Progression of Wristwatch Styles: From Bracelet Watches to Smartwatches

Part 6: 2000–2018: Mechanical Revival Continues, Quartz Remains Dominant, Larger Is Better, Smartwatches Go Mainstream, and the Apple Watch Arrives

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Author's note: This article (Part 6 of 6) completes this series as it discusses the evolving watch industry in the beginning of the twenty-first century. Watches have more numerous styling options than ever as mechanical, quartz, and Smartwatches[1] are available from minimalist to highly complicated models with an increasing number of case, movement, and dial materials. The sizes of some watches have grown large and dwarf their predecessors. The popularity of the Smartwatch has forced changes in the fashion and luxury watch industries, as the Apple Watch has had explosive success in just the few years since it was released.

Mechanical Revival Continues

As the twenty-first century arrived the revival of the mechanical watch was apparent. Swiss watch exports numbered 1.7 million units in 1987 and increased to 2.5 million in 2000. In 2016, Swiss mechanical watch exports numbered 6.96 million units (27% of the total Swiss watches produced and 80% of the total sales) and led world manufacturers with $19.1 billion in export value. Since 2000, there has been more "high-mech" research that has resulted in new developments, and many "firsts" in mechanical wristwatch history including Francios-Paul Journe's resonance (twin balances beating in near-perfect synchronization, released in 2000), Ball Watch Co.'s Inspector II (Figure 1) ("Moon Glow" illuminated watch calendar and 26 microtubes on the dial with self-powered micro gas light known as 3H [night reading technology], released in 2003), and Seiko's spring drive kinetic (self-winding with an electromagnetic escapement, released in 2005).

There are now more independent brands with an emphasis on luxury marketing, and more media attention regarding mechanicals (especially concentrated within social media and blogs). Other companies outside of Switzerland design and manufacture high-end mechanicals including the U.S. firm RGM Watch Co. in Mount Joy, PA (manufacturer of in-house movements, other watch parts including cases, and grand complication watches), the German firm Nomos Glashütte (using in-house manual-winding and automatic mechanical movements since 2005; in 2014 introduced their own in-house escapement, known as the NOMOS swing system), the Russian firm Konstantin Chaykin (which uses in-house movements and, in 2013, created a new animation complication released on its Cinema watch), and the Japanese firm Seiko (known for the excellent Grand Seiko collection with precision in-house movements). But these and other companies outside of Switzerland only make up a fraction of the total worldwide sales of high-end mechanical wristwatches. The Swiss have been able to dominate the mechanical luxury sector by using their history, styling, experience, and mystique as advertising strategies.

Although a majority of wristwatch industry literature and hype concentrates on luxury brands, many inexpensive mechanical watches are also available. Examples include the hand-wound chronograph Seagull 1963 (released in 2011 and made by China's Tianjin Seagull Watch Co.[2] with a price

Figure 1. Ball Watch Co. Official Railroad Standard Inspector II with 3H night reading technology, ca. 2003. AUTHOR'S COLLECTION.

around $300) and the hand-wound vintage-inspired Timex Marlin (released in 2017 and was the company' first mechanical watch since 1982, with a price of $199). The Timex Marlin is only one of a growing number of re-issues and retro-designed wristwatches that have been released in recent years.

Quartz Remains Dominant

Although the mechanical revival has been impressive during the twenty-first century, one cannot lose sight of the fact that quartz watches, in worldwide production numbers, are enormously dominant over mechanicals. In 2015, according to the Japan Watch & Clock Association, there were an astounding 1.46 billion watches produced worldwide. Quartz watches totaled 1.42 billion (which is 97% of all watches produced). Analog quartz accounted for 84%, and digital quartz was 16% of the total produced.

The timing accuracy of quartz technology is continually improving. The high-accuracy quartz (HAQ) movements are specified to an incredible ±10 seconds a year. These watches use thermos-compensation technology that allows them to maintain a stable rate despite temperature fluctuations. Citizen's CTQ57-0953 Chronomaster, known as "The Citizen," is considered to be the most accurate watch in the world, specified to ±5 seconds a year. It retails for around $2,300. In 2010, Bulova (now owned by Citizen Watch Co., Ltd.) released their CURV Chronograph models, which were the first-ever curved chronographs. These Japanese-made HAQ movements feature a 262 kHz vibrational frequency that improves accuracy, and they run with a smooth sweeping seconds hand.

