

Assessment A

Lisa Pugh

Tim Cook, Apple's CEO. "And once again Apple is poised to captivate the world with a revolutionary product that can enrich people's lives. It's the most personal product we've ever made." (Press Release, 2014)

The innovation I have chosen to look at is
Apple Watch

Interchangeable straps, 18hour battery life, digital touch screen, motion sensors, fitness, fall detection and ECG.

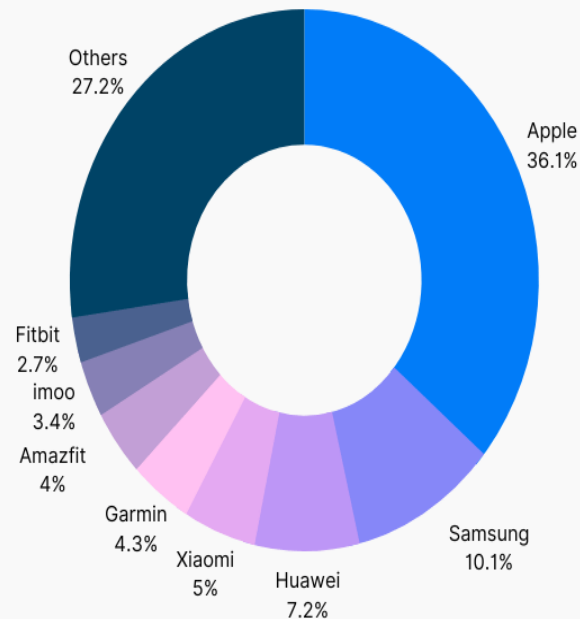
Apple does one thing with all its innovation, it wants the best user experience at the forefront of its design. Innovation that makes it intuitive and easy to use. They have accomplished this through an ever-involving business model that integrates all of Apple apps, services and products. This integration of systems allows them to offer proper solutions for their customer requirements and keeps consumers buying their products so that their software links up. Apple brand has become a household name thanks to the advertising and slogans, so much so that they have a brand following and this is key to a lot of their success.



(Flickr, 2018)

The extent to which they have shifted the chosen company's market position.

Smart watch market share

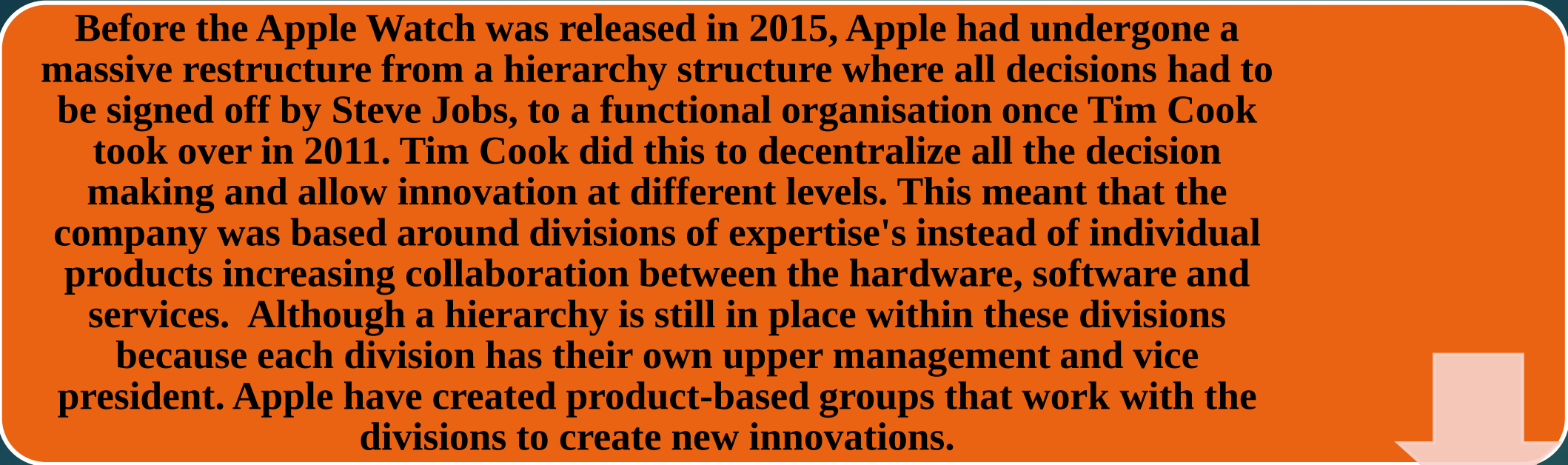


(Peter Susic, 2023)

