EDISON

Mobile ecosystems

The second derivative

Technology

6 March 2014

It is time to look for the second derivative. Smartphones have been the belle of the ball so far, but the place to now look is the ecosystem. This is because ecosystem users are likely to continue growing long after revenue growth in the smartphone market has fallen to zero. Here we would look to Yahoo!, Baidu, Google and Microsoft and forget about trying to eke out a painful commodity existence in Android.

- **Low puff.** The smartphone market is running out of growth and this year prices could easily fall hard, resulting in low or no revenue growth. Commoditisation is everywhere and where six months ago Samsung and Apple were sitting pretty, even they are now feeling the pinch. This investment theme is out of breath.
- **High puff.** On the other hand, the ecosystems appear to have lots of growth left in them. There are currently around 1.5 billion mobile ecosystem users globally, which we expect to more than double by 2017 to 3.5 billion. Any business model that has exposure to user numbers rather than smartphone shipments has a much stronger basis for growing revenues over the next few years.
- **Myth.** Most commentators think that the ecosystem war is over, with iOS having 30% of the users and Android 70%. While this is an accurate split of operating systems it bears no resemblance to reality when considering the ecosystems. The main reason for this is that Android is not an ecosystem. It is an operating system upon which a number of ecosystems are based.
- **Reality.** There are three big ecosystems with more than 300 million subscribers (iOS, Google and China), two medium sized ecosystems with more than 100 million subscribers (Yahoo! and Samsung) and a number of small ones all trying to become viable. We think that 100 million subscribers plus are needed to be viable and 300 million to make a proper return.
- **Investment positioning.** First and foremost we are looking for companies with exposure to the size of the ecosystem rather than device shipments. In that regard Yahoo!, Baidu and Google immediately move to the top of the list. Facebook and Twitter are also candidates, but they are both seeing slowing growth in their user counts. Microsoft is also a contender but this piece is so small inside the company that it is more a play on a recovery in PCs than it is an ecosystem investment. Apple is likely to be hobbled by falling hardware margins and has significant problems when it comes to delivering an ecosystem of its own. Commodity Android should be avoided at all costs.

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Market update

Smartphones

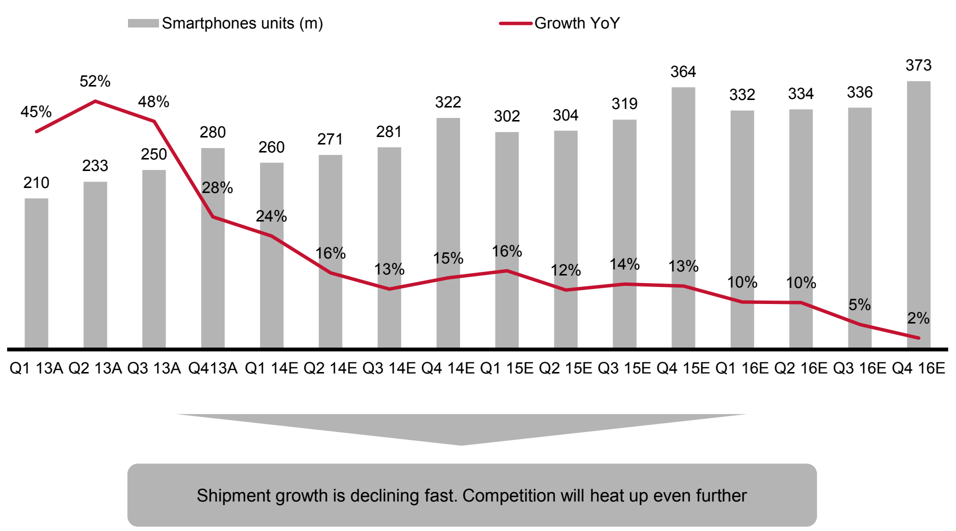
The smartphone market continues to grow but at a rapidly slowing pace. In unit terms things are still comfortably in the double digits but when it comes to revenues there is another story to tell. There are only so many people in the world who can afford a $600+ smartphone and only a certain number of subscribers for whom an operator will subsidise such a device. This has resulted in a slowing of the market from 47% y-o-y growth in Q412 to 27% in Q413. This is still great growth when compared to many industries, but it is really occurring in emerging markets and at very low price points. Hence the ASP of the smartphone market continues to fall. ASP declines are unlikely to stop before unit shipments stop growing. This means that in revenue terms the market is already ex-growth, which will lead to tougher competition and margin pressure.

This is the major reason why many of the smartphone vendors reported disappointing growth in Q4 2013 when it came to revenues and profits, although device shipments have remained pretty healthy. A slowdown in revenue growth and greater competition means that the commoditisation of the hardware segment can only accelerate (see Mobile Software – iRobot, 6 March 2014, Exhibit 4 page 8). This is part of the reason why both Samsung and Apple are struggling with maintaining the profitability of their handset business, which only increases the importance of the ecosystem as the provider of value.

There remain two choices. Either add value through components or add value by providing users with an ecosystem within which they can live their digital life (see below and see Mobile Software – iRobot, 6 March, Exhibit 3, page 7). Failure to successfully execute in one of these two segments will mean that margins will be forever stuck in mid-single digits in the best instance.

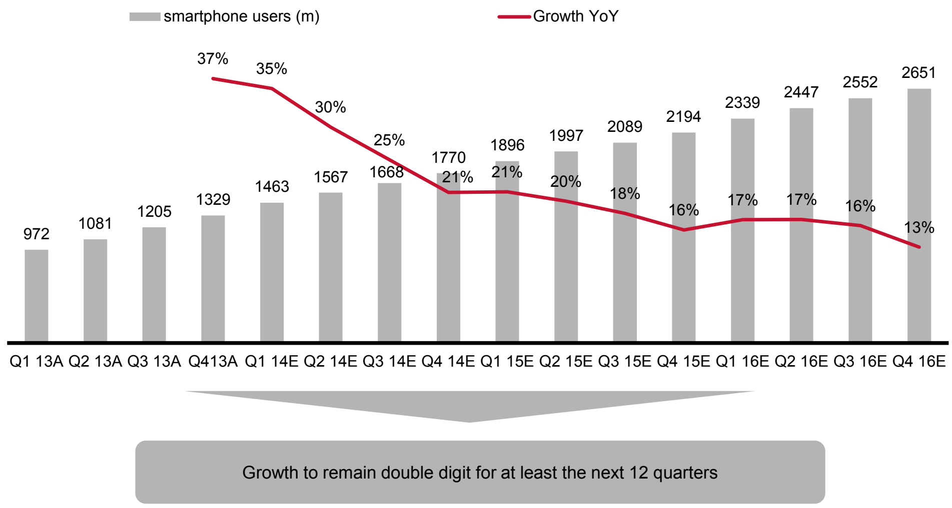
Being in the ecosystem has the advantage of gaining exposure to user growth (Exhibit 2) rather than handset revenues. User growth remains very healthy and is much less susceptible to price erosion at this time. Earning revenues through subscription or through targeted advertising to users is the only real growth story left in the smartphone world. Hence this is where Edison recommends that investors look for superior returns over the next few years (see page 27).

Exhibit 1: Smartphone shipments Q112-Q416e



Source: Edison Investment Research, Counterpoint Research

Exhibit 2: Smartphone users Q112-Q416e



Source: Edison Investment Research

Tablets

Market

Tablets have become a critical piece of the digital ecosystem as their convenience and ease for effecting basic computing tasks make them greatly superior to smartphones for particular functions. In a similar way to consumer PCs, tablet use peaks during the hours of 6-10pm confirming that these devices have taken over from the PC as the preferred device for the consumption of content. Edison does not believe that the tablet and the smartphone will kill the PC, but the portion of users that only use PCs for simple content consumption functions have no reason ever to go near a PC again.

Hence, we have included tablets in our forecasts and ecosystem estimates and analysis. The tablet market is much more of a two-horse race than smartphones, with Apple and Samsung being the only two with market share of greater than 5%. This market is totally dominated by iOS and Android, as we do not count Windows 8 devices as tablets. This is for two reasons. First, Windows RT has not and is not going to have any traction in the market. This fact is so evident that all of the device makers except Microsoft have abandoned the platform and even Microsoft seems to wince when the subject is broached. Edison believes that Windows RT will be quietly killed off over the next year or so. Second, Edison believes that Windows 8 tablets have a place in the tablet market but because they are actually fully functioning PCs, Edison counts them as such. The tablet market is defined as devices with more limited capability and not running a fully-fledged OS. Both Android and iOS are capable of becoming fully fledged computing platforms over time but at the moment they are very limited. Hence the products that are created using these systems are really only good for content consumption excluding them from competing with PCs for users who need more advanced functions from their devices.

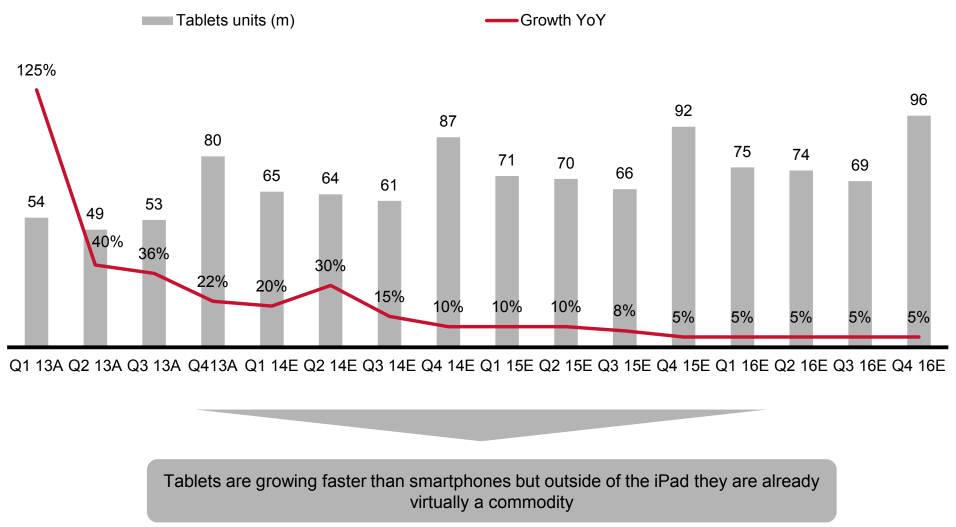
The tablet market has also slowed markedly over the course of 2013, growing just 10% y-o-y in Q4. The reasons are exactly the same. Tablets by their nature have higher ASPs than phones and there is a much more limited market for tablets than there is for phones. Furthermore, Edison suspects that tablets do not carry the same importance with the user as smartphones and consequently the user is likely to buy a smartphone first and then a tablet if there is money left over.

While tablets have been the most rapidly adopted new type of device in history, they have also commoditised faster and Edison thinks that the market is already showing signs of maturity.

Consequently, Edison expects that growth will slow to 10% y-o-y by Q414 (Exhibit 3) globally and to virtually stagnate in developed markets.

Edison sees tablets as an add-on for a smartphone. The use case is different as the vast majority do not connect to cellular networks and are not used to receive or send text or instant messages. Instead they are used for browsing and the consumption of media as evidenced by the fact that a tablet will on average generate far more data traffic than a smartphone. Unfortunately for the operators, the vast majority of this traffic is carried by Wi-Fi.

Exhibit 3: Tablet shipments Q113-Q416e



Source: Edison Investment Research, Counterpoint Research

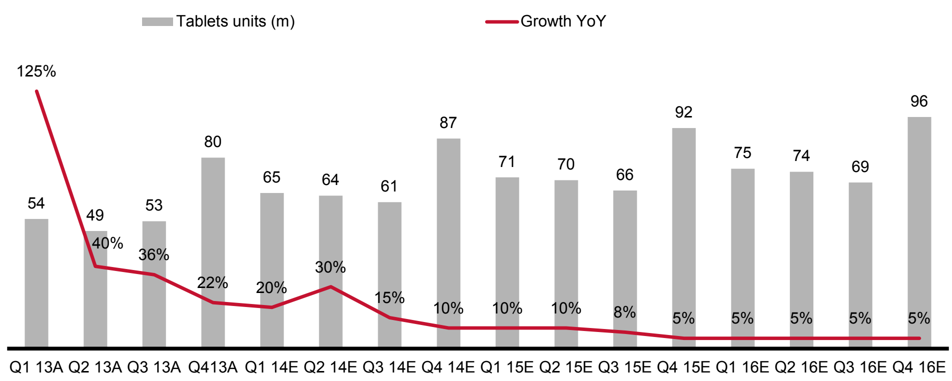
Ecosystem

Tablets are an extension of the smartphone. They use the same software, have a similar user experience and can run the same applications. Consequently, Edison believes that almost all tablet users are also smartphone users. This complicates the counting of ecosystem users as there is scope for double counting users who use both devices (see page 9). Edison research indicates that the vast majority of tablet owners are already smartphone owners, and as such have already been captured by the ecosystem analysis that has been carried out in smartphones.

