I.T Technology

A Case study report by **Jon Aragones**

**R O B O T I C S**

**What does it do? (600 words)**

From [Wikipedia](https://en.wikipedia.org/wiki/Robotics), the free encyclopedia

**Robotics** is an [interdisciplinary](https://en.wikipedia.org/wiki/Interdisciplinarity) branch of [engineering](https://en.wikipedia.org/wiki/List_of_engineering_branches) and [science](https://en.wikipedia.org/wiki/Branch_of_science) that includes [mechanical engineering](https://en.wikipedia.org/wiki/Mechanical_engineering), [electronic engineering](https://en.wikipedia.org/wiki/Electronic_engineering), [information engineering](https://en.wikipedia.org/wiki/Information_engineering_(field)), [computer science](https://en.wikipedia.org/wiki/Computer_science), and others. Robotics deals with the design, construction, operation, and use of [robots](https://en.wikipedia.org/wiki/Robot), as well as [computer systems](https://en.wikipedia.org/wiki/Computer_system) for their control, [sensory feedback](https://en.wikipedia.org/wiki/Sensory_feedback), and [information processing](https://en.wikipedia.org/wiki/Information_processing).

* **What is the state of the art of this new technology?**

REF **Web Article 1**:

<https://www.sciencedirect.com/science/article/pii/S1474667017637418>

From the article of ScienceDirect, the origin and the history of robotics are introduced, and the present status of robot progress, its significance and a new role of the robot in human society are discussed. Nationwide research activities are reviewed and some of the research and development results are reported. The population of the robot is rapidly increasing in advanced countries and the social impact of the robot’s diffusion must be carefully inspected. Finally, how to meet with a coming robot era from the standpoint of human society is considered.

REF **Web Article 2**:

<https://www.aivoke.com/news/state-of-the-art-robotics/>

The current state of research seems to be only a few steps away from it if you have a closer look at state-of-the-art robotics. Many people connect the topic Artificial Intelligence mostly with robotics. This is very superficial because robotics is only one part of the big puzzle that is AI research. You could call it the “give AI a shell” part. Furthermore, some AI personalities take the view that embodiment is one fundamental factor for Artificial Intelligence. Independent from that view there is a lot of research and development concerning robotics.

* **What can be done now?**

REF **Web Article 3**:

<https://www.bbvaopenmind.com/en/technology/robotics/seven-human-things-that-robots-can-already-do/>

**THINGS THAT ROBOTS CAN ALREADY DO**

**My Investigation:**

There are different types of robot doing different type of work mainly having human interaction but others work replacing human activity. There are Robot duties like sorting packages and deliver them in front of your door like[*Spot*](https://www.fastcompany.com/3066541/robot-revolution/boston-dynamics-robot-dog-delivery)*,* its dog shape allows it to also go up and down stairs. Also, there is some robots that helps human on their house chores a robotic butler like [*Roomba*](https://www.irobot.com.au/), the ‘intelligent’ vacuum cleaner that detects, thanks to its sensors, the areas for cleaning. After that, robotic lawnmowers appeared, with daily schedules and programmable zones, then barbecue-grill cleaning robots, an invention designed for this typically American hobby. More devices have also emerged for cleaning tables and windows. Even some robots that works for health, education, and recreation. The article mentions about the [*Da Vinci*](https://www.davincisurgery.com/)a robotic system which became the arms and eyes of the real physician. It allowed him **to perform complicated operations at a distance** and to have specialized surgeons who were located thousands of kilometres from the hospital where the patient was. Other robots have soft and caring character which helping people in needs like [*Robocoach*](https://www.theguardian.com/technology/2015/oct/14/singapore-introduces-robocoach-to-keep-older-citizens-in-shape)*,* a full-sized robot with a big smiley face mainly use for elderly. However, for childcare facilities they uses [*Zenbo*](http://fortune.com/2016/05/30/asus-zenbo-robot/)the storytelling robot, and for mini educational with kid interaction robot [*Kibo*](http://kinderlabrobotics.com/kibo/) is keeping kids learning with fun. The most interesting and revolutionary robots are [*Auto Self Driving Cars*](https://en.wikipedia.org/wiki/Self-driving_car) the vehicle that are able to make autonomous decisions after analysing millions of data collected with cameras and sensors.