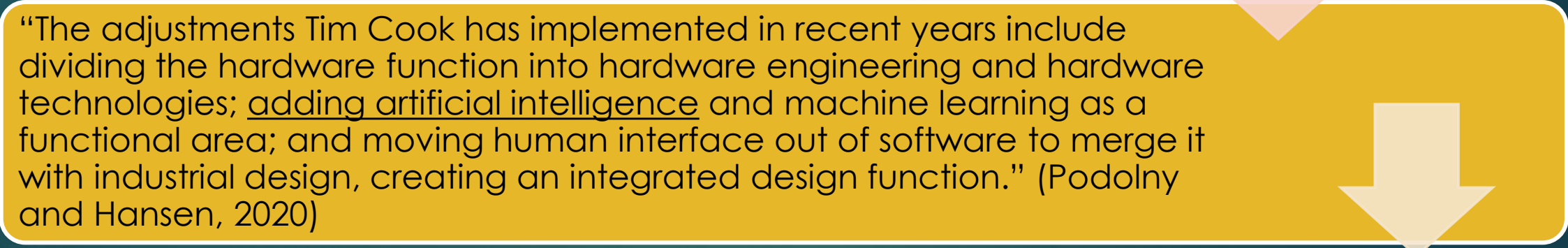
- ▶ The Apple watch has allowed Apple to expand into the growing wearable market and compete against other companies such as Fitbit, it has also allowed Apple to maintain its position as a leading technology company by integrating it with their iPhone.
 - ▶ To shift into the fashion market Apple took on former Burberry CEO Angela Ahrendts to become their head of retail due to her experience in the fashion industry. Angela used her knowledge of the fashion world to position Apple watch in pop-up shops in high end retailers to go head-to-head against established luxury brands. They then used influencers from the music world and front cover billing from magazines like Vogue. This made the Apple watch fashionable and got traction from across the world.
 - ▶ Due to this by 2017 Apple Watch had become the number 1 watch maker over taking Rolex.
- After the mixed success of series 0 Apple has resolved its challenges with series 0 and evolved through further incremental innovation it has allowed Apple to look at different high value markets where it can take this innovation even further.
- ▶ "Big techs are already sizing up the health sector. According to CB Insights the big tech giants Facebook, Amazon, Microsoft, Google, and Apple have taken an interest in the USD 8.3 trillion healthcare industry." "Apple has focused on smart devices using the Apple Watch and iOS to capture health metrics, and a data sharing feature so users can share medical data with providers." (Jane Thomason, Global health 2021)
 - ▶ "What is apparent is that Apple is building out an ecosystem of wearable computers that its customers will buy some subset of, depending on their needs. Still on the horizon are augmented-reality wearables -- perhaps glasses or goggles -- and other sensors on our bodies or in our environments that provide additional ways to monitor health." (Christopher Mims - Wall Street Journal 2018)

The extent to which they have influenced the company's internal structures and management processes

Before the Apple Watch was released in 2015, Apple had undergone a massive restructure from a hierarchy structure where all decisions had to be signed off by Steve Jobs, to a functional organisation once Tim Cook took over in 2011. Tim Cook did this to decentralize all the decision making and allow innovation at different levels. This meant that the company was based around divisions of expertise's instead of individual products increasing collaboration between the hardware, software and services. Although a hierarchy is still in place within these divisions because each division has their own upper management and vice president. Apple have created product-based groups that work with the divisions to create new innovations.



