72	Dongeyixin	#N/A	11.29	33.25
73	Changbo	#N/A	#N/A	33.1
74	Zhufutixing	81.08	155.57	32.38
75	Souba	#N/A	#N/A	29.93
76	360Tonghua	#N/A	104.81	28.67
77	QQvoice	41.87	58.17	27.72
78	Okboo	#N/A	12.46	26.74
79	Zhaopengyou	89.06	68.28	25.95
80	Maai Beta	76.04	30.04	25.06
81	MiMiCall	#N/A	23.04	24.99
82	Android SMS	29.27	17.53	23.62
83	HandcentSMS	86.05	55.72	23.57
84	Xiaoxuntong Assistant	#N/A	89.27	23.3
85	Kuaibo	#N/A	15.45	20.66
86	AliWangwang for Taobao sellers	#N/A	145.43	20.39
87	Huixin	#N/A	#N/A	20.21
88	VVCall	#N/A	#N/A	19.88
89	Shengqiandianhuabao	#N/A	21.39	19.17
90	Duoqu Zhufuduanxin	#N/A	10.62	19.05
91	ETsmssprite	10.1	10.1	18.18
92	G3tonghua	#N/A	40.53	17.53
93	3Gwldh	137.54	229.49	17.25
94	Duanxintong	74.21	27.73	17.24
95	Alitong	107.9	149.99	15.73
96	WiFiwldh	#N/A	#N/A	14.88
97	Sovi	#N/A	#N/A	13.27
98	Duoqu SMS	#N/A	24.3	13.19
99	Yibo	#N/A	#N/A	13.06
100	Handbb jisu	#N/A	24.5	11.55
101	Kuhuawang	5.25	27.85	11.45
102	Kaakoo	#N/A	51.21	10.38
103	139talk	23.84	18.62	10.22
104	Huatong	#N/A	#N/A	9.8
105	Diaosi	#N/A	22.55	9.65
106	Xianzhen Sip	#N/A	5.05	9.53
107	Yunhao	#N/A	94.41	9.28
108	hello	#N/A	#N/A	9.09
109	Tongtong	261.51	105.87	9.09
110	Xiuba app	#N/A	16.35	8.94
111	Jiuzhoutong	35.5	50.65	8.51
112	ETfetion	23.23	19.19	8.34
113	Taodianhua	#N/A	#N/A	7.19
114	4Gdh-shenzhen	#N/A	#N/A	7.19
115	Mobile MSN Messenger	145.05	73.46	7.12
116	Duodadianhua	#N/A	#N/A	7.07
117	Changliaotong	#N/A	#N/A	7.07
118	Facebook Messenger	#N/A	#N/A	7.07
119	Sqt001	61.77	27.34	6.54
120	Free call	#N/A	24.94	6.26
121	MobileVOIP	#N/A	23.45	6.06
122	Yueyuetong	#N/A	#N/A	6.06
123	Xinxipaopao	14.23	10.33	6.06
124	Wexin selection	#N/A	13.23	5.39
125	Linphone	211.7	932.01	#N/A
126	Google Voice	1,044.53	668.11	#N/A
127	PHONE+	132	270.26	#N/A
128	BBQ	16.81	6.63	#N/A
129	Sina Weiyou	15.06	61.57	#N/A
130	HYDRA	67.15	52.63	#N/A