* **What is likely to be able to do be done soon? (say in the next 3 years).**

REF **Web Article 4**:

<https://www.theguardian.com/zurichfuturology/story/0,,1920335,00.html>

*“A mind and a hand where it's needed while you sit safely at home and run the show*. *It's a future goal”*

-- **Mark W. Tilden**, *robot physicist*

**My Comments:**

There are more Robots that we are yet to see and yet are for replacing human activity to machine. This is not bad at all in terms if we say what it makes the better way. The future technology for Robots are intend to be involved with human interaction rather machine that works on its own just like a standalone machine that we see today.

REF **Web Article 5**:

<https://www.techrepublic.com/article/humanoid-robot-market-to-double-by-2023-industrial-robotics-to-hit-72b/>

The article mentions that by 2023, we will see an increasing use of humanoid robots for education, as well as in the retail industry, to better personalize customer support. The medical and logistics sectors are also interested in integrating more artificial intelligence (AI) via robots, as do industries that run autonomous rescue operations, according to the report.

-- **Alison DeNisco Rayome***, Senior Editor for TechRepublic*

**My Comments:**

Future machine will be like Robots that can identify its own character with the ability to build a character to produce fast and better outcome, a thinking machine uses Machine Learning as an Artificial Intelligent. We already have Humanoid version of robots that available in public, however, there are some more fascinating Robots that will be available soon to experience.

**What is the likely impact? (300 words)** What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant any current jobs or technologies?

REF **Web Article 6**:

<http://marshallbrain.com/robotic-nation.htm>

*“Once the humanoid robot became a commodity item, robots began to move in and replace humans in the workplace in a significant way.”*

*--* [**Marshall Brain**](http://www.marshallbrain.com/)**,** *writer*

**My Comments:**

Robotics technology can have great impact to all of us specially to those people who works in the field involving technologies like; workers in manufacture facilities, airline services and many others. Robotics technology could potentially dominate hands on works more than human and eventually replacing humans in the workplace then robots will serve as more talented than humans.

In the article it mentions that *“Robots in the workplace will be a very popular idea because they will eliminate labour costs. Pilots will be the first to go because pilots are incredibly expensive and their jobs are largely automated already.”* It seems really frightening that no more jobs left for humans in terms of the economy is falling down, but the article also mention that “*Conventional wisdom says that the economy will respond to all of these unemployed workers by creating new jobs for* them.” This means that the technology will help the economy to stabilize itself but the article inclines to produce the idea that the increasing of un-employed workers is because of this robotic technology. At glance we can see workers rate of employments are going down which what is happening today but not because of this technology as the matter of fact this technology that available to us benefited many by producing product more than enough that the normal person can able to produce in short period of time. We just not reducing the cost of the outcome products and remains with high price tags. So, this only means that today just big companies taking advantage of technology against human capacity. As for future analogy of this robotics technology we can see that we are actually buying our time to extend our life. If the Robot can produce product outcome without human sacrifice then it is a life saver. Money can become so powerful element to control human as today but, in the future, it will be just a paper as no value it may seems. Workers who works with Artificial Intelligence will be smarter than ever.

Robotics technology may change the future into a better place or make it worse. The article stated that *“our society, as it is structured today, works like this -- you must either own a profitable business, or work for someone who owns a business, in order to "make a living." You have no choice. You must earn money in order to live your life. If you do not work and earn money, you are homeless. “,* in this statement shows just how poor the employment structure that we have today. So, as to go for future progress to make our future a better place we must change this structure into smarter way against the statement of “*You must earn money in order to live your life.”* Most business company now a day change this money thinking into workplace family attachment with loyalty balance mindset. Robots can be one of the way to get the changes we need. If the Robots can produce products with minimal cost then more is plenty than empty. Shortages will be unknown as everything can be provided and plenty of people will afford it.

**How will this affect you? (300 words)** In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

**My Comments:**

Robotics Technology can be viewed differently today as Humanoid or Machine. As of today, Machine is the most dominantly known to assist human in doing their task and for producing high quality product with consistency. Humanoid technology is yet to become common and be used in the workplace but we could see that it could be beneficial to human race if human interaction to the robots are minimal.

