

## **Pioneering Innovation: The Top 5 Malaysian Industries with the Most Patents Granted**

By Alvin Boey

### **Introduction**

Innovation has always been the driving force behind economic growth and development in any country. In recent years, Malaysia has emerged as a hotbed of technological advancement and creativity, as evidenced by the increasing number of patents granted across various industries. We witnessed firsthand the impressive strides Malaysia has made in pioneering innovation. In this article, we will explore the top five Malaysian industries that have been granted the most patents, highlighting the groundbreaking technologies that are shaping the nation's future.

### **Electronics and Electrical Engineering**

The Electronics and Electrical Engineering industry in Malaysia has played a pivotal role in the country's rapid economic development. Historically, Malaysia's success in attracting multinational corporations (MNCs) to establish manufacturing and research facilities has created an environment conducive to technological innovation.

This sector, encompassing a wide range of products and services such as semiconductors, consumer electronics, and electrical components, has long been a cornerstone of Malaysia's economic landscape. Notable trends include advancements in semiconductor technology, electronic components manufacturing, telecommunications, and renewable energy solutions. Malaysia has seen a surge in patent filings related to Internet of Things (IoT), artificial intelligence (AI), and automation.

The Malaysian Intellectual Property Office (MyIPO) has reported a significant increase in patents granted in the Electronics and Electrical Engineering sector. In the past seven years, there has been an average growth of 14% in patents granted from this sector, indicating a robust and expanding ecosystem of innovation within the industry.

The nation is home to several major semiconductor manufacturing facilities, which play a crucial role in global supply chains, further solidifying its position in the forefront of technological advancements. Prominent multinational companies such as Intel, Samsung, and Western Digital have established a strong presence in Malaysia, driving the Electronics and Electrical Engineering sector forward. Additionally, local companies and research institutions have played a crucial role in contributing to the industry's growth.

The Malaysian Government has actively promoted R&D in the Electronics and Electrical Engineering sector through various initiatives and grants. Collaborations between academia, industry, and government agencies have led to groundbreaking research projects, fostering a culture of innovation.

To further boost innovation, the Malaysian Government has implemented policies and incentives to support the Electronics and Electrical Engineering industry. These include tax incentives for research activities, grants for technology adoption, and the establishment of technology parks to encourage collaboration and knowledge exchange.

### **Chemicals and Materials**

As Malaysia propels forward in the realm of innovation, the Chemicals and Materials industry emerges as a pivotal player, securing a significant number of patents and making substantial contributions to the nation's intellectual property landscape. Operating at the nexus of manufacturing, construction, healthcare, and environmental sustainability, this sector plays a vital role in shaping diverse domains.

The Chemicals and Materials industry in Malaysia has a rich historical evolution, aligning with the nation's industrialization efforts. From the early days of being a raw material supplier, Malaysia has transformed into a hub for the production and innovation of diverse chemicals and materials, meeting both domestic and international demands.

MyIPO data shows that the Chemicals and Materials industry has experienced a remarkable increase in patents granted over the past seven years, with an average growth rate of 21%. This growth underscores the industry's commitment to innovation and the development of novel solutions.

This industry encompasses a broad spectrum of sub-sectors, including petrochemicals, specialty chemicals, polymers, and advanced materials. Malaysia has demonstrated expertise in the production of palm oil-based chemicals, rubber products, and a variety of specialty materials, contributing to the industry's dynamic and diverse landscape.

To foster innovation within the Chemicals and Materials sector, Malaysia has actively invested in research and development initiatives. Collaborations between industry players, research institutions, and government bodies have led to the development of new materials, processes, and applications, driving the industry's growth.

In recent years, there has been a notable emphasis on environmentally sustainable practices within the Chemicals and Materials industry. Malaysia has seen an increase in patents related to green chemistry, eco-friendly materials, and sustainable manufacturing processes, reflecting a commitment to mitigating environmental impact.

The integration of biotechnology into the Chemicals and Materials industry has been a notable trend in Malaysia. This includes the development of bio-based materials, enzymes for industrial processes, and biodegradable polymers, showcasing the industry's commitment to technological advancements aligned with global sustainability goals.

The Malaysian Government has implemented supportive policies and regulations to encourage innovation within the Chemicals and Materials sector. This includes incentives for R&D activities, initiatives promoting the adoption of green technologies, and regulations that ensure the safe and sustainable production of chemicals.