Wristwatches Grow Huge

Is bigger better? According to consumers (especially men) in the recent market the answer regarding wristwatches is "Yes!" Women are also wearing larger watches; recent fashion trends have been for women to wear mid-sized men's watches. Wristwatches have bulked up and grown huge (Figure 2) in the beginning of the twenty-first century. Some are even wide

enough across to overshadow the width of an 18-size pocket watch. In addition to fashion and mid-range watch companies, high-end watchmakers including Breitling and Omega (and even the traditionally conservative Cartier) have introduced models of larger size (42–48 mm and larger). The jewelry and watch industries refer to this trend as "wrist presence."

Over the past several years many watch brands have been sizing models down to approximately 38–42mm. With the popularity and practicality of diver, pilot, and various Smartwatches it seems doubtful that watch sizes will return to the typically small sizes (approximately 32 mm and less) of the 1940s and 1950s, or even the sizes of the 1960s and 1970s (approximately 34–36 mm). It is possible that larger watch sizes (wider than 36 mm) will remain in style for quite some time, especially in the Smartwatch market where larger screens are preferable.

Twenty-First Century Smartwatches

Smartwatches are not new to the twenty-first century. They have been around since the 1970s when the Digital Revolution[3] paved the way for digital technology to be integrated into wrist-worn timepieces. Since the 1970s, numerous Smartwatch models with various functionalities have been developed and released. Twenty-first century Smartwatches have more sophisticated integrated circuits, can interface with mobile devices, and can connect to the Internet; hence the term "smart." Most Smartwatches were discontinued in a relatively short period because they catered to a small niche consumer base and were unable to penetrate the mainstream market.

Many Smartwatches developed between 2000 and 2012 were able to function as stand-alone products with features including global positioning satellite

Figure 2. (Left) Renato-Mostro 55MOG-B sporting a huge 55 mm diameter case, ca. 2013, compared with (Right) a Rolex DateJust with a 36 mm diameter case, ca. 1970. AUTHOR'S COLLECTION.

(GPS[4]), activity tracking, heart rate monitoring, and various sports activity functionality. Digital wrist cameras, universal serial bus (USB[5]) links, and instant data receiving capabilities all came into general usage.

The Casio WQV-1 Wrist Camera was released in 2000 and was the world's first digital camera watch. It features the ability to take and store up to 100 monochrome 120 × 120 grayscale photographs. This innovative device proved wrist cameras are feasible and the technology is now available on some of the current Smartwatches. The Microsoft Smart Personal Objects Technology (SPOT) was released in 2004. Microsoft teamed with watch manufacturers that included Fossil and Swatch to design a touchscreen Smartwatch that was intended to offer information at a glance. Its release was well publicized and was touted as a revolutionary, smart, and sexy device. It worked on a proprietary network using FM radio signals that allowed Microsoft to maintain total control over the devices and the service. When cellular broadband started expanding and gaining popularity, Microsoft de-supported the platform in 2008, which rendered this devise obsolete.

The WiMM One Android was released in 2011 and was the first Smartwatch that was powered by Android.[6] It runs on an Android operating system and is equipped with a low-power processor, magnetometer, accelerometer, and the capacity of up to 32GB of storage. Additionally, it pairs with a smartphone via Bluetooth[7] and Wi-Fi[8] connectivity. With all this new, and potentially consumer-friendly, technology the Smartwatch industry did not have much success during this time because most products that were introduced in the beginning of the twenty-first century became obsolete before 2013.