Robot should always be designed into a unified method and not just to be general use for everything. If ever the Robotics Technology reach the same level of iRobot that has Artificial Intelligence such Humanoid Robo become like a human then either there might be to concern or become a relief to us. However, a companion with a loving and caring Robot in your household is not a bad idea at all. When an elderly needs a personal assistance like nurse such a loving smart Robot can really be helpful in anyways, or a Robot teacher that will able to teach kids or even adults with precise knowledge is really beneficial for our advancement as for our advantage. Just to think of how much we spend in some unnecessary things and we do forget the most important things in life, and if then Robots can be able to do the unnecessary things for you, so as you can concentrate for the most important things in your life. Life balance will be then just as common to everyone, stress level is reduced as seems none at all. Life runs as it seems a flow of clouds instead a flow like a river.

The dream came into reality with work balance is undoubtedly. Robot is not just seemingly like a toy rather it is a companion that makes things better for you. Self-Driving cars is the example one among of the innovation of technology in the field of Robotics which when reached the full maturity of the technology it will really benefits human improving our transportation into secure and life saving device. Travelling can just become a door to enter into new room.

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I.T Technology

A Case study report by **Damian**

**Cloud Computing and Services**

**What does it do? (600 words)**

Cloud computing has become a technological revolution although it has been debated when it really did start, some say it originally started in the 1960s but back then technology wasn’t really a thing until now. Cloud computing really started taking off on August 9th, 2006 when the CEO of Google Eric Schmidt announced a new platform.

Since then other major companies such as Microsoft IBM Amazon etc have seen this as a great asset and have developed their own unique cloud computing services. It has shifted the way in which we use technology today services can be as little as just some data storage like google drive to a full package service to having an operating system and all apps a client needs to have for productivity for their business.

**What is the likely impact? (300 words)**  
A lot of companies are shifting towards cloud services and this is a way of cutting costs but still maximizing business productivity, which can be good and bad for business. The pro’s for cloud services are you don’t need multiple server racks and storage servers to be on site and having IT employees to manage and maintain servers for you. But the downside of having a cloud service is you rely heavily on the service provider to keep things running smoothly and for instance, the server you are using/renting has a problem and stops running you have to rely on the provider to get it back up and running quickly so you can continue with production.

**How will this affect you? (300 words)s**

The way I see cloud computing affecting me personally is I could be working for a company being their IT person making sure their servers are maintained and I am on site to swiftly solve any issues that arise, moving to cloud services could mean I lose my job or I am no longer needed.

There is another downside and something we all have to be conscious of is security being an onsite IT professional means any security risks to data breaches and the like can be rectified immediately whereas cloud services you have to rely on them to sort it out for you and say for instance you are renting from a provider based in the United States but you are in Australia means you have to wait for them.

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I.T Technology

A case study report by **Dane**

**Cyber Security**

**What does it do? (600 words)**

What is the state of the art of this new technology? What can be done now? What is likely to be able to do be done soon (say in the next 3 years)? What technological or other developments make this possible?

Answer:

On the website Techtarget.com, they define cybersecurity as

“Cybersecurity is the protection of Internet-connected systems, including hardware, software, and data, from cyber attacks.” To better understand exactly what cybersecurity can do, we must first understand the types of threats that cybersecurity will help to protect against.

Below is a brief list of the types of threats commonly seen in the cybersecurity world:

•Ransomware – As the name suggests, it’s a file or programs the can restrict or disable a user’s access to their computer. The attacker then demands a payment to give the user back their access.

•Malware – Any file or program that is intended to cause harm or damage to a computer’s system or files. These include viruses, spyware, trojans, and worms.

•Social Engineering – This attack comes from users being made to feel like what they’re seeing is real, then interacting with a file or program that can give the attackers sensitive information such as bank details, passwords and in some cases complete access to their computer's network.

•Phishing – Similar to above, the attack may come in the form of something like an email which encourages the user to provide sensitive information that otherwise wouldn’t have been given.

**Why is cybersecurity important?**

With consideration to the above-mentioned threats, it becomes clear that people and business should employ technology that protects them from such attacks.