131	Yunhaoma	7.95	49.45	#N/A
132	Weiyou	24.3	37	#N/A
133	Efenliao	20.11	22.88	#N/A
134	Tiantian	10.71	21.96	#N/A
135	Baidutong	118.5	20.04	#N/A
136	SIP139	5.69	17.46	#N/A
137	Voice360	56.81	15.47	#N/A
138	Ehu	122.45	15.47	#N/A
139	Freecall	34.82	13.86	#N/A
140	Kktalk Messenger	29.76	13.54	#N/A
141	Gexin	47.26	13.37	#N/A
142	Sixin	297.57	12.41	#N/A
143	SMS Backup+	7.07	7.15	#N/A
144	Hupan	34.15	6.93	#N/A
145	Wo	44.34	11.79	#N/A
146	Groupsms	19.52	11.64	#N/A
147	Voice sms	10.22	9.45	#N/A
148	Tango	6.93	8.76	#N/A
149	66call	8	7.77	#N/A
150	Mianfeibodianhua	#N/A	234.03	#N/A
151	Bameiliao	#N/A	65.78	#N/A
152	VoIPFree	#N/A	61.27	#N/A
153	Yixin-Jincheng	#N/A	38.44	#N/A
154	9158	#N/A	32.06	#N/A
155	Huhuk	#N/A	24.26	#N/A
156	200call	#N/A	23.68	#N/A
157	Wexin Navigator	#N/A	23.32	#N/A
158	Youletong	#N/A	22.32	#N/A
159	Yikuaitong	#N/A	20.04	#N/A
160	JYSphone	#N/A	18.27	#N/A
161	Dingding	#N/A	17.96	#N/A
162	indoona	#N/A	15.2	#N/A
163	Ephone	#N/A	14.05	#N/A
164	Google Hangouts	#N/A	12.83	#N/A
165	Jego	#N/A	10.41	#N/A
166	Caiyin	#N/A	8.82	#N/A
167	51375 group call	#N/A	7.52	#N/A
168	3Gdianhuatong	#N/A	6.37	#N/A
169	Youkeshengqianbao	#N/A	6.22	#N/A
170	Weiyuyin	#N/A	6.06	#N/A
171	Sunultimate	#N/A	5.67	#N/A
172	Jierizhufuduanxindaquan	#N/A	5.05	#N/A
173	AOL AIM	#N/A	5.05	#N/A
174	MMS reader	#N/A	5.05	#N/A
175	Chaojidianxin Bomber	12.63	#N/A	#N/A
176	Guojidianxin	11.31	#N/A	#N/A
177	Pansi SMS	8.08	#N/A	#N/A
178	Changletong	42.14	#N/A	#N/A
179	btcall	13.54	#N/A	#N/A
180	IM+	51.33	#N/A	#N/A
181	EBUDDY	24.77	#N/A	#N/A
182	iMiChat	9.09	#N/A	#N/A
183	Iphone QQ Duokai	8.34	#N/A	#N/A
184	Iphone qq 24hours	7.07	#N/A	#N/A
185	Jiongxin	36.28	#N/A	#N/A
	Total number of IM apps	91	139	124

Note: The table is built on iResearch Inc. (2012). Monthly unique users are those who use a given app at least one time in a given month. A user using the app for more than one time is still counted as one user. “#N/A” means the app was not available at that point in time. The apps highlighted in grey are the leading IM apps developed by foreign firms.

Table A3. The number of monthly unique users of social networking services apps in China (Aug 2012-Aug 2014) (Unit: 10 thousand)

SN	App	Aug-12	Aug-13	Aug-14
1	Qzone	4,215.94	6,512.07	5,552.50
2	RENN	1,801.29	2,533.99	1,968.89
3	Kaixinwang	339.75	176.67	37.5
4	Friends Network	221.84	196.02	52.08
5	GOOGLE+	101.04	170.81	93.54
6	FACEBOOK	99.79	288.31	215.62
7	Chirp	45.78	17.98	#N/A
8	Weifaxian	27.16	#N/A	#N/A
9	Duitang	25.92	163.46	192.97
10	Feizan	19.13	38.38	21.22
11	LinkedIn	19.09	26.91	59.26
12	BeginShare	14.44	#N/A	#N/A
13	Yemao	9.57	#N/A	#N/A
14	Mobile MOMO	8.95	#N/A	#N/A
15	Niupai	8.08	31.55	#N/A
16	Daka	7.27	#N/A	#N/A
17	Douliu	6.2	9.09	#N/A
18	Xiaoenai	6.06	135.31	95.15
19	Douyou	#N/A	84.51	#N/A
20	Liangbuluquanzi	#N/A	63.01	#N/A
21	Who?Now!	#N/A	53.48	83.95
22	It's me!	#N/A	33.83	#N/A
23	iShejjiao	#N/A	21	15.35
24	Path	#N/A	17.32	14.05
25	Demai	#N/A	16.82	#N/A
26	Wanpai	#N/A	13.13	#N/A
27	Guanxiwang	#N/A	11.68	#N/A
28	51 Space	#N/A	11.11	6.39
29	Gexing	#N/A	5.05	#N/A
30	Qupai	#N/A	#N/A	286.65
31	Fenmuer	#N/A	#N/A	131.3
32	Youmi	#N/A	#N/A	118
33	Simiquan	#N/A	#N/A	117.61
34	Qiaoqiao	#N/A	#N/A	116.51
35	Hangouts	#N/A	#N/A	113.91
36	Blued 2013	#N/A	#N/A	112.24
37	Ji	#N/A	#N/A	91.35
38	Soap Comic	#N/A	#N/A	84.89
39	Xiaobalaile	#N/A	#N/A	73.91
40	Kupao	#N/A	#N/A	72.28

