

THE FUTURE OF TELECOMMUNICATION MAY RELY ON IP:

A LOOK AT AT&T'S INNOVATION



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INTRODUCTION

For the last few decades, telecommunications has been at the heart of our society. Being a part of modern society, it is essential for us to stay connected to people around us and those who are far away. People have made communicating processes quicker, more efficient, can cover longer distances, and more affordable. These innovations have led to the telecommunications systems of today, making it faster and easier for us to reach anyone, wherever they are, at any time of the day. One can see that this is an idea which caught on rapidly, thus making it a vast business field. But even the best businesses need to continuously innovate to survive, especially looking at how digitalized the world has become. To survive, companies in the telecom (telecommunications) sector have undergone digital transformations, especially AT&T with their current focus of bringing IP (Internet Protocol) technology to a new level. What AT&T shows here is that IP-based innovation is the key for the telecom sector to strengthen its importance in the contemporary digital society.

This case study will examine the digital transformation of AT&T, one of the largest and most influential telecom companies in the United States. Some have known that AT&T's transformation to focus on IP-based solutions is crucial in seeing how the telecom business moves, thus examining it would be essential in a case study such as this. Aside from just focusing on AT&T, this case study coverage will discuss the big picture of having digital transformations in the telecom business. By pointing out the innovations that AT&T brings, and how it can open the opportunities for a telecom company to thrive in the future, we can see how transforming a part of the business methods into a digitalized form can help create a more efficient and profitable nature of the business.

Using a more idealistic approach, we can comprehend the way digital transformation affects the business visibly and measurably. For this topic, it is important to look at the big picture, because telecoms is a vast business field, with many things happening in it at once, and it is very dynamic. Crucially, it helps to unravel the possibilities digital transformation brings to the table for the future of telecom.

This case study consists of four parts: 1) the digital transformation phenomenon; 2) understanding the telecom business; 3) the digital transformation of AT&T; and 4) how digital transformation can influence the telecom business in the future. By dividing the article into these sections, it can help understand how digital transformation works in real-world terms. One thing to note is that this writing is not backed by AT&T, and that neither the author nor the research center has any affiliation with the company. These are pure research findings based on the topic of the digital transformation of the telecom business.

DIGITAL TRANSFORMATION IN BUSINESS

Let's talk about the core idea in this case study – digital transformation. The first thing to note is that as mentioned before, one key factor in running a successful business is to innovate, be it the product, service, or its operations. The thing with innovations in business is that with it, the company can adapt to the shifts in the society as time goes on. These shifts may include consumers' taste, purchasing power, and trends, among all else. The underlined way for a business to innovate in this study is digital transformation. It is the profound transformation of business and organizational activities, processes, competencies and models to fully leverage the changes and opportunities in a mix of digital technologies and their accelerating impact across society in a strategic and prioritized way, with present and future shifts in mind.¹ The reason why digital transformation is needed as a business innovation is that it opens an ample opportunity for business, in this day of age, to experience growth.

Business innovations follow what the society needs and wants because these are what sets the demand, and where there's demand, there's money waiting to be spent. It is why innovation is so important for companies to be involved in – it helps them survive and grow. This often means that a company needs to change many of their components. Today, the world is shifting towards a more digitalized way of things as technologies keep developing. Having modern technologies in our lives means that doing almost anything is now easier than before – ordering flights, ordering a taxi, watching movies, reading books, studying for exams, having a conference, and many others.





Since many of our activities are done not in a physical way but rather in a digital form, it is best for businesses to be in the cyber world too. This means transforming their operations to digital, with lowering operational costs and enhancing customer experience being considered as the core of digital transformation.ⁱⁱ

The business sector in which the transformation may be applied is perhaps the determining element. With digital transformation, companies can have the opportunity to be more agile, people-oriented, innovative, customer-centric, streamlined, efficient and able to induce/leverage opportunities.ⁱⁱⁱ With markets that are highly commoditized, it can be argued that digital transformation serves as an urgency.

In practice, digital transformations can apply to every single component of a company and the customers' experience. For example, one does not need to always go to a travel agent's office to book a flight or a hotel. Applications from travel agencies can be downloaded and operated from a smart device or computer through which related activities can be commenced. Ever found it hard to find a mint-condition second-hand Hyundai Sonata from the early 2000s? They can be found more easily online. Car dealers often offer bonuses for purchases, and that is to attract more buyers via their website which anyone can easily access, so long as they have an internet connection. These things are only small examples of a digital transformation in business, yet they were all unheard of just a decade ago. Yet these are actual innovations, and it is not difficult to see that it is a step towards a better future.