**What can be done now?**

On the website <https://cybersafesolutions.com/services/>, they offer a list of services that can be used to facilitate cybersecurity. Some of these services include:

•Managed Detection Response and Containment – Networks are constantly monitored to detect any abnormal activity. If a threat is detected, it can be contained and responded to in real time.

•Network Security Monitoring – Threats are identified, assets can be tracked and regularly scanned for any vulnerabilities. Behavioral analytics can be performed to further identify potential threats.

•Endpoint Security Monitoring – Endpoint intrusions (unauthorized access) can be instantly identified and isolated to prevent theft of data and sensitive information.

•Security Awareness Training & Simulated Phishing Tests - Staff and individuals can be trained to recognize potential threats and react accordingly.

•Penetration Testing – This is used to detect system vulnerabilities by performing simulated attacks on a network or system. Once the weak spots are identified, corrective measures can then be implemented.

•Threat Hunting – Compromise Assessment – A proactive approach is taken to seek out and destroy threats, or to ensure that endpoints or assets are ready for the attacks when they occur.

•Security Policy Development – Organisation can undertake the development of a cybersecurity policy that can include regular testing, upgrades, and evaluation of the protection system.

Individuals and organizations have a vast array of cybersecurity products to choose from that vary in application and cost. When implemented, these products provide protection against the types of threats mentioned previously. Technological developments from the makers of the products mentioned below make advanced protection possible.

**Some of these products include:**

•Checkpoint CloudGaurd – Protects against cyber attacks on cloud infrastructure workloads.

•CrowdStrike Falcon X – This automates threat analysis, and can provide intelligence and automation to organizations data security centres. It immediately shares threat data to other tools like firewalls and gateways.

•Force point Dynamic Data Protection – This product continually uses behavioral analytics to determine any out of the ordinary use of assets or data and then automatically provided appropriate security countermeasures.

•Okta ThreatInight – This product learns user’s behavior over time and can allow users to log in password free in a “normal” setting. If the same user attempts to log in from an “unusual” setting, the product will ask a security question and a second factor before granting access.

**What is the likely impact? (300 words)**

What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant any current jobs or technologies?

Answer:

The development of advanced cybersecurity will certainly impact how people interact with technology. People are becoming increasingly aware of the consequence of cyber attacks, and a result more people are looking to the market to but cybersecurity products.

On the website <https://www.csoonline.com/article/2946017/worldwide-cybersecurity-market-sizing-and-projections.html>, they predict that the market will continue to grow to a potential 170bn sizing due to the increased interest and demand. What does this mean? It means cybersecurity businesses will continue to advance research in the industry and provide consistent solutions to the ever-growing threat of cybercrime.

**What is likely to change?**

As cybersecurity technology develops and progresses, particularly in the AI and automation areas, humans are likely to become increasingly redundant. IT professionals who specialize in the monitoring of network and system security may eventually be replaced by AI. Businesses will move towards an AI system that can learn human behavior, work non stop, analyze high volumes of data and provide instant security solutions that humans simply can’t compete with.

The positive of that is that the demand for creators of this technology will increase and the level of AI will advance not only cybersecurity but all technologies where machine learning exists.

**How will this affect you? (300 words)s**

In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

Human interaction with technology increases exponentially every year. We only have to look around as we walk down a city street to see a plethora of people with their heads buried in their phones. We see interaction with automated banking systems, shopping systems, transport systems, and information systems. On the website https://zephoria.com/top-15-valuable-facebook-statistics/ they report that there are currently 2.32 billion Facebook users. 2.32 billion……. That’s 2.32 billion people using some sort of device to access information in a cyber setting. That means there are 2.32 billion opportunities for people to attack someone’s information.

The advancement in cybersecurity will allow for the peace of mind to use these technologies without the fear of being susceptible to an attack. With the increase in market size, it follows that cost should fall as businesses have to compete with the flooded market competition.

I don’t believe anything will actually be that different in my daily life. Not yet anyway. It’s possible and likely that identification protocols such as retina and facial recognition will become the norm for everyday use of technology.

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I.T Technology

A case study report by **Rav**

**Autonomous Vehicles**

**What does it do? (600 words)**

What is the state of the art of this new technology? What can be done now? What is likely for it to be able to do soon (say in the next 3 years)? What technological or other developments make this possible?