The Smartwatch Goes Mainstream

After decades of research and development, technological failures, and a long list of discontinued models, the Smartwatch finally broke through with success in the mainstream market. The 2013 release of the original Pebble Smartwatch (Figure 3) was the beginning of successful commercialization and mainstream acceptance of the Smartwatch. Because Pebble Technology Corp. was not able to attract enough traditional investors, they turned to crowdfunding[9] through a Kickstarter[10] campaign in 2012. Pebble successfully raised more than $10 million that was pledged by more than 68,000 people. In a little more than a month in 2013 the Pebble Smartwatch sold more than 70,000 units.

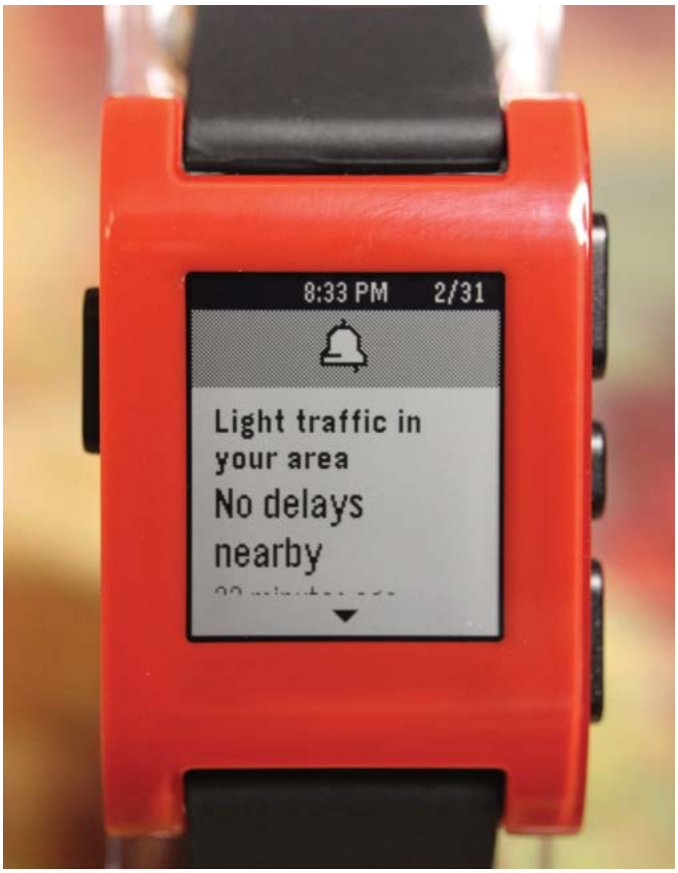

Figure 3. Original Pebble Smartwatch displaying local traffic conditions, ca. 2013. AUTHOR'S COLLECTION.

After the unprecedented success of the Pebble Smartwatch in 2013, scores of published articles focused on the Smartwatch and it suddenly became popular in the mass media (and is now a household name). Companies such as Samsung and Apple (and many more) increased funding for research and development projects as the Smartwatch industry finally seemed to be promising. This Smartwatch industry popularity has been referred to as a "wrist revolution."

After the Smartwatch went mainstream in 2013, it was clear that many consumers were not "techies" and did not want to wear a watch that looked like a miniature cell phone from the same companies that make cell phones and computers. A circular, more traditional design was desired by many consumers. One of the first commercially successful circular Smartwatches was Motorola's Moto 360 (released in 2014). It was also the first Android-wear Smartwatch with the circular case design that has the look of a traditional wristwatch.

Figure 4. Apple Watch Series 3 (38 mm, gold aluminum case with pink sand sport band), ca. 2017. PHOTOGRAPH BY AUTHOR.

Figure 5. Apple Watch Series 3 (42 mm, space gray aluminum case with gray sport band), ca. 2017. PHOTOGRAPH BY AUTHOR.

Many more Smartwatches were released in 2014, and according to the research firm International Data Corporation (IDC[11]) global sales of Smartwatches that year were 4.2 million units. But it turned out that the biggest news in the Smartwatch industry in 2014 came when Apple Inc. announced that it would launch its Smartwatch in 2015.

