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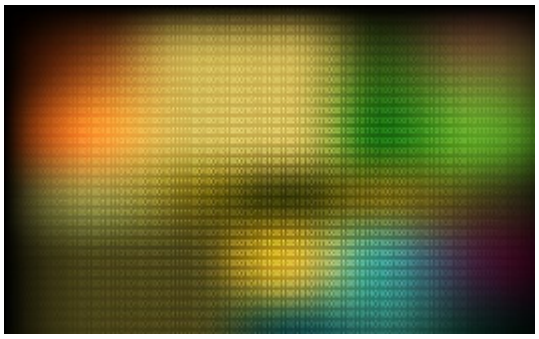


RESEARCH REPORT

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EXECUTIVE SUMMARY

Smart Watches

Apple Watch, WatchKit, Android Wear, Tizen, WebOS, and Embedded OS: Global Market Analysis and Forecasts for Smart Watch Devices, Operating Systems, and Applications

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SECTION 1

EXECUTIVE SUMMARY

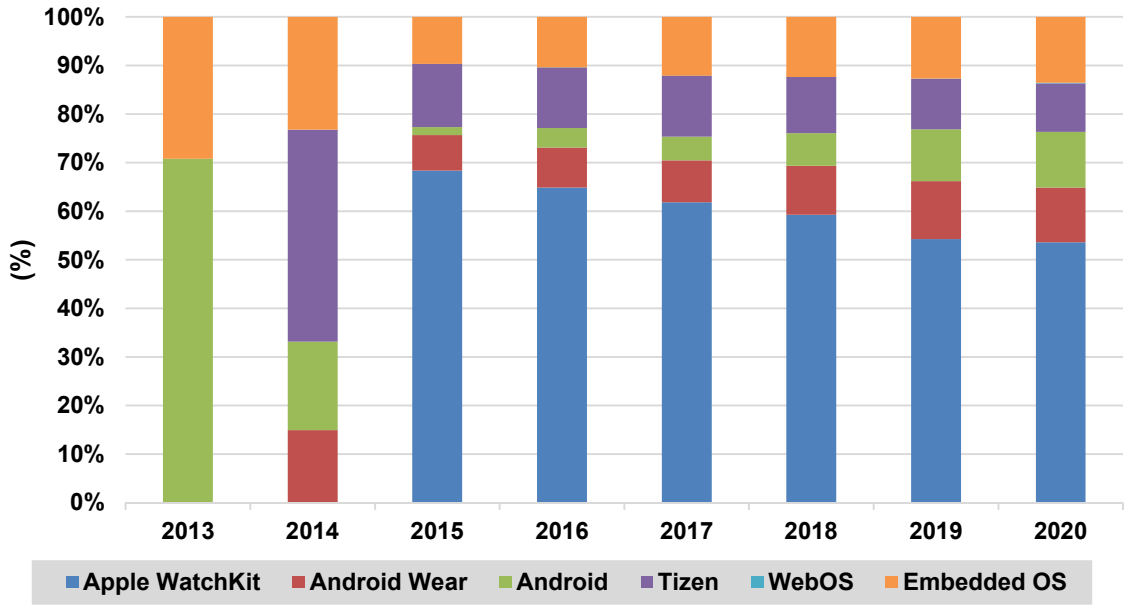
1.1 INTRODUCTION

The smart watch, as a wearable device category, has been around since 2012, when Pebble launched its Kickstarter project. Since then, the market has evolved and grown with Samsung, Sony, Motorola, LG, and a host of other companies launching their own products. While the market has grown, there has been no truly compelling mass-market product from both a hardware and software standpoint.

The Apple Watch, set for release in 2015, is possibly the first smart watch product of its kind with both the hardware and software attributes to make it a mass-market consumer device. Apple's weight behind the smart watch product category should benefit the market from a consumer education standpoint and set the bar for innovation, just as Apple did when it launched the iPhone and the iPad. Apple's big differentiator is the highly successful and innovative app ecosystem it has created, which now has the chance to extend iOS apps into a smart watch interface, offering unique experiences.