41	Mika	#N/A	#N/A	66.87
42	TTWX	#N/A	#N/A	43.77
43	Kaomi	#N/A	#N/A	33.9
44	NSJNQC	#N/A	#N/A	26.66
45	Qingchifan	#N/A	#N/A	25.51
46	Hiliao	#N/A	#N/A	20.03
47	Kugou Fanxing	#N/A	#N/A	17.59
48	Foursquare	#N/A	#N/A	12.12
49	Xiaonei Mimi	#N/A	#N/A	8.2
50	AA Social	#N/A	#N/A	5.18
Total		18	24	35
Incumbents			13	14
New entrants			11	21
Exits			5	15

Note: The table is built on iResearch Inc. (2012). Monthly unique users are those who use a given app at least one time in a given month. A user using the app for more than one time is still counted as one user. “#N/A” means the app was not available at that point in time. The apps highlighted in grey are the leading apps developed by foreign firms.

Table A4. The number of monthly unique users of microblogging apps in China (Aug 2012-Aug 2014) (Unit: 10 thousand)

SN	App name	Aug-12	Aug-13	Aug-14
1	Sina Weibo	6,326.84	8,310.91	11,279.91
2	Tencent Weibo	842.46	834.45	1,093.63
3	Weijingxuan	166.94	219.2	132.83
4	TWITTER	102.92	123.41	98.52
5	Weico	70.48	297.36	326.81
6	Mobile Weibo	51.46	42.57	6.06
7	Sina Red Weibo	50.34	8.95	#N/A
8	Weibotong	34.67	20.95	#N/A
9	Diandian	20.2	5.05-5.48	8.88
10	YiBo	19.83	#N/A	#N/A
11	Netease Weibo	11.99	6.49	5.33
12	Sohu Weibo	11.31	25.77	#N/A
13	Lofter	9.09	59.56	194.6
14	Muzhiwan	#N/A	67.8	10.48
15	Huaban	#N/A	19.92	5.45
16	Moke	#N/A	15.44	13.28
17	Weibo Subscribe	#N/A	10.48	#N/A
18	Lebo	#N/A	8.4	#N/A
19	VG	#N/A	8.01	#N/A
20	Tumblr	#N/A	#N/A	41.87
21	Baidu Tieba Youth	#N/A	#N/A	32.89
	Total	13	18	14
	Incumbents		12	12
	New entrants		6	2
	Exits		1	7

Note: The table is built on iResearch Inc. (2012). Monthly unique users are those who use a given app at least one time in a given month. A user using the app for more than one time is still counted as one user. “#N/A” means the app was not available at that point in time. The apps highlighted in grey are the leading apps developed by foreign firms.

