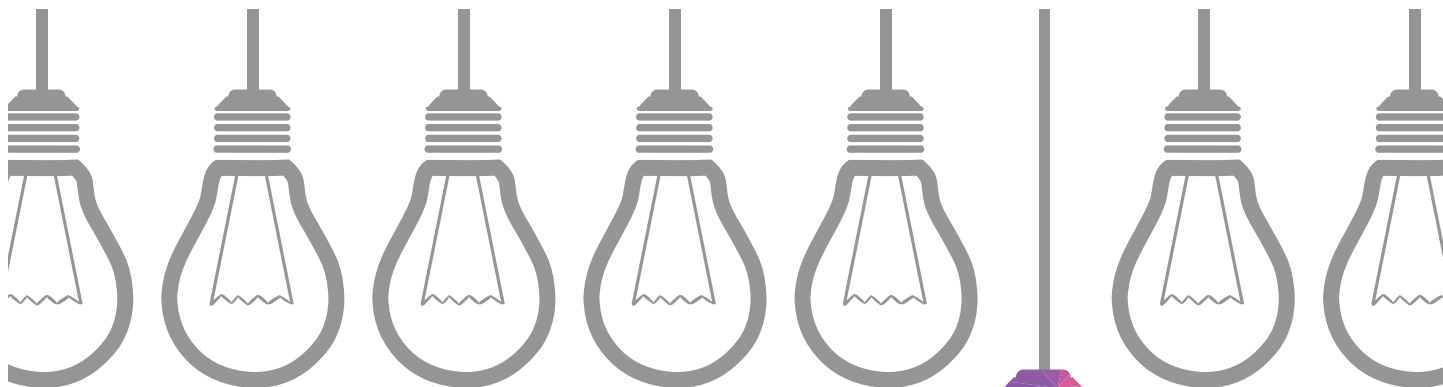




Trends in Wireless Phones

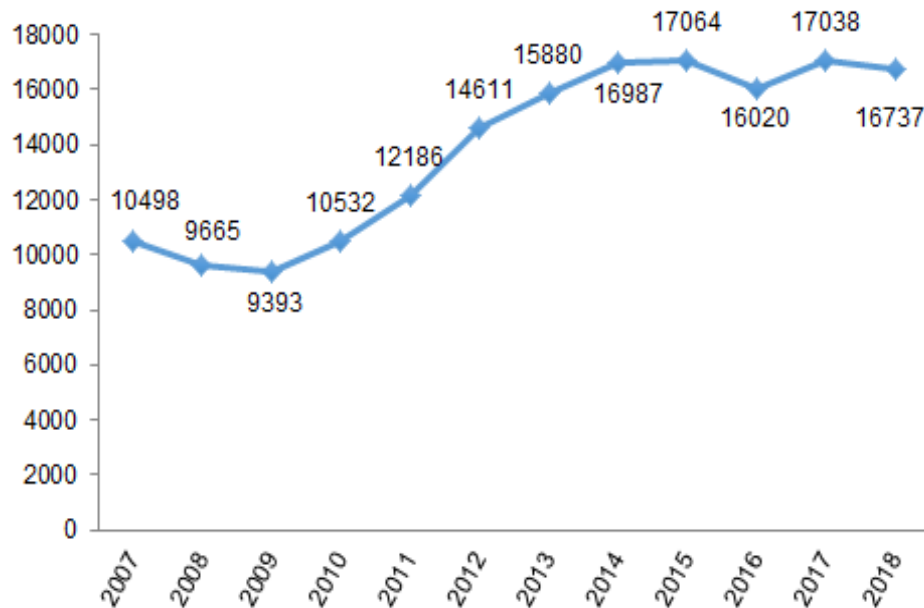
The number of patent filings relating to software is on a downtrend, likely signifying that most phone platforms have reached maturity. Explosive growth in app development earlier this decade has resulted in quick saturation and bloat of the app marketplaces.

The Wireless Phones industry is a maturing industry that has seen a number of competitors leave the market in recent years. However, while overall patenting activity has slowed down significantly, some technologies within this industry are continuing to experience an innovation and patenting uptrend. To delve deeper into the trends of patenting wireless phones innovation, we have defined the following technology clusters within the general Wireless Phones industry:

Taxonomies and expanded definitions of these clusters are included in appendix A.

