

Content

When Things Start to Think



Story Screenshot (Gibson, 2015)

They ascended lattices of light, levels strobing, a blue flicker.

That'll be it, Case thought.

Wintermute was a simple cube of white light, that very simplicity suggesting extreme complexity.

"Don't look much, does it?" the Flatline said. "But just you try and touch it."

"I'm going in for a pass, Dixie."

"Be my guest."

Case punched to within four grid points of the cube. Its blank face, towering above him now, began to seethe with faint internal shadows, as though a thousand dancers whirled behind a vast sheet of frosted glass.

"Knows we're here," the Flatline observed.

Case punched again, once; they jumped forward by a single grid point.

A stippled gray circle formed on the face of the cube.

"Dixie. . . ."

"Back off, fast."

Neuromancer



(vecteezy.com)

People have been imagining what the future brings with the rapid development of Artificial Intelligence. Early in 1984, William Gibson told a story in his book *Neuromancer* about the high-tech future, a world everything is connected on a network known as “The Matrix” (Gibson, 2015). The matrix in this novel is described by a place where “data dance with human consciousness... multi-national information systems mutate and breed into startling new structures whose beauty and complexity are unimaginable, mystical, and above all nonhuman (McCaffery & Gibson, 1988).”

We are stepping into a smart future, where Internet of Things will be the fundamental, and the imagination of the Matrix would be the reality.

Let's explore IoTs together.

Story Plot (wikipedia):

Henry Dorsett Case is a low-level hustler in the dystopian underworld of Chiba City, Japan. Once a talented computer hacker, Case was caught stealing from his employer. As punishment for his theft, Case's central nervous system was damaged with a mycotoxin, leaving him unable to access the global computer network in cyberspace, a virtual reality dataspace called the "matrix". Case is unemployable, suicidal, and apparently at the top of the hit list of a drug lord named Wage. Case is saved by Molly Millions, an augmented "street samurai" and mercenary for a shadowy US ex-military officer named Armitage, who offers to cure Case in exchange for his services as a hacker. Case jumps at the chance to regain his life as a "console cowboy," but neither Case nor Molly knows what Armitage is really planning. Case's nervous system is repaired using new technology that Armitage offers the clinic as payment, but he soon learns from Armitage that sacs of the poison that first crippled him have been placed in his blood vessels as well. Armitage promises Case that if he completes his work in time, the sacs will be removed; otherwise they will dissolve, disabling him again. He also has Case's pancreas replaced and new tissue grafted into his liver, leaving Case incapable of metabolizing cocaine or amphetamines and apparently ending his drug addiction.

Cover of a Brazilian edition, depicting the character of "razorgirl" Molly Millions

Case develops a close personal relationship with Molly, who suggests that he begin looking into Armitage's background. Meanwhile, Armitage assigns them their first job: they must steal a ROM module that contains the saved consciousness of one of Case's mentors, legendary cyber-cowboy McCoy Pauley, nicknamed "Dixie Flatline." Armitage needs Pauley's hacking expertise, and the ROM construct is stored in the corporate headquarters of media conglomerate Sense/Net. A street gang named the "Panther Moderns" is hired to create a simulated terrorist attack on Sense/Net. The diversion allows Molly to penetrate the building and steal Dixie's ROM with Case unlocking the computer safeguards on the way in and out from within the matrix.

Case and Molly continue to investigate Armitage, discovering his former identity of Colonel Willis Corto. Corto was a member of "Operation Screaming Fist," which planned on infiltrating and disrupting Soviet computer systems from ultralight aircraft dropped over Russia. The Russian military had learned of the idea and installed defenses to render the attack impossible, but the military went ahead with Screaming Fist, with a new secret purpose of testing these Russian defenses. As his team attacked a Soviet computer center, EMP weapons shut down their computers and flight systems, and Corto and his men were targeted by Soviet laser defenses. He and a few survivors commandeered a Soviet military helicopter and escaped over the heavily guarded Finnish border. The helicopter was shot down by Finnish defense forces mistaking it for a hostile aircraft, and everyone aboard was killed except for Corto, who was seriously wounded and disfigured. After some months in the hospital, Corto was visited by a US government official, who returned him to the United States to receive computer-aided psychotherapy and reconstructive surgery and to be able to provide what he came to realize was false testimony, designed to mislead the public and protect the senior military officers who had covered up knowledge of the EMP weapons. After the trials, Corto snapped, killing the official who had first contacted him and then disappearing into the criminal underworld, becoming Armitage.

