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For most nations a strong telecommunications platform is essential to communications, finance, policy implementation, education, and health, and to maintaining national competitive advantage. Change in information and telecommunications technology (ICT) has accelerated over the last two decades, and these two areas have increasingly converged. A clear need to align infrastructure and competitive landscapes has led many nations to reconsider how they legislate for and regulate their ICT industries. The form and function of these legislative and regulatory frameworks are highly reflective of the political economy of the nation. Outward facing liberal nations need regulators that can maintain a balance between ensuring consumer and business needs are served by open markets, and the need for national security and integrity.

Bahrain is one such liberal economy and has grappled more successfully with this balance than most. Being at the forefront of technological, market, and regulatory change for decades, Bahrain’s telecommunications industry offers insights that reach beyond Bahrain’s borders. To sustain its competitive positioning, Bahrain’s monarchy and the Bahrain Government have taken an active role in driving the industry’s evolution. At the core of this change process has been the Kingdom of Bahrain Telecommunications Regulatory Authority (TRA).

This case study undertakes an analysis of Bahrain’s telecommunications industry, with a focus on the parallel evolution of the nation’s regulator, the TRA. While the structure of the case study follows a chronology, a number of key themes emerge that provide the platform for the analysis. It is based on a rigorous case study methodology, drawing on a wealth of primary and secondary data (see Appendix page 58).

As the document shows, the telecommunications industry in Bahrain has had its trials and tribulations in seeking convergence between the path of regulation and that of the technological development, which is driving the industry globally. However, what is proffered is a continuing story of invention, reinvention, and experimentation, where no comparable peers exist.

The two key themes below are indicative of the balancing act a regulator must seek to achieve, while also responding to technological developments (as a regulator does not have the luxury of pre-empting technological change):

1. the interplay of regulation versus competition and the shifts in focus that have occurred across the industry’s evolution
2. the challenge of creating consumer surpluses while ensuring ‘healthy’ industry profitability to sustain investment in resource hungry infrastructure.

The ultimate goal, as outlined in Bahrain’s Vision 2030, is to establish an internationally focussed and globally competitive ICT hub for Bahrain.

The evolution of Bahrain’s telecommunications industry is tackled in this case study across four key sections:

Section 1: Market liberalisation – breaking the monopoly
Section 2: An increasingly competitive landscape
Section 3: Entering an era of drastic change – moving towards an ecosystem
Section 4: Creation an ICT hub: a future outlook
The telecommunications industry has played a significant role in developing and fostering economic growth in Bahrain, and in many other countries across the world. The industry has been characterised by continuous change in technology, enabling its growth. Such growth can be helped or hindered by evolving and shifting regulatory frameworks. While the pace of technological change is core to the telecommunications industry – as witnessed by the rise (and fall) of the WiMAX and international calling cards, as some examples – recent times have shown changes that may alter the way we conceive the ‘traditional’ telecommunications industry. Two themes are indicative of possible implications for the industry: first, the technology-machine convergence, and second, the blurring of boundaries between the ICT and telecommunications industries.

Telecommunications is an industry where technological leaps occur with alarming regularity. This is illustrated in Figure 1, which shows the history of the telecommunications industry in the UK as seen by mobile operator 3. Over time, we have witnessed what is regarded as human-machine convergence, as technology increasingly becomes one with the individual. In the GCC there are some nuances to this human-machine convergence, such as the massive uptake of YouTube and WhatsApp, which allow (or cause) individuals to be deeply and constantly connected to their mobile devices. Facebook and WhatsApp are the most used social media platforms across the GCC. In Bahrain, WhatsApp (85%) slightly outstrips Facebook (81%) for usage. Add to this social demand and the extensive demand for cloud computing services, for individuals and particularly business. Bahrain’s major service based industries - banking, finance, health, and education – are heavily dependent on cloud and other support services-provided by the telecommunications industry. Yet technology-based companies such as Nokia, Blackberry, Sony, and Yahoo struggle to predict future technology directions, raising the question: how does a regulator plan for a highly uncertain future?
Introduction