Wireless Phones - Level I Clusters	Level II Clusters
Hardware Components	Antenna
	Battery Module
	Camera
	Charging Accessories
	Display
	Speakers & Microphones
	System On Chip (Soc)
Security/Authentication	-
Software Components	Mobile Applications
	Operating System
	User Interface (Ui/Ux)
Wireless Technology Standards	3G
	4G/Lte
	5G

The overall number of patent filings in the Wireless Phones industry has been plateauing



After rapidly rising between 2009 and 2014, the number of patent filings in the Wireless Phones industry has begun to drop off, with a notable uptick in 2017, which is likely due to the recent wave of 5G innovation. In part, the slowing trend in patenting may be due to market saturation (e.g., by 2013, 91% of U.S. adults had a cell phone).⁹² Another reason for the flattening trend in patent filings may be the refocusing of early innovators like Nokia (sold its handset division to Microsoft in 2013),⁹³ Motorola (Google sold its Mobility subsidiary to Lenovo in 2014),⁹⁴ Blackberry (stopped making handsets in 2016),⁹⁵ and ZTE (banned from U.S. market in 2018).⁹⁶



⁹² <http://www.pewresearch.org/fact-tank/2013/06/06/cell-phone-ownership-hits-91-of-adults/>

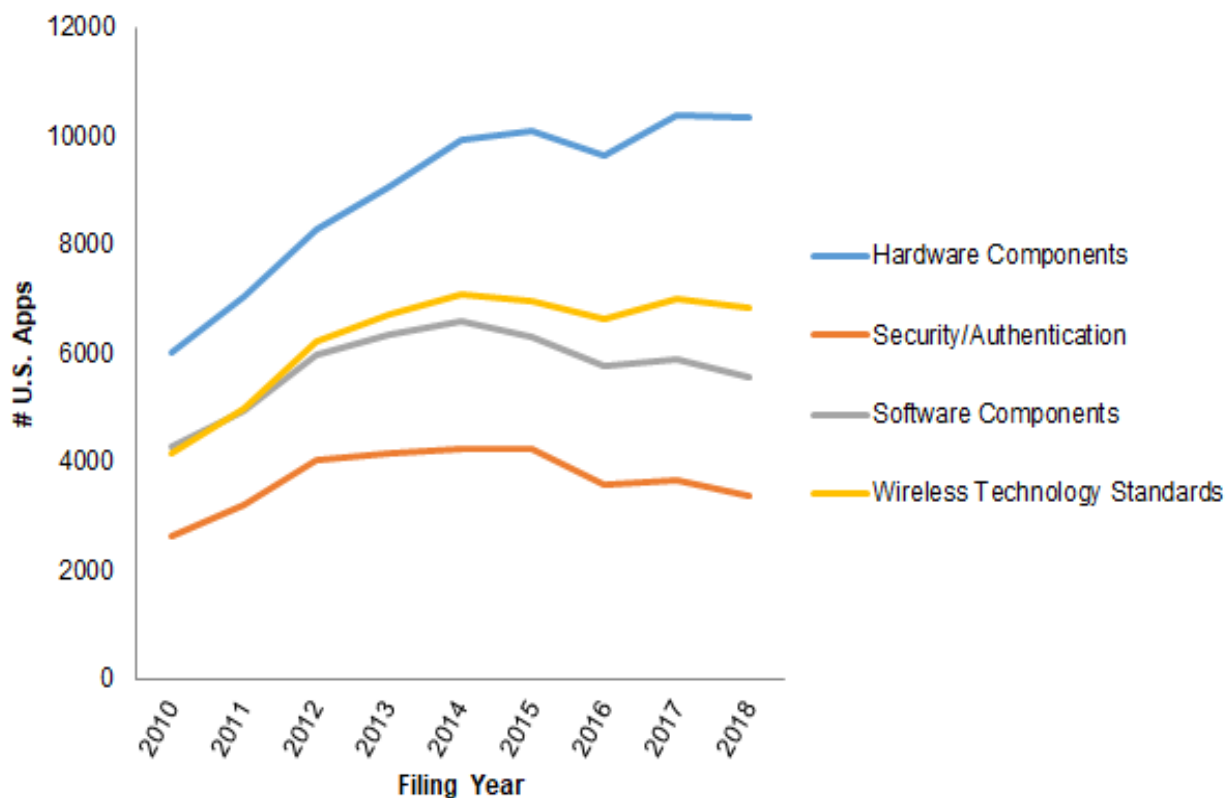
⁹³ <https://www.theatlantic.com/business/archive/2013/09/why-nokia-died-nobody-buys-phones-anymore/279337/>