Furthermore, tablets are shared much more between users than smartphones, which further limits their contribution to the ecosystem. This is because a large part of the monetisation opportunity on a smartphone is based around learning about that user and then using the targeting for relevant marketing purposes. The more accurate the targeting, the higher will be the value of the marketing and the better the margins on revenues for the owner of the ecosystem. With multiple users on tablets and virtually no individual sign on and account sharing, the relevance of the targeting will fall substantially as the ecosystem picture of that user will be muddied. That combined with the fact that almost all owners of tablets also own a smartphone leaves the incremental contribution to the value of the ecosystem highly questionable.

Edison believes that the tablet has an enriching effect on some aspects of digital life but continues to believe that the real value for the ecosystem remains in the smartphone where one phone almost always equates to one user. **Hence, Edison assumes that 80% of all tablets are owned by smartphone users and when it comes to counting users in the ecosystem counts only one fifth of tablet users as genuine additions to the ecosystem (see below).**

Exhibit 4: Tablet users Q113-Q416e



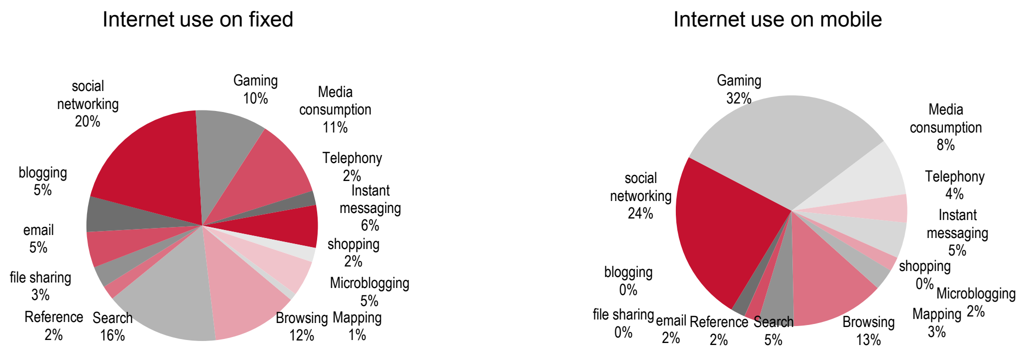
Tablets are growing faster than smartphones but outside of the iPad they are already virtually a commodity

Source: Edison Investment Research, Counterpoint Research

Digital Life

Digital life remains a central part of Edison Investment Research's ecosystem analysis (see Mobile Software – iRobot, 6 March 2014, page 12). Digital life is the sum of all activities that a user does online on a smartphone (Exhibit 5 right-hand side) split by the amount of time the user spends engaged in each activity. Edison has assumed that the amount of time spent on each activity is analogous to the amount of information that the provider of the activity can collect about that user. Edison has also assumed that the amount of data collected is directly proportional to the amount of revenue that can be generated through targeted advertising to that user. This, of course, is a generalisation as some users will be more valuable than others due to differences in their disposable incomes. Furthermore some activities will lend themselves to monetisation better than others. At this early stage of the development of the global opportunity, Edison does not yet believe that it materially affects the conclusions it has drawn.

Exhibit 5: Internet use on fixed and mobile



The whole is MUCH bigger than the sum of the parts. This strongly advocates for complete offerings rather piecemeal players

Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

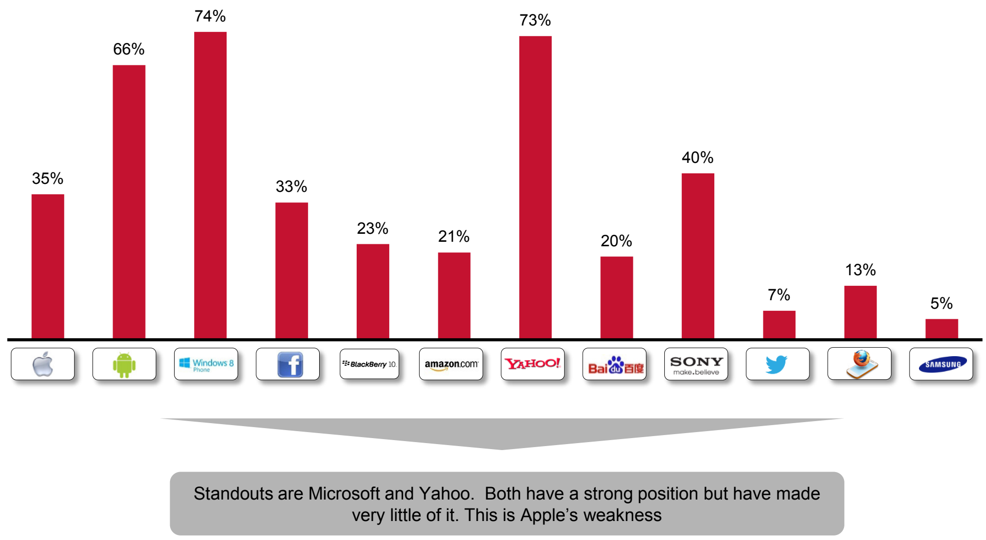
A key observation from this analysis is that the whole is much greater than the sum of the parts. This is for two reasons:

- The more of the pie that is addressed, the more the ecosystem will know about the user. Therefore targeting will be more accurate, more relevant and hence carry much higher ASPs.
- The greater portion of digital life that the ecosystem addresses, the more time the user will spend in within that ecosystem. Hence there will be a greater opportunity to target the user.

Combining, these two reasons makes clear that the both ASPs and volumes will increase as coverage improves giving a much greater uplift in overall revenues. If one addresses only a slice of the market, then the opportunity for that player is much smaller. This is why the likes of Facebook (page 18) and Twitter (page 23) are trying to expand beyond social networking and micro blogging. They may dominate their relative segments, but they are only a minor part of digital life. To grow long-term they must expand into other areas and become more than just a part of the user's digital life. The more relevant they are, the more time users will spend using their services and the more information they will collect on their servers. This is why digital life is a central part of Edison Investment Research's analysis and why Edison has analysed this concept for all of the major ecosystem contenders. The analysis is reasonably straightforward in that each ecosystem is assessed for which services it has an offering for. The service is given a score equal to the weight that service has in the Digital Life pie (Exhibit 5).

The scores are added to give an estimate of how well an ecosystem covers the services that are required to fulfil the online demands of the consumer. This analysis does not rate the quality of these services nor how successful they are. It is merely a measure of the opportunity and head start of one ecosystem against another.

Exhibit 6: Coverage of digital life by mobile ecosystem



Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

The clear standouts remain Microsoft (page 15) and Yahoo! (page 16) and also new contender Sony (page 22), which also gets a reasonable score. This is largely due to its strong position in gaming, although it has yet to really make anything of it in the mobile phone space. Edison also suspects that this analysis has a tendency to overstate the impact of gaming on the ecosystem. Users spend 32% of their time (exhibit 5) on smartphones playing games (Exhibit 5), but Edison has doubts whether gaming contributes 32% of the value of the ecosystem. The reverse can be said of search, where users only spend 5% of their time, but it is clear that far more than 5% of the value of the ecosystem comes from search. This is why Edison refrains from drawing any hard and fast conclusions from this analysis but uses it as a good indicator in the absence of a better measure.

Contender changes

Edison analyses the top 12 ecosystem contenders. This list changes with time as the fortunes of these contenders rise and fall. For this update the following changes have been made.

Out

Although Edison believes that Blackberry is clearly on the way out, the fact that it still has an ecosystem of some description makes it a more credible contender than some of the others that were considered in June 2013 (see Mobile Software – iRobot, 6 March 2014). Blackberry still has 60 million plus users and ships over 1m devices each quarter. By contrast Tizen and Jolla have no ecosystem to speak of and have shipped less than 1m devices to date. Furthermore, commitment to Tizen is unravelling fast with NTT DoCoMo shelving plans to make devices. Jolla comes out ahead of Tizen as it has devices in the hands of users, but it is still way behind Blackberry in terms of shipments and traction. Consequently Tizen has been removed from the analysis to be replaced with two that Edison believes have better prospects.

In

Top of the waiting list were Samsung and Sony (see Mobile Software – iRobot, 6 March 2014, page 44) and as both of these are faring better than Blackberry, they have been added to the main list of 12 contenders. Furthermore both of these companies understand the need to become an ecosystem and are investing in order to be relevant in that space. Sony is much further along the road in terms of assets than Samsung, but Samsung has much deeper pockets, better profitability and hence a much greater capacity for investment. Neither of these companies has a history of software and services and both have a lot to prove if users are to begin identifying with their services as the places where they want to live their digital lives.

Ecosystems

In addition to digital life, Edison uses three simple tests to asses each ecosystem to ascertain the degree of success each is likely to have as well as to get an idea of how mature the offering is. These simple tests are referred to as the “three laws of robotics” and are described in more detail in Mobile Software – iRobot, 6 March 2014, page 14.

This combined with the assessment of digital life with data and forecasts from the smartphone market (page 1) contributes to estimates surrounding the size of the ecosystem now and how it will evolve over the next five years.

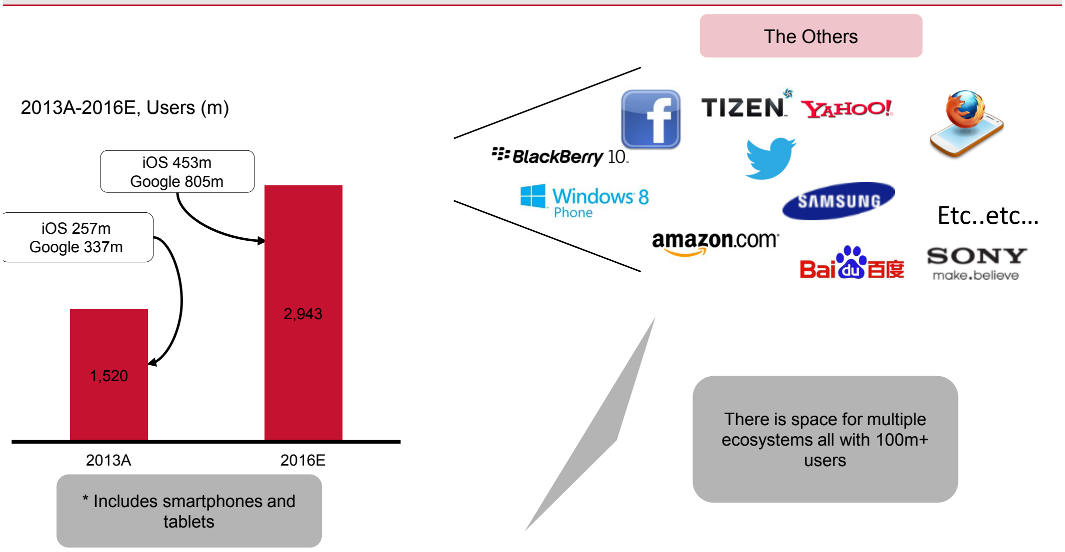
Edison Investment Research’s key assumption that an ecosystem needs 100 million plus subscribers to be viable and more than 300 million to be really successful remains unchanged. The performance of the some of the ecosystem players suggests that these assumptions are about right as the ecosystems that are failing are all below 100 million in size and all those making good money are now well over 300 million in size. **Note that all ecosystem numbers now include the impact of the tablet market, which is discussed on page 4.**

The myth regarding two ecosystems continues to persist. Most people including many in the mobile phone industry still believe that there are only two ecosystems and that the market is now so saturated that there is no space for anyone else. All of Edison Investment Research’s analysis indicates that this is very far from the case and that there is plenty of space for multiple ecosystems.