1876
Alexander Graham Bell invented the telephone

1921
First London phone box

1926
First transatlantic call

1927
First commercial phone service between US and Europe

1969
USA President Nixon calls Neil Armstrong on the moon

1999
First WAP phone invented

1994
The infamous Nokia ringtone in born

1992
First text message sent

1985
Vodafone is launched as the first UK mobile network

1979
Burger phone is invented

2000
First camera phone invented

2003
Three establishes the UK's first 3G only network

2006
Three is first to launch international Skype calls by mobile

2007
First iPhone launched

2010
Three launch all-you-can-eat data

2014
Three start selling all their phones unlocked

2013
Three launch 4G at no extra cost

2013
Three launch Feel At Home

2013
More people have mobile phones than toilets

FIGURE 1: THE HISTORY OF TELECOMMUNICATIONS

1 blog.three.co.uk/2015/05/15/celebrating-world-telecommunications-day
Drastic shifts in regulatory frameworks have been observed in other industries. Take for instance two of the world’s largest industries: automotive and pharmaceuticals. Each faces extensive national and international regulation. In the more traditional automotive industry, the rate of technological change has meant that regulation has fought to keep pace for a century. Open markets have a great appeal to technology and knowledge driven industries; however, the reality is these industries are usually heavily regulated. In reality, given other global pressures, such as concerns about climate change, the level of regulation has only increased in the last thirty years. It is also this regulation that has itself pushed technological development in what is usually a virtuous cycle.

Regulators cannot afford to be hands off with a set-and-forget regulatory system. The closer they are to the industry players and the more in touch they are with their developments, the more facilitative of technological change for the consumer’s benefit they can be. However, recent technological advancements, such as autonomous driving, create challenges for the automotive industry. This is especially so for incumbent manufacturers threatened by a new technology, which provides grounds for new entrants, such as Apple and Google to make inroads into a mature industry. In addition, the technology supporting autonomous driving has the potential to radically disrupt the traditional financial concept of motor insurers, question the accountability of drivers/technology providers, as well as call for novel regulatory frameworks at national and international levels.

The pharmaceutical industry is another case in point. The world’s leading regulator, the US Food and Drug Administration (FDA), has shifted rapidly from its role as a stringent regulator dictating patient safety over drug efficacy stemming from key legislative developments in 1963. A series of legislative changes, which commenced in 1983 and culminated in a new designation in 2012, have driven a dramatic change in the FDA, effectively moving it from a stringent regulator to a super-collaborator. The more recent legislation has required meetings between drug developers and the FDA on up to a weekly basis, as opposed to the six-monthly meetings under previous legislation. There has been a dawning realisation in the pharmaceutical industry that while the largest pharmaceutical companies may be involved in up to 2000 clinical trials (the key drug development stages in the industry), the FDA is involved in every one of the 30,000 or more clinical trials. This has created a capability in the FDA that is far more extensive than any one of the industry players. Of course, to achieve this emerging role of super-collaborator, the FDA has required a dramatic boost in its funding. It has largely gained this increased funding from industry user fees.

---

A country like Bahrain was not new to these pressures. There has been an acute awareness of the need to welcome trade and partnerships, deeply embedded over 5,000 years. Being a small island population in the centre of one of the world’s major trading routes, has required the Bahrainis to be at the forefront of technology adoption. Anything that hindered this rate of adoption had to be addressed through open and liberal markets. In this context, regulation has to adapt to such changes, but also to set the critical junctures to ensure the nation’s competitiveness.

This has parallels with the situation facing the TRA and Bahrain. The TRA also operates in a rapidly changing, technologically advanced sector where regulation can only keep pace by being closer to industry operators.

The pharmaceutical and automotive industries provide two examples of the trends being witnessed in industries globally. Heavy handed, deterministic regulation, administered by bloated regulators is likely to reduce the competitiveness of a nation’s industries. The effect is more acute and extensive where there are connections to the global industry.

Digitisation, with the advent of large scale computing, followed by the ubiquity of personal computing, and then mobile accessibility, have led to the unstinting effect of Moore’s Law⁴ in telecommunications. It drove a new need for enhanced infrastructure and an increased spectrum to meet ever-growing demands for speed and data. For many countries, the flaws in the statutory monopoly model, where the publicly owned monopoly provider was the industry, showed up rapidly. The typical response has been to open telecommunications industries up to market forces.

The argument for these market forces is threefold:

1. telecommunications technologies are global, and an open industry will also open access to the technological developments driving the industry
2. more open markets also potentially offer greater responsiveness to consumer and business needs
3. increased competition drives innovation leading to greater consumer choice and wider service offerings at lower prices.

The combination of technological and competitive limitations was exacerbated by entire national economies opening their markets through trade flows.

