Trends in automation: Robotics

Introduction

Let's meditate on both pictures.

At left, a boy trying to cultivate a land, and at right, robots doing the same work. Imagine yourself at the shoes of this young boy, trying to cultivate a land huge of multiple miles.
*Time consumming,
*extreme tiredness,
*diseases,
*harmful insects,
and yet the work will not be as proficient as it should.

In light of easing all the hardship Humans are facing, robots have been created. With the particularity of being faster and precise, they have brought lot of positivity in Humans'life.

Yet, people are reticent of fully adopting them.

Trends in automation: Robotics



What is Robotics?

A robot is a device that combines mechanics, electronics and IT. The word robotics is derived from the word robot. Isaac Asimov, the inventor of the word robotics, uses for the first time in one of these news called Runaround.

Robotics is then all scientific and industrial fields related to the design and production of robots. Most of the time, a robot has a skeleton with one or more members and a computer that acts as a brain. Embodied robots, for example Roomba robot vacuums, are in our homes. But, they also exist in the non-embodied form of bots, software that perceives and acts.

Robots are built to perform dangerous and strenuous tasks that are sometimes complex for humans. The advantage is that they perform these different tasks more precisely and do it independently.
Since the 1970s, robots have become mobile, have an on-board computer, a camera, and most importantly, are able to reason.

Trends in automation: Robotics

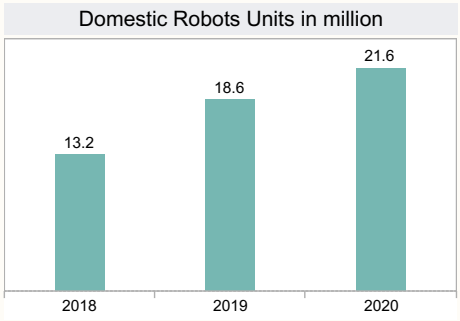
Mindset Change?

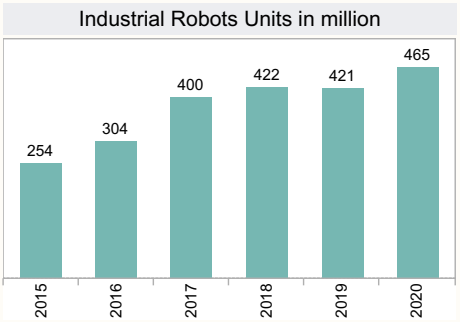
With their efficacity proven, robots areare slowly becoming part of our daily life.

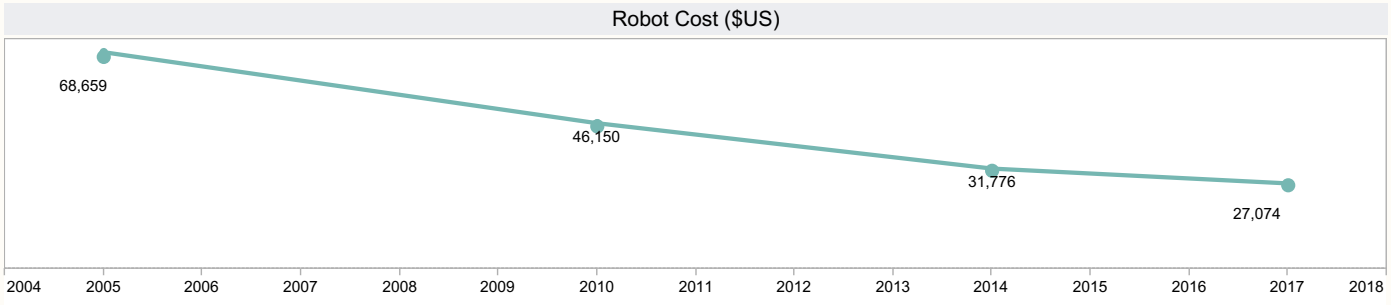
*The units of robots used at home for house chores is increasing. Chatbots like **Alexa**, Amazon's conversational agent, are found in 20% of American homes

*Robots are more and more used in manufacturing, with the units almost doubled from 2015 to 2020

*As token of their gradual use, robots price has plunged to $27,074, halth of what it was in 2004.