⁹⁴ <https://qz.com/172207/why-google-just-sold-motorola-to-lenovo-for-3-billion/>

⁹⁵ <https://www.businessinsider.com/blackberry-stops-making-own-phones-quarterly-results-q2-2017-2016-9?r=UK>

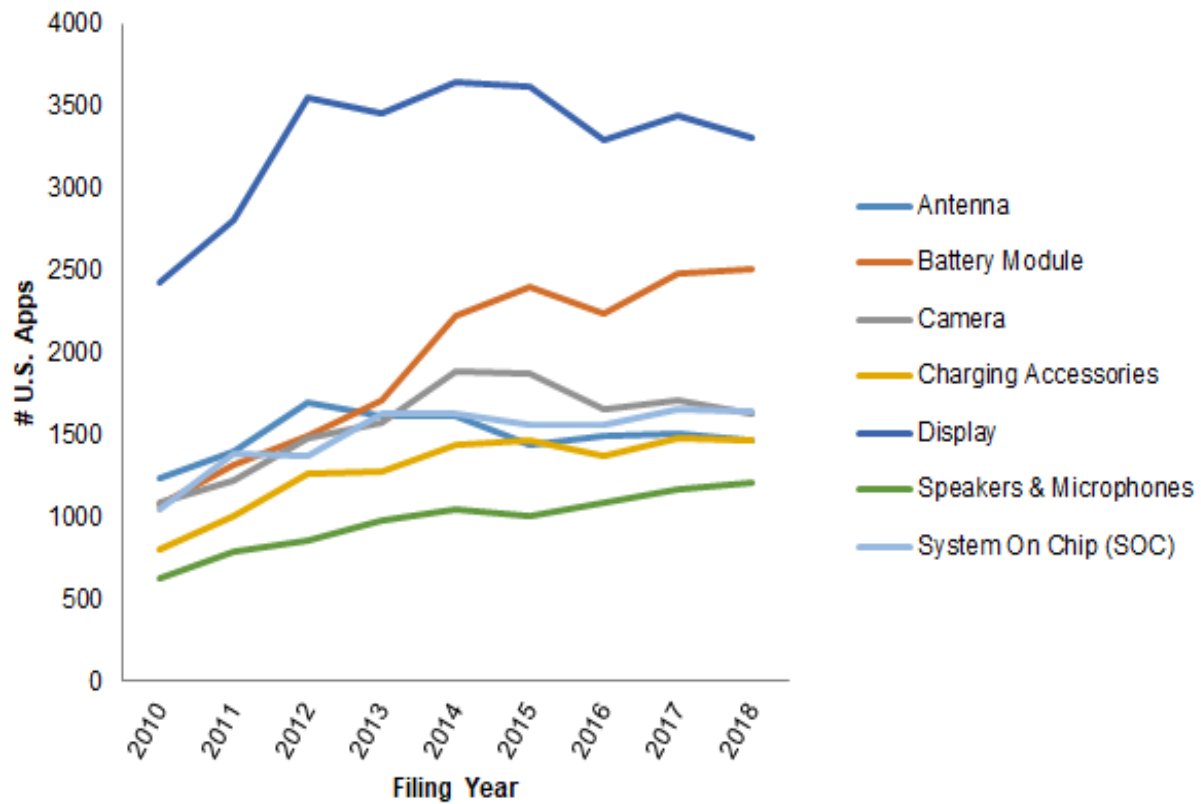
⁹⁶ <https://www.engadget.com/2018/05/09/zte-phones-us-ban-qualcomm/>

Patent filings in the Hardware Components technology cluster dominate the patent trends in the Mobile Phones industry



The largest number of patent filings in the Mobile Phones industry relates to the Hardware Components technology cluster. The subclusters comprising the Components technology cluster, however, show marked differences in patenting activity.