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⁴ Gordon Moore was co-founder of Intel. In 1965 he noted that the number of transistors per square inch on integrated circuits had doubled every year since their invention. This exponential growth was expected to the future for computers, and has been regarded as a benchmark ever since.
BAHRAIN AND TELECOMMUNICATIONS: A POTTED HISTORY

Bahrain has been a busy trading hub in the Gulf and for the world. As an island, it is located in close proximity to important trading partners, particularly member states in the Gulf Corporation Council (GCC) - a political and economic alliance between Saudi Arabia, Kuwait, the United Arab Emirates, Qatar, Bahrain, and Oman (established in 1981). For instance, the King Fahd Causeway (length: 25 kilometres) connects Saudi Arabia with Manama, Bahrain’s capital, making it a frequent destination for businessmen and holidaymakers. Trading has also been an economic driver to generate wealth for a country spanning 717 square kilometres (277 square miles) with a population of 1.4 million. Bahrain has the fifth highest income per capita in the Middle East, the highest life expectancy in the Gulf and a European rate of literacy. The fDi Intelligence division of the Financial Times has named Manama a top 10 ‘Global City of the Future’, making it the leading city in the Middle East and North Africa in the category, and 6th in the category of human capital and lifestyle of small and mid-sized cities, placing it ahead of Zurich and Edinburgh.

Until the great depression of the 1930s, trade and the pearl industry dominated the Bahrain economy. Bahrain was the first country to discover oil in the Arabian Gulf in 1932, allowing it to establish an oil industry ahead of other nations in the GCC. Since the mid-1970s, the government has sought to re-invest revenues from natural resources to diversify the economic base, for instance by building critical infrastructure to establish new industries, such as telecommunications, aluminium production, banking and finance, including Islamic banking activities. This resulted in sustained economic growth benefiting Bahrain’s population with an increasing living standard.

Bahrain’s first telecommunications link to the rest of the world dates back to 1864, when the island was connected to the Indo-European undersea telegraphic cable. This remained the only telecom medium until 1931 when Cable & Wireless’ predecessors started to operate radio links that provided telegram and telephony services. In 1981, Batelco was formed out of a Cable & Wireless’ subsidiary, with Cable & Wireless maintaining a 40% stake in the new company until 1989. From its inception, Batelco has significantly contributed to a well-resourced industry, while remaining a statutory monopoly over much of its history. In 2003, Bahrain went from a statutory monopoly to an open market. Yet, several structural changes had to be made in order to ensure a competitive landscape, governed by a well-functioning regulator.

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THE RISE OF TELECOMMUNICATIONS IN BAHRAIN

It is generally accepted that the biggest development in the history of telecommunications was the introduction of the telegraph in the 1860s, as it replaced the horse, the train, and the ship with almost instant communication (initially between the Atlantic and Pacific coasts of the US in 1861). This monumental infrastructural development meant for the first time that events such as the eruption of Krakatoa volcano in Indonesia could be reported worldwide on the same day as the event occurred. From that point of disruption, the telecommunications industry settled into a structure that supported large infrastructure investments to deliver services to increasing proportions of consumers, business, and government.

Since the telegraph and its core infrastructure telephone lines, telecommunications was seen largely as a public good – something that should not be exclusive, and for which few rivals would exist. Across industrialised nations, a common industry structure saw the establishment of a statutory monopoly, often government owned and run, as was the typical case for public goods. Similar to the postmaster, and often closely associated with it, telecommunications became a commodity to be delivered at low cost and generally low sophistication.

The statutory monopoly was an effective and convenient means of creating, maintaining, and delivering from the extensive national infrastructure, for the people, and owned by the people.

In line with developments across the world, Bahrain established a national telecommunication company in 1981 – Bahrain Telecommunication Company (Batelco) – which has been the incumbent ever since. Batelco has a significant role in Bahrain as one of the largest employers in the country and a generating revenue of USD 987.8 million in 20157.

Since the telegraph, Bahrain’s telecommunications industry has sought to keep pace with cutting-edge technological developments and international connectivity. For a nation located on a small island, this meant heavy investment in infrastructure to support connectivity. For instance, Bahrain introduced its first satellite station in 1969. To sustain international connectivity, the first coaxial cable was developed to connect to the UAE and Qatar in 1983. In 1985, the first fibre optic cable was installed, running the 25 kilometres along the King Fahd Causeway. And in 1992, Bahrain was one of the first countries in the world to move to complete digitisation of their national and international telephone switches8. The timeline below summarises key events in Bahrain’s telecommunications history.