“The adjustments Tim Cook has implemented in recent years include dividing the hardware function into hardware engineering and hardware technologies; adding artificial intelligence and machine learning as a functional area; and moving human interface out of software to merge it with industrial design, creating an integrated design function.” (Podolny and Hansen, 2020)



“On the other hand, some medical wearable devices have also succeeded in receiving FDA approval, including the well-known Apple Watch [\[301\]](#) for the detection of falls and irregular heart rhythm, thus, achieving Steve Jobs' goal. (Ometov et al., 2021)

The extent to which they have been technology dependent and if so which technologies

The Apple Watch is dependent on a lot of other technology to function predominantly the iPhone.

The Apple watch needs the iPhone to function to allow it to connect to its Wi-Fi or Bluetooth, processing power and software ecosystem to enable it to deliver its features. It relies on the iPhone Wi-Fi to access the internet, make calls and send messages but also provided the processing power needed to run the apple watch operating system and apps. Due to both being tightly integrated into the same ecosystem it allows users to seamlessly transition between devices and access their data while connected on both devices.

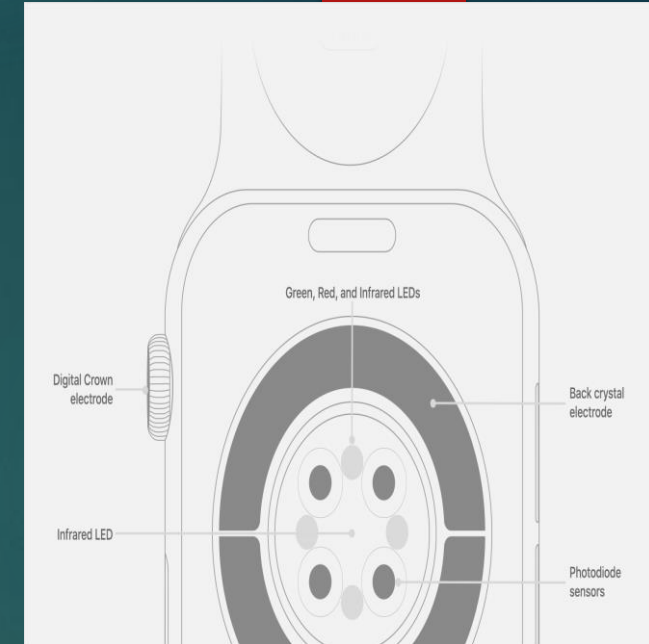


Image from Apple.com

GPS: Is used to track the user's location and provide accurate workout data for example the distance you ran and the pace.

Optical heart rate sensor: Is used to detect changes in blood flow by using green LED light and photodiodes to measure the user's heart rate.

Infrared: Is used to measure your heart rate when you are not active and for heart rate notifications.