Tractica expects that this market will grow beyond just Apple, with a host of other watch operating systems (OSes) competing for share, including Android, Android Wear, Tizen, and WebOS. Another important category of emerging watch OSes will be the embedded OS systems used in e-ink display watches like the Pebble, niche-use sports watches, and a hybrid analog smart watch category that blends traditional watch craftsmanship and mechanical features with smart connectivity, fitness, and wellness tracking.

Chart 1.1 Smart Watch Market Share by OS, World Markets: 2013-2020



(Source: Tractica)

This Tractica report examines global market trends for smart watches and provides 7-year market sizing and forecasts for smart watch device shipments and revenues during the 2013 to 2020 timeframe. The report focuses on the technology issues, market opportunities and barriers for smart watches, and the relevant application markets, including consumer, enterprise, industrial, healthcare, and sports. A separate analysis provides details on smart watch OSes and the implications for watch app developers. Key industry players are analyzed in depth, including assessments of their relative strengths and weaknesses. Market forecasts are segmented by region, application market, and connectivity technology.

1.2 MARKET DRIVERS

The market for wearables has a number of drivers, with Apple's decision to enter the market being a major one. Apple brings a number of elements that will boost the market, including its world-class product and design team, one of the most visible global brands with an extensive footprint in retail stores, a large and creative app developer base, and the best-in-class supply chain to scale the market beyond levels yet seen. Apple's participation in this market also sets the wheels in motion for a whole range of component manufacturers in Asia, from memory chips to displays, all of which are revved and ready to kick into action. Some of this was in evidence at the recently concluded 2015 International CES 2015 in Las Vegas, with multiple smart watches on display in the Asian section of the show.

The smart watch as a companion device to the smartphone is a highly compelling proposition and one that will be a key driver. The smart watch is essentially a good tag team partner for the smartphone and should eventually help smartphone vendors differentiate their offerings based on the level of integration and cross-platform interaction they can provide.

The wrist is a highly convenient and accessible piece of real estate on the body. From a user interface/user experience (UI/UX) perspective, the wrist is a whiteboard waiting for new kinds of interactions, which will enhance the smartphone user experience, not replace it. This is a key reason why Tractica believes that the smart watch will see the most success as a wearable.

The entry of the smart watch is well timed, as the innovation in hardware and software has reached an optimal point for entry into a watch form factor. The massive success of the smartphone market has allowed silicon vendors and component manufacturers to improve manufacturing and production techniques, giving rise to smaller, but equally powerful component technologies like touchscreen displays, microcontrollers (MCUs), microprocessors (MPUs), memory, packaging, etc., all of which need to be just perfect to create a smart watch. The industry is now at a turning point where some of the smartphone hardware and software technology can be optimized for a wearable smart watch form factor.

App developers are looking for the next phase of growth and evolution of UI interactions. While they continue to earn revenue from smartphones, from an intellectual and creative challenge perspective, app developers are likely to have more satisfaction developing for new platforms like the smart watch. Also, it has been 7 years since the birth of the smartphone app market back in 2008 and there is a long tail of developers that still only make a limited amount of money. The smart watch provides a brand new platform where you could make a mark and start from the same base, rather than starting anew.

1.3 Market Barriers

While there are a number of drivers for the smart watch market, there are still barriers that could restrict its growth. For one, the current crop of smart watches and apps has not been as compelling as one would expect. While the launch of Google's OS Android Wear provided a boost to the market, giving original equipment manufacturers (OEMs) a chance to build products that can use specific software designed for a wearable use case, 12 months since the launch, we have not seen any compelling applications. One conclusion could be that developers are not yet convinced about the smart watch platform and whether it is something they would like to spend time and effort on, away from the lucrative smartphone market.

Another issue that smart watches could face for some time to come is that of supporting true contextual notifications. Android Wear is built on Google Now, which is a contextualization engine, but in reality, Google Now still has a way to go before it truly gives valuable information. Apple lacks a contextual technology like Google Now and it remains to be seen how WatchKit will use contextual information around location, time, and calendar to produce notifications. Until then, smart watches will suffer from issues like repeat notifications, which are likely to put off users, rather than engage new ones.