---

**FIGURE 2: KEY EVENTS IN BAHRAIN TELECOMMUNICATIONS HISTORY**

1864
Bahrain’s First Telecommunications Link - connected to the Indo-European undersea telegraphic cable (remained only Telecom medium until 1930)

1930
Electricity Department operated the country’s first telephone exchange with 15 staff members, two motor cars and 39 lines in operation

1947
First telegraphic office opened

1949
First automatic telephone exchange installed

1969
Bahrain enters the age of the satellite (Middle East’s first satellite station opened)

1979
Bahrain becomes partner in the Gulf submarine coaxial cable (linking Bahrain to Qatar and UAE)

1980
Bahrain’s first digital telephone exchange opens

1982
Batelco connects the 50,000th fixed telephone line in Bahrain

1985
First section of Bahrain’s first fibre optic cable installed

1989
Voice mail launched

1990
First fibre optic cable (of its kind in the Middle East) laid along the 26 kilometre King Fahd Causeway becomes operational

1991
First 128 kilobits-per-second data circuit in the Arabian Gulf established to the UK

1992
Batelco purchases shares in S Tel (Indian Mobile operator with licenses to operate in 6 Indian states)

1993
Bahrain launches 2030 economic vision

1994
Electricity Department operated the country’s first telephone exchange with 15 staff members, two motor cars and 39 lines in operation

1995
Bahrain becomes partner in the Gulf submarine coaxial cable (linking Bahrain to Qatar and UAE)

1998
International connectivity: FOG cable system becomes operational (first high-grade link between Bahrain, Kuwait, Qatar and UAE)

1999
Batelco’s 100,000th mobile phone customer connected – and the 100th International Roaming operator link established

2000
Bahrain becomes partner in the Gulf submarine coaxial cable (linking Bahrain to Qatar and UAE)

2002
Second mobile operator – Zain – is granted mobile operator license in Bahrain

2003
Batelco purchase 96% share of Umniah Mobile Communications

2004
Complete liberalisation of the telecommunications industry in all markets

2008
Bahrain becomes one of the first countries in the world to have complete digitisation of national and international telephone switches – total cost of over BD 17 million

2009
Third mobile operator – Viva – is granted mobile operator license in Bahrain

2010
Bahrain wins “Global Best to Invest Award” – recognises Bahrain as the top country to invest in per capita in the Middle East and Africa

2016
2017

**SECTION 1  MARKET LIBERALISATION - BREAKING THE MONOPOLY**
2002
The Bahrain Telecommunications Regulatory Authority is established

2000
Batelco Jordan established to provide Internet, manage data and associated value-added services within Jordan

1999
Batelco’s 100,000th mobile phone customer connected – and the 100th International Roaming operator link established

1998
International connectivity: FOG cable system becomes operational (first high-grade link between Bahrain, Kuwait, Qatar and UAE)

2002
First Bahrain Telecommunications Law is implemented; release of NTP1

2003
Second mobile operator – Zain – is granted mobile operator license in Bahrain

2004
Complete liberalisation of the telecommunications industry in all markets

2004
Batelco purchase 96% share of Umniah Mobile Communications

2008
Bahrain launches 2030 economic vision

2017
Bahrain wins “Global Best to Invest Award” – recognises Bahrain as the top country to invest in per capita in the Middle East and Africa

2009
Third mobile operator – Viva – is granted mobile operator license in Bahrain

2009
Batelco purchases shares in S Tel (Indian Mobile operator with licenses to operate in 6 Indian states)
A VISION AND STRATEGY

In 2002, the vision to create a competitive landscape was initiated by His Royal Highness, Prince Salman bin Hamad bin Isa Al Khalifa, Bahrain’s Crown Prince and supported by Bahrain’s Government. The vision formed an important cornerstone at a time when Bahrain experienced a significant event in history. Bahrain held general parliamentary elections, electing its first government in 2002. This major development was part of a major reform program by Bahrain’s new King Hamad bin Isa Al Khalifa. In the same year, the Bahrain Telecommunications Law culminated in Bahrain’s first National Telecommunication Plan (NTP1). In 2003, the Telecommunication Regulatory Authority of the Kingdom of Bahrain was launched to oversee the implementation of NTP1. Bahrain’s Economic Development Board (EDB), itself only founded in 2000, had extensive involvement in drafting the supporting legislation. The EDB was a major vehicle of the liberalisation of the telecommunications industry, ensuring swift integration and alignment with ongoing economic and national reforms.