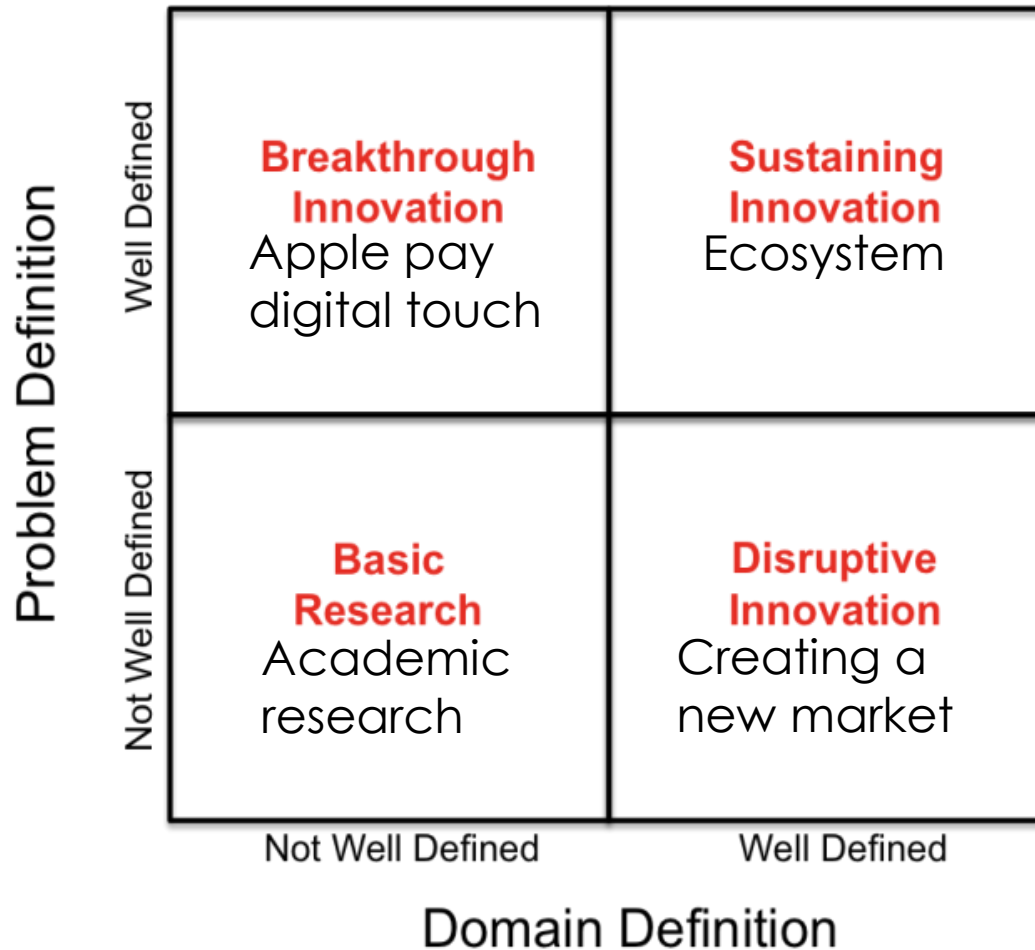


Accelerometer and gyroscope: These sensors work together to track the user's movement and activity for example steps taken, distance traveled, calories burned and detect when you have had a fall.

Electrical heart sensor: Using electrodes built into the digital crown and the back crystal, it measures the user's heart rhythm and can detect irregular heartbeats for example atrial fibrillation. "An inexpensive wearable heart rate monitor and machine learning algorithm can be used to detect AF with very high accuracy and has the capability to transmit ECG data which could be used to confirm AF. It could potentially be used for intermittent screening or continuously for prolonged periods to detect paroxysmal AF. Further work could lead to cost-effective and accurate estimation of AF burden and improved risk stratification in AF". (Lown et al., 2020)

Battery: Lithium-ion batteries ensuring they are safe when in close contact with the human body, cost of battery's and extending the charge life to fit with consumers demands. New alternatives are being looked at and progression has been moved forward with climate change and finding ways to be more sustainable

Innovation Matrix



How Apple
used Gregg
Satell
Innovation
Matrix

A consideration as to the outcome of the innovation

For a first gen product series 0 set up the company well to make further innovations and in truth it needed them as it saw sales drop due to it not performing well enough as a fitness watch, most of its issue were ironed out in other series.

The three rings fitness was addictive and game like that people felt they had to complete; it was eye catching and positive. The switching of bands was convenient and created individualism for the consumer and is still used today. The personalization won the consumer's over demonstrating aesthetics was an important attribute in this market.

The accuracy of the sensor used on the Apple Watch were consistently accurate through various trials making consumers feel confident in the result they were receiving.

The Apple Watch and the iPhone integration allows for seamless user experience but does mean that the two devices are highly dependent on each other to function. I believe this is what makes the Apple Watch stand out from other watches because it allows the Apple Watch to be more than just a watch but an addition of your phone but also allows you to have a vested interest in taking care for your own health at a tap of a screen.