Battery life is another issue that will impact smart watch growth. Most high-end smart watches like the Apple Watch or the watches from Samsung, Motorola, and LG have battery life of a day, at the most, which could deter new adopters. Another issue for smart watches is convincing a whole generation of young people to wear a wristwatch at all. Many people under the age of 25 have never used a watch, as the utility of checking time has shifted to the smartphone. It might be challenging to convince these users about its utility and making it an additional device that you cannot forget, just like your smartphone, wallet, or house keys.

1.4 Technology Issues

Unlike smartphones, which have a largely uniform set of components that are needed to produce the devices, the smart watch market is different. Smart watches vary from the high-end, multi-function watches like the Apple Watch with high-end MPUs, to low-end, niche use watches like the Pebble that use basic MCUs. There is no single hardware platform for smart watches. Most of the prominent semiconductor providers for wearables, including Qualcomm, Freescale, and Broadcom, are supporting the complete spectrum of solutions, with ARM-based MCU cores playing a big role, especially for Android and Android Wear smart watches. Texas Instruments and NXP provide their own MCU products for the wearables market. In addition, new entrants like MediaTek are launching a system-on-a-chip (SoC) product for smart watches and Apple is releasing its own S1 chip, which it calls a system in a package (SIP) platform. The fragmented nature of the smart watch market should give component vendors plenty on which to differentiate their solutions.

The smart watch is a unique platform, different from the smartphone, around which new UI/UX interactions are likely to develop. For example, Apple has introduced the concept of glances on WatchKit, where a short glance gives the user a basic level of information, however, a longer engagement can bring up additional information on the screen. Apple has also introduced a new gesture with pressure, wherein a finger used as a button press on its watch screen will bring up new interactions. Voice control is another important UI/UX mechanism already used in Android Wear and watches like the Martian Voice Command. The other area to keep an eye on is holographic displays where the content leaps out of the display as a 3D object, with which one could interact. Watches with their limited display real estate could be an interesting intersection point for holographic displays.

Although battery life is an issue that could impact smart watch market growth, it is one of the most important focus areas for companies within this space. Technologies like wireless inductive charging are improving constantly, although issues exist with embedding the inductive coils into small wearable form factors like a watch. Although wireless charging through wireless pads will improve, a recent technology called WattUp from Energous Corporation received a lot of attention and awards at CES 2015. WattUp allows true wireless charging for devices within a range of 30 feet. Wireless power is an area to watch out for as a potential solution for smart watches and the larger wearable space in general.

1.5 STRATEGIC RECOMMENDATIONS FOR THE VALUE CHAIN

There is a high likelihood that, by 2016, Apple will become the largest watch company in the world, surpassing Swatch, which has leading global market share with revenues of over $9 billion. This alone suggests that we are at a turning point for the watch market, with new disruptive opportunities beckoning. Tractica still firmly believes that the traditional watch market will continue to survive because there is a large customer base that still prefers to own a watch that has a long history and skilled craftsmanship behind it.

The fact that Apple does not refer to its watch as a smart watch should provide ample clues as to how Apple approaches this market and does not really see the watch replacing the traditional watch market, but rather inventing a new one. This is something for the industry to understand and assimilate into its DNA.