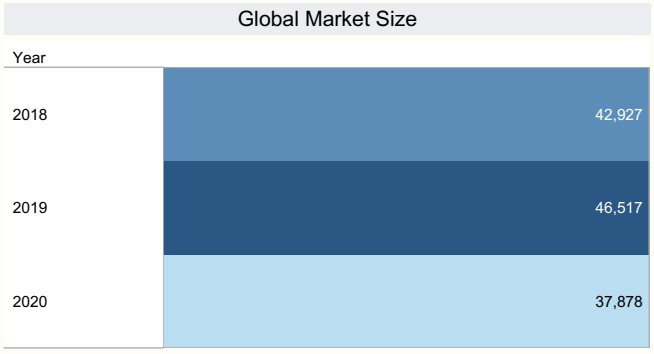
Trends in automation: Robotics

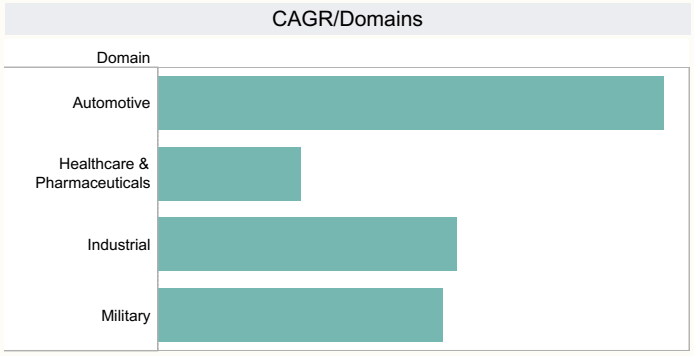
Robotics Expansion

*Robotics has reached a high global market size of $46,517,000 in 2019, which decreased in 2020 due to COVID-19.

*Based on the compound annual growth rate (CAGR), the automotive industry is growing at a faster rate thanks to a wider robotics adoptation.

Let's review more in depth the revenues.





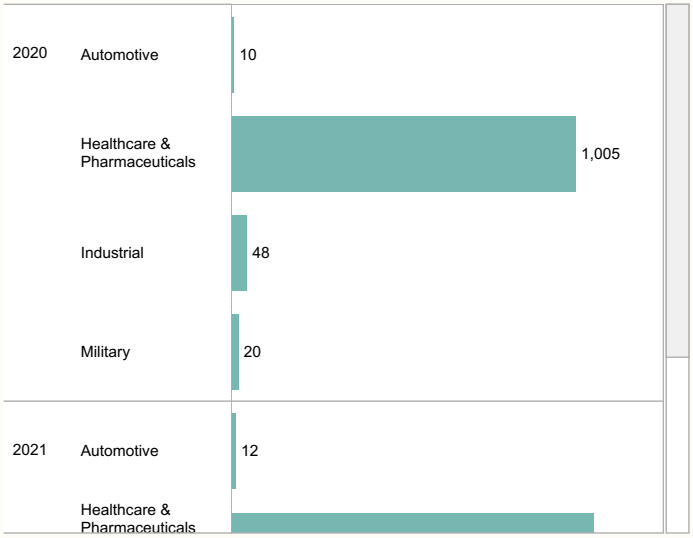
Trends in automation: Robotics

Revenue Boost

Precision, high efficiency, and fast work are advantages among others that robotics offers.