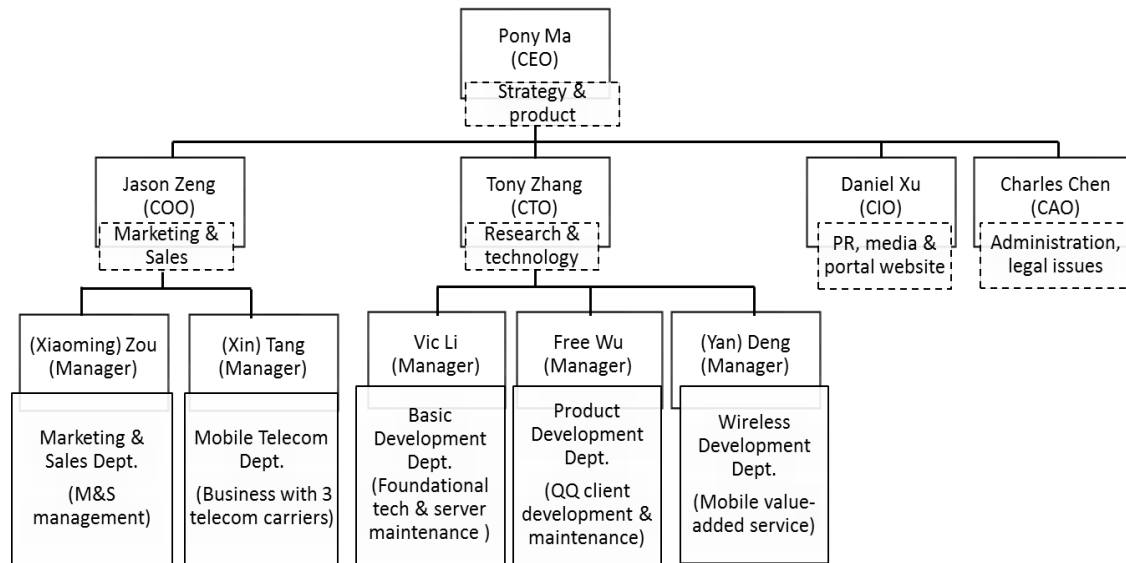


Figure A3. Tencent's organizational structure (2002)

Note: The Basic Development Dept., Product Development Dept., and the Wireless Development Dept. are the bases of the consequent firm-level R&D divisions, namely Platform R&D system (R) and Operation Platform System (O) between 2005 and May 17 2012 (as shown in Figure A4), and afterwards the Technology & Engineering Group (TEG) (as shown in Figure A5).