The promise of 18hour battery life never live up to expectation in the early series and would need to be charged after doing a workout up until series 4. The fitness app was limited to very few activities and interaction took too long that people would often preferer to use their phone. After series 0 Apple really took on board what the consumer thought of their innovation and took it on board. Series 1 added a dual-core processor, GPS sensor in series 2, S3 processor series, water protection up 50m and RAM series 3, ECG and fall detection series 4 to name just a few.

Competitors like Google, Microsoft and Samsung are all trying to compete with Apple and beat them at there own game by doing similar product and the effect on Apple is

“characterized by aggressive price cutting and resulting downward pressure on gross margins, continual improvement in product price/performance characteristics and frequent introduction of new products.”(Eric Johansson, 2021).

"Hardware (infrastructure) was found to have a strong impact on the performance/quality value. Hence, to improve smartwatch performance, manufacturers should upgrade and enhance their hardware infrastructure, such as faster processors, better sensors, more pervasive mobile networks. Furthermore, design aesthetics has a strong impact on user attitudes and social value." (Hsiao and Chen, 2018)

What I have learnt in undertaking this assessment

- Nearly all innovation comes from someone's else idea that they take and enhance further to gain revenue.
- It does not matter that the first innovation isn't a success if the company adapts learning from the user behaviours the innovation can still be a success.
- Having familiarity of functions enable the user to quickly adopt the innovation users want .
- I have learned about Gregg Satell innovation matrix and how the four quadrants shows different way to innovate and can go through more than one quadrant during the life span of the innovation.
- Innovation is sometime reliant on technology catching up to the vision of the future product.
- Innovation requires good business structures that allow the freedom to innovate while still giving clean guidelines to keep it under control.

References and workload

I looked up all references, did all the slides, found all the pictures, googled all searches and read the books.

UTWS Library

Hsiao, Kuo-Lun (2017) What drives smartwatch adoption intention? Comparing Apple and non-Apple watches
Library Hi Teach; Vol.35, issue1. DOI:10.1108/LHT-09-2016-0105

Lima, Kadiyala, V., Huang, A., Agusala, K., Cho, D., Freeman, A. M., & Druz, R. (2022). At the Crossroads! Time to Start Taking Smartwatches Seriously. *The American Journal of Cardiology*, 179, 96–101. <https://doi.org/10.1016/j.amjcard.2022.06.020>

Hsiao, & Chen, C.-C. (2018). What drives smartwatch purchase intention? Perspectives from hardware, software, design, and value. *Telematics and Informatics*, 35(1), 103–113. <https://doi.org/10.1016/j.tele.2017.10.002>

Mims. (2018). EXCHANGE --- Technology -- Keywords: In Apple's Third Act, The iPhone Plays a Supporting Role --- What will be the tech giant's next big thing? Look for an expanding ecosystem of wearable computers. *The Wall Street Journal. Eastern Edition*.

Belani, Wahood, W., Hardigan, P., Placzek, A. N., & Ely, S. (2021). Accuracy of Detecting Atrial Fibrillation: A Systematic Review and Meta-Analysis of Wrist-Worn Wearable Technology. *Cureus (Palo Alto, CA)*, 13(12), e20362–e20362. <https://doi.org/10.7759/cureus.20362>

Jane Thomason (Dec 2021). Big tech, big data and the new world of digital health
Global Health Journal -Volume 5 Issue (4) Page 165-168

Ometov, Shubina, V., Klus, L., Skibińska, J., Saafi, S., Pascacio, P., Fluoratoru, L., Gaibor, D. Q., Chukhno, N., Chukhno, O., Ali, A., Channa, A., Svertoka, E., Qaim, W. B., Casanova-Marqués, R., Holcer, S., Torres-Sospedra, J., Casteleyn, S., Ruggeri, G., ... Lohan, E. S. (2021). A Survey on Wearable Technology: History, State-of-the-Art and Current Challenges. *Computer Networks (Amsterdam, Netherlands : 1999)*, 193, 108074–. <https://doi.org/10.1016/j.comnet.2021.108074>