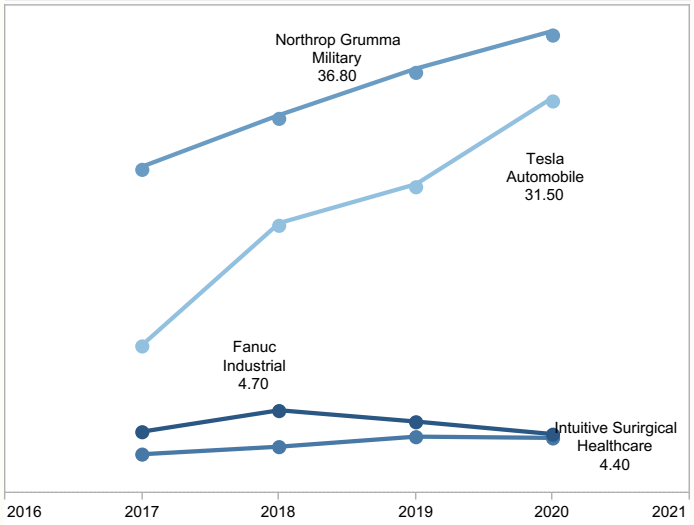
*This revolution has helped boost revenues, with the Healthcare and Pharmaceuticals industry being the most positively impacted.
*However, at an individual level, looking at some of the top companies in each industry, we can see that the military industry is leading.

Robotics Revenue Per Domain



Navigate to Revenue per Domain

Revenue per Top Companies in Each Industry ($billion)



Navigate to Revenue Per Company

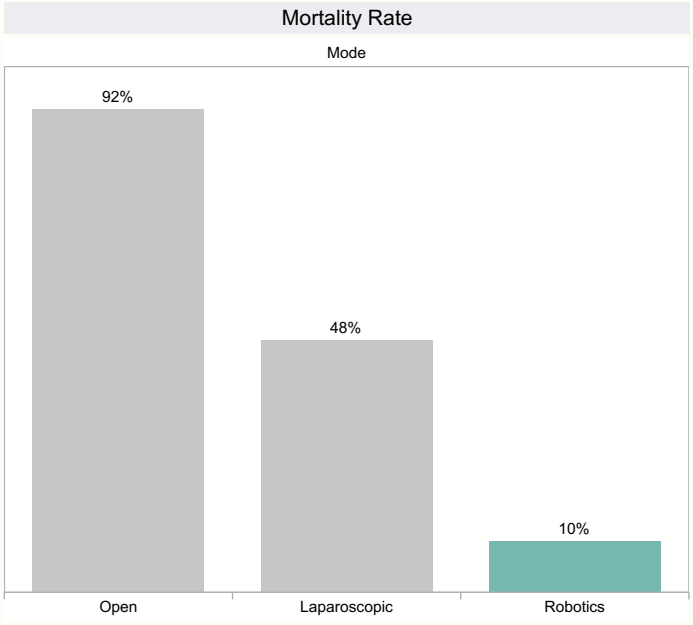
Trends in automation: Robotics

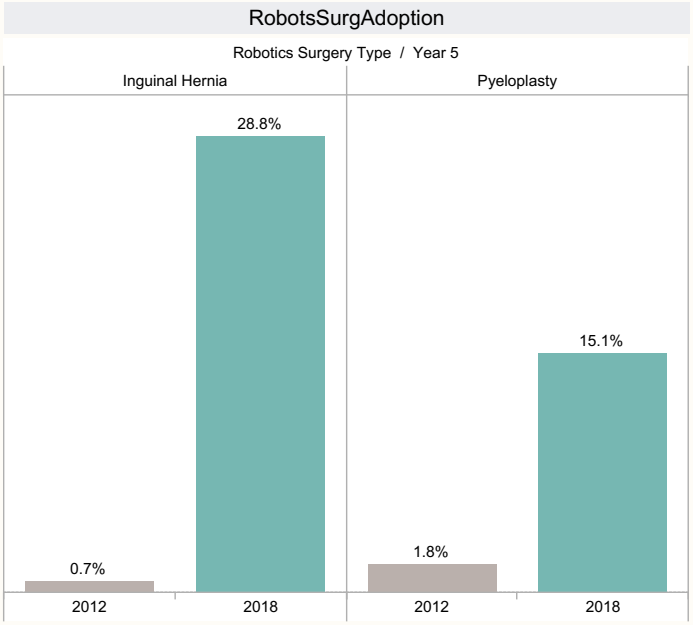
Medical Impact

Robotics has been a uge push in the medical domain.

*Thanks to the high precision, robots have helped carried out surgeries, with a low mortality rate of 9.7%.

*Consequently, their adoption is increasing, with more than 20% for inguinal hernia surgery type.