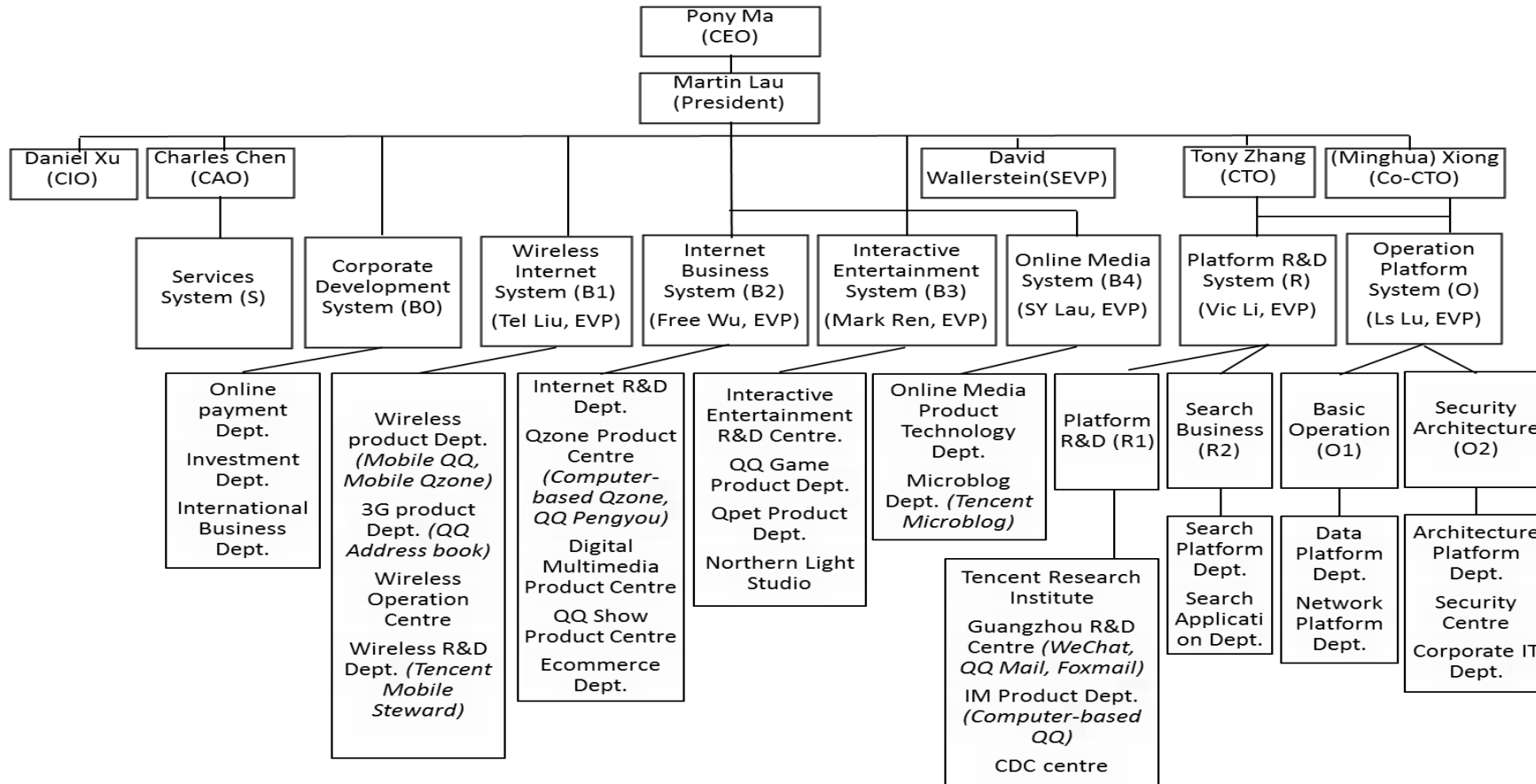


Figure A4. Tencent's organizational structure (Oct 24 2005-May 17 2012)

Note: (1) Tencent made its first major change in organizational structure in 2005. The simple structure was divided into eight divisions, including five business divisions (represented as B0-B4) and three supporting divisions (represented as R, O and S). The five business divisions (B0-B4) took charge of their respective business growth and possessed their own R&D and other functional departments. The three supporting divisions (R, O and S) were responsible for R&D, platform operation and functional services at the firm level. (2) Computer-based QQ and Mobile QQ belonged to two business divisions (R1 and B1) although they were virtually the same IM app for two types of terminals. The WeChat team was in Guangzhou R&D Center under the department of Platform R&D (R1) within the firm-level R&D division (R). (3) Data source: The author's summary of public data (e.g. Chen, Zhou, & Feng, 2012; Sina Science and Technology, 2012; Wu, 2016).