Autonomous Vehicles have in recent years been at the forefront of the car industry often associated to be the future of cars. With computers becoming more and more reliable, the next progressive step in the car industry seems to be going electric/hybrid technology and to have vehicles with autonomous functionality.

Autonomous vehicles are cars that are able to navigate their terrain with minimal or no input from the driver. This means that the vehicles are able to navigate differing traffic conditions, weather conditions as well as navigating all roads while keeping other motorists and from harm. Autonomous vehicles have 5 levels, starting at level 0 which is no automation whatsoever, to Level 5 which is a fully autonomous vehicle able to navigate all road conditions with no input from the driver (except of course the destination).

Autonomy is achieved by having several different technologies working together to create a working recognizable image of the world to which the computer can use to navigate the vehicle accordingly. Different companies employ various environment detection technology like radar, lidar, sonar, GPS, inertial measurement units, ultrasonic sensors as well as a network of cameras surround the vehicle to create a highly accurate map of the world around the vehicle. The computer then interprets the visual data to detect various road conditions like road lines, signage, other motorists, traffic lights and vehicle speed to steer, accelerate and decelerate according to what it sees. The algorithms it follows allow it to predict circumstances before they happen and also to react faster than any human could in a potentially hazardous situation.

Many of the large motoring companies have taken the leap now including BMW, Mercedes, Nissan, Ford, and even tech companies are getting on board as well like Google and more recently Apple. There are even companies that have been created solely to produce autonomous driving vehicles like Waymo and Yandex. Perhaps at the forefront of prevalently available technology is Tesla, as they have had a lot of success with their electric cars, offering a level of autonomous driving across all their models.

If we take Tesla as an example for what is currently possible, the car itself has the hardware capability to drive at the highest autonomous level (SAE Level 5) with eight cameras around the vehicle and twelve ultrasonic sensors, in addition to forward facing radars and enhanced processing capabilities. This hardware is not activated as yet since Tesla wants to make sure that they have as much real-world data first before sending the over-the-air update to provide the autonomous functionality. Currently, using the existing hardware from vehicles on the road, they are collecting the necessary data to make the correct improvements to release the update to the public in the near future. Other car manufacturers are also developing similar technologies to implement into their cars but Tesla’s vehicles are miles ahead because of the data they’ve collected from real-world experience. Waymo, Yandex and Renault are companies that have also achieved Level 5 autonomy but they don’t have any production vehicles available currently, only test vehicles.

In the next 3 years, we should be able to see fully autonomous vehicles being released by every large and small car manufacturer in the world. We are already at the cusp of the motor industry changing and slowly we will see more and more automated vehicles on the road without drivers. The one thing that would be impeding its progress is the government's legislation and policies that govern autonomous vehicles which, to some extent, be adopted globally. Until that time, we are going to see vehicles, like Tesla’s vehicles, that have the capability to be fully autonomous but not utilized as yet or perhaps cars that have Level 1 to 3 autonomy on the roads that drivers can take advantage of as soon as it's available.

Technological improvements that would aid in the improvement of processing visual data would be A.I. If an efficient model can be created that allowed perfect dependability for interpreting visual data, it would greatly increase the policy adoptive rate of global governments. As is the case, the more data the A.I has sorted through the more efficient it will be. Therefore, sufficient amounts of data should be processed before implementing them into a car’s computer for maximum success.

**What is the likely impact? (300 words)**

What is the potential impact of this development? What is likely to change? Which people will be most affected and how? Will this create, replace or make redundant current jobs to technologies?

Autonomous vehicles will have a huge impact on everyone’s life as it's used by everyone to some capacity. Parents use their cars to get to work and drop their children at school, taxi services take people from one point to another and buses and trains transport large groups of people to designated locations. If we assume that in the next few years, we do attain true autonomy in vehicles it will mean a variety of changes for people’s lifestyles, depending on how the use of autonomous vehicles are implemented into society.