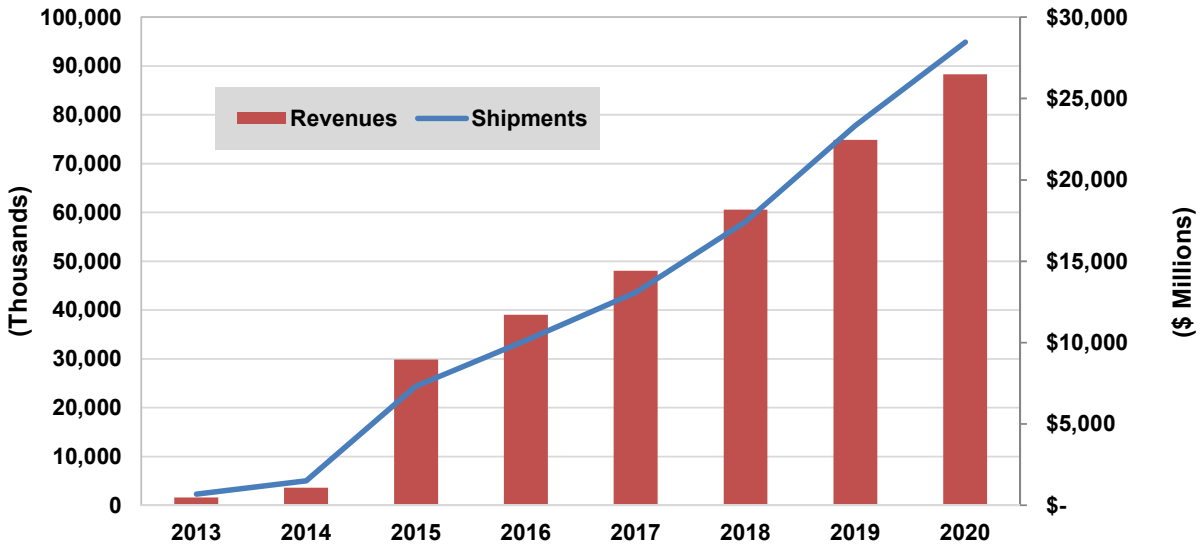
Companies in this space should build on their strengths, just like Apple is building on its own. The best bet for a small company is to make a product with a specific niche usage, most likely around sports, fitness, or wellbeing. A large company should figure how to position and integrate the watch with other successful products like the smartphone, smart home, laptops, or other consumer electronics.

While Tractica sees software and application platforms allowing companies like Apple to address multiple niche applications or use cases, there is also an opportunity to build watch hardware for niche verticals like sports, enterprise, or industrial, keeping the software fairly basic and embedded. Both approaches are likely to see traction as the market grows, with a long tail of applications emerging eventually.

1.6 MARKET FORECAST

The worldwide market for smart watches will see a boost in 2015 with the release of the Apple Watch. This is expected to drive the market forward, with other watch brands growing as well in the long term. Overall, Tractica forecasts that worldwide shipments of smart watches will grow from 2.3 million in 2013 to 94.9 million in 2020, growing at a compound annual growth rate (CAGR) of 71% between 2013 and 2020. Worldwide smart watch revenues will grow from $489 million in 2013 to $26.5 billion in 2020, at a CAGR of 77% between 2013 and 2020.

Chart 1.2 Smart Watch Shipments and Revenues, World Markets: 2013-2020



(Source: Tractica)

