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## School of Design, Engineering & Computing

# Project Conclusion and Comparison

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# 8 Comparison and Conclusion

## 8.1 Comparison between Wi-Fi and WiMAX

In general Wi-Fi and WiMAX complement each other rather than compete against each other.

Wi-Fi has been one of the great successes of the computer industry. Wi-Fi operates in the unlicensed band and is designed to provide wireless access to a small area. The technology can operate with other Wi-Fi networks competing for the same bandwidth. Though WiMAX can work in the unlicensed spectrum nearly all operators prefer to provide services from the licensed spectrum where they are guaranteed to be the only company using that bandwidth. Fixed WiMAX is positioned to compete against ADSL broadband providers. This is particularly true in rural areas and developing countries. It is said that WiMAX broadband service was the first to recover after the Asian Tsunami in Indonesia.

Where WiMAX and Wi-Fi do compete is in Wi-Fi meshes. Widespread Wi-Fi meshes on the whole have been unsuccessful – Swindon Project being one example. The Swindon Wi-Fi mesh project has been put on hold whereas the Teesdale WiMAX project is forging ahead. [901, 902, 903]

## 8.2 Comparison between WiMAX and LTE

The fundamental differences between the 2 technologies arise from the fact that they come from very distinct business quarters, each driven by different and sometimes opposing priorities. [906]

WiMAX is essentially driven by the Computer Industry with companies like Intel being big backers. It is based on the requirements for computers and is therefore architected for PCs. The fact that it has shrank in size to make it portable has been an added, secondary consideration.

LTE, on the other hand, has emerged from the Telecommunications Community. To all intents and purposes, it is a telephone for making calls. However, it has also evolved becoming more and more versatile in its uses. The convergence between the two has been

coincidental with WiMAX end user devices becoming more “mobile” and LTE phones (e.g. I-phone) becoming “smarter”.

In the WiMAX business approach, goods are sold and services are subsidised while the LTE business approach does precisely the opposite. Goods like the PC, laptops etc have to be purchased whereas the services like Google are subsidised through advertising revenue.

In the Telecommunications sector however, it is the cost of the hardware that gets subsidised. As a result, the telephones and handsets themselves cost very little and even upgrades are available for next to nothing. It is the services and subscription contracts that generate the income and “talk time” is paid for by the minute.

Another difference lies in the nature of the architectures which are poles apart. In the Telecommunications architecture, the Value Added Services are crucially important. They have to be secure, customer care and support services matter and reliability is of the utmost importance. In contrast, the WiMAX architecture is based on IP and is relatively flat. There are no fiddly servers and the customers remain largely unknown. The concern has to be about the BIT PIPE and even then, it only has to be a “best effort” pipe. These differences mean that the competing technologies have different potentials and advantages in different market scenarios.

## 8.3 Comparison between my e-learning tool and traditional methods

The objective of the project was to produce an e-learning tool that would help students understand the complex concepts in Wi-Fi, WiMAX and LTE.

It was to encourage independent learning and to improve outcomes. To achieve this, the tool had to be engaging, different, full of practical examples and present the information in a multifaceted way. The tool includes video, audio and flash animations. It is hoped that the variety will cater for a range of preferred learning styles and provide a blended learning experience.

I have tried to take the student along the journey of discovery that I took in learning the subject, showing them videos of the 3G masts I visited, the tests I carried out to improve the Wi-Fi performance in my flat by switching from 2.4GHz to 5GHz. I also showed the

frustrations that I had with my HSDPA connection speeds being down at $1Mbits^{-1}$ instead of the advertised 7.2 [904, 905]. The hype on the peak rates that LTE-Advanced and WiMAX 2 offer must be taken with caution. LTE-Advanced and WiMAX 2 will definitely be faster than today's technology but it is unlikely that the end user will see the $100Mbits^{-1}$ that is currently being bandied about

Finally I hope that future students will enjoy my tool as much I did developing it.

## 8.4 References - Comparison and Conclusion

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