The EDB is extremely active in promoting ICT in every area it hits: education, manufacturing, tourism, financial services, health. Like beetroot, it leaks into everything!

Tala Fakhro
Director Company and Market Research
Economic Development Board
Kingdom of Bahrain

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GOVERNING THE LIBERALISATION OF THE INDUSTRY: THE INCEPTION OF THE TRA

The TRA has had a leadership role in the region since it was established in 2002. The TRA was brought into existence to fulfil multiple social and economic needs, anchored in the Focused Strategy Framework (2011) vision to ‘create a communications environment that enriches the social and commercial fabric of the Kingdom of Bahrain’\(^\text{10}\). This strategy framework is comprised of the following key points:

- foster competition
- optimise technologies
- empower consumers
- ubiquitous broadband
- security and cyber safety
- efficient regulator.

Specifically, the TRA is responsible for the implementation of Bahrain’s National Telecommunications Plan and to govern the competitive environment of the telecommunications industry. The TRA works closely with policy-makers to develop and execute objectives that align with national economic interests. The TRA’s inaugural General Director, A. Andreas Avgousti, noted in the TRA’s first annual report that the organisation’s aim was to make Bahrain a communications hub for the region, support economic development, and provide access to the latest technological advances\(^\text{11}\) - an aspiration as relevant today as it was then. The TRA is managed by a Board of Directors, which is appointed for a three to four year term. The first Chairman of the Board, Dr Mohammed J.K. Alghatam, was appointed in December 2002 and since that time the TRA has focussed on its original aims outlined in 2002. Being only the second telecommunications regulator in its region to be established, the TRA had few benchmarks to follow as it even pre-dated the UK body.

The TRA’s clear purpose was to enhance market competitiveness. Its brief was to move the country’s sector from a statutory monopoly operator to one in which multiple players vied for a share of a hopefully growing market. This designated purpose remained stable, while the market situation moved from a monopoly, to a duopoly with the introduction of Zain (2003), to an oligopoly with Viva (2010).

---


In order to keep pace with change, there needed to be structural changes to the sector, to liberalise Bahrain’s telecommunications industry. In 1981, the Bahrain Telecommunication Company (Batelco) was created to serve the country’s national and international infrastructure and service. By 1982, it connected the 50,000th fixed telephone line in Bahrain. Batelco continued Bahrain’s technological leadership, becoming the first telecommunications operator in the Middle East to achieve ISO certification in 1996. In 1999, it connected its 100,000th mobile phone customer and created the 100th international roaming operator link. Adopting the latest technology at the time, Batelco launched Speednet, based on ADSL technology. This was also a first in the GCC.

Batelco’s leadership has extended well beyond the technological realm. As a leader in the GCC, Batelco trained many of the technicians, managers, and strategists who went on to major roles in the telecommunications industry across the region. This diaspora has continued until today, with many of those in senior roles in the other operators, as well as the TRA, coming out of the Batelco. This is a unique role Batelco has played in building both the physical capital and the human capital at the heart of Bahrain’s telecommunications industry. However, this role had to be balanced with the need to inject competition in to Bahrain’s telecommunications industry to ensure the industry could meet the pressures of technological change. The experience around the world was that a monopoly was not the appropriate industry structure to provide agile, consumer-focussed service.
With the inception of the TRA, Bahrain began its market liberalisation with an auction to licence for spectrum. In 2003, Zain, a subsidiary of the Bank of Kuwait, was established as the second licensed operator after successfully acquiring the license, and became the first new entrant to join Batelco. Initially Zain entered Bahrain as MTC Vodafone.

To create a thriving infrastructure and competitive environment, the TRA set regulations that allow each licensed operator to build infrastructure, thereby offering a stable environment for investment. From 2003 to 2009, Batelco and Zain operated in a largely duopolistic industry structure. Having created its own infrastructure, Zain competed both in the segment of national fixed-lined telephony and as a mobile operator, through WiMax and as an Internet Service Provider. Since its entry, Zain has continuously invested to further develop and expand its telecommunications infrastructure to support 3G and 4G operations. For instance, Zain signed a contract with Ericsson to upgrade its LTE equipment in December 2013.
CREATING A COMPETITIVE LANDSCAPE

The growth of Bahrain’s telecommunications industry has been coupled with and was accelerated by additional initiatives enhancing economic growth. For instance, the introduction of the Formula One Grand Prix in 2004 had a significant impact on Bahrain. Bahrain attracted 10.4 million tourists in 2014, a dramatic increase compared to 2.3 million in 1995. The expertise gained from running the Formula One in Bahrain, from managing the circuit, to managing teams, to mechanical and technical skills developed and applied across other forms of motor racing such as superbikes, is something Bahrain now exports to the world.