THE TELECOM BUSINESS

For decades, the telecom industry has never faded – not even once. And to be frank, the modern society has made it even stronger and more competitive. The needs of people in this modern age to stay connected with everyone else becomes the fuel for this industry to keep running, and there is never a shortage of it. With this as the base, companies in the telecom industry has shifted to different means of communication to attract its customers.

What we know as the ‘traditional’ telephone call continue to be the industry's biggest moneymaker, but telecoms today is less about voice and is increasingly more about text and images (including videos) thanks to advancements in network technology. High-speed internet access for computer-based data applications such as broadband information services and interactive entertainment becomes even more popular. Digital Subscriber Line (DSL) is the main broadband telecom technology in this day of age. The fastest growth in this field comes from services which are value-added, delivered over mobile networks.^{iv}

The telecom sector continues to be at the epicentre of growth, innovation, and disruption of basically any sort of industry. Mobile devices and related broadband connectivity get more embedded in the fabric of society today, and they are key factors in driving the momentum around trends such as video streaming, Internet of Things (IoT), and mobile transaction.^v One author from Investopedia think of telecommunications as “the world's biggest machine, strung together by complex networks, telephones, mobile phones and internet-linked PCs, the global system touches nearly all of us. It allows us to speak, share thoughts and do business with nearly anyone, regardless of where in the world they might be. Telecom operating companies make all this happen.”^{vi} This statement signals just how large the telecom industry is. The amount of mobile data traffic is expected to grow eightfold in the coming years, up to more than 30 exabytes per month by 2020. In fact, Insight Research projects that telecommunications services revenue worldwide will grow from \$2.2 trillion in 2015 to \$2.4 trillion in 2019.^{vii}