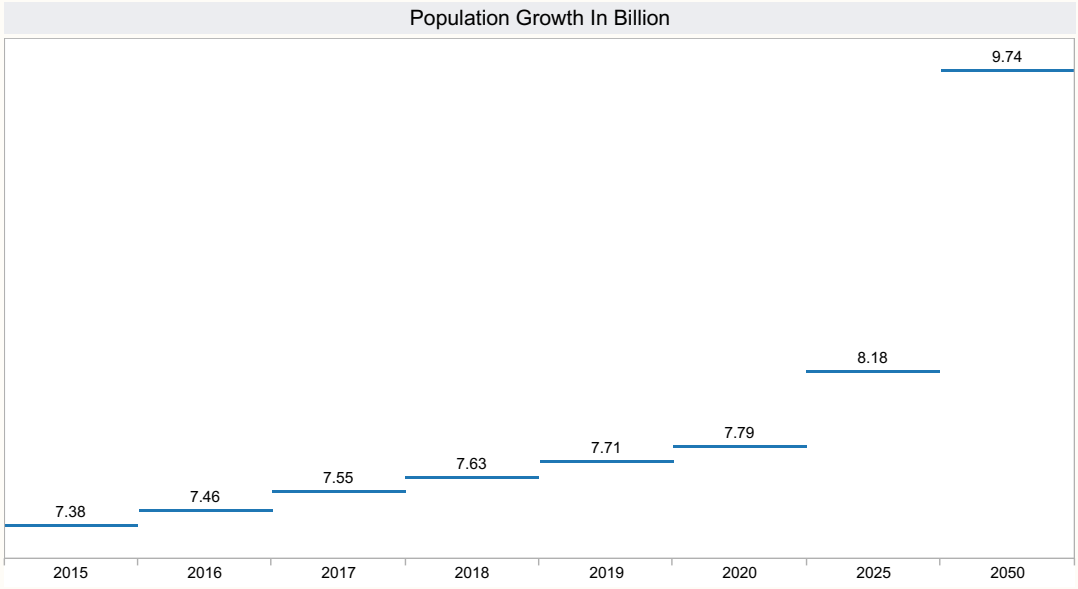


Trends in automation: Robotics

World Population Growth

Thanks to robotics, humans were introduced to a *new lifestyle*.
Easy transportation, easy house chores, easy physical work, better medical care, which led to a higher life expantancy.

As such human poplulation is growing gradualy each year, and is expected to reach almost 10 billion in 2050.