Myth 1: Android is an ecosystem. In fact Android is an operating system and it is the applications that sit on top of it that create the ecosystem. Hence Android is in fact a collection of different ecosystems, of which Google and China are the largest (see page 13).

Myth 2: The market is saturated. The smartphone and tablet markets are running out of growth but user numbers are going to continue growing. At the end of 2013 Edison estimates there were around 1.5bn ecosystem users, which is expected to grow to 2.9bn by 2016 (Exhibit 7). Edison continues to believe that an ecosystem of 100 million users is viable, meaning that in theory there is space for 30. This is unlikely to happen and what is most likely is a few big ones, a cluster of smaller ones and a group that are all trying to break in that will come and go (Exhibit 8).

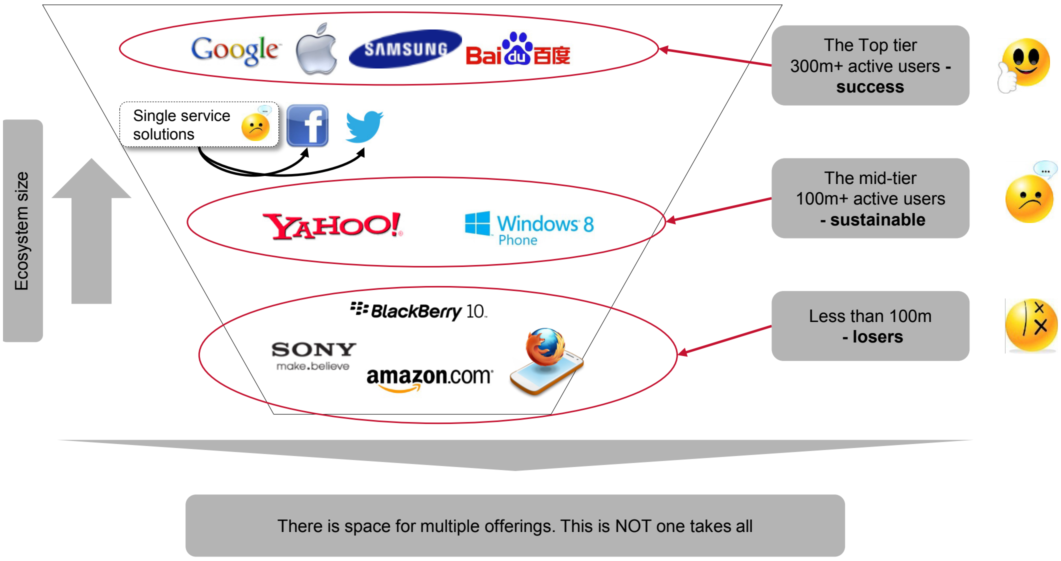
Exhibit 7: Ecosystem* users by ecosystem



Source: Edison Investment Research, Counterpoint Research

During the past six months it is has become clearer which ecosystems will really succeed and which ones will merely survive. iOS, Google and China are already over 300 million users each and Samsung, with 115m users and dominance in the handset space, should also be able to breach 300 million users by 2016.

Exhibit 8: Ecosystem users by provider, 2016

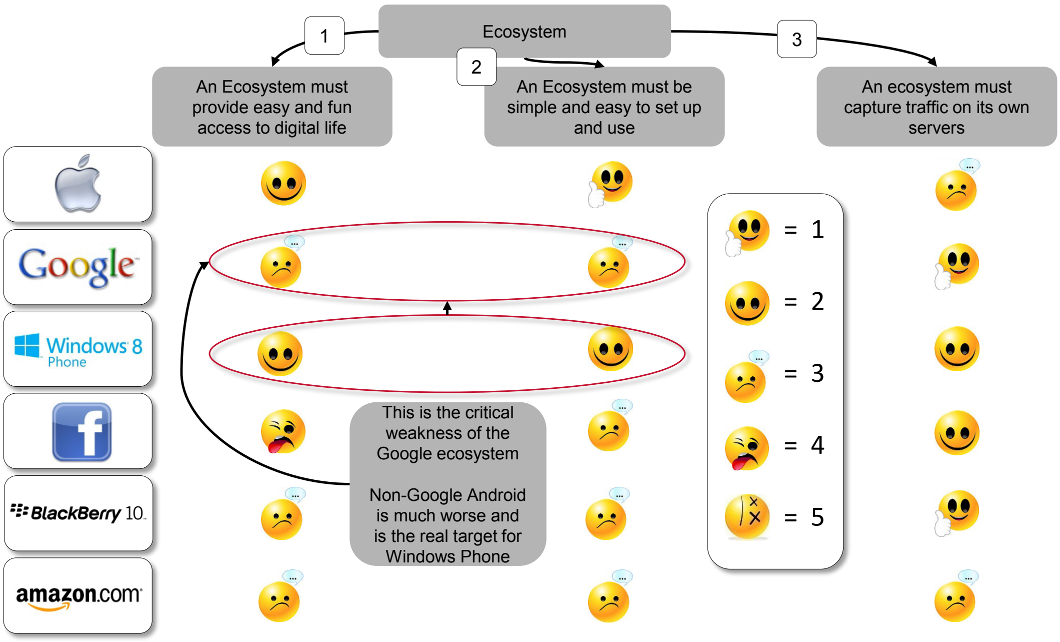


Source: Edison Investment Research

The outlook for Microsoft remains unclear, but even with market share rising to 11% in the handset space, it will be difficult for it to pass 300m without a substantial change in its direction (page 15). Yahoo! (page 16) has purchased many assets, but still really has to break out if its fixed-line mould. For all its merits, Yahoo!'s new management remains very far adrift of its promise.

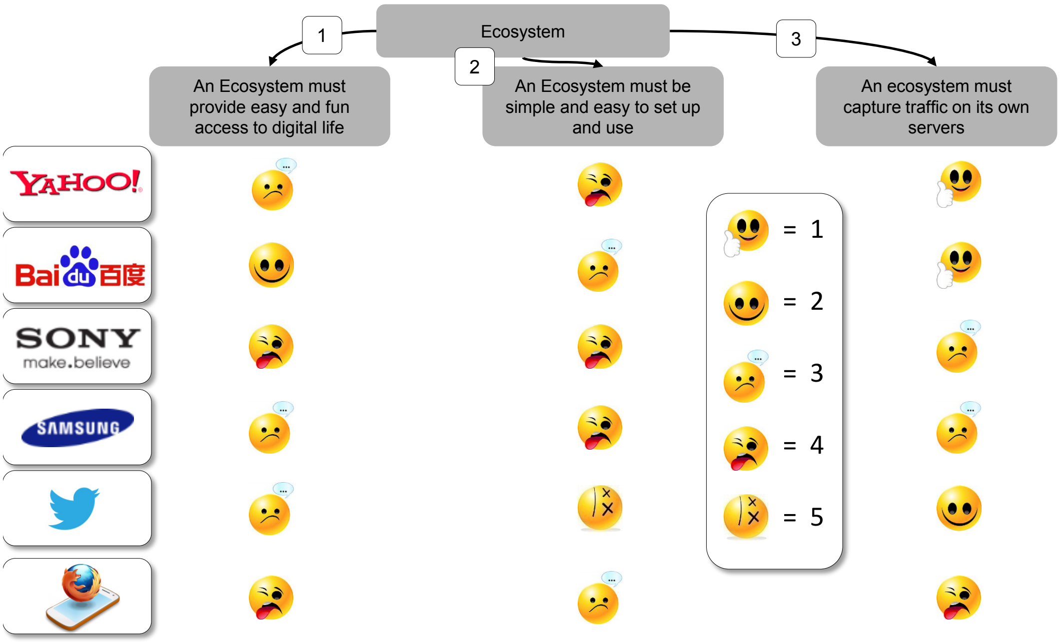
Sony (page 22) has a hill to climb but it has ambition, while Amazon's (page 21) issue remains the cost of Amazon Prime. Blackberry is on the way out, while Mozilla (page 24) still comes up short when it comes to fulfilling its promises. Facebook (page 18) and Twitter (page 23) are still trying to break out of their segments and do more in digital life. They have some time, but growth will evaporate long before their current valuations are currently forecasting unless it happens reasonably soon.

Exhibit 9 (a): The three laws of robotics for mobile ecosystems – 1



Source: Edison Investment Research

Exhibit 9 (b): The three laws of robotics for mobile ecosystems – 2



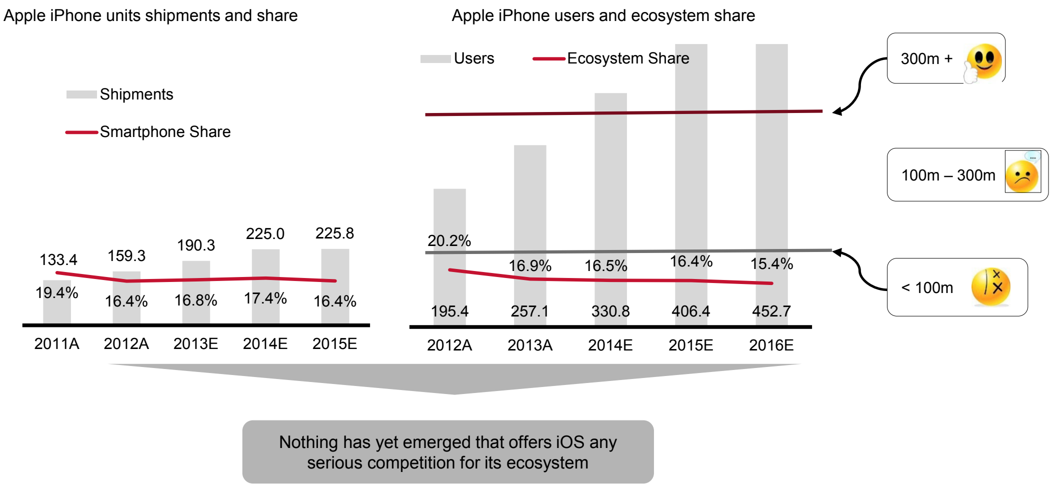
Source: Edison Investment Research

iOS: Must have services

Apple's major strength remains the quality of its ecosystem and its ability to generate revenues for developers. This keeps users at one end buying the devices and developers at the other writing applications for the platform. The strength of the iPhone 5S has been surprising given that on the key hardware measures that users care about, it falls very far short of that which Samsung and the Android vendors are offering for the same price.

This is all down to the quality of the ecosystem, which in no small way has been enhanced by the iPad and the fact that there is very little fragmentation inside iOS. Many iPhone owners also own an iPad, where the installed base is more than big enough (122 million at the end of 2013) to justify writing applications specifically for that device. This means that there is a much better user experience on the tablet when compared to Android applications, which are very often simply the phone application running on a larger screen. The lack of fragmentation is also a major positive point for developers as they only have to write an application once for all iPhones and iPads, meaningfully reducing their break-even points.

