Telecommunication Engineering: Scope, Nature And Extent Of The Profession

Abstract

This report discusses and analyses the scope, nature and extent of the profession, telecommunications engineering. The report is referenced to the nature and range of the work that’s done, engineers as managers, emerging and innovative telecommunication technologies, career prospects and the training required for the profession, including other aspects.

Introduction

Telecommunication is the transmission of signals, signs, messages, words, images and sounds by wire, radio, optical or electromagnetic systems. Telecommunication occurs when the exchange between communicators include the use of technology.

Communication in Australia and its population is done electronically through devices such as telephones, radio, television, computer and/or smartphones/tablets, and services like telephony and broadband networks. These have always been important in the country looking at the distances between states/territories and cities, with the majority of the population being spread out. The government has driven telecommunication development and have a considerable role in the management of telecommunications.

Nature And Range Of Work Done

Telecommunication engineering is an are of engineering which combines two other main areas, electrical and computing. Telecommunication relates to the theory and practical implementation for a wide range of systems like the telephone, data networks, radio and television broadcasting, satellite and space communication.

Engineers in the profession are involved in research, both pure which aims to improve scientific theories for better understanding and, one that is targeted at improving and developing commercial products. As many engineers in telecommunication are electrical/electronic engineers, so their knowledge lets them design, develop and test the equipment needed to transmit information and data over long distances. While other engineers specialize in software and computing make the programs and code required for the systems. Supervising the manufacturing which involves maintaining standards and coordination with the teams and the supplier. Engineers may also participate in sales and marketing of the systems as to sell the item the individual must have high knowledge. Telecommunication engineers are also involved in installation of systems because it needs high levels of organizational and interpersonal skills, with specialist knowledge. Maintenance and upgrading the equipment that has been installed may again be done by engineers. The range of work done in telecommunication engineering can be as basic as circuit design to large developments in technology.

Engineers As Managers

Telecommunications managers organize and direct the use of technological devices and services. They work as a connector between the businesses that use telecommunication equipment and the corporations that supply them.

Few managers work for phone companies or long-distance carriers, they mostly manage a clients' telecommunication requirements on the phone or face to face.

A telecommunication manager may proceed as a shopper, pricing out the most suitable long-distance plans or packages for their company.

The managers must understand the clients needs and wants. They should also be able to analyse and judge the demands of the company they are working for and recommend the appropriate solutions.

Some of them are self-employed, but most work for others. Telecommunication managers working in big companies, work in offices and are likely to work together with the employees they supervise

Emerging And Innovative Technologies Unique To Telecommunication

Telecommunication technology is emerging at an unimaginable rate, with many advances over the few past years. The following are some of the new innovations in telecommunication

• AI

- Artificial Intelligence (AI) and Machine Learning (ML) will be the main parts in telecommunication developments and will transform the way corporates and companies will communicate with their customer and also, the way the companies' process are organised. AI will help to manage, optimise and maintain infrastructure and customer services.

• AR/VR

- AR is used to show digital visualizations on real images. AR is used by many people like in social media and to play games. This technology will continue to develop, and will for communications through images and/or videos to show visualisation. This can also change people do their jobs, for example, engineers can visualise how a structure can be constructed and how it will fit within a specific area, the need create drawings will be minimised or eliminated completely.

- Virtual Reality (VR) will help to communicate with others while virtually being at the same place, but in reality, being in an entirely different location. It may also be used for marketing purposes, this will allow consumers to analyse the product or service thoroughly. Virtuality will also empower businesses to have meetings more conveniently, easily and more accessibly.

• 5G

- 5G is the fifth generation of cellular network technology that provides broadband access. 5G will give a faster, more secure, reliable and nimble wireless technology. The new generation will drastically decrease the time it takes devices such as smartphones to communicate and share information with each other wirelessly (lower latency). 5G will also allow more devices to connect to the same network at the same time.

• Internet Of Things (IoT)

- Internet of things is the internet connection of physical devices that is used in everyday life. These devices can be used and communicated with multiple other devices via internet connection, as well as being able to monitor and control the specific device. This is thanks to cheap processors and wireless networks, which add digital intelligence to devices which lets them communicate real-time information and data without another human being involved. Examples of IoT, can include technologies such wearable devices like watches, connected cars in which the operator can optimize the car and can also be used for agricultural purposes. This innovation can allow for smarter cities by having smart surveillance, transportation, management, water distribution and environmental monitoring. Like smart cities, homes can be smarter too, with the ability to control home appliances through your smart phones and the use of sensors.

Career Prospects

The fast-growing nature of telecommunications engineering would mean that career prospects are outstanding and with the beginning salaries for individuals being very competitive.

Telecommunications engineering can branch out to parts involving the area such as:

- Telecom Researcher
- Field Manager
- Hardware Designer/Engineer
- Electronic Designer/Engineer
- Network Designer/Engineer/Manager
- Product Manager
- Radio Frequency Engineer
- Computing Engineer

Training For Telecommunications Engineering

Telecommunications engineers need to have knowledge on electrical and/or software engineering. They should be able to solve difficult mathematical analysis, this can include:

- Vector Calculus
- Complex Variables
- Fourier Series
- Differential Equations
- Matrix Applications

Most engineers working in this industry have backgrounds in either electrical engineering and/or

software/computer engineering. Many have a bachelor’s degree in the specializations mentioned, but some may go on to earn a post-graduate degree such as diplomas or masters.

Conclusion

Engineering working in this area will develop and manage technologies that allow people to communicate with others. Without telecommunication, Australia or even the world will have a huge amount of difficulty communicating and managing the country. Telecommunication engineering is growing at a very fast rate and is a very competitive profession to get into. Individual who want to work in this industry will have many opportunities for work but will have to be critical thinker while having mathematical skills. Telecommunications will keep growing as the needs for new ways of communication increases.