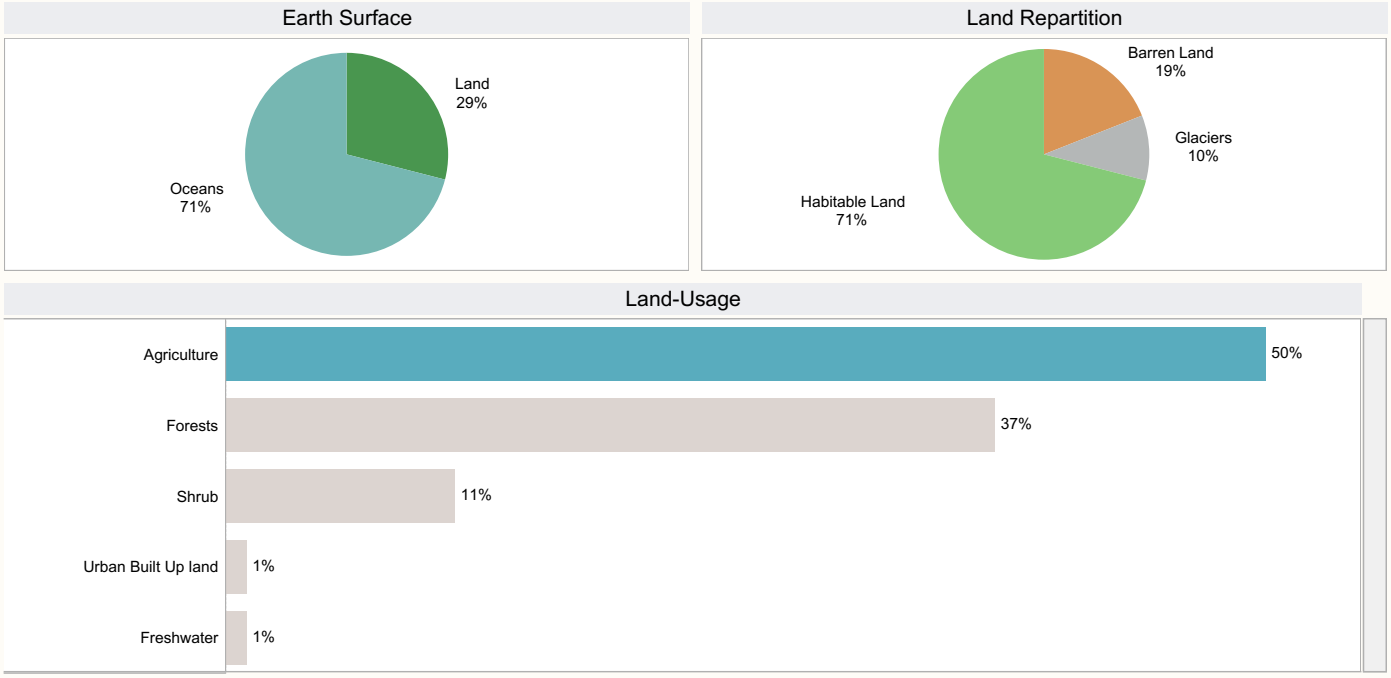


Trends in automation: Robotics

Need of Farming Space ?

Within the small portion of land, there is only 71% that is habitable and usable. In that branch, 50% is dedicated to agriculture, subdivized into farming and animals breeding.

As seen previously, the world population is growing, and urbanization is taking more and more space as well as barren lands due to global warming. This may threaten the agricultural space. It is indeniable that we can't enlarge the agricultural superficie indefinitely.
The lack of lands and the growing population is leading to growing concerns of hunger and food scarcity.



Trends in automation: Robotics

Robotics: The solution to fight world hunger

From the previous page, we saw that farming space is already threatened. However, another problem exists. Because of lack of efficiency and precision, a huge part of crops are of spoiled.

*Up to 40% can be over-fertilzed
*Up to 20% can be underfertilized

To help sustain the growing world population with enough food, robotics will be the huge help.

* It is valued that robotics can help crops production increase by 67%

Crop Production Increase Thanks to Robotics

67%

Trends in automation: Robotics

Robotics' help in climate change

Another brillant advantage of robotics is that it helps in the fight against climate change.

*The "Growbot", invented by skygrow is a type of robots that helps plant trees ten times faster than a human. Its use is helping reboiser the earth, and fight global warming as plants are our shield to the sun and CO2 reduction.

*According to PwC and Microsoft in onlinerobotics.com, robotics is projected to reduce global greenhouse gas emissions by four per cent in 2030, which is equivalent to 2.4 gigatons of carbon dioxide emissions.

Greenhouse gas reduction
4%

Conclusion

The recent explosion of autonomous machines is the result of extraordinary advances in the field of deep learning. Robots have proved themselves being incredibly useful, easing human's life and providing greater proficiency. Moreover, with the growing population, robotics will play a key role in the struggle against food scarcity.

Robotics is about to revolutionize the business world. This technology promises to transform our economic models in the years to come. If robotics is currently mainly used in the manufacturing and production sectors, this technology will soon reach the distribution, finance and even education sectors.

Although robotics has advanced, researchers estimate that it will still take between 30 or 50 years for us to enter the era of strong artificial intelligence. This lengthy timeframe is due to the high cost of robots acquisition as well as people's reticence to adopt this technology, fearing huge job losses and a less "human word".
However, referring to newscientists.com, robotics will create up to 7 million jobs between 2017 and 2037. Jobs will just become more computarized.

An innovation cannot be taken for granted at first, it has to go through social acceptance. Hence, for a full expansion of robotics, people need to understand that robots have been created to serve human, not to replace them. Society needs to evolve with a mind spirit of "human with robots" not "human against robots".