Exhibit 10: Forecasts for Apple iPhone shipments and ecosystem users



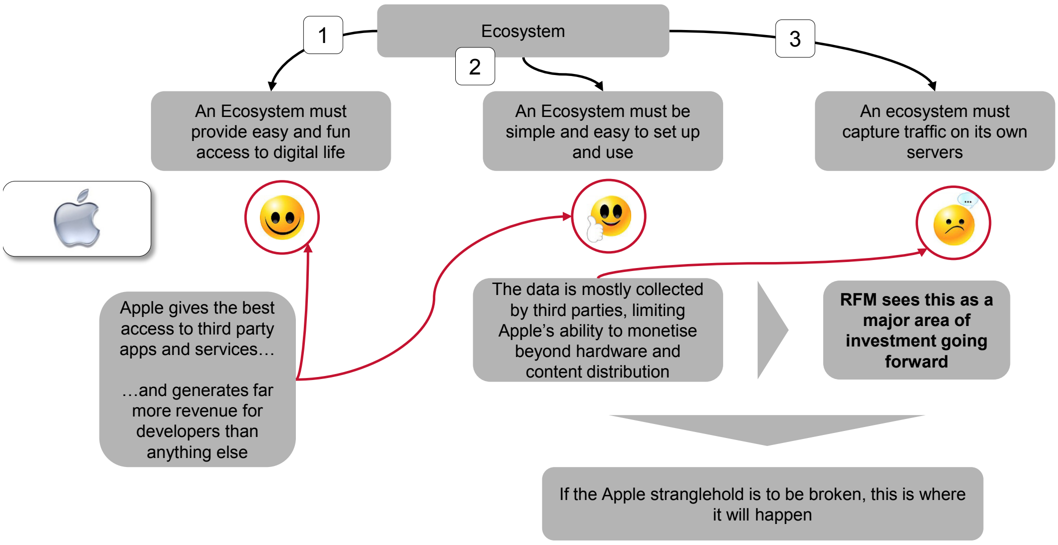
Source: Edison Investment Research, Counterpoint Research

This should be enough to keep the ecosystem growing in the medium term in terms of users even as growth in Apple's revenue slows and market share falls. It is important to note that the health of the ecosystem is not what drives Apple's profitability. Apple's 30% cut of developer revenue remains only a tiny proportion of overall revenues. Apple makes almost all of its revenues and profits from hardware and it is in hardware where Edison has concerns for growth and profitability.

Apple's digital life coverage is poor, which means that **the real value in its ecosystem is its ability to distribute third-party applications and services in an easy and fun way.** Its digital life coverage score is weak (Exhibit 6) and even some of the applications that it does have such as Maps and iCloud are substandard and need to be vastly improved.

Fast forward several years to a situation where all services all available on all ecosystems to a similar level of quality and the edge that Apple currently has will be gone. This is why Edison believes that Apple must deliver its own applications and services to the ecosystem and these have to become must-have services. Failure to do this will mean that the user's attachment to Apple devices will begin to wane, especially if the same quality experience is available elsewhere. The result will be lower pricing to maintain share and falling margins. **This is why Apple must invest heavily in its own applications and services, and Edison believes that this is where most of the R&D budget is currently going.** If Apple's stranglehold on the high end of the market is going to be broken, this is how it will happen. At the moment both Android and Microsoft have much bigger issues to deal with before they are even close to being able to compete on a level playing field with this ecosystem.

Exhibit 11: Analysis of the Apple ecosystem



Source: Edison Investment Research

Google: The right stuff

Android

Android is not an ecosystem. **It is an operating system upon which an ecosystem can be installed.** Android is an open-source system that can be used to provide the basic functionality of a smartphone or a tablet. It is the Google applications that make up the Google ecosystem and it is these that generate the data that Google uses for monetisation. Critically these applications are not open source. They come as a package that is only for devices that meet the specification set and decided by Google. These devices are exclusively part of the Google ecosystem and there is no real opportunity for a handset maker or an ecosystem provider to add any value beyond hardware specification or form factor. **This is why anyone who wants to make above commodity margins in Android devices in the long term must create their own version of the Google applications and entice users to prefer them over Google**. This is a massive task, but Amazon (page 21) is already trying to do this, and both Samsung (page 20) and Sony (page 22) must embark down this road to be nicely profitable in the long term.

Hence, Android is not an ecosystem in its own right. It is a collection of different ecosystems built on the same software base and which will share some interoperability. The chief of these is Google and it is to the Google ecosystem that the rest of this section is dedicated.

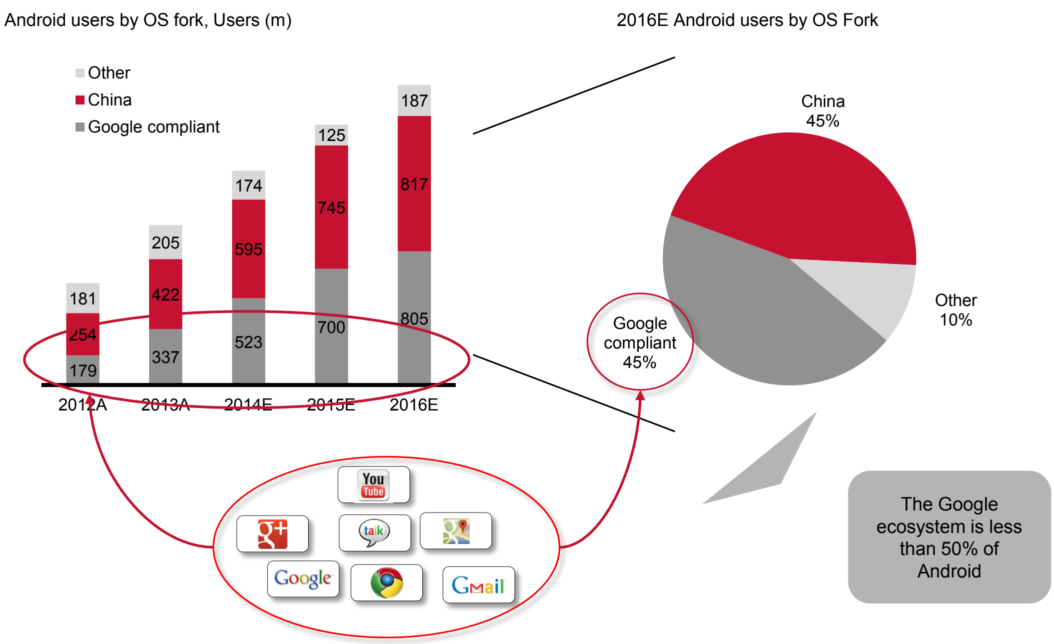
Google

Edison has split out of Android devices the number of devices that are **both GMS compliant (required to run Google Applications) and running Android 4 or better.** (Edison believes that Android 4 or better is required to deliver a good enough service for the user to use the device enough to be a valuable member of the ecosystem.)

Even excluding half of Android devices from the Google ecosystem leaves a meaningful number of users from which Google has a substantial revenue opportunity. Around one third of smartphones that are shipped are compliant with Google's requirements, meaning that the ecosystem can grow substantially even as the growth in device shipments slows down.

We forecast that Google's ecosystem will be twice the size of the iOS ecosystem by 2016, making it far and away the dominant player. Furthermore, Google also has very significant revenues from iOS devices, which also stands to grow as the size of the iOS ecosystem expands (Exhibit 13).

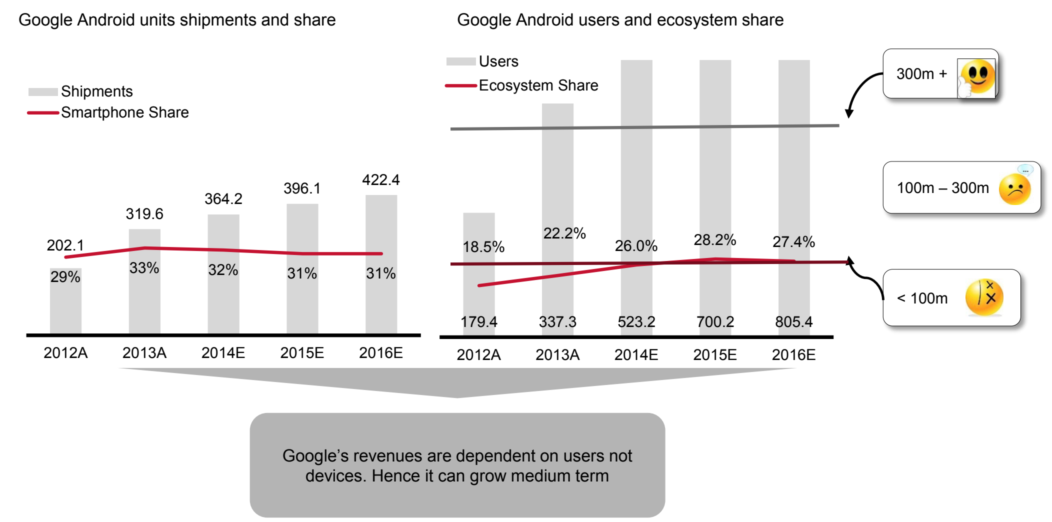
Exhibit 12: Android users by OS fork



Source: Edison Investment Research, Counterpoint Research

Google has all of the ingredients to see growth as the hardware vendors start to see low or no growth. This is because it is exposed to the ecosystem user count rather than device shipments. On that basis it is likely to be one of the few companies that sees steady revenue growth from smartphone users in 2014 and beyond.

Exhibit 13: Forecasts for the Google ecosystem



Source: Edison Investment Research, Counterpoint Research

Microsoft: Wobble or decline?

Things have been looking up for Microsoft all year long, with steady increases in market share and fast growth of its ecosystem. That was until Q4 when things came badly unstuck. Smartphone market share has grown from 2.9% to 4.3% in Q4, but in Q1 it looks like a big step back will be taken. The signal for this has come from Nokia's Q4 results, where it looks like the company shipped 8.8m units compared to end market demand of 12.0m. The reason for this appears to have been inventory work down. Nokia typically carries four to six weeks of inventory. At the beginning of Q4, four to six weeks of inventory was around 5.0m units, but this has been reduced 3.3m in anticipation of a much weaker Q1. The only conclusion that can be drawn from this is that clients are telling Microsoft/Nokia that demand has softened meaningfully for Q1 and so to keep inventory in the four to six weeks range, shipments into the channel were reduced. **This basically implies that market share is going to fall to 3.8% in Q114 from 4.3% in Q413 after two years of steady improvements.**

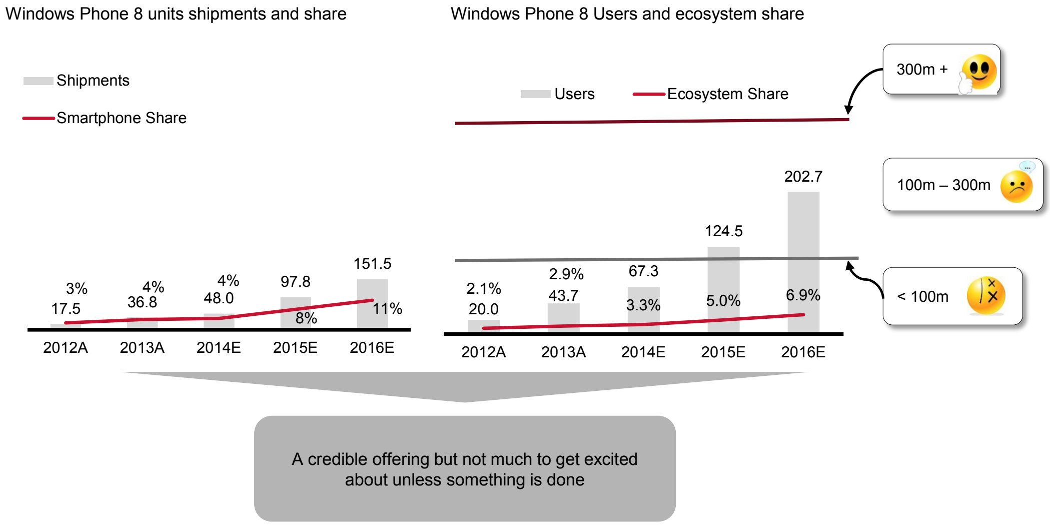
Whether this is a wobble or the beginning of a decline is unclear, but this is major red flag for the development of the Microsoft ecosystem.

Wobble: There is a vast amount of corporate activity going on at Microsoft at the moment. The company is in the midst of a huge reorganisation, which has been topped off for the last six months by looking for a new CEO. On top of this Nokia is going through the process of being acquired by Microsoft. All of this is enough disruption to take one's eye off the ball and experience the slip in share that now looks inevitable for Q1. Hopefully when all is tidied up, the foot will be back on the gas and the issues around marketing, retail and applications will be addressed, getting the ecosystem back on track.

Decline: The Microsoft ecosystem is beset with significant problems (lack of applications, poor marketing at retail etc). These problems are solvable, but there is enough doubt in the market regarding Microsoft's commitment to its consumer assets to make customers nervous. All of the issues surrounding the blue squares of death (see Mobile Software – iRobot, 6 March 2014, page 26) remain unsolved and it has been the low price of the Lumia 520 that has really driven the market share gains. Educating consumers as to why the Microsoft ecosystem is great for them is an incredibly difficult task, but with commitment it is achievable. Microsoft has all of the assets necessary to become the 'third ecosystem' and it is way ahead of all other competition, but it seems incapable or unwilling to go the last mile to win the consumer (see Mobile Software – iRobot, 6 March 2014, page 27). If Microsoft's commitment really is wavering, then it will be all downhill from here. Only a clear message from the new man at the helm, Satya Nadella, will be able to clear the air.