The Chemicals and Materials sector in Malaysia has a profound impact on various end-user industries, including automotive, construction, healthcare, and electronics. The innovation in materials and chemicals contributes to the enhancement of product performance, durability, and overall efficiency across diverse applications.

### **Biotechnology and Life Sciences**

The Biotechnology and Life Sciences sector in Malaysia has undergone encouraging development, rooted in the nation's strategic initiatives to diversify its economy. Initially centred on agriculture and natural resource management, Malaysia has evolved into a prominent hub for biotechnological research, spanning diverse areas including genomics, pharmaceuticals, and medical biotechnology. This evolution is underscored by a discernible increase in patent filings related to biotechnology and life sciences, signifying the sector's growing prominence in recent years.

The Biotechnology and Life Sciences sector in Malaysia has experienced substantial growth in patents granted, with an average overall increase of 19% for the past seven years. This reflects the sector's commitment to advancing scientific knowledge and translating research into innovative solutions.

One of the key areas within this industry is healthcare, where Malaysia has made notable strides in genomics, personalized medicine, and pharmaceutical development. Local companies and research institutions actively engage in the discovery of novel therapies, diagnostic tools, and vaccines, contributing to the improvement of healthcare outcomes domestically and globally.

In addressing the challenges of food security and sustainable agriculture, Malaysia's Biotechnology and Life Sciences sector has embraced agricultural biotechnology. This includes the development of genetically modified crops, biopesticides, and innovative farming techniques, enhancing crop yield, and ensuring food security for the growing population.

Malaysia's commitment to environmental sustainability is reflected in the Biotechnology and Life Sciences industry's focus on environmental biotechnology. The development of bio-based solutions for waste management, water treatment, and pollution control demonstrates a proactive approach to addressing environmental challenges and promoting a greener future.

To foster innovation in Biotechnology and Life Sciences, the Malaysian Government has also implemented various initiatives and support mechanisms. This includes funding for research projects, tax incentives for companies engaged in biotechnological activities, and the establishment of biotechnology parks to facilitate collaboration between industry and academia.

The Malaysian Government has established a robust regulatory framework for the Biotechnology and Life Sciences industry to ensure ethical practices and the safe development and deployment of biotechnological solutions. This framework provides a clear

pathway for companies and researchers to navigate the complex landscape of biotechnology-related activities.

The commercialization of biotechnological innovations has a significant economic impact in Malaysia. Successful biotech products and services contribute not only to the industry's growth but also to job creation, economic diversification, and the elevation of Malaysia's status as a global player in the field of biotechnology and life sciences.

### **Automotive and Transportation**

The evolution of the Automotive and Transportation industry in Malaysia is intertwined with the nation's industrialization journey. Initially focusing on assembly and production for domestic consumption, Malaysia has progressed to become a key player in the global automotive supply chain, with an increasing emphasis on research and development.

According to data from MyIPO, patents granted in the Automotive and Transportation sector have experienced an average growth rate of 15% over the last seven years. This signifies a robust and accelerating pace of innovation within the industry, showcasing Malaysia's dedication to staying at the forefront of automotive technology.

The industry is a cornerstone of Malaysia's manufacturing sector, with major international automotive companies establishing production facilities in the country. These facilities engage in vehicle manufacturing and assembly, contributing to job creation and economic growth while fostering technology transfer and skill development among the local workforce.

The Automotive and Transportation sector in Malaysia has experienced a notable upswing in research and development endeavours. Corporations within this sector are proactively allocating resources to augment vehicle efficiency, fortify safety features, and advance environmental sustainability. Prominent strides have been made, encompassing the development of electric vehicles, autonomous driving technologies, and pioneering materials for vehicle manufacturing.

In alignment with global trends that saw an increase of almost 300% (compared to year 2011) for patent applications filed with the European Patent Office, MyIPO data also indicates a remarkable increase in Malaysian patent filings related to electric and hybrid vehicle technologies. The healthy increase in patent filings aligns seamlessly with the amplified focus on research and development within this domain in recent times. It also showcases Malaysia's commitment to environmental conservation and sustainable transportation solutions.

As the industry focuses on green and sustainable transportation solutions, a rise in the number of patent applications related to fuel-efficient systems and sustainable materials for vehicle construction has also been observed.

