

Move over, Pessimists - Emerging Top 50 Technologies Offer a Gold Mine of Opportunities

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In their book "abundance," Peter H. Diamandis and Steven Kotler give us plenty of hope that every basic need will soon be met if not done yet! The exhaustive research into it depicts how our minds get clogged with loads of information, portraying challenges that are likely to cause significant devastation in our daily world. However, many such outlandish challenges have indeed remained on paper rather than actually affecting any of us.

In fact, we live in a world of opportunities and thanks to extensive research conducted across various stakeholders, there are a lot of benefits that can be reaped, regardless of the outlook projected by pessimists.

To characterize the opportunities available, we at Frost & Sullivan, believe that we are at the cusp of a technology-driven ecosystem that is not restricted to just one branch of ICT-based innovations which find mention and examples on the Internet. We cover a wide spectrum of industries that include materials, energy, medical devices and several more that are driving transformational change. So what are they? The Top 50 Technologies, the leading research offering of the TechVision group, the global emerging technology, innovation, and convergence-focused practice of Frost & Sullivan, offers strategic guidance and actionable ideas on the hottest 50 technologies that pack maximum potential to fuel global innovation; spawn innovative products and services; and drive wholesome commercial growth. The Top 50 Technologies are key beacons that will guide the strategic moves of innovation-driven organizations in the near future.



In the 2019 edition, as many as 40 new technologies made it to the list out of the 50, giving us a perspective that newer solutions are emerging from across the different clusters that will have a positive impact on every industry. These positives will also have an influence on the different megatrends, which are macroeconomic forces that are likely to have huge ramifications on businesses, economies, and people. A trend, such as Urbanization, Smart is the New Green, and Innovating to Zero, are concepts on which numerous solutions are built. These trends give rise to novel business models that were not otherwise thought of. Slowly, we are witnessing the influence of society on different areas, creating radical change. A decade ago, no one would have thought that most businesses will be moving towards "Uberization," which Uber has shown the world. We are transcending toward experiential living. These business models have given rise to a number of potential convergences across different industries. We are witnessing the coming together of automation, energy, and ICT industries to provide us with serendipitous innovations that disrupt traditional models. The influence of all these innovations has led to the emergence of a new breed of techno-philanthropists who are shaping the development of the "long-tail" economy. The new wave of emerging options is fuelling heavy investments from governments, venture

capitalists, evangelists and several others in the ecosystem, giving birth to the popular theme we are all excited about – Disruptive Innovations!

We now draw your attention to some of the innovations we came across that we believe will be of significant interest. These are depicted in the Top 50 chart that you see.

Within the materials realm, steady progress in R&D has propelled the development of hybrid, self-healing, nano and other materials that are likely to have an impact on sustenance, improving energy efficiency, and performance. This will result in extending the lifespan of various products and components. The broader medical devices space is leveraging developments in the domain of digital technology and creating a visible impact on technologies, such as radiomics and telerobotic surgery, which deliver a core medical value proposition through cutting-edge IT platforms and tools. In the environment space, circular and low-carbon economy principles are expected to see an upsurge in adoption in the near future as they help various industries to improve their environmental performance while simultaneously providing additional revenue streams.

Our increased focus on connected technologies brings to the fore significant developments in the field of cognitive security. The market is attractive for technologies with near-term adoptability in the area related to fog intelligence.

In the microelectronics arena, the evolution of the Internet-of-Things (IoT) and connected living could be expected to create a major stir in the smart devices market in the future due to the deployment of billions of devices. A key trend related to this development is the ever growing customer needs. Miniaturization will be a key driver as end users are constantly inclined to have electronic gadgets that are smart, handy, power efficient and, of course, economical. The spike in adoption of smart devices, smartphones in particular, has encouraged product developers and consumer electronics manufacturers to invest heavily on the research and development initiatives of technologies. High adoption of smartphones and rapid network infrastructure development are expediting the growth of smart homes (connected homes) and smart appliances. Advancements in smart home automation have assisted in navigating everyday chores efficiently. Apart from the reduction in workload, connected homes increase performance and offer optimized output. For instance, an automated solution with connected appliances would optimize the usage of appliances, thereby leading to reduction in cost and time, which will be a major boon for end users.

Key Strategies to Capitalize on Market Opportunities

In the electronics sector, the race to constantly innovate has pushed manufacturers to actively pursue partnerships, joint ventures, and collaborations to stay ahead in today's ultra-competitive marketplace.

The current stakeholders in the electronics industry are largely consumer electronics and display manufacturers, wireless communication and semiconductor developers, technology developers, research institutes, and universities. Consumer electronics companies, such as Apple and Samsung, are some of the forerunners in the electronics industry that are displaying keen interest on advancement of technologies. Automotive OEMs are also looking for potential collaborations with technology developers to incorporate the technologies in their products to offer an enhanced experience to end users.