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SCOPE OF STUDY

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SOURCES AND METHODOLOGY

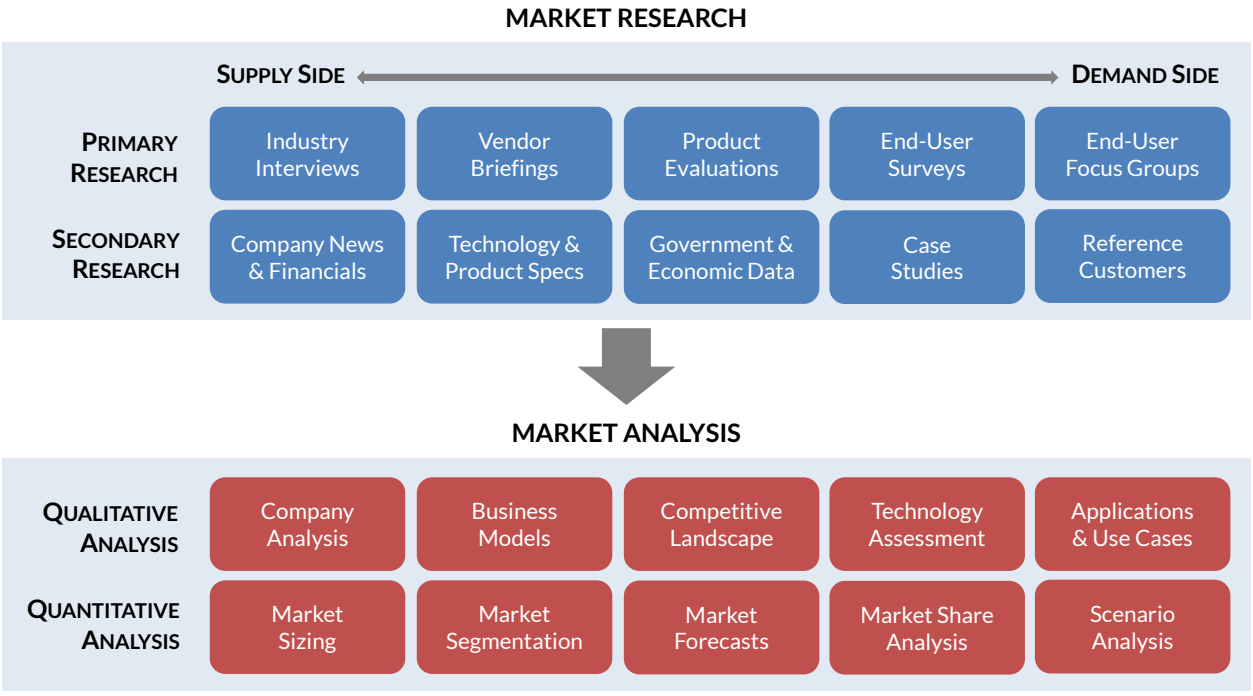
Tractica is an independent market research firm that provides industry participants and stakeholders with an objective, unbiased view of market dynamics and business opportunities within its coverage areas. The firm's industry analysts are dedicated to presenting clear and actionable analysis to support business planning initiatives and go-to-market strategies, utilizing rigorous market research methodologies and without regard for technology hype or special interests including Tractica's own client relationships. Within its market analysis, Tractica strives to offer conclusions and recommendations that reflect the most likely path of industry development, even when those views may be contrarian.

The basis of Tractica's analysis is primary research collected from a variety of sources including industry interviews, vendor briefings, product demonstrations, and quantitative and qualitative market research focused on consumer and business end-users. Industry analysts conduct interviews with representative groups of executives, technology practitioners, sales and marketing professionals, industry association personnel, government representatives, investors, consultants, and other industry stakeholders. Analysts are diligent in pursuing interviews with representatives from every part of the value chain in an effort to gain a comprehensive view of current market activity and future plans. Within the firm's surveys and focus groups, respondent samples are carefully selected to ensure that they provide the most accurate possible view of demand dynamics within consumer and business markets, utilizing balanced and representative samples where appropriate and careful screening and qualification criteria in cases where the research topic requires a more targeted group of respondents.

Tractica's primary research is supplemented by the review and analysis of all secondary information available on the topic being studied, including company news and financial information, technology specifications, product attributes, government and economic data, industry reports and databases from third-party sources, case studies, and reference customers. As applicable, all secondary research sources are appropriately cited within the firm's publications.

All of Tractica's research reports and other publications are carefully reviewed and scrutinized by the firm's senior management team in an effort to ensure that research methodology is sound, all information provided is accurate, analyst assumptions are carefully documented, and conclusions are well-supported by facts. Tractica is highly responsive to feedback from industry participants and, in the event errors in the firm's research are identified and verified, such errors are corrected promptly.

Chart 10.1 Tractica Research Methodology



(Source: Tractica)

NOTES

CAGR refers to compound annual growth rate, using the formula:

CAGR = (End Year Value ÷ Start Year Value)$^{(1/steps)}$ – 1.

CAGRs presented in the tables are for the entire timeframe in the title. Where data for fewer years are given, the CAGR is for the range presented. Where relevant, CAGRs for shorter timeframes may be given as well.

Figures are based on the best estimates available at the time of calculation. Annual revenues, shipments, and sales are based on end-of-year figures unless otherwise noted. All values are expressed in year 2015 U.S. dollars unless otherwise noted. Percentages may not add up to 100 due to rounding.

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