

Introduction

The mobility of computer interconnectivity has and continues to revolutionise Information Systems (ISs) (Valacich & Schneider, 2014). Nowadays, whether one is sitting at lunch with a customer, in motion whilst on a train, or on holiday in a remote location, companies and people can remain “connected” (Ericsson, N.D.a). Through radio technologies computer networks have a flexible range covering both urban and rural areas (Ericsson, N.D.a). The 5th generation mobile network (5G) which is a new global wireless standard is promised to be an enabler for the continuation of the evolution of ISs (ITU, 2018). With capabilities far superior to its predecessor 4G, 5G is expected to greatly influence the way computer systems can be used, especially when combined with other emerging technologies like Cloud Computing, Artificial Intelligence (AI), and the Internet of Things (IoT) (AT&T, 2020).

Mobility’s Revolutionary History

If one were to cast their mind back to the 1990s, they would remember the days of the large 2G cellular phones which only facilitated voice calls and Short Message Service (SMS) (Ericsson, N.D.b). A decade later 3G arrived on the scene and provided the additional functionality of Internet connectivity through the Cellular network platform (Ericsson, N.D.b). At that juncture special-purpose computers in the form of cellular phones, as well as general-purpose computers gained direct access to the Internet via the cellular network (Ericsson, N.D.b). This was a big step towards smartphones, and the general use of mobile broadband services to connect to the Internet. From 2010 onwards has been the era of 4G and the smartphone (Ericsson, N.D.b). 4G has much higher data speed capabilities than 3G which assisted in giving birth to application

stores and features like video streaming using YouTube (Ericsson, N.D.b). Smartphones are essentially handheld devices with the combined functionality of a cellphone and a computer having Internet connectivity (PCMag, N.D). One can note how the evolution of better cellular wireless technologies has brought about change (PCMag, N.D). For example, by putting the power of smartphones in the hands of billions of people the Internet has effectually exponentially grown, and businesses have gained access to people in a new and interesting way. For instance, think about ecommerce and the ease of making purchases using a mobile device (Valacich & Schneider, 2014). Now that 5G has arrived it too is expected to bring massive change (AT&T, 2020).

The Future

Once again, the new mobile network generation will provide an increase in data transfer rates, in fact speeds up to 100 times faster than 4G (AT&T, 2020). Additionally, it will be able to maintain an end-to-end latency 10 times less than 4G (AT&T, 2020). Furthermore, a 1000-fold increase in capacity to facilitate more connections within an area than before (AT&T, 2020). There will also be other functionality introduced not previously seen (Cisco, N.D). For instance, 5G networks will provide seamless open roaming capabilities between cellular and Wi-Fi network access (Cisco, N.D). The new networks will also provide edge cloud computing, which will vastly enhance what terminal devices will be able to perform (AT&T, 2020). Devices with small battery, storage, and compute resources can use this cloud functionality to achieve greater processing and outputs (AT&T, 2020). Normal public cloud services are too far in distance for some of the required latencies, and therefore haven't been able to provide

the needed services up to this point (AT&T, 2020). The IoT is another area which will be able to immensely prosper in the 5G environment, where the new network can facilitate the billions of devices required to be interconnected (AT&T, 2020). Furthermore, with the low latencies and high speeds almost real time Supervisory Control And Data Acquisition (SCADA) services will be possible (ITU, 2018). This feeds the current industry trend of Big Data, Cloud Computing, and AI which will be able to process data and provide new insights for research and business (ITU, 2018). The mobile networks will also be more flexible by providing Software Defined Networking (SDN) capabilities allowing applications and their related data to influence network traffic forwarding (Cisco, N.D). Security has also been enhanced in the new network in different ways, but one area of note is that private frequency channels can be allocated for businesses within the public network, providing a form of Virtual Private Network (VPN), although a defense in-depth approach is still recommended by security specialists (AT&T, 2020).

Use Cases

To put into perspective the possibilities 5G creates, some societal, business, and personal use cases are listed below further to what has already been mentioned:

- Smarter electric grids (Ericsson, N.Db).
- More connected vehicles sharing data to prevent accidents (Ericsson, N.Db).
- Connected sensors to warn of natural disasters (Ericsson, N.Db).
- Remote expertise through a specialist consultation (Ericsson, N.Db).
- Production lines that autonomously react to supply and demand (Ericsson, N.Db).

- Inventory that stocks itself (AT&T, 2020).
- Remote access to powerful robots and vehicles (Ericsson, N.Db).
- Increased use of IoT in agriculture to efficiently produce crops (Ericsson, N.Db).
- Enhanced teaching methods through immersive content (Ericsson, N.Db).
- The use of virtual, augmented, and extended reality, to interact differently with products and services (AT&T, 2020).

Some Concerns

As with any technology there are downsides and 5G is no exception. Because of the higher frequency band used for the greater speeds, the penetrability and coverage of the radio signals is drastically reduced and therefore requires much denser cells, meaning that more antennas and the related equipment will have to be deployed in closer proximity (ITU, 2018). Additionally, there are concerns of the digital divide growing substantially due to the new technology being available far quicker in urban areas, giving businesses and people located in these regions an advantage over those in the rural areas (ITU, 2018).

References

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