The industry in Malaysia has not only excelled in manufacturing but has also made strides in automotive design and styling. Local designers and engineers are contributing to the aesthetic and functional aspects of vehicle design, gaining recognition for their creativity and innovation on both domestic and international stages.

The Malaysian Government has similarly implemented policies and incentives to support the growth of the Automotive and Transportation industry. Initiatives include tax incentives for companies engaged in automotive manufacturing and R&D, fostering an environment conducive to innovation, and positioning Malaysia as a hub for automotive excellence.

As the automotive landscape evolves, Malaysia is actively exploring the development and integration of Connected and Autonomous Vehicles (CAVs). Filing and grant of patents related to CAV technologies, such as sensor systems, communication protocols, and automated driving algorithms, signify Malaysia's commitment to staying at the forefront of technological advancements in transportation.

While the Automotive and Transportation industry in Malaysia has achieved remarkable milestones, challenges such as global market volatility, technological disruption, and the need for skilled talent persist. The industry's prospects lie in continued investment in R&D, fostering collaborations, and adapting to emerging trends such as electric and autonomous vehicles.

### **Information Technology and Software Development**

From the early stages of computer hardware manufacturing, Malaysia has transformed and emerged as a hub for software development, hosting a vibrant ecosystem of local and international companies. The Information Technology industry encompasses a wide array of software applications, ranging from enterprise solutions and mobile apps to cutting-edge developments in artificial intelligence (AI) and machine learning.

MyIPO data indicates that Malaysia has experienced a significant surge in patents granted within the Information Technology and Software Development sector. In the year 2022, this sector accounted for 6.9% of the total patent filings, underscoring its dynamic and evolving nature.

The Malaysian Government has actively promoted digital transformation initiatives, encouraging businesses to embrace technology to enhance efficiency and competitiveness. This has led to a surge in patents related to digital platforms, cloud computing, cybersecurity, and other transformative technologies.

A robust start-up ecosystem has burgeoned within the Information Technology (IT) and Software Development sector in Malaysia. The instrumental role of innovation hubs and incubators in cultivating nascent ventures, stimulating creativity, and serving as a collaborative platform for entrepreneurs, researchers, and established industry entities is noteworthy. This phenomenon may explain the observed upswing in recent patent filings associated with this dynamic and evolving industry.

In recent years, it has been observed that major players and companies have increased investments in AI, blockchain, the Internet of Things (IoT), and cybersecurity. The healthy increase in patent filings related to these specific areas of technology signify Malaysia's goal of staying at the forefront of technological innovation.

The Malaysian Government has also implemented e-Government initiatives to enhance public services through digital platforms. This includes initiatives to improve online accessibility, data security, and the efficiency of government operations, contributing to the overall digitalization of the public sector.

Considering the growing significance of cybersecurity, Malaysia has observed an uptick in patent filings pertaining to advanced cybersecurity measures and data protection technologies. Recent data indicates that Malaysia has had 11 active applicants who filed new patent applications in this domain. For context, Singapore had 18 applicants, Japan had 39 applicants, the Republic of Korea had 53 applicants, and China had 304 applicants between the years 2000 and 2022.

To sustain the growth of the IT and Software Development industry, Malaysia places a strong emphasis on educational initiatives and skill development. Universities and training programs are tailored to meet the evolving needs of the industry, ensuring a skilled workforce capable of driving innovation.

Malaysian IT companies actively engage in international collaborations, partnering with global tech giants and participating in joint research and development projects. These collaborations enhance Malaysia's standing in the global IT community and contribute to the exchange of knowledge and expertise.

The influence of the IT and Software Development industry extends beyond its boundaries, impacting various sectors such as finance, healthcare, education, and manufacturing. Technological advancements, software solutions, and digital platforms contribute to the overall efficiency and competitiveness of these industries.

## **Conclusion**

Malaysia's emergence as a hub for technological innovation is evident in the increasing number of patents granted across various industries. From electronics and electrical engineering to biotechnology and software development, Malaysian companies and researchers are at the forefront of pioneering groundbreaking technologies.

We are certainly excited to witness the impact of these innovations on both the domestic and global stage. The continued commitment to research and development, coupled with a supportive regulatory environment, positions Malaysia as a driving force in the global innovation landscape. With these advancements, Malaysia is poised to shape the future of industries and contribute to a more sustainable and technologically advanced world.