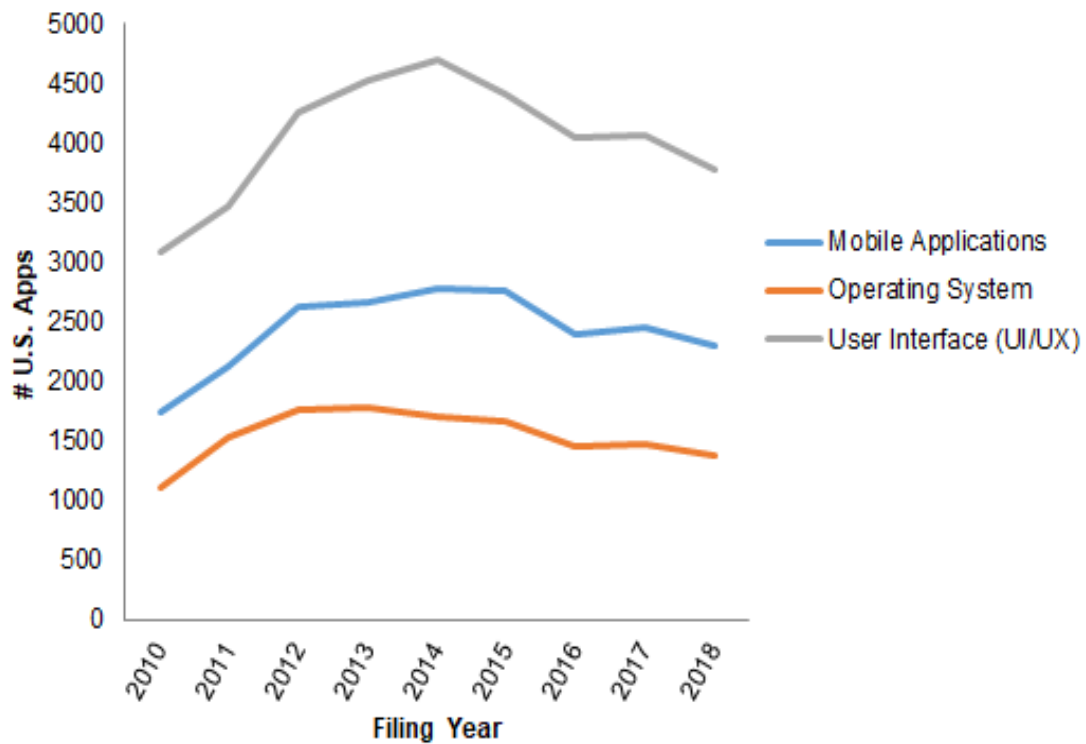




Patent filings related to Battery Modules and to Speakers & Microphones continue to rise, likely because they are the areas that still offer significant opportunity for improvement. Other component clusters, however, show a slowing trend in patent filings, suggesting that an uptrend in patent filings relating to these components will remain stagnant until there are significant new technological breakthroughs.