Collaborative research initiatives and technology acquisitions are some of the key growth strategies witnessed in the electronics space. For instance, in 2014, LuxVue, a microLED company was acquired by Apple in order to use the patented microLED technology in its smartwatch.

Participants from the display, lighting, and automotive industries are expected to be the forerunners in adopting and commercializing microLED and screenless display-based solutions. Healthcare industry participants can be expected to investigate the possibilities of transient electronics and test its commercialization feasibility. Advancements in stretchable electronics would also encourage the development of flexible and transparent electronics.

2020 Scenario

By 2020, microLED is expected to be a commercially available technology in the display industry. Advanced manufacturing processes, improved efficiency, and robustness would be the key factors encouraging display manufacturers to adopt microLED as a replacement for LEDs and OLEDs. MicroLED has the potential to create an impact on the lighting industry based on developments in flexible electronics and transparent electronics.

Transient electronics would be in the final stages of research, and commercialization of the technology can be expected in the long term. Post commercialization, the technology is expected to be disruptive, particularly in the healthcare segment.

By 2020, petahertz electronics would be in the research phase and the potential for commercialization would be identified. Based on further R&D, it does have the potential to be commercialized in the long term (5-10 years).

Stretchable electronics has been in the research phase for over a decade. By 2020, some commercially available solutions may emerge due to advancements in flexible and transparent electronics. Stretchable electronics can be expected to be commercialized in the long term and have a high impact on the healthcare and consumer electronics space.

Currently, most of the screenless display initiatives are in the research phase. By 2020, holographic 3D techniques and heads-up displays are expected to be commercially available and deployed across multiple applications. Smart eyewear and brain-computer interface-enabled screenless displays would be in the research phase and their commercialization will hinge on health and safety regulations.

While each domain represents an area of intensified research & development, top-tier investments, and tremendous market potential, the possible convergence of several of these technologies opens up unprecedented opportunities for new revenue models and the next generation of innovative products and solutions.

In conclusion, we can rest assured that technologies emerging out of the innovations that we see in the Top 50 chart are poised to propel the markets forward for the next 100 years and more. They offer a gold mine of opportunities to be tapped that are both unique and abundant. Move over, pessimists.

About the author



Anand Subramanian is the Vice President with the TechVision business unit of Frost & Sullivan based in Chennai, India. Mr. Anand manages the group’s overall business which includes consulting and is also responsible for providing the business unit’s syndicated reports to clients. At Frost & Sullivan, Anand has focused on engagements and issues that deal with evaluation of emerging technologies and business models, their impact on market terrain and the firms that operate within it. He manages the Profit & Loss of the business unit in Asia and is the firms representative within India.

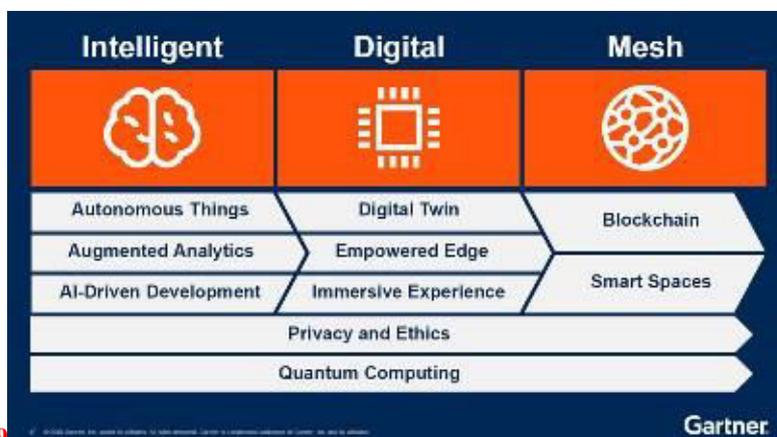
Anand has been involved with numerous proprietary engagements in North America, Europe and Asia-Pacific with Fortune 50, Fortune 500 and numerous start-ups. Anand has participated in several engagements with leading clients to help them leverage global market and technology opportunities and establish strategic partnerships. He has participated in strategic assignments for Procter & Gamble, General Motors, Lockheed Martin, Boeing, and IBM. Over the years, he has also participated in initiating and managing the production of hundreds of emerging technology studies.

Prior to his current role, Anand has worked as an analyst, project manager, and technology market consultant. He has written multiple research reports, white papers and technology articles that have been published in global research journals and prominent business magazines.

Anand has been quoted in Forbes, Washington Post and other key business dailies. He has also been invited to speak at multiple conferences as the guest of honor, thought leader and as an expert on issues related to Business Strategy, and emerging technologies in the business domain.

Anand also is the Head of Frost & Sullivan’s – Global Innovation Center in India. He manages Frost & Sullivan’s internal captive center which is the nerve center of all activities supporting the global offices. Anand is with Frost & Sullivan since March, 2001.

Gartner's Top 10 Strategic Technology Trends for



2019

Source & Courtesy: <https://in.pcmag.com/feature/126328/gartners-top-10-strategic-technology-trends>