Edison Investment Research remains a believer in the Microsoft ecosystem and of its potential right the way across consumer electronics, but without the nod from the top, no one else will. In the absence of a coherent strategy one way or the other, Edison has left the outlook unchanged but has adjusted for a more sanguine outlook following the fall in share that is coming in Q114.

Exhibit 14: Forecasts for Windows Phone 8



Source: Edison Investment Research, Counterpoint Research

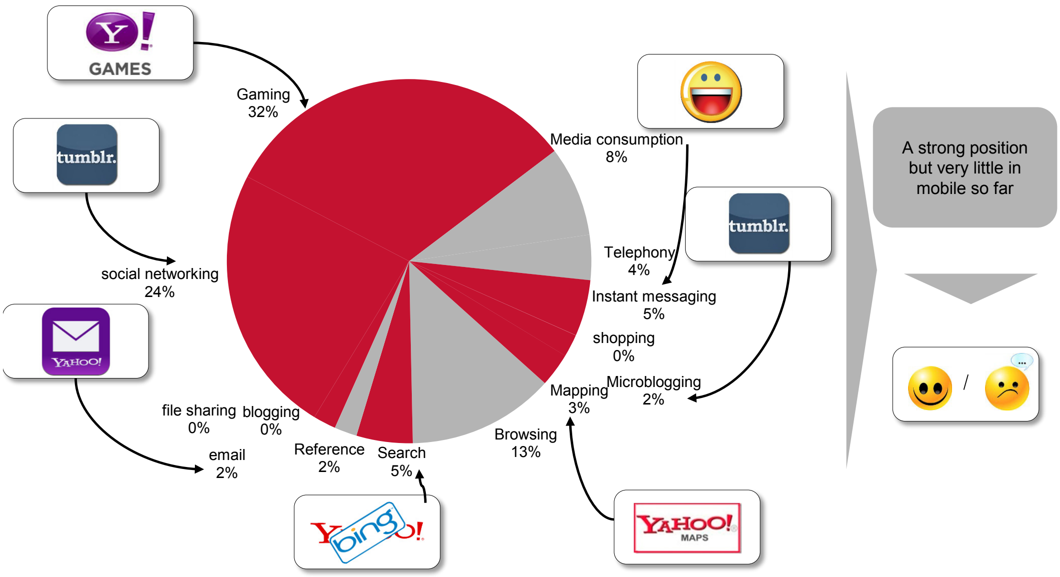
Yahoo!: Delivery time

Yahoo! has massive promise, but as yet has failed to deliver anything meaningful in the mobile space. **It has four saving graces:**

1. Its usage in the fixed-line world remains incredibly robust despite years of malaise and mismanagement.
2. Its 25% stake in Alibaba has been driving the share price, allowing poor performance in the core business to go unpunished.
3. It has a very good portfolio of localised assets. It is much stronger than Apple, Google or Microsoft in this regard and with most of the growth coming from outside of developed markets this could be a major help in getting its ecosystem up and running.
4. It has a very strong portfolio of assets, which with some work could create the backbone of an ecosystem through which revenue growth could be re-established.

This fact is most noticeable when looking at Yahoo!'s digital life pie (see below and Exhibit 6). Yahoo!'s coverage is second only to Microsoft in terms of the services that it is already capable of offering, and yet it has no meaningful revenues in mobile and its revenues from the internet are barely growing. This is an incredibly poor showing when compared to Google, Facebook and so on, all of which are experiencing good growth. For the moment this is not a problem as all the attention is focused on Alibaba, but when the real value of this asset has been crystallised, the market will begin to wonder what Yahoo! has been spending all the money on.

Exhibit 15: Yahoo! in digital life



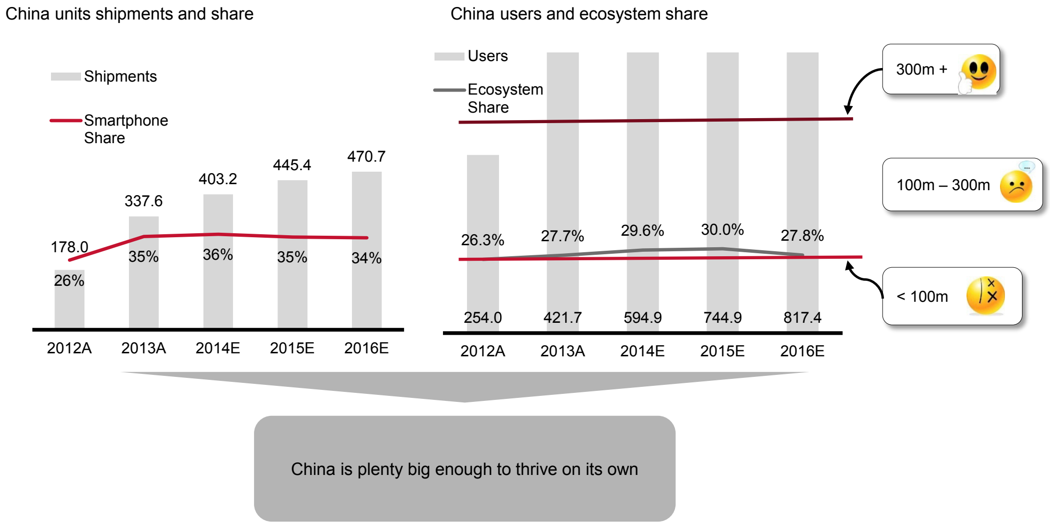
Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

For the last year, Yahoo! has purchased assets in order to build out its offering, but very little has been delivered in terms of a tangible ecosystem. These assets remain disparate with the user databases all distinct from one another. This also means that sharing of user data across the services in order to get a much clearer picture of the user's activities is not happening. This will severely limit Yahoo!'s ability to increase the quality of its targeting and hence its ASPs (see page 6). With its services remaining separate, Yahoo! is not going to in a position to benefit from its exceptionally strong position in digital life and will remain a disparate range of offerings. Things need to change before Microsoft gets its act together and before the market remembers that there is more to Yahoo! than Alibaba.

China: Copy with pride

The Chinese versions of Western services continue to work much better in the local market than their progenitors. This is largely because these services are better tailored to local taste and are optimised to deal with some of the difficulties resulting from a character-based language. Furthermore, the Chinese government is very keen for China to develop its own technology industry and as a result home-grown offerings tend to have a significant advantage.

Exhibit 16: Forecasts for China smartphones and ecosystem



Source: Edison Investment Research, Counterpoint Research

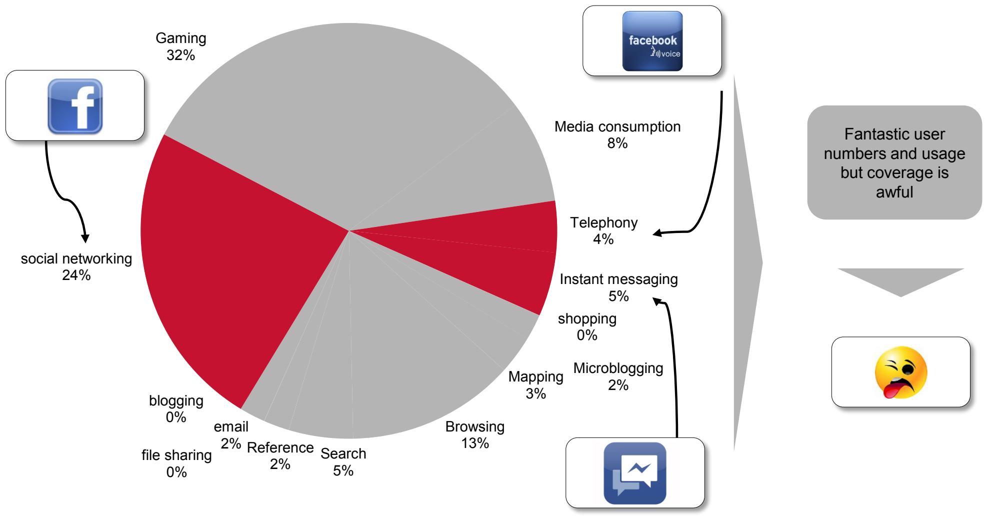
That being said, Apple is starting to get some traction in the local market, meaning that its ecosystem will also begin winning users in China. However, Edison suspects that most Chinese users will be using digital life services provided by local players on iOS. This means that as the other ecosystems catch up, Apple's edge will be lost unless it comes up with its own services. Even if it does, we thinks that these services will not be that popular in China and so we continue to believe that the Chinese ecosystem will be utterly dominated by local providers such as Baidu, Weibo, Tencent and so on.

Facebook: Beyond social

Facebook has come good following a difficult patch where it was struggling to monetise mobile activity. This problem is well and truly behind it as revenues from mobile are now more than 50% of total advertising revenues and are likely to continue growing fast. What is following is a honeymoon period of rapid growth while it makes up the ground that it lost while it was sorting out its mobile monetisation infrastructure. This is masking the longer-term problem that the company faces.

This problem is the fact that its coverage of digital life is limited to one third of the pie (Exhibit 5 and Exhibit 17). This means that its total revenue opportunity is very limited as it only covers part of the pie, and the information that it holds on its users is less complete than it would otherwise be if it had better coverage of the pie. Hence at some point relatively soon, growth will slow down meaningfully as monetisation will have been optimised and growth will be limited to user growth. With 1.2 billion users already in the system, this is going to be slow. It seems likely that when growth begins to slow that there will be a substantial re-rating of the shares unless Facebook can break into the other segments of digital life (Exhibit 5).

Exhibit 17: Facebook in digital life



Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

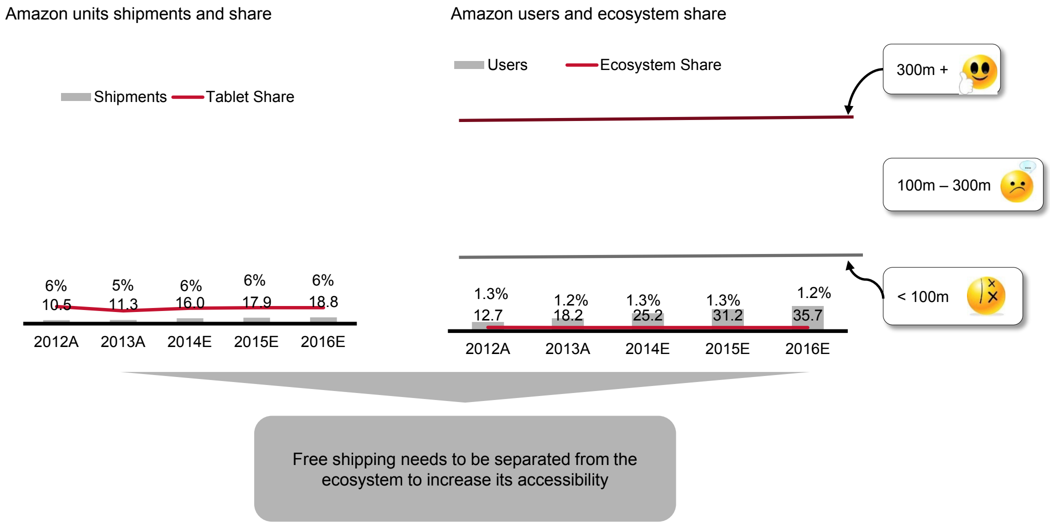
To hold onto above average growth, Facebook must begin to entice users into other areas and especially gaming. At the moment it offers games in the fixed line but nothing on mobile. Gaming is very important in mobile and this represents a significant opportunity if Facebook can get it right. This is a big "if" as Facebook has tried and failed to extend meaningfully out of its core proposition, but hopefully it is learning as it goes. Facebook has some time but as many are finding out, this time is much more limited than one might think.