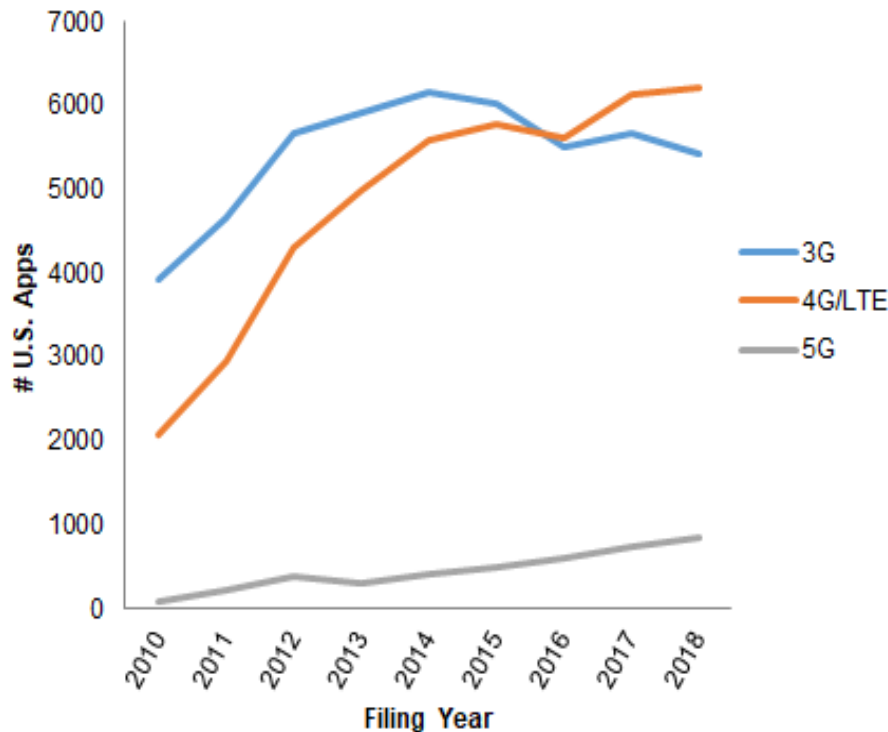
The number of Software patent filings appears to have peaked



The number of patent filings relating to software is on a downtrend, likely signifying that most phone platforms have reached maturity. Explosive growth in app development resulted in quick saturation and bloat of the app marketplaces.



5G innovation is starting to take off



In 2015, 98% of the U.S. population had access to 4G networks and, currently,⁹⁷ the vast majority of new wireless phones sold in the United States are 4G-enabled. The ubiquity of access to 4G corresponds to a drop in patent filings related to 3G as that standard matured and the continuing rise in 4G/LTE-related filings. It is also of note that, while smartphone sales are slowing, the sales of 4G low end phones are expected to skyrocket in the coming years,⁹⁸ suggesting that there may be continuing innovation and patent filings in the 4G standard technology cluster. Also, IoT has brought persistent data to many more devices using LTE data.

The steady rise in 5G-related patent filings is following the pattern of the previous generations of wireless phone standards. Therefore, with the first 5G phones expected to go on sale later in 2019,⁹⁹ it is likely that 5G-related patenting activity will continue to rise in the future.

⁹⁷ <https://bgr.com/2015/03/23/lte-coverage-map-united-states/>

⁹⁸ <https://www.cnbc.com/2017/03/22/4g-feature-phones-emerging-markets-apple-iphone-samsung.html>

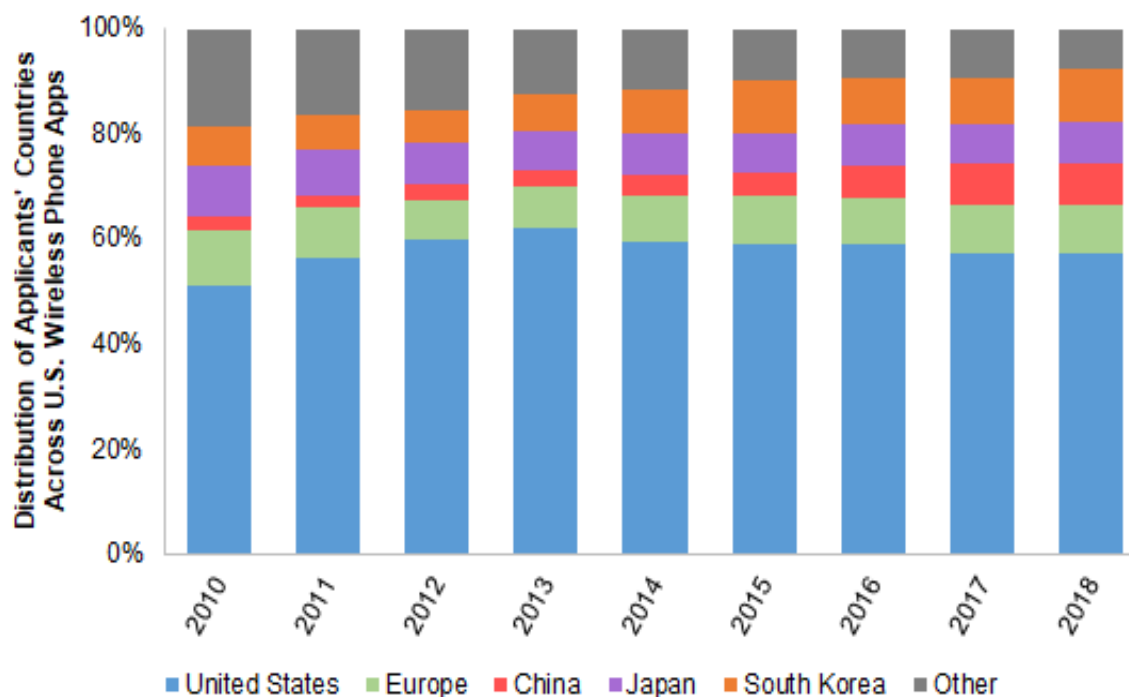
⁹⁹ <https://www.digitaltrends.com/mobile/5g-capable-phones/>