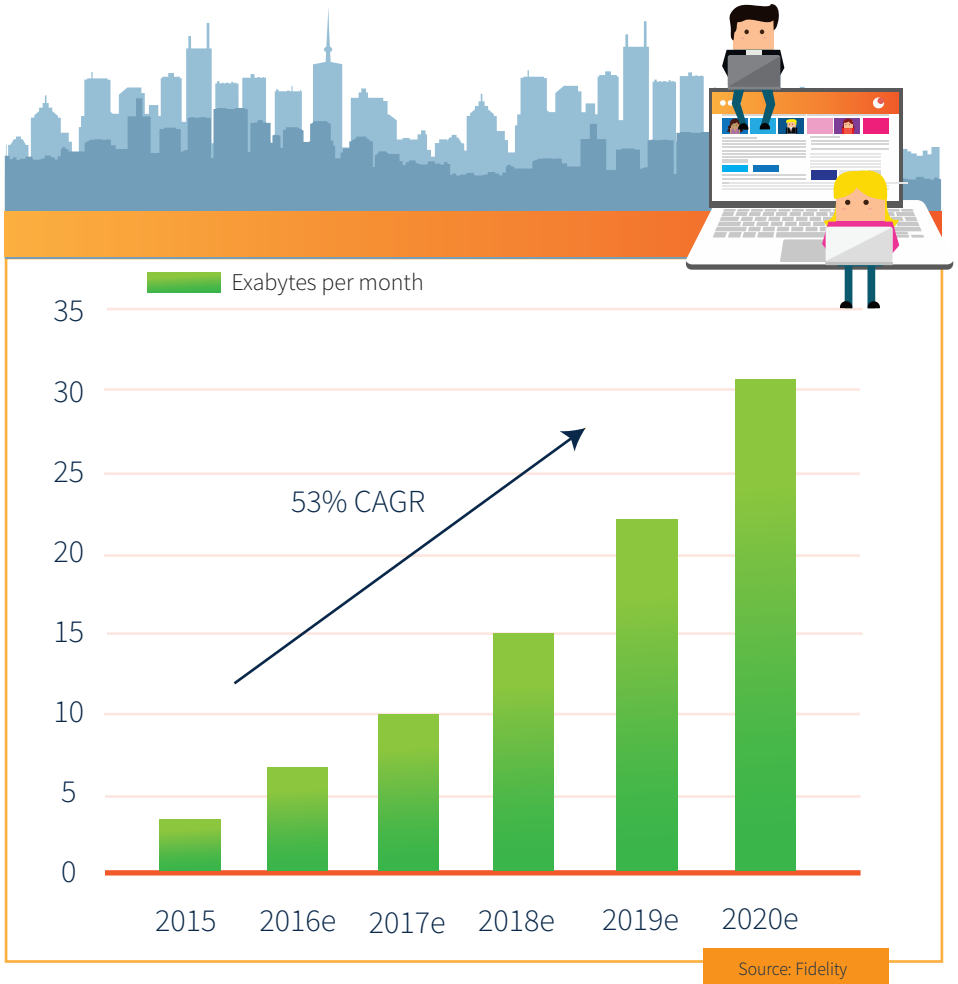


Figure 1: Global Mobile Data Traffic^{viii}

The world's top ten telecommunications companies each have a market value of more than \$50 billion. As of 2017, they are: 1) China Mobile, 2) Verizon, 3) AT&T, 4) Vodafone, 5) Nippon, 6) Softbank, 7) Deutsche Telekom, 8) Telefonica, 9) America Movil, and 10) China Telecom. Seeing that the needs for telephone and wireless connection all over the world would only keep increasing, the telecom industry is predicted to continue expanding its operations globally. More individuals in emerging markets are subscribing to telephone and internet contracts, while newer telecommunication technologies in developed nations are expanding pre-existing customer bases of providers.^{ix}

AT&T'S DIGITAL TRANSFORMATION

AT&T is the telecom company that is focused in this case study. The reasons being are that: 1) AT&T is one of the world's largest telecom corporation, and 2) the major contributor to its success is its eagerness in innovating through digital transformation. What AT&T has done to start is to put digital transformation as a business philosophy – “don't put the cart before the horse”, they say. They focus on the infrastructure upon which the services operate. A report by Nemertes Research found that 45 percent of companies still operate TDM PBXs in some (or even all) of their locations, and up to 54 percent of large organizations.^x They regard this as an older technology, one that could be replaced by more modern IP-based capabilities. Moreover, it seems that using IP technologies as an innovation in business is prioritized by AT&T, as the foundation of the company's digital transformation. Other companies in the sector do not seem to have this kind of prioritization, making AT&T interesting to be discussed in this study.

IP, or Internet Protocol, is the core language of the Internet. It offers the potential to bring together the disparate networks and services that have evolved over the past 20 years. IP alone didn't exist since around ten years ago. Today, the IP revolution is already doing pretty well. For consumers and small businesses, the IP transformation means evolving from today's bundles that brings together voice, broadband and video services, to tomorrow's fully integrated IP-based offerings that deliver access to applications anytime, anywhere. Services will switch from wired to wireless connections. Users will be able to tap into multiple services over any number of devices, and applications will adapt to whatever device they're using.^{xi} This technology is what AT&T is proud of.





According to them, there will be new ways to perform daily activities in the future using their innovation idea – quoting directly from a publication from the company itself:

- Start a call from the office, walk to the car, drive home, and walk into the house. As the user's location changes, the call seamlessly switches from the office network to the wireless network to the home network, always providing the best possible connection.
- View high-quality IP video from their PDAs or wireless phones, with the same viewing options they would enjoy from their televisions from home.
- Access e-mail and voice mail from a single inbox.

The company also came up with 'Project Lightspeed,' which they claim as *"the linchpin of the new AT&T's consumer and small business transformation effort"*.^{xii} For the company, this project is an evolutionary initiative to drive powerful fibre-optic connections closer to customers and enable a new portfolio of IP-based voice, data and video services.