Amazon: Pricing problem

On its current trajectory, Amazon is miles adrift of where it needs to be. To be credible in this space it needs 100 million users and in Edison is currently forecasting that it will hit just over one third of that by the end of 2016. The problem is simple. This ecosystem costs the user about $80 a year to be a member, meaning that only the hard-core shoppers are likely to join.

Amazon's ecosystem is based on Amazon Prime. This is a membership package that gives free shipping on all purchases on the Amazon site for one year. One also gets access to streaming video and music, and it is with this package that the experience on the Kindle Fire really comes to life. Hence Edison assumes that almost all owners of the Kindle Fire are Amazon Prime members and will be through the Fire user experience that the ecosystem is delivered.

Exhibit 18: Forecasts for Amazon.



Source: Edison Investment Research, Counterpoint Research

There has been plenty of commentary regarding whether Amazon will be doing a mobile device. Edison suspects that it will release a device, but first it has to fix the problem with its ecosystem. Free shipping needs to be separated from the other services in order to make them much more accessible and this combined with a great device might get the numbers moving in the right direction. **At the moment the Amazon ecosystem remains an irrelevance but action is expected.**

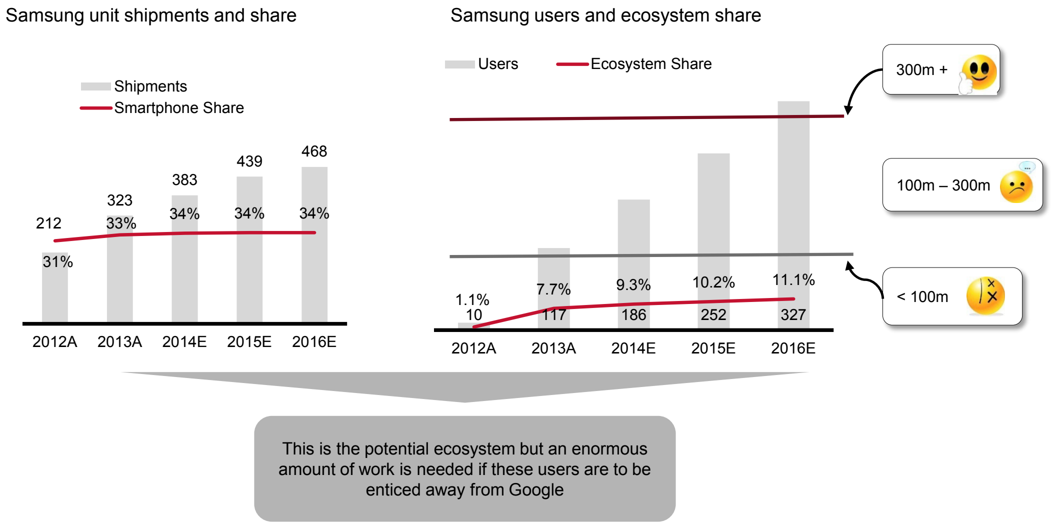
Samsung: New entrant

Samsung is a new entrant into the ecosystem league, replacing Tizen, which is becoming increasingly irrelevant as time passes and its members fall by the wayside (Mobile Software – iRobot, 6 March 2014, page 40). To date Samsung has simply been a hardware maker and its high-quality screens, form factor design and logistics have allowed it to become the number one smartphone OEM worldwide. While the smartphone market has been growing fast, Samsung has been able to make good returns from hardware, but this is already beginning to change.

The market is slowing and the hardware segment is commoditising fast. This is starting to put pressure on Samsung's profitability as its differentiation is being quickly eroded. **In order to create a sustainable advantage, Samsung must move into the ecosystem.** This brings it front and centre into conflict with Google as a large slice of the devices running the Google ecosystem (page 13) have been manufactured by Samsung. If Samsung can create great services that users love then it has a chance to migrate its brand value from hardware into software, thereby keeping its margins at its current high levels.

This is essential for Samsung to preserve its profitability. In a way it faces exactly the same issue as Apple (page 12), but it has a much steeper hill to climb. To date, Samsung has really only seen success with one service, ChatOn. This service has over 100m users and is the basis from which the Samsung ecosystem has been forecast.

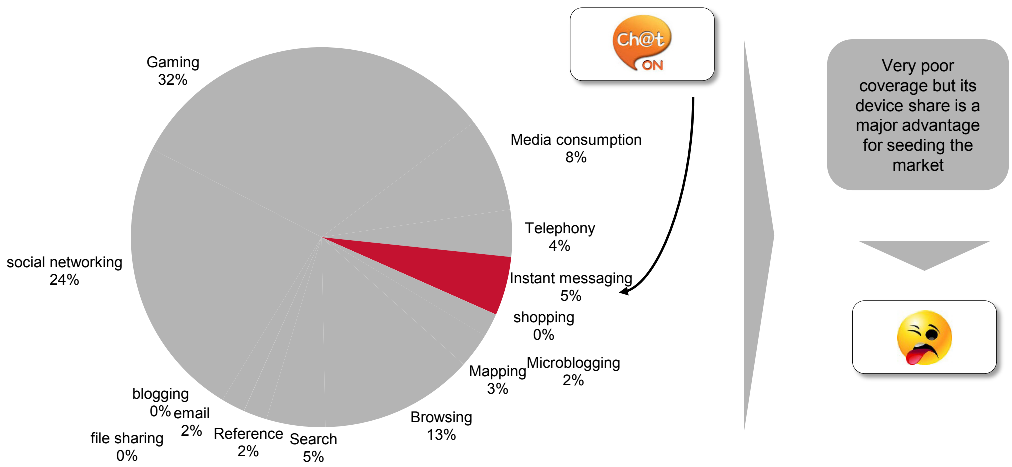
Exhibit 19: Forecasts for Samsung



Source: Edison Investment Research, Counterpoint Research

Readers should note that there is a significant amount of double counting going on here (Exhibit 19). Many of the users that have been counted for Google are also counted here because these users are using Samsung devices. Edison has assumed that from here on, an increasing percentage of Samsung smartphone shipments carry Samsung services and that the users use and identify with them. This figure is currently at 35% but increases to 50% where it flattens out. **Critically, these users have not yet been removed from the Google ecosystem count because Edison feels that it is imprudent to do so at this time.** This is because Samsung's digital life services remain at a very nascent stage (see below)

Exhibit 20: Samsung in Digital Life



Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

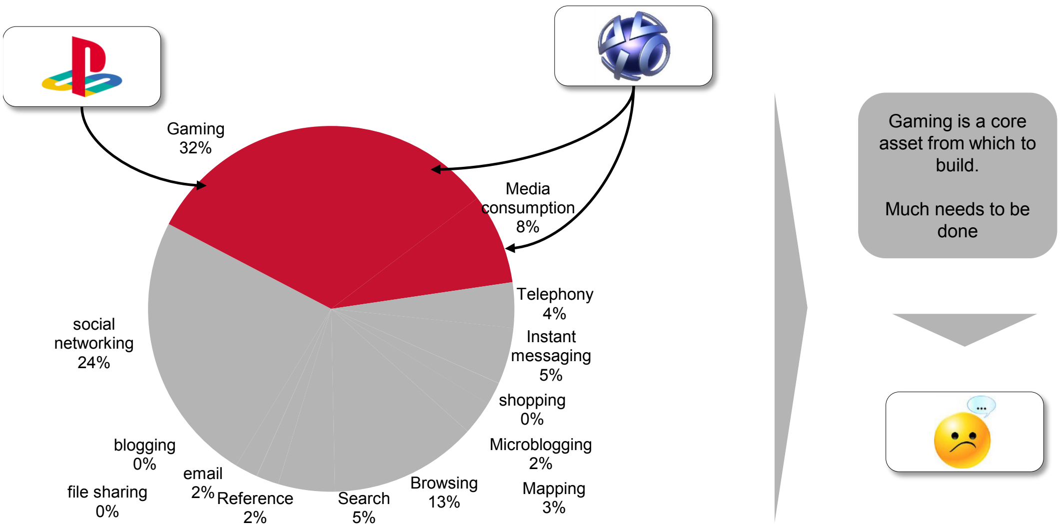
Samsung's coverage of digital life remains very poor. It is investing heavily in developing its own services and the quality of its software has improved beyond all recognition during the last 10 years. However, with no services upon which to judge the quality of its ecosystem, **Edison is making these forecasts as a measure of potential only.** As it stands today, Samsung's margins are on a trajectory to fall back under 10% as its devices commoditise in the coming years. There is an enormous hill to climb.

Sony: New entrant

Sony is the second new entrant into the list of 12 ecosystems that are vying for the hearts and minds of the user. Sony has less chance than Samsung to actually make it as a viable ecosystem, but it is much further down the road in terms of development. The main reason for this is Sony's PlayStation gaming network, which also delivers digital content to the console. Sony has diverse assets (content, software and hardware) and brands across its organisation and if these can be brought together something credible could emerge.

PlayStation network has 150 million users and if these users can be enticed to also use Sony mobile phones and tablets then Hirai-san's dream may start to come true. He has reorganised Sony as best he can to optimise the harmonisation of these assets, but it is a slow ship to turn around. The problem is that the entire culture of this company has to be turned on its head to achieve this goal, and in any company this is a difficult and painful process. However, there is much at stake and failure to bring these assets together will probably mean the end of Sony as a consumer electronics company.

Exhibit 21: Sony in digital life



Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

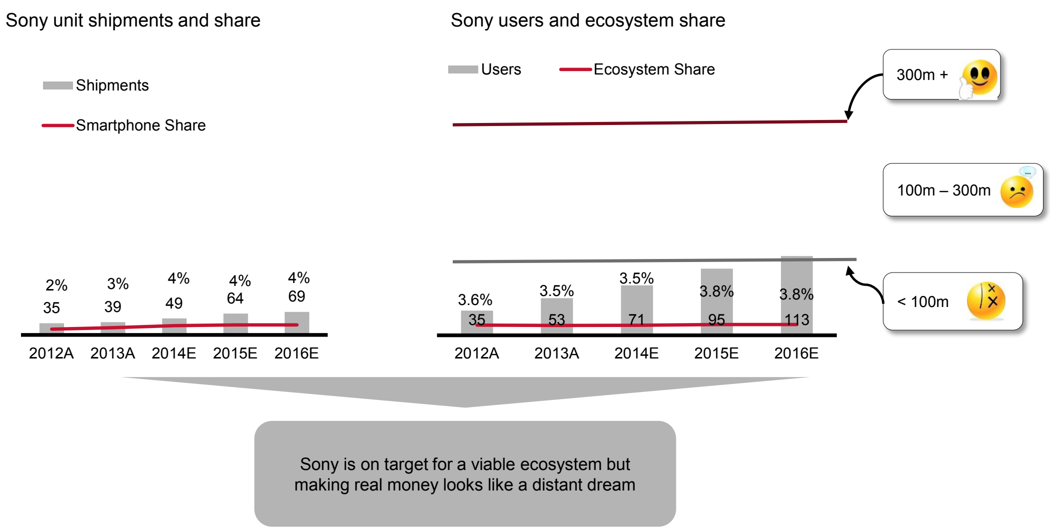
Sony's coverage of digital life is reasonable (Exhibit 21), but only because of its strong position in gaming. Furthermore, this position is almost exclusively in consoles as this strength has not been well represented in mobile. The PS Vita trails the Nintendo 3DS when it comes to adoption, meaning that so far Sony has done a poor job of extending the appeal of this asset into the handheld arena, let alone the mobile phone space.

This needs to be quickly addressed as well as improving its coverage of digital life. If this can be achieved and critical mass gained then Sony will once again be able to charge a premium for its hardware as users will be keen to get access to their services. Adoption is likely to be driven by smartphones and tablets and it is on this basis that the size of Sony's ecosystem has been based and forecasted.

Sony is on track to have a viable ecosystem, but it will be a long, hard slog to reach the magic 100 million user number (Exhibit 8). Furthermore with only 100 million users, Edison doubts whether Sony will be able to make a decent return as it will be sub-scale and much less relevant than Google, iOS or even Microsoft.

Hence the priorities for Sony must be: 1) successfully extend PlayStation to mobile, 2) Improve coverage of digital life services and 3) gain share in mobile devices. Success on these three will have a great impact on Sony, but at the moment the trajectory is not yet there.