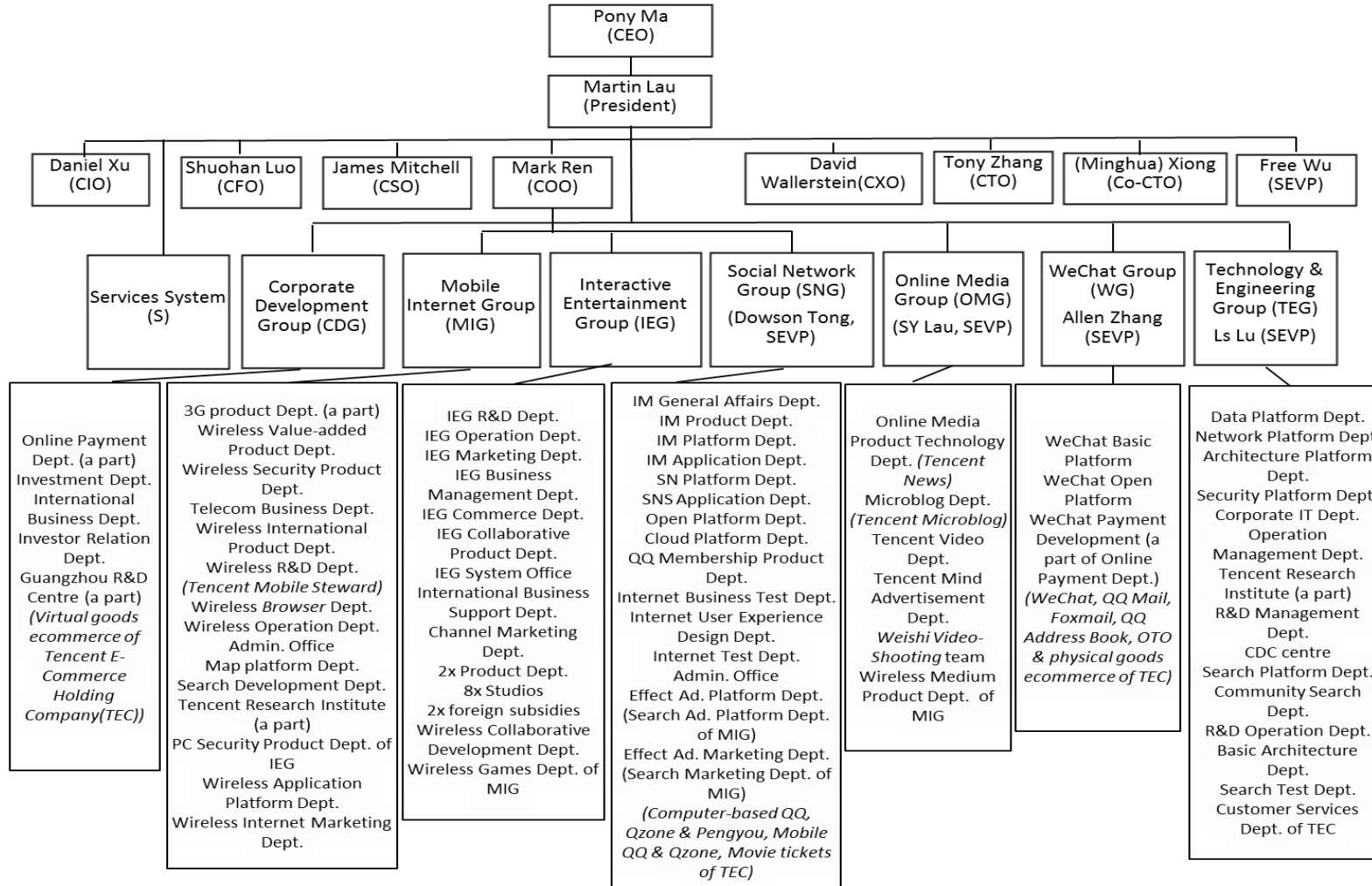


Figure A5. Tencent's organizational structure (May 6 2014- Now)

Note: (1) As WeChat succeed and Mobile QQ declined in relatively terms, Tencent changed its structure again in 2014. The WeChat team was promoted to a large division, whereas the previously large division responsible for Mobile QQ (namely Wireless Internet System B1) was divided and the Mobile QQ team was merged to another division (namely Social Network Group). (2) The division Technology & Engineering Group was combined from the previous two supporting divisions (R and O) and still took charge of firm-level R&D. (3) Data source: The author's summary of Tencent's company announcement and multiple public sources.

REFERENCES

- Chen, X., Zhou, F., & Feng, Y. 2012. "Perpetual Penguin" quests for new impetus: Tencent's war against its ego (in Chinese), *Nanfang Weekend*. Shenzhen & Guangzhou, China: Nanfang Media Group.
- iResearch Inc. 2012. mUserTracker database (in Chinese). China: iResearch Inc.
- Mobile QQ Team. 1998-2017. Mobile QQ updates (in Chinese), Vol. 2014. Shenzhen, China: Tencent Holdings Limited.
- Sina Science and Technology. 2012. Tencent: Before reorganization (in Chinese), Vol. 2014: Sina Corporation.
- WeChat Group. 2011-2017. WeChat Update Logs (in Chinese) Vol. 2014: Tencent Holdings Limited.
- Wu, X. 2016. *Tencent Biography over 1998-2016: The Evolution of Chinese Internet Firms (in Chinese)* (WeRead ed.). Hangzhou, China: Zhejiang University Press.