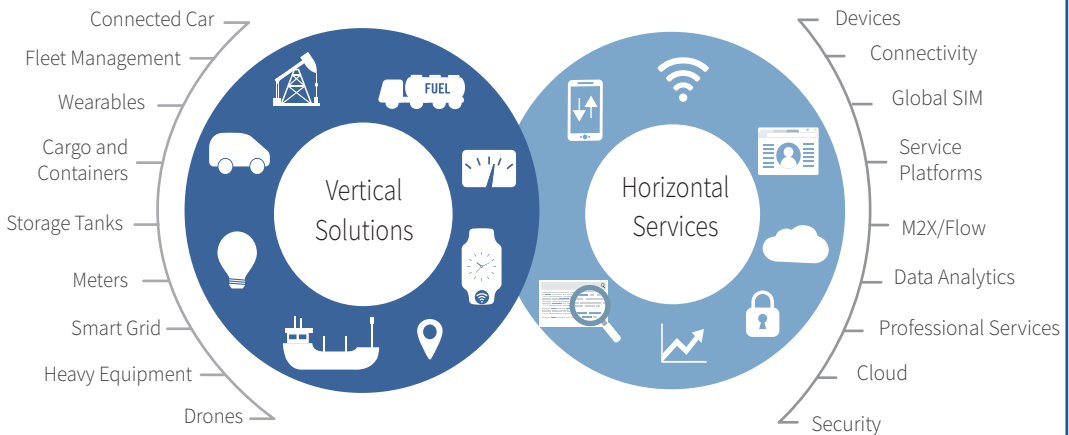
For the business side of the pond, the same end-user benefits of IP transformation apply, according to AT&T. The impact of these benefits is further magnified by the capability to provide employees with 'seamless mobility'. It says in their publication that *"the new AT&T envisions a future that combines a suite of IP-based services with both wireline and wireless access technologies that deliver full, secure access to all business applications and data nearly anywhere."*^{xiii} According to the company, the basic idea of this is that this integration can enable employees to access applications such as e-mail and others alike from wherever they are. Businesses maintaining their own networks can also benefit in the form of dramatic cost savings and productivity improvements. IP enables businesses to build and maintain a single network for all communications, rather than managing multiple networks for voice and data. Moreover, employee moves and other changes are simplified with IP services, reducing demands on in-house IT personnel.^{xiv} All this means that the company can operate more competitively.

Innovating through the usage of IP leads to the bigger picture of the company's growth, which is the Internet of Things (IoT). It can be regarded as one of the pillars of AT&T's strategy in trying to thrive in the future. Traditionally, carriers have focused on connectivity being their differentiator when competing with large IT companies that also focus on IoT. Over the past few years, AT&T has publicly touted its network as its key

differentiator. In addition to the network connectivity foundation, the IOT team is building their platform and service value proposition to develop a complete enterprise solution for IoT; one that integrates disparate devices using various types of connectivity.^{xv}



AT&T Combined Approach to IoT



Source: Digital Transformation

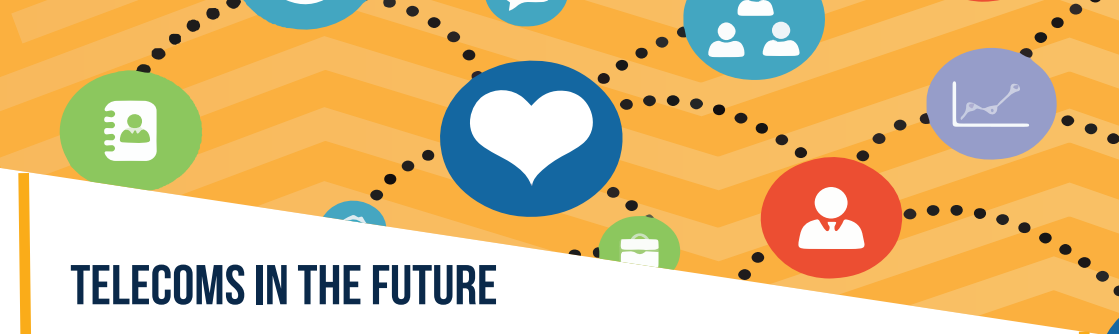
Figure 2: AT&T Combined Approach to IoT ^{xvi}

Looking at AT&T's approach towards digital transformation, it is interesting to see what they have been trying to penetrate. It seems as if they are trying to play a role in as many platforms as possible – something that does not seem to be prioritized by other major telecom corporations.

AT&T has touted the strength of its wireless network for years, as one of the most popular mobile carriers among all else. Now, it seems as if they are trying to do more to communicate the strength of its Wi-Fi and Ethernet capabilities. And guess what – they rely on IP technology. However, not all applications require cellular connectivity. Their acknowledgement of this fact means that by enhancing Wi-Fi and Ethernet capabilities, people and institutions can conduct application-based activities more efficiently without relying solely on mobile networks. AT&T is apparently doing well in establishing itself as a leading contender for Industrial IoT and smart city deployments following this slight twist in the communication of its strategy.

We mentioned platforms earlier, so let's not leave that behind. With the development of its platforms, one may see that AT&T tried to create a certain environment for platform providers and the developer community to create new IoT solutions.^{xvii} The way they did it is by combining the potential of advanced IP technology solutions with the field in which it is deemed useful. The commitment to IoT is most visible on AT&T's connected car strategy. A total of 22 road vehicle manufacturers: Audi, BMW, Buick, Cadillac, Chevrolet, FCA US, Ford, Freightliner, GMC, Honda, Infiniti, Jaguar, Land Rover, Lincoln, Nissan, Opel, Porsche, Subaru, Tesla, Vauxhall, Volvo, and Volkswagen are all teamed up with AT&T for in-car technology solutions.^{xviii} Not only that, they seem to be quite committed in the world of automated driving experiences – something expected to be quite common in developed countries soon enough.