Leaders in wireless technology continue to grow their patent portfolios

USING 2016 DATA:		
		Most Families Filed by
		(Applicants in alphabetical order)
Wireless Phones		Apple, IBM, Intel, Qualcomm, Samsung
Level I		
Hardware Components		Apple, Intel, LG, Qualcomm, Samsung
Security/Authentication		IBM, Mastercard, Qualcomm, T-Mobile U.S.A., Samsung
Software Components		Google, IBM, LG, Microsoft Samsung
Wireless Technology Standards		Apple, Intel, LG, Qualcomm, Samsung
Level I	Level II	
Hardware Components	Antenna	Apple, Guang Dong Oppo Mobile Telecommunications Corp., LG, Qualcomm, Samsung
	Battery Module	Apple, IBM, LG, Qualcomm, Samsung
	Camera	IBM, LC, Microsoft, Qualcomm, Samsung
	Charging Accessories	Ford, IBM, Intel, Qualcomm Samsung
	Display	Apple, Goggle, IBM, LG, Samsung
	Speakers & Microphone	AAC Technologies Pte., Apple, Bragi Gmbh, Cirrus Logic International Semiconductor, Samsung
	System On Chip (SOC)	Apple, Intel, Qualcomm, Samsung, Universal Display Corp.
Software Components	Mobile Applications	Apple, Belling Xiaomi Mobile Software Co., IBM, Kyocera, LG, Microsoft
	Operating System	Apple, Google, IBM, LG, Microsoft, Qualcomm
	User Interface (UI/UX)	Google, IBM, LG, Microsoft, Samsung
Wireless Technology Standards	3G	Apple, Intel, LG, Qualcomm, Samsung
	4G/LTE	Apple, Intel, LG, Qualcomm, Samsung
	5G	AT&T, Ericsson, Intel, Qualcomm, Samsung

Leaders in the Wireless Phone industry continue to patent broadly, with patent filings across multiple technology clusters. In addition, leaders in software, like IBM, are continuing to innovate and file patent applications in this industry as well.

Patent filings originating in the United States account for approximately 60% of the overall number of filings in the Wireless Phone industry



The percentage of U.S.-based patent filings in the Wireless Phone industry peaked in 2013 but has been drifting down since then. In contrast, China has been increasing its share of patent filings in this industry, and the trend is likely to continue, in part because of the growing Chinese consumer base and its adoption of mobile technology along with pursuit of different technology standards.¹⁰⁰

¹⁰⁰ <https://www.ozy.com/acumen/the-biggest-mobile-market-in-the-world-hint-its-not-the-us/88904>



About KT

We help leaders create, expand, and protect the value of their businesses and most prized assets. Our attorneys bring a balance of business savvy, technical skills, and creative thinking to the opportunities and issues our clients face daily. From the most complex challenges to the routine, we work together to make businesses better, smarter, more protected, and more successful.



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