Over the same period, Bahrain’s telecommunications industry has been thriving, continuously growing infrastructure to keep pace with technological developments. To foster further competitive dynamics and ensure progress in a technologically fast-paced industry, the TRA took action, auctioning licenses to attract additional operators. The TRA’s rationale was clear: raising competitive pressures would benefit the consumer – consumer surplus was the goal.

Another auction was held in 2008. It provided other organisations, namely Viva and MenaTelecom, the opportunity to enter the market. In 2009, Viva joined as a licensed operator, while MenaTelecom focused on penetrating the growing area of fixed wireless broadband services. Both Viva and MenaTelecom added dynamism, providing a fast and, to differing extent, lasting impact on the telecommunication industry. They offered business customers and Bahrain’s residents a diverse range of services and generated the most revenue from mobile (see Figure 4).

---

The introduction of Viva jolted the market, with Viva gaining market leadership in the mobile market by the end of 2012. One critical success factor for the immediate impact of Viva was the location effect. With urbanisation, Bahrain covers a relatively concentrated area comprised of residential and industrial estates. Interviews with CEOs of Zain and Viva confirmed the manageable task to rollout infrastructure with one CEO joking: “we could lay a new fibre optical across the island within 48 hours if we wanted to” (source: anonymous).

The jolt also brought responses from the existing operators, with market shares oscillating from 2012 onwards (Figure 5).

![Figure 5: Bahrain Mobile Market Subscriber Numbers](image)

<table>
<thead>
<tr>
<th></th>
<th>Q1/12</th>
<th>Q2/12</th>
<th>Q3/12</th>
<th>Q4/12</th>
<th>Q1/13</th>
<th>Q2/13</th>
<th>Q3/13</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ZAIN</strong></td>
<td>528</td>
<td>548</td>
<td>589</td>
<td>612</td>
<td>686</td>
<td>748</td>
<td>759</td>
</tr>
<tr>
<td>Market Share (%)</td>
<td>29.6</td>
<td>28.6</td>
<td>30.3</td>
<td>28.8</td>
<td>30.6</td>
<td>33.2</td>
<td>34.1</td>
</tr>
<tr>
<td><strong>BATELCO</strong></td>
<td>738</td>
<td>695</td>
<td>681</td>
<td>702</td>
<td>722</td>
<td>845</td>
<td>875</td>
</tr>
<tr>
<td>Market Share (%)</td>
<td>41.3</td>
<td>36.3</td>
<td>35</td>
<td>33.1</td>
<td>32.2</td>
<td>37.5</td>
<td>39.4</td>
</tr>
<tr>
<td><strong>VIVA</strong></td>
<td>520</td>
<td>672</td>
<td>675</td>
<td>810</td>
<td>831</td>
<td>660</td>
<td>589</td>
</tr>
<tr>
<td>Market Share (%)</td>
<td>29.1</td>
<td>35.1</td>
<td>34.7</td>
<td>38.1</td>
<td>37.1</td>
<td>29.3</td>
<td>26.5</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>1,786</td>
<td>1,915</td>
<td>1,945</td>
<td>2,124</td>
<td>2,239</td>
<td>2,253</td>
<td>2,223</td>
</tr>
</tbody>
</table>

![Figure 4: Breakdown of Retail Services Revenues in 2014](image)

---


BAHRAIN AS A GCC TEST-BED

Telecommunications is a global industry; however, local and regional competition are much more prevalent than many would think. The reality that may surprise many outside of the GCC is that the four operators currently in Bahrain – Batelco (Bahrain), Zain (Kuwait), Viva (Saudi), and MenaTelcom (Kuwait) – are all GCC owned companies. Other larger global operators have competed in the auctions for the positions in the market, including initially Zain, which started as MTC-Vodafone, but have not remained in the market. As the recognised telecommunications leader in the GCC, and a small market, Bahrain is the perfect test bed for each of these players to experiment with technology, market, operational, and organisational innovations. From a consumer surplus perspective, this also means that Bahrain benefits from more rapid rollout and uptake of emerging technologies and more strategic attention from the region’s major players. Some would say this was vision. Others would say it was happy circumstance. Yet the benefits are real, and are unlikely to diminish in the near future.