If we stick with the optimism in a way that we see digital transformation as a tool for future success in the telecom sector, then AT&T now has the edge in bringing the industry to a new level. Here is one thing to underline: because of AT&T's efforts in innovating through the utilization of IP technology, the company has allowed itself to contribute in many elements relevant to the digital society, which would probably be difficult to do otherwise. In measuring the success of digital transformation, we look at how the company manages to benefit from their innovations. AT&T in this regard, with its IP-based innovation, has done well and the same cannot be said about all the other players in the sector.



TELECOMS IN THE FUTURE

Today, we are familiar with the telecom world as a part of our daily routine as what connects us with other people mainly through gadgets. But seeing how quickly the industry has developed, it seems to be a very potential sector. What AT&T has done by innovating its way through development in IP infrastructure has seemingly opened the floodgates for every other major telecom corporations to, at least, try to do the same.

As any eager businesses, AT&T has tried to push its boundaries further by stepping into areas which telecom businesses don't usually play in. Offers in automotive platforms and governmental systems as mentioned previously confirm such statement. It is a form of a business expansion, one who feels as if they are confident that what they can offer can be useful and beneficial. With AT&T being a major player in the industry, it is not impossible that their competitors will follow suit soon, and we might be able to see one day where the telecom industry will be the industry that rules the world's activities, perhaps in the same way we see oil companies today. What makes the telecom industry so promising in the future is that its innovations are visually limitless compared to the oil industry. With advancements in information technologies getting faster and faster each year, they have the opportunity to grow and become the most powerful industry the world has ever seen. It might be a bold hypothesis, but it might be difficult to argue against it.

One important thing to note is that the big days of telecom might not come as soon as we expect it to be. The thing is, the largest part of the telecom business the directly customer-based aspect, mostly on telephone services and mobile networks. One might agree with the statement that nothing special has revolutionized this part of the business in the last few years. Despite this, major telecom companies (as shown by AT&T) are most likely predicted to be concentrating so much on other platforms which are less accessible to what we know as 'regular customers'. Bearing in mind that most people's economies are not strong enough to purchase technologies such as self-driving Tesla cars, we might need to wait for a few decades before the arrival of the digital telecom's golden age.



CONCLUSION

Businesses can come from anywhere, and anyone can do business. Telecommunications is one of those business fields which have been thriving for decades. Arguably, this is due to the necessity for us to stay connected with other people. Telecommunication corporations have helped us reach anyone we'd like, no matter their distance from us. But now, the world has become more digitalized and the way business adapts to this shift is by innovating in the aspect of digitalization.

The telecom industry itself is considerably large. It is predicted that in the next couple of years, the value of the industry will continue to climb at a rapid pace. This is not entirely surprising, bearing in mind how much people rely on telecommunications. One major player in the business, AT&T, have strengthened its position by digitally innovating using advanced IP technologies following the trend of digitalization across the globe. They believe that IP is the key to reach higher efficiency and effectiveness in conducting various activities in the future. Using digital integration supported by IP-based solutions, they have come up with new possibilities to make various aspects easier and more sophisticated than ever before. Through IP, they have set up themselves to take part in important fields such as governmental systems and the automotive industry, showing the potential of telecom business innovation by IP utilization. Everything can go faster and more efficient, and more accessible in pretty much any situation.

Although it seems as if what AT&T has done is the sign of how powerful the industry will become (and how soon), everyone might have to hold their horses for now. The world is probably still not that close to being a fully integrated system as AT&T might have imagined. No matter how advanced their technologies are in innovating their way through advancements, they still have to rely on their direct customers. Phone users who rely on mobile networks, Ethernet, and Wi-Fi are still the main money maker for the corporations in the telecom industry, and it seems like no ground-breaking innovation in this part of the business is coming. AT&T has shown its edge over the competitors in the telecom sector by showing off what they can do with IP-based solutions, and they have been trying to underline the argument that what the company is doing are the best way for this industry to grow. It is difficult to deny that the potential is massive, and one day, we all can take the benefit from it – for now, we just have to wait patiently.

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