The Apple Watch Arrives

After many rumors going back to 2011, Apple Inc. finally released its long-anticipated Smartwatch, the Apple Watch, in April 2015. One of its more popular features is its digital crown that acts similar to a home button. In 2015, according to IDC, global sales of Smartwatches were 19.4 million units, and the Apple Watch, in its first year, accounted for 11.6 million of those units. The Apple Watch was an instant hit and the Smartwatch industry finally had a mega star.

In 2016, the Apple Watch, in its first full year of production, quickly became the dominant global Smartwatch model as it sold 12 million units (55%) of the total 21.1 million sold. Samsung Electronics was second with 2.4 million units (11.4%) of the total sold.

The Apple Watch Causes Shockwaves

The success of the Apple Watch has sent shockwaves throughout the traditional and Smartwatch industries. Pebble, the upstart company that forced Fortune 500 technology corporate giants (Apple, Samsung, and others) to play catch up in the Smartwatch industry, found it could not compete with Apple Inc. and was sold to Fitbit[12] in December 2016 for the "fire sale" price of $23 million.

Smartwatches have now moved from the high-tech market into the midrange traditional watch industry market. The Fossil Group, the world's fashion watch leader, has felt the effects of the Apple Watch. In 2014, before the release of the Apple Watch, Fossil's revenues were $3.51 billion (watches accounted for 78% of the total). Without the technology to compete with Smartwatches, coupled with reduced mall and department store business and the rise of e-commerce, Fossil's fashion watch sales have been steadily declining. By the end of 2016, Fossil's sales fell to $3.04 billion (a 13% decline from 2014). In an effort to compete in the Smartwatch industry Fossil launched a new strategy called "New World Fossil" and acquired Misfit, a manufacturer of Smartwatches, and is now releasing Smartwatches through some of its 17 fashion brands.

Apple Becomes World's Largest Maker of Watches

In September 2017, Apple Inc.'s CEO Tim Cook announced that Apple, which reported a 50% year-to-year growth in its Apple Watch sales, has replaced Rolex as the largest watchmaker (in sales) in the world. On September 22, 2017, Apple released its new Series 3 Apple Watches (Figures 4 and 5), which include improved speed and cellular connectivity as they can now send and receive text messages, answer phone calls, and receive notifications in the absence of an iPhone. The new Apple Watch Series 3 sales have been exceptional—first-quarter 2018 was the best quarter ever for Apple Watches.

On September 12, 2018, Apple Inc. announced the release of its Apple Watch Series 4 Smartwatch. The redesigned Series 4 models come in two sizes, 40 mm and 44 mm, and are equipped with an S4 processor chip that Apple claims is twice the speed of the previous generation. Their screens are more than 30% larger and the speaker is 50% louder. The microphone aperture is now located away from the speaker to improve call quality. Apple describes several new health and fitness features, including fall detection and heart monitoring, as "an intelligent guardian for your health." The fall detection feature uses the built-in accelerometer and gyroscope to determine if a person is falling from the movement of their arms. After a fall detection, and if no motion is detected after a certain amount of time, the SOS feature can contact emergency services and provide the GPS location. The heart-monitoring capability now includes an electrocardiogram (ECG) feature that can detect cardiac irregularities and abnormalities, which is the first of its kind in a Smartwatch. New software, watchOS5, includes auto workout detection, improved notifications, and a new Walkie Talkie feature.

Smartwatches and the Luxury Watch Market

There have been several Smartwatch entries from luxury Swiss brands, but the hardware and software technology has come from outsourcing (companies outside of Switzerland). Breitling entered the Smartwatch market in December 2015 using a traditional timepiece look on its Exospace B55Connected Smartwatch. It is a type of hybrid between a traditional watch with some Smartwatch functionality, mainly notifications, with both analog and digital displays. It uses Breitling's SuperQuartz movement that has the capability to keep time up to ten times more accurately than standard quartz technology. The original list price was $8,900. In March 2017, Montblanc released Summit, its first Smartwatch, which features standard Android Wear 2.0 technology. The original list price started at $890. In 2015, Tag Heuer released the first luxury Android Wear Smartwatch, the Tag Heuer Connected. The original list price was $1,500. In January 2018, Tag Heuer released the Android Wear Connected Modular 41 (41 mm) and the Connected Modular 45 (45 mm). There are seven standard models with customizable straps and lugs. Tag Heuer collaborated with Intel and Google to develop this Smartwatch. The original list price was $1,200.