Exhibit 22: Forecasts for Sony.



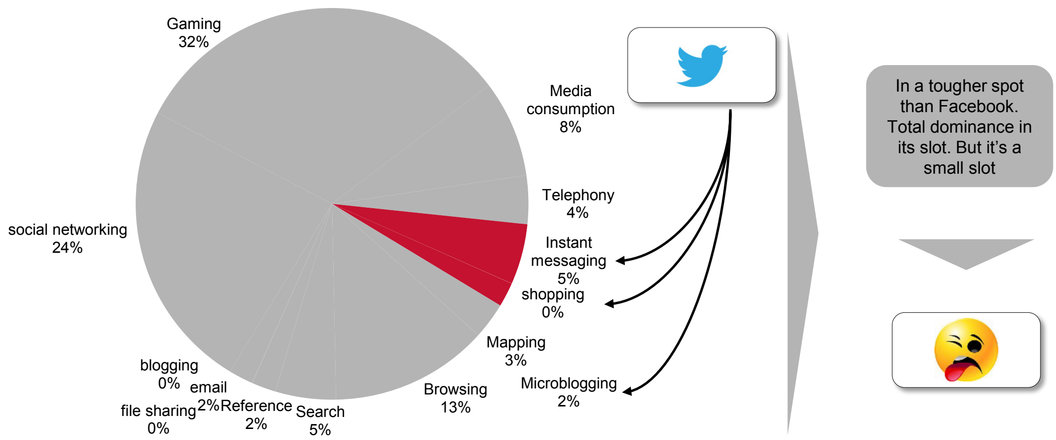
Source: Edison Investment Research, Counterpoint Research

Twitter: Stuck in the corner

Despite a hugely successful IPO, Twitter remains fundamentally limited in terms of its appeal and its reach. It has less than one-fifth of the number of users that Facebook has and only covers 5% of the digital life pie (Exhibit 5). This limitation became more apparent at the maiden set of results, where the user count saw a much faster than expected slow-down in growth.

With its current coverage of Digital Life (Exhibit 23), Edison thinks that revenues will flatten out at around $2bn, which is catastrophic for a stock that trades on 16.7x 2014e EV/sales. This is why Twitter must broaden its horizons beyond microblogging if it is ever to justify its current valuation.

Exhibit 23: Twitter in digital life



Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

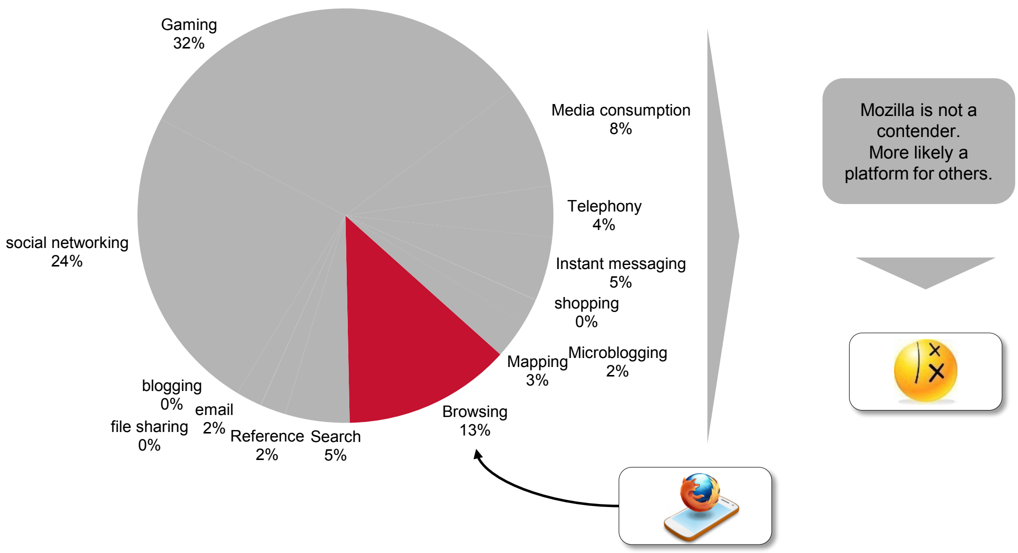
Although the user numbers are showing worrying signs of slowing down, revenue growth has continued to be strong. This is because monetisation is reasonably new to Twitter and it is not yet close to fully optimising the revenues it can earn from its users. If it remains a point solution in microblogging, Edison calculates the revenue potential at $2bn per year. This gives Twitter two years to work out how to expand outside of its core offering and how to monetise it. This is achievable, but progress to date has been slow.

For investors, Twitter remains a very risky proposition as its valuation is already assuming revenue growth meaningfully beyond $2bn. As a prudent investor, Edison does not want to pay for revenues for which we have no clear understanding of how they will be achieved.

FireFox OS: Still about the promise

The promise of Mozilla is **mid- to high-level smartphone performance for a mid- to high-level feature phone price.** Several devices have been launched by operators this year but Edison is not convinced that they have sold in meaningful volumes. This is simply because the Firefox OS does not yet live up to the promises that were made when the platform launched in 2013.

Exhibit 24: Firefox OS in digital life



Source: Edison Investment Research, Nielsen, Pewinternet.org, ComScore, NetMarketShare

Firefox OS is based on Linux where the functionality of the device is written in HTML5 using open web standards rather than the platform-specific APIs of the existing smartphone OS. The beauty of this system is that APIs are isolated from the hardware, meaning that there is no need to re-write or port any applications to run on devices from different manufacturers.

In theory this is every application developer's dream, but in practice this approach has always suffered from awful performance because of the processing overhead involved in making sure that the APIs are properly abstracted from the hardware. Mozilla claims to have solved this problem, in much the same way that SavaJe did, but the devices launched so far have not yet been able to fulfil that promise. As a result the shipment numbers and ecosystem membership are likely to remain barely above baseline.

Exhibit 25: Forecasts for Firefox OS

Firefox OS	2012A	2013A	2014E	2015E	2016E
Shipments	0.0	1.3	1.4	1.4	1.4
Smartphone Share	*0.0%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*
Users	0.0	1.2	1.9	2.3	2.5
Ecosystem Share	*0.0%*	*0.1%*	*0.1%*	*0.1%*	*0.1%*

The vital promise must be fulfilled before any meaningful traction results

Source: Edison Investment Research

Jolla: Proof of concept

The Jolla device has been available for three months, but the company has not said how many it shipped. Edison thinks that somewhere around 50,000 looks to be about right. This leaves a massive hill to climb if Jolla wants to register a presence in the smartphone world. The Sailfish OS user experience has been quite well received, but it still lacks an ecosystem of any real significance.

Exhibit 26: Forecasts for Jolla

Jolla	2012A	2013A	2014E	2015E	2016E
Shipments (m)	0.0	0.1	0.4	0.8	0.8
Smartphone Share	*0.0%*	*0.0%*	*0.0%*	*0.1%*	*0.1%*
Users (m)	0.0	0.1	0.4	0.9	1.2
Ecosystem Share	*0.0%*	*0.0%*	*0.0%*	*0.0%*	*0.0%*

Jolla’s device still looks like a proof of concept with the idea being to licence the software to others looking to create their own ecosystems.

Source: Edison Investment Research

Jolla, like BlackBerry, has attempted to get around its lack of third-party developers by implementing an Android emulator. Android applications will run on the device thanks to the Alien emulator from Myriad. Myriad has been working on this for a long time and there is hope that Android apps will work much better on Jolla than they do on BlackBerry’s awful BB10 implementation. No matter how good this it is, it can only serve as a stop gap as the Android equivalent will always perform better and consume less system resources. Hence, Jolla must develop its own ecosystem if it is to have any chance of survival as a player in this space.

Jolla has no position in digital life, meaning that unless something drastically changes, it will be unable to earn revenues from monetising traffic. This means it must make money selling handsets in order to survive. With 150 engineers, gross margins of 25% and an ASP of €400, Jolla needs to sell around 250,000 devices a year to break even. That does not sound like much in a market of 900m units, but the high end is already well developed and almost saturated. This will be tougher than it sounds but not impossible. This is especially the case with the significant Chinese backing that Jolla has.

Another option is for Jolla to license its software to third parties. This is problematic where software licence prices have fallen to $0 thanks to Android, but there is a possibility with customised implementations to client specifications. The Jolla handset could serve as the proof of concept and there could be interest from handset makers looking to get out from underneath the skirts of Google and Microsoft. The problem will still be the ecosystem. In this instance it would be up to the customer in question to create the ecosystem on top of the delivered software. The unit royalty will be far less than €400 and so Jolla would need to ship something in the region of 20m units to make this business fly without hardware revenues. Edison thinks that this is the plan B should the handsets not ship in the kind of volumes needed to make the company viable.

Cash flow is the metric to watch at Jolla. Jolla appeared as a phoenix, but without the lifeblood of cash flow it will be nothing more than a zombie with a short afterlife. At the very least Jolla is a far more viable and complete option than its half-brother Tizen.

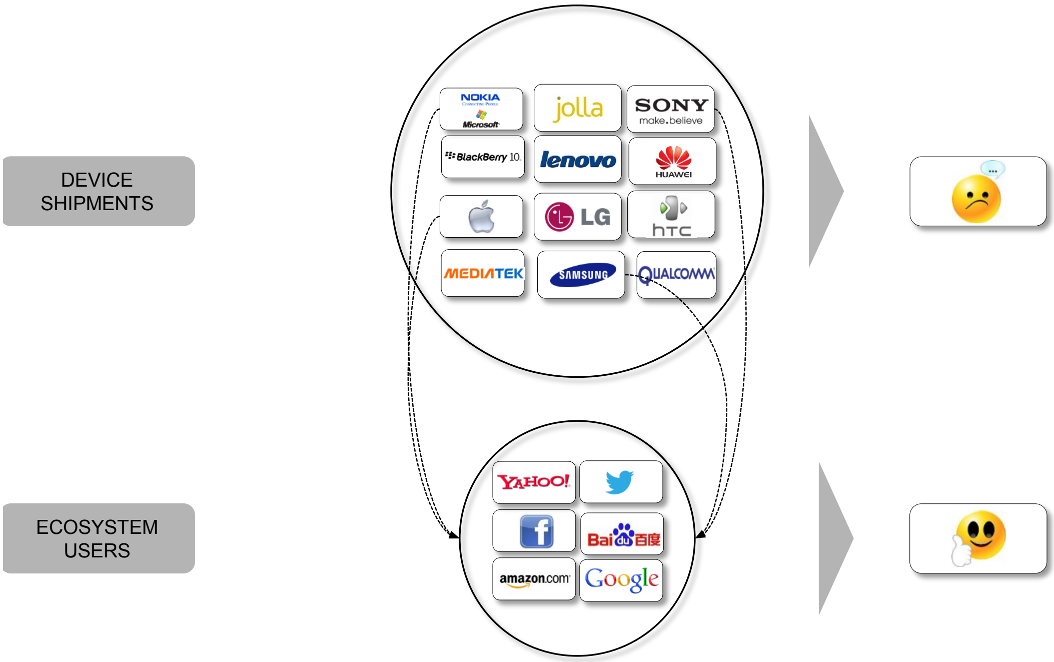
Conclusion

In the last six months, the situation in the mobile ecosystem has become much clearer. There are now three ecosystems (Google, iOS and China) that are comfortably over the 300 million user number, meaning that these ecosystems are both here to stay and should generate significant revenues for both their owners and developers who write for them.

The bigger issue is the slowing of smartphone growth, which is set to more than halve this year to 16%. This means that volume will be harder to come by, and competition will only become more fierce. For the commodity Android makers, this is very bad news and almost all of them are really struggling to differentiate themselves.

The place to look for growth is in the ecosystem where global membership should grow by 32% this year to over 2bn members. This is where Edison recommends that investors look for significant returns, as those that are making revenues from the number of users in the mobile ecosystem will see much better revenue growth over the next two years than anyone shipping handsets. This leads Edison to prefer the likes of Yahoo!, Google and Microsoft over the hardware makers such as Samsung, Sony, Blackberry and Apple (see below).