In Istanbul, the team recruits Peter Riviera, an artist, thief, and drug addict who is able to project detailed holographic illusions with the aid of sophisticated cybernetic implants. Although Riviera is a sociopath, Armitage coerces him into joining the team. The trail leads Case and Molly to Wintermute, a powerful artificial intelligence created by the Tessier-Ashpool family. The Tessier-Ashpools spend most of their inactive time in cryonic preservation in a labyrinthine mansion known as Villa Straylight, located at one end of Freeside, a cylindrical space habitat at L5, which functions primarily as a Las Vegas-style space resort for the wealthy.

Wintermute's nature is finally revealed—it is one-half of a super-AI entity planned by the family, although its exact purpose is unknown. The Turing Law Code governing AIs bans the construction of such entities; to get around this, it had to be built as two separate AIs. Wintermute (housed in a computer mainframe in Berne, Switzerland) was programmed by the Tessier-Ashpools with a need to merge with its other half, Neuromancer (whose physical mainframe is installed in Rio de Janeiro, Brazil). Unable to achieve this merger on its own, Wintermute recruited Armitage and his team to help complete the goal. Case is tasked with entering cyberspace to pierce the Turing-imposed software barriers using a powerful icebreaker program. At the same time, Riviera is to obtain the password to the Turing lock from Lady 3Jane Marie-France Tessier-Ashpool, an unfrozen daughter clone and the current CEO of the family's corporation, Tessier-Ashpool SA. Wintermute believes Riviera will pose an irresistible temptation to her, and that she will give him the password. The password must be spoken into an ornate computer terminal located in Villa Straylight, and entered

simultaneously as Case pierces the software barriers in cyberspace—otherwise the Turing lock will remain intact.

Armitage's team attracts the attention of the Turing Police, whose job is to prevent AIs from exceeding their built-in limitations. As Molly and Riviera gain entrance to Villa Straylight, three Turing officers arrest Case and take him into custody; Wintermute manipulates the orbital casino's security and maintenance systems and kills the officers, allowing Case to escape. Armitage's personality starts to disintegrate and revert to the Corto personality as he relives Screaming Fist. It is revealed that Wintermute had originally contacted Corto through a bedside computer during his original psychotherapy, eventually convincing Corto that he was Armitage. Wintermute used him to persuade Case and Molly to help it merge with its twin AI, Neuromancer. Finally, Corto breaks through the remains of the Armitage personality, but he is uncontrollable, and Wintermute kills him by ejecting him through an airlock into space.

Inside Villa Straylight, Riviera meets Lady 3Jane and tries to stop the mission, helping Lady 3Jane and Hideo, her ninja bodyguard, to capture Molly. Worried about Molly and operating under orders from Wintermute, Case tracks her down with help from Maelcum, his Rastafarian pilot. Neuromancer attempts to trap Case within a cyber-construct where he finds the consciousness of Linda Lee, his girlfriend from Chiba City, who was murdered by one of Case's underworld contacts. Case manages to escape after Maelcum gives him an overdose of a drug that can bypass his augmented liver and pancreas. Then, with Wintermute guiding them, Case goes with Maelcum to confront Lady 3Jane, Riviera, and Hideo. Riviera tries to kill Case, but Lady 3Jane is sympathetic towards Case and Molly, and Hideo protects him. Riviera blinds Hideo with a concentrated laser pulse from his projector implant, but flees when he learns that the ninja is just as adept without his sight. Molly then explains to Case that Riviera is doomed anyway, as he has been fatally poisoned by his drugs, which she had spiked with a lethal toxin to ensure he would never survive the mission, regardless of the outcome. With Lady 3Jane in possession of the password, the team makes it to the computer terminal. Case enters cyberspace to guide the icebreaker to penetrate its target; Lady 3Jane is induced to give up her password, and the lock is opened. Wintermute unites with Neuromancer, fusing into a superconsciousness. The poison in Case's bloodstream is washed out, and he, Molly, and Maelcum are profusely paid for their efforts, while Pauley's ROM construct is apparently erased, at his own request.