For instance, if a family were to own an autonomous vehicle their morning and evening commute could be entirely different. In the morning, of course, everyone would travel together to their destinations but since no one would be driving, they could catch up on work or talk to each other instead. After driving to each destination, the car can then be tasked to do something else. This could be anywhere from asking the car to pick up packages or groceries from the store or perhaps picking up some ride fares while everyone is working. The car could even be asked to pick up and drop off the children at home when it’s time for them to go back home and then go to pick up the parents from work at the appropriate time.

When speaking about benefits, the one that is talked about the most is safety and traffic improvements. Safety in the form of reduced human-error related accidents and aggressive driving, when autonomous vehicles are fully capable will mean that we might see a handful or no death tolls at all. Since there is no human error, the vehicles will be able to move at higher speeds and in close proximity to each other, therefore affecting our travel time and experience. There are various other benefits like lower premiums for insurance and lower impact on the environment like many prevailing technologies there are also disadvantages. The most immediate threat it causes is to the taxi services, namely local taxi companies, Uber and Lyft. A lot of immigrants rely on this as income when they first enter the country, taking their jobs away will mean they have to look for employment elsewhere, adding extra pressure to their lives. Ethics also comes into play as well. A case could be made that while humans are slower at reacting to road situations, they might be able to make better ethical decisions based on the circumstances of the situation i.e in a collision involving a baby and an elderly person and one had to be sacrificed who would be saved?

**How will this affect you? (300 words)s**

In your daily life, how will this affect you? What will be different for you? How might this affect members of your family or your friends?

As a consumer of a product, I think it would greatly benefit my day to day life. From going to work I would be able to relax and enjoy my commute, maybe even get started on my day by replying to some emails without having to worry about traffic. This would leave me refreshed and ready to start the day. I could use it on a ride fare service to make me some extra money or perhaps pick up something or someone for me while I am at work. Furthermore, when going on long trips with friends, I would be better able to enjoy their company while getting to my destination.

I think that my family would also feel the similar benefits to myself, as well as a calmer sense of mind knowing that their child is safe traveling on the road. In addition, we might share one vehicle with the three of us, rather than paying for and owning a vehicle each.

The one thing that I might miss is being in control of a vehicle. I think as a choice, the autonomous car should accommodate a steering wheel for recreational use and as a fail safe. Although going on long journeys might be a chore, to some extent there is a sense of enjoyment that comes from accelerating and turning the vehicle. I think that many people who enjoy driving would feel the same way, as driving is more than something they have to do, its more a hobby to them.

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**Raspberry Pi**

Reported by: **Jaime**

The Raspberry Pi is a small size computer that can be connected to different type of outputs, and use a standard type of inputs to communicate. Was launched to the market to make it accessible and inexpensive, to help teach it in the classroom, the project was developed by the University of Cambridge.

**What does it do? (600 words)**

The Raspberry Pi is the board of a simple computer, CPU, RAM, audio and video input and output ports, network connectivity, SD slot for storage, clock, a socket for power.

**What can we do with Raspberry PI technology?**

The Raspberry Pi can be used for different functions from a mini computer that allows us to language; to more complex tasks such as creating projects that adopt such as videogame consoles, meteorological stations or even music machines.

**What is likely to be able to do be done soon? (say in the next 3 years).**

With the advances of microprocessors, the processing capacity will grow, making it a world leader in low-cost PC. As hardware performance increases, the capacity of tasks that can be performed will increase, for the moment it is limited to Linux distributions catalogued as light.

**What is the likely impact? (300 words)**

Raspberry Pi, will continue to grow worldwide, reaching many more disposable, and different manufacturers are copying the models either to improve it or adapt to different markets.

The technology of the Raspberry Pi, will gain ground over time as many manufacturers of technological devices have begun to take open code to create their own projects, and with a community that grows every day, we will find a Raspberry Pi in video surveillance systems, monitoring stations, autonomous cars, medical equipment, etc.

**What is the likely impact? (300 words)**

As a lover of technology, I already had the opportunity to own a Raspberry Pi and managed to create a console that emulated video games, I love it personally and I managed to recreate my memories of when I was little, I do not know what can be done in the future I think create a different project.

when the capacity increases they will end up supporting operating systems different from those based on Linux, we can say that they will reach Microsoft's OS, which will allow them to reach many homes and regions where even PC technology is limited.