Exhibit 27: Revenue exposure to hardware shipments and ecosystem users



Source: Edison Investment Research

Market forecasts

Exhibit 28: Mobile ecosystem number and share

Ecosystem users (m)	2012A	2013A	2014E	2015E	2016E
Symbian	50.0	21.2	0.0	0.0	0.0
Tizen	0.0	0.0	0.0	0.0	0.0
Blackberry	79.4	65.4	34.4	0.0	0.0
iPhone OS	195.4	257.1	330.8	406.4	452.7
Windows	20.0	43.7	67.3	124.5	202.7
Facebook	1060.0	1230.0	1340.0	1366.8	1394.1
Amazon	12.7	18.2	25.2	31.2	35.7
Firefox	0.0	1.2	1.9	2.3	2.5
Jolla	0.0	0.1	0.4	0.9	1.2
Android	614.5	964.3	1292.5	1570.1	1809.6
o/w Google	179.4	337.3	523.2	700.2	805.4
o/w China	254.0	421.7	594.9	744.9	817.4
o/w Other	181.1	205.3	174.4	125.0	186.8
Yahoo!	0.0	0.0	0.0	0.0	0.0
Samsung	10.4	117.0	186.1	252.1	326.6
Sony	35.0	53.0	71.3	95.0	112.9
Total	**967.4**	**1519.9**	**2009.9**	**2482.5**	**2943.9**

Ecosystem share of users	2012A	2013A	2014E	2015E	2016E
Symbian	5.2%	1.4%	0.0%	0.0%	0.0%
Tizen	0.0%	0.0%	0.0%	0.0%	0.0%
Blackberry	8.2%	4.3%	1.7%	0.0%	0.0%
iPhone OS	20.2%	16.9%	16.5%	16.4%	15.4%
Windows	2.1%	2.9%	3.3%	5.0%	6.9%
Amazon	1.3%	1.2%	1.3%	1.3%	1.2%
Firefox	0.0%	0.1%	0.1%	0.1%	0.1%
Jolla	0.0%	0.0%	0.0%	0.0%	0.0%
Android	63.5%	63.4%	64.3%	63.2%	61.5%
o/w Google	18.5%	22.2%	26.0%	28.2%	27.4%
o/w China	26.3%	27.7%	29.6%	30.0%	27.8%
o/w Other	18.7%	13.5%	8.7%	5.0%	6.3%
Yahoo!	0.0%	0.0%	0.0%	0.0%	0.0%
Samsung	1.1%	7.7%	9.3%	10.2%	11.1%
Sony	3.6%	3.5%	3.5%	3.8%	3.8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Edison Investment Research, Counterpoint Research

Exhibit 29: Global handset shipments by vendor

Total Handsets Units by vendor Units (m)	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E
Apple	11.4	24.9	46.6	89.3	133.4	159.3	190.3	225.0
Huawei	7.0	13.5	30.0	46.0	49.4	56.2	63.6	70.0
HTC	6.5	10.8	24.9	43.3	32.5	23.0	17.7	13.5
LG	102.6	122.1	114.2	86.4	58.4	73.2	81.7	86.9
Google Motorola	106.6	58.5	38.6	40.3	35.3	16.5	15.2	12.2
Nokia / Microsoft	472.3	440.9	461.3	422.5	335.2	253.2	227.1	240.5
BlackBerry	23.1	34.3	47.5	51.5	36.1	18.7	8.3	0.6
Samsung	199.2	235.8	278.6	316.2	386.2	462.5	495.1	527.7
Sony Mobile	93.4	54.9	41.8	32.6	32.7	38.8	49.2	63.9
ZTE	14.2	16.0	50.0	69.3	69.6	54.1	44.9	47.4
Others	185.8	199.6	463.4	579.6	578.5	630.1	610.3	533.7
Total	**1211.2**	**1596.8**	**1776.9**	**1747.3**	**1785.5**	**1803.4**	**1821.4**	**1839.7**

Market Share Handsets	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E
Apple	2.1%	2.9%	5.0%	7.6%	8.9%	10.6%	12.4%	12.3%
Huawei	1.1%	1.9%	2.6%	2.8%	3.1%	3.5%	3.8%	4.0%
HTC	0.9%	1.6%	2.4%	1.9%	1.3%	1.0%	0.7%	0.7%
LG	10.1%	7.1%	4.9%	3.3%	4.1%	4.5%	4.8%	4.9%
Google Motorola	4.8%	2.4%	2.3%	2.0%	0.9%	0.8%	0.7%	0.4%
Nokia / Microsoft	36.4%	28.9%	23.8%	19.2%	14.2%	12.6%	13.2%	15.0%
BlackBerry	2.8%	3.0%	2.9%	2.1%	1.0%	0.5%	0.0%	0.0%
Samsung	19.5%	17.4%	17.8%	22.1%	25.9%	27.5%	29.0%	29.6%
Sony Mobile	4.5%	2.6%	1.8%	1.9%	2.2%	2.7%	3.5%	3.7%
ZTE	1.3%	3.1%	3.9%	4.0%	3.0%	2.5%	2.6%	2.7%
Others	16.5%	29.0%	32.6%	33.1%	35.3%	33.8%	29.3%	26.6%
Smartphone % Market	**15%**	**19%**	**27%**	**39%**	**54%**	**63%**	**71%**	**75%**

Source: Edison Investment Research, Counterpoint Research

Exhibit 30: Global smartphone shipments by vendor

Of Which Smartphones Units by vendor Units (m)	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E
Apple	25.1	46.6	89.3	133.4	159.3	190.3	225.0	225.8
Huawei	13.5	0.4	15.6	29.0	48.1	56.7	64.5	68.8
HTC	10.8	24.6	43.0	32.5	23.0	17.7	13.5	13.8
LG	0.6	5.6	19.0	26.4	48.9	61.5	71.0	75.6
Google Motorola	2.6	13.7	17.4	16.6	16.2	15.2	12.2	7.5
Nokia / Microsoft	70.9	102.2	84.6	36.4	33.6	47.0	97.8	151.5
BlackBerry	34.3	47.5	51.5	36.1	18.7	8.3	0.6	0.0
Samsung	5.9	25.4	90.5	212.4	322.5	382.7	438.7	467.6
Sony Mobile	1.4	10.3	19.6	34.8	38.5	49.2	63.9	68.8
ZTE	0.0	0.0	10.5	29.5	36.2	34.0	38.7	41.3
Lenovo	0.0	0.0	0.0	19.9	46.2	56.7	64.5	68.8
Others	20.7	23.0	30.7	79.7	181.9	213.9	200.0	185.9
Total	**185.7**	**299.2**	**471.7**	**686.7**	**973.0**	**1133.2**	**1290.3**	**1375.3**

Market Share Smartphones	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E
Apple	13.5%	15.6%	18.9%	19.4%	16.4%	16.8%	17.4%	16.4%
Huawei	7.2%	0.1%	3.3%	4.2%	4.9%	5.0%	5.0%	5.0%
HTC	5.8%	8.2%	9.1%	4.7%	2.4%	1.6%	1.0%	1.0%
LG	0.3%	1.9%	4.0%	3.9%	5.0%	5.4%	5.5%	5.5%
Google Motorola	1.4%	4.6%	3.7%	2.4%	1.7%	1.3%	0.9%	0.5%
Nokia / Microsoft	38.2%	34.1%	17.9%	5.3%	3.5%	4.1%	7.6%	11.0%
BlackBerry	18.5%	15.9%	10.9%	5.3%	1.9%	0.7%	0.0%	0.0%
Samsung	3.2%	8.5%	19.2%	30.9%	33.1%	33.8%	34.0%	34.0%
Sony Mobile	0.8%	3.4%	4.2%	5.1%	4.0%	4.3%	5.0%	5.0%
ZTE	0.0%	0.0%	2.2%	4.3%	3.7%	3.0%	3.0%	3.0%
Lenovo	0.0%	0.0%	0.0%	2.9%	4.7%	5.0%	5.0%	5.0%
Others	11.1%	7.7%	6.5%	11.6%	18.7%	18.9%	15.5%	13.5%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Edison Investment Research, Counterpoint Research

Exhibit 31: Global smartphone shipments by OS

Smartphones Units by OS Units (m)	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E
Symbian	81.0	111.6	88.4	28.1	1.3	0.0	0.0	0.0
BlackBerry 9 and older	33.9	49.7	51.5	37.8	16.7	3.9	0.3	0.0
iPhone OS	25.1	46.6	89.3	133.4	153.4	190.3	225.0	225.8
Windows Mobile / Phone	15.0	12.4	8.8	17.5	36.8	48.0	97.8	151.5
Linux	8.1	6.4	3.8	1.9	3.1	5.7	6.5	6.9
Android	6.8	67.2	219.5	449.1	710.3	809.3	880.3	938.7
BlackBerry 10	0.0	0.0	0.0	0.0	8.1	4.4	0.3	0.0
Others	15.8	5.4	10.4	18.8	43.7	71.6	80.2	52.4
Total	**185.7**	**299.2**	**471.7**	**686.7**	**973.0**	**1133.2**	**1290.3**	**1375.3**

Smartphones Share by OS %	2009A	2010A	2011A	2012A	2013E	2014E	2015E	2016E
Symbian	43.6%	37.3%	18.7%	4.1%	0.1%	0.0%	0.0%	0.0%
BlackBerry 9 and older	18.3%	16.6%	10.9%	5.5%	1.7%	0.3%	0.0%	0.0%
iPhone OS	13.5%	15.6%	18.9%	19.4%	15.8%	16.8%	17.4%	16.4%
Windows Mobile / Phone	8.1%	4.1%	1.9%	2.5%	3.8%	4.2%	7.6%	11.0%
Linux	4.4%	2.1%	0.8%	0.3%	0.3%	0.5%	0.5%	0.5%
Android	3.7%	22.5%	46.5%	65.4%	73.0%	71.4%	68.2%	68.3%
BlackBerry 10	0.0%	0.0%	0.0%	0.0%	0.8%	0.4%	0.0%	0.0%
Others	8.5%	1.8%	2.2%	2.7%	4.5%	6.3%	6.2%	3.8%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Edison Investment Research, Counterpoint Research

Exhibit 32: Global tablet shipments by Vendor

Tablets Units by vendor (m)	2012A	2013A	2014E	2015E	2016E	2017E
Apple	65.8	74.2	87.6	98.0	103.6	104.3
Microsoft	0.9	1.6	2.3	0.0	0.0	0.0
BlackBerry	1.1	0.7	0.0	0.0	0.0	0.0
Samsung	17.7	37.6	54.1	59.8	62.8	63.2
Amazon	10.5	11.3	16.0	17.9	18.8	19.0
Asustek	7.0	12.2	13.9	15.0	15.8	15.9
Lenovo	2.7	9.0	10.4	11.3	11.8	11.9
Acer	2.6	6.1	5.2	6.0	6.3	6.3
Dell	0.0	0.0	0.0	0.0	0.0	0.0
HPQ	0.0	0.8	6.4	9.0	9.4	9.5
Sony	0.0	1.6	5.2	6.0	6.3	6.3
Others	54.8	80.4	75.7	76.0	79.1	79.7
Total	**163.0**	**235.5**	**276.9**	**299.0**	**313.9**	**316.2**

Tablets Share by Vendor	2012A	2013A	2014E	2015E	2016E	2017E
Apple	40.4%	31.5%	31.6%	32.8%	33.0%	33.0%
Microsoft	0.6%	0.7%	0.8%	0.0%	0.0%	0.0%
BlackBerry	0.7%	0.3%	0.0%	0.0%	0.0%	0.0%
Samsung	10.9%	16.0%	19.5%	20.0%	20.0%	20.0%
Amazon	6.4%	4.8%	5.8%	6.0%	6.0%	6.0%
Asustek	4.3%	5.2%	5.0%	5.0%	5.0%	5.0%
Lenovo	1.7%	3.8%	3.8%	3.8%	3.8%	3.8%
Acer	1.6%	2.6%	1.9%	2.0%	2.0%	2.0%
Dell	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
HPQ	0.0%	0.3%	2.3%	3.0%	3.0%	3.0%
Sony	0.0%	0.7%	1.9%	2.0%	2.0%	2.0%
Others	33.6%	34.2%	27.3%	25.4%	25.2%	25.2%
Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Source: Edison Investment Research, Counterpoint Research

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