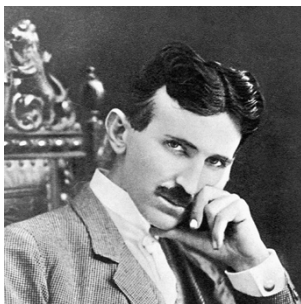
In the epilogue, Molly leaves Case. Case finds a new girlfriend, resumes his hacking work, and spends his earnings from the mission replacing his internal organs. Wintermute/Neuromancer contacts him, saying that it has become "the sum total of the works, the whole show," and has begun looking for other AIs like itself. Scanning old recorded transmissions from the 1970s, the super-AI finds an AI transmitting from the Alpha Centauri star system. In the matrix, Case hears inhuman laughter, a trait associated with Pauley during Case's work with his ROM construct, thus suggesting that Pauley was not erased after all, but instead transformed and exists in the matrix.

In the end, while logged into the matrix, Case catches a glimpse of himself, his dead girlfriend Linda Lee, and Neuromancer. The implication of the sighting is that Neuromancer created a copy of Case's consciousness. The copy of Case's consciousness now exists with that of Linda's and Pauley's, in the matrix. As promised there has been change, but what that change means is left ambiguous.

Internet of Things

Early in 1926, Nikola Tesla envisioned a “connected world.” He told Colliers Magazine in an interview (Kennedy, 1926):

“When wireless is perfectly applied, the whole Earth will be converted into a huge brain, which in fact it is, all things being particles of a real and rhythmic whole [. . .] and the instruments through which we shall be able to do this will be amazingly simple compared with our present telephone. A man will be able to carry one in his vest pocket.”



(This image is in the [public domain](#) due to its age; PD-OLD.

<https://upload.wikimedia.org/wikipedia/commons/thumb/d/d4/N.Tesla.JPG/800px-N.Tesla.JPG>)

The term Internet of Things, or IoT, was first coined in 1999 during a presentation done by British technology pioneer Kevin Ashton on supply chain management at MIT. Early forms of communication with an IoT often involved machine of the same type, which is called machine to machine or M2M communication. For example, devices used in supply chain management systems to track inventory where all communication was done locally within the same system (Khalil, 2017).

Today, the Internet of Things has expand beyond machine to machine and enclosed systems between machines of the same type. Now devices and sensors of all type can communicate with each other from anywhere in the world. These can include larger scale industry applications, like SCADA systems, commercial products like smartphones, or local networks of sensors to collect and transfer data like traffic monitoring systems, just to name a few examples. Many domains have been defined to represent the concept of IoT environments (Khalil, 2017).

These domains cover specific areas within the IoT ecosystem and can vary in scope. For example, Internet of Everything, or IoE, by Cisco, Industrial IoT, or IIoT. Internet of Everything that's used by Cisco is to refer to intelligent communication of people, processes, data, and things that can be exposed to their services. The Internet of Everything concept includes, beside machine to machine communication, machine to people, and technology-assisted people to people interaction (Khalil, 2017).

IoTs =

Things + Computational Intelligence + Internet Connectivity

Incorporating various perspectives while revealing its nucleus, we may consolidate and define:

IoT is a world of interconnected things which are capable of sensing, actuating and communicating among themselves and with the environment (i.e., smart things or smart objects) while providing the ability to share information and act in parts autonomously to real/physical world events and by triggering processes and creating services with or without direct human intervention (Hassan, 2018).