Refences

Motor Intelligence. (2021, August 16). *URL list* . Scribd. Retrieved December 18, 2021, from https://pt.scribd.com/document/351653950/URL-List
Bulao, J. (2021, December 7). *27+ robotics industry statistics to show you how big it is in 2021* . TechJury. Retrieved December 15, 2021, from https://techjury.net/blog/robotics-industry-statistics/#gref
Netscribes. (2021, August 24). *Robotic surgery: A hi-tech path to Healthcare's future*. Netscribes. Retrieved December 15, 2021, from https://www.netscribes.com/robotic-surgery/
Gray, R. (2019). *Robotic revolution: Algorithms and drones are Transforming Farming*. BBC News. Retrieved December 18, 2021, from https://www.bbc.com/future/bespoke/follow-the-food/the-robots-putting-food-on-the-table/
Placek, M. (2021, February 5). *Industrial Robots - average cost* . Statista. Retrieved December 18, 2021, from https://www.statista.com/statistics/1120530/average-cost-of-industrial-robots/
City of Wisconsin Dwell. (n.d.). *City of wisconsin Dells*. Tree City Information - City of Wisconsin Dells . Retrieved December 18, 2021, from https://www.citywd.org/index.asp?SEC=36A8C137-850C-473A-897A-944D8FE8CC5F&Type=B_BASIC
SkyGrow. (2020). *Growbots*. SkyGrow. Retrieved December 18, 2021, from https://www.skygrow.com.au/solution
Stewart, E. (2021, July 2). *Robots were supposed to take our jobs. instead, they're making them worse.* Vox. Retrieved December 18, 2021, from https://www.vox.com/the-goods/22557895/automation-robots-work-amazon-uber-lyft
Pitchbook. (n.d.). Pitchbook. Retrieved December 15, 2021, from https://my.pitchbook.com/profile/11432-17/company/financials/INCOME_STATEMENT
Pitchbook. (n.d.). Pitchbook. Retrieved December 15, 2021, from https://my.pitchbook.com/profile/11979-46/company/financials/INCOME_STATEMENT
Pitchbook. (n.d.). Pitchbook. Retrieved December 15, 2021, from https://my.pitchbook.com/profile/59620-42/company/financials/INCOME_STATEMENT
Pitchbook. (n.d.). Pitchbook. Retrieved December 15, 2021, from https://my.pitchbook.com/profile/10377-37/company/financials/INCOME_STATEMENT
Salman, M., Bell, T., Martin, J., Bhuva, K., Grim, R., & Ahuja, V. (2013, June). *Use, cost, complications, and mortality of robotic versus nonrobotic general surgery procedures based on a nationwide database*. The American surgeon. Retrieved December 18, 2021, from https://pubmed.ncbi.nlm.nih.gov/23711262/
thebusinessresearchcompany. (2021, January). *Global Military Robots Market Data and industry growth analysis*. The Business Research Company. Retrieved December 15, 2021, from https://www.thebusinessresearchcompany.com/report/military-robots-market-global-report-2020-30-covid-19-growth-and-change
thebusiness reasearchcompany. (2021, March). *Global Industrial Robots Market Data and industry growth analysis*. The Business Research Company. Retrieved December 16, 2021, from https://www.thebusinessresearchcompany.com/report/industrial-robots-market-global-report-2020-30-covid-19-growth-and-change
Global pharmacies and healthcare stores market data and Industry Growth Analysis. The Business Research Company. (2020, December). Retrieved December 18, 2021, from https://www.thebusinessresearchcompany.com/report/pharmacies-and-healthcare-stores-global-market-report-2020-30-covid-19-impact-and-recovery
thebusinessresearchcompany. (2020, December). *Global Motor Vehicle and parts dealers market data and industry growth analysis*. The Business Research Company. Retrieved December 16, 2021, from https://www.thebusinessresearchcompany.com/report/motor-vehicle-and-parts-dealers-global-market-report-2020-30-covid-19-impact-and-recovery