Moving Forward

It seems incredible that in the beginning of 2018 two of the world's top five watchmakers were Apple (a technology firm) and Fossil (a fashion industry firm). With well over a billion watches being produced each year it seems reasonable to assume that there will always be niches for low-end, midrange, and luxury traditional wristwatches. The future success of the Smartwatch depends on whether the "connected" trend will continue to fuel mainstream market demand. A question for the traditional watch industry is how deeply Smartwatch demand will penetrate into their market and influence styling and technological changes in the years to come.

Notes

1. A Smartwatch in the 1970s through the 1990s was a digital wrist-worn device that had capabilities such as calculating, limited programmability, and the storing of data in its memory circuitry. In the twenty-first century, Smartwatches have evolved to include features such as Internet and cell phone connectivity, complex health monitoring, and wearable pay (a technology embedded in the device that interacts with a point-of-sale [POS] terminal to process credit and debit payments).

2. Tianjin Seagull Watch Co. was founded in 1955 and is located in Tianjin, China. The company produces a wide range of low-end, midrange, and high-end mechanical movements including multifunctional, quarter and minute repeaters. They possess more than 2,000 pieces of advanced machining and testing equipment, and account for one-quarter of the global production

of mechanical watch movements by volume. They are now manufacturing in-house, custom-designed, advanced tourbillons including a multi-axial orbital tourbillon movement.

3. The Digital Revolution (also known as the Third Industrial Revolution) is the change from analog, mechanical, and electronic technology to digital technology. This Revolution began in the late 1950s into the 1970s when digital computers and digital record keeping became common. Its derived technologies include digital cellular phones and Smartwatches that are now mass-produced using digital logic circuits.

4. A global positioning satellite (GPS) navigation device accurately calculates geographical location by receiving information from GPS satellites. Once an exclusive technology developed and used by the military, it is now widely used in automotive and mobile devices. The GPS satellite data are free to the public and work almost anywhere in the world.

5. U*niversal serial bus* (USB) was developed in the mid-1990s to standardize the connection for communication and to supply electrical power to various computer peripherals (including keyboards, digital cameras, printers, and disc drives.) USB technology replaced earlier interfaces including serial and parallel ports as well as separate power chargers for mobile devices and is now the industry standard. It has also been adapted for use on Smartphones and Smartwatches.

6. Android is a mobile operating system (OS) that was designed primarily for touchscreen mobile devices such as smartphones and tablets. It is now used on many different Smartwatches as well. The user interface for Android is largely based on direct user manipulation by touch gestures that loosely correspond to real-world actions, such as swiping, tapping, and pinching, to manipulate on-screen objects. A virtual keyboard is also included to enable the user to input text.

7. Bluetooth is short-range radio technology (or wireless technology) that enables communication between Bluetooth-compatible devices. It is used for short-range connections among cellular phones and Smartwatches, desktop and laptop computers, and other devices such as digital cameras, scanners, and printers.

8. Wi-Fi is the standard wireless local area network (WLAN) technology that allows computers and a vast array of other electronic devices (including Smartwatches, tablets, and smartphones) to connect with each other and to the Internet.

9. Crowdfunding is an alternative to traditional financing. It is the practice of funding a project or venture by raising monetary contributions from a large number of people, today often performed via Internet-mediated registries, but the concept can also be executed through mail-order subscriptions, benefit events, and other methods.

10. Kickstarter is an American public-benefit corporation. They have built a global crowdfunding platform focused on creativity in areas such as films, music, stage shows, comics, journalism, video games, technology, and food-related projects.

11. *International Data Corporation* (IDC) has more than 1,100 analysts worldwide and is a global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets.

12. Fitbit Inc. was founded in 2007 and is headquartered in San Francisco, CA. It is a global leader in wireless-enabled wearable technology devices such as activity trackers, and released its first Smartwatch, Fitbit Ionic, in 2017.

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