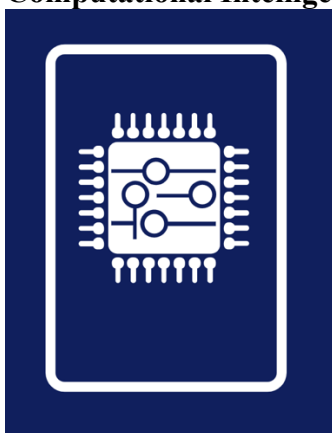
Thing



(vecteezy.com)

Let's go through a refrigerator example and break down the term Internet of Things. So in this case a refrigerator is just a thing besides a computer. It has some features and some use. So in the case of a refrigerator like this, we know what a refrigerator does. It keeps things cold and so on. So we start off with a thing (Ian Harris, 2019).

Computational Intelligence



(vecteezy.com)

Now we add some type of computational intelligence. Typically it's a micro controller, running some kind of code, which is the computer inside. It doesn't look like a computer, it looks like a refrigerator, but it actually has computational intelligence inside. And it's

somehow is used to improve the functionality of the device, to make the device do what it did before, but better (Ian Harris, 2019).

Internet Connectivity



(vecteezy.com)

Then, to top it off, we add Internet connectivity. It's got a network connection which means it can use all sorts of other resources that are not local. You take the thing, put some intelligence in there, and put some network connectivity. All that put together is generally what you'd call an Internet of Things device. Now, an intelligent refrigerator could talk to you if it wanted to. It could also tell you when you buy foods that are high on fat content. You can have your refrigerator actually order food for you when the stock is low (Ian Harris, 2019).

IoTs in Action

Since networking is pervasive, IoT is everywhere. It is embedded in devices and you're not necessarily aware of that, but they're all over the place and if you just look around whatever room you're in, you'll probably see these devices (Ian Harris, 2019).

Smart Home



(rawpixel.com)

Apple Home

With the Home app, you can easily and securely control all your HomeKit accessories. Ask Siri to turn off the lights from your iPhone. See who's at the front door on your iPad. Control things remotely with the help of Apple TV. Even tell your HomePod to turn up the music.

The Home app makes all your connected devices work harder — and smarter — for you (Apple-Inc.).

Read more: <https://www.apple.com/au/ios/home/>

Smart Compus



self-authorized

UQ Smart Campus

UQ Smart Campus super project is centered around IoT devices being developed for and with UQ Properties & Facilities as a client/mentor partner. Devices and any software developed should be fully tested and deployed on campus into production by the end of the project (Pudmenzky).

Read more: <https://smartcity.uqcloud.net>

Smart City



(Joseph)

Smart Singapore

The smart city initiative of Singapore was established from the Smart Nation Vision in 2014. A smart nation is one where people are empowered by technology to improve their lives. And it focuses on five key domains: transportation, home and environment, business productivity, health, and public sector services (Khalil, 2017).

Read more: <https://www.smartnation.sg/>

Quiz (Ian Harris, 2019):

1. Which of the following could be an IoT device?
"a lamp",
"a couch",
"a pen",
"all of the above"
2. An IoT device can most easily be differentiated from a standard computer based on
"computational performance",
"memory capacity",
"interface with the user and the world",
"weight/size"
3. The following trend is NOT related to the growth in IoT technology:
"Increase in computer monitor size over time.",
"Increase in computer performance over time.",
"Decrease in computer size over time.",
"Decrease in computer cost over time."
4. Which of these security approaches is feasible for most IoT devices?
"Use of anti-virus software.",
"Use of an internal firewall.",
"Regular installation of product firmware updates.",
"Complete separation of the device from the Internet."
5. IoT devices gather private information about users. Which statement is most true about the security of that data?"
"Users can ensure security of collected data by encrypting it manually.",
"Users must rely on data-collecting agencies to securely store and transmit their data.",
"Users can sue data collecting agencies if their data is not held securely.",
"Most data gathered by IoT devices is safe because IoT devices are not a target of hackers."

JavaScript Library

jQuery (jQuery)

ScrollMagic (ScrollMagic)

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