Lown, Brown, M., Brown, C., Yue, A. M., Shah, B. N., Corbett, S. J., Lewith, G., Stuart, B., Moore, M., & Little, P. (2020). Machine learning detection of Atrial Fibrillation using wearable technology. *PloS One*, 15(1), e0227401–e0227401. <https://doi.org/10.1371/journal.pone.0227401>

Satell. (2017). Mapping innovation : a playbook for navigating a disruptive age. McGraw-Hill Education. Edition1

Xi, Zhang, X., Ma, Y., Zhou, C., Yang, J., Wu, Y., Li, X., Luo, Y., & Chen, D. (2018). Recent Progress in Flexible Fibrous Batteries. *ChemElectroChem*, 5(21), 3127–3137. <https://doi.org/10.1002/celec.201800741>

Online references

Andrew Beattie (Jan 29th 2022) Apple's key weaknesses. Investopedia

<https://www.investopedia.com/articles/investing/072715/apples-key-weaknesses.asp#:~:text=Despite%20its%20dominance%20in%20the,and%20incompatibility%20with%20other%20software.>

Victor Hristov (Oct 11 2022) Apple Watch history: the evolution of the ultimate smartwatch. Phonearena

https://www.phonearena.com/news/apple-watch-history-evolution_id136466

Organimi

<https://www.organimi.com/organizational-structures/apple/#:~:text=Apple%20uses%20a%20company%20structure,the%20different%20areas%20of%20expertise.>

John Dudovskiy (Feb 3 2021) Apple Organizational Structure: a brief overview

<https://research-methodology.net/apple-organizational-structure-a-hierarchical-structure-that-may-change-in-near-future/>

Press Release (Sep 9 2014)

<https://www.apple.com/uk/newsroom/2014/09/09Apple-Unveils-Apple-Watch-Apples-Most-Personal-Device-Ever/>

Bernadette Johnson -How stuff works

<https://electronics.howstuffworks.com/gadgets/high-tech-gadgets/apple-watch.htm#:~:text=The%20Watch%20relies%20on%20your,most%20of%20its%20other%20functions.>

Eric Johansson (April 16 2021) 5 problems facing Apple it won't talk about at its April event. Verdict

<https://www.verdict.co.uk/5-problems-facing-apple-april-event/>

Joanna Stern (Oct 3 2018) **Apple Watch Series 4 Fall Detection Tested By a Hollywood Stunt Double.** Wall Street Journal

<https://www.youtube.com/watch?v=G7xI2dUPN3A>

Apple (Dec 20, 2020) Monitor your heart rate with Apple Watch

<https://support.apple.com/en-by/HT204666#:~:text=The%20optical%20heart%20sensor%20in,light%20and%20absorbs%20green%20light>

Flickr (Sep 22,2018) Slide 1 Image apple watch (Creative Commons Licence)

https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.flickr.com%2Fphotos%2Fmarkgregory%2F44808714062&psig=AOvVaw1VCDXcbnZ_4USa2ZjAQ19R&ust=1680474265913000&source=images&cd=vfe&ved=0CA0QjhxqFwoTCKjSuuTcif4CFQAAAAAdAAAAABAc

Frederica Laricchia (March 16, 2023) **Wearables shipments worldwide market share 2014-2022, by vendor**

<https://www.statista.com/statistics/515640/quarterly-wearables-shipments-worldwide-market-share-by-vendor/#:~:text=The%20wearable%20device%20industry%20is,shares%20close%20to%2040%20percent.>

Peter Susic (Feb 22, 2023) **30+ Little-Known Apple Watch Statistics 2023: Sales, Market Share, Number Sold**

<https://headphonesaddict.com/apple-watch-statistics/>

Joel M. Podolny and Morten T. Hansen (Nov-Dec 2020) How Apple Is Organized for Innovation. Harvard Business Review

<https://hbr.org/2020/11/how-apple-is-organized-for-innovation>

conversationagent () Mapping Innovation with Greg Satell

<https://www.conversationagent.com/2017/07/mapping-innovation.html>