BENEFITS OF AN INCREASINGLY COMPETITIVE LANDSCAPE

An increasingly competitive landscape has created several benefits. It has contributed to placing Bahrain in a leading position with respect to building infrastructure and enabling operators, which have seen residents in Bahrain have the highest use of the Internet in the GCC (see Figure 6).

FIGURE 6: COMPARATIVE DATA WITHIN THE GCC

---

A closer analysis demonstrates the impact of the infrastructure investment spawning a dramatic growth in mobile and broadband subscribers (see Figure 6). The introduction of Zain, Viva, and MenaTelecom across segments of Bahrain’s telecommunications market has also contributed to dramatically increased market penetration, reaching nearly 180% by 2013. So, the pie has also grown. This market penetration is an indication of the response by consumers to the improved competitive position of the industry. Lower prices will generally be linked with market growth, and in the case of Bahrain, the world leading 180% penetration sets a consumer benefit benchmark for other nations to aspire to. The influx of frequently visiting tourists who tend to hold a long-term network card in Bahrain has also contributed to a growing penetration rate, one of the highest in the GCC.

Bahrain data is based on TRA analysis.
SECTION 2  
AN INCREASINGLY COMPETITIVE LANDSCAPE

FIGURE 7: GROWTH IN BROADBAND AND MOBILE SUBSCRIBERS IN BAHRAIN

According to recent data, there were 2,223MM mobile lines in the country at the end of September 2013, a contraction of 1.3% quarter on quarter, but a growth of 14.3% year on year. This brought the country’s mobile penetration rate to 166.9%, one of the highest in the ME NA region. Consistently mobile broadband-generated Internet traffic accounts for an increasing proportion, with quarterly usage increasing from GB 27MM in 2013 to GB 130MM in 2015 (see Figure 7).

Figure 6 shows that by 2014 penetration was at 180% and broadband subscription at 142%. Overall, at the end of the first quarter of 2016, mobile broadband subscriptions represented approximately 91% of the total broadband subscriptions.

As a result of a healthy competitive landscape and continuous investment in infrastructure, Bahrain has generated a strong consumer surplus, which underlines the steady increase in the penetration of mobile services among subscribers. These penetration rates compare favourably with global measures of mobile penetration (see Figure 8).
This has created substantial benefits to consumers:

- decline in mobile prices in Bahrain by 55% (2010 to 2015)
- decline in fixed broadband prices of up to 85%
- in April 2016, the TRA reported that 89% of Bahrainis have access to the Internet at home, while only 12% have a fixed-line service.\(^{19}\)

Increasing consumer surplus has also contributed to a steady increase in the industry’s revenues (see Figure 9). It demonstrates that the introduction of new entrants, in particular Viva, increased industry revenues. It is a case in point that increased competition may grow the pie of industry revenues and employees, drawing on an analogy, rather than re-distribute the shares of a static or shrinking pie. Disruption is usually better for the consumer and therefore leads to market growth.

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VIVA – KILLING TWO BIRDS WITH ONE STONE - MARKET LEADERSHIP WHILE GROWING THE PIE

Enhancing competition meant attracting new entrants. Zain, an established telecommunications company from Kuwait entered the market in 2002 as MTC-Vodafone 3MT and gained a strong foothold in the market. The same was expected with an ensuing auction in 2009, won by Viva, a subsidiary of Saud’s large telecom STC. Being backed by STC provided the strong resourcing Viva needed, but strategies specific to Bahrain were required if Viva was to proceed. Viva entered the market with aggressive market positioning designed to attract young “digital natives”. Within three months, according to Viva’s CEO Ulaiyan Al Wetaid, Viva had achieved the market share it had predicted to achieve in three years. Within a year Viva had captured 38% of the Bahrain Telecommunications market. Both Batelco and Zain lost substantial ground to Viva.

Consequentially, it would be expected that the existing operators would launch sustained and aggressive action to grab back what they would have considered rightfully theirs. However, the reality is that Viva also dramatically increased penetration of digital technologies across numerous consumer and business industries in Bahrain. Within two years of Viva’s launch in 2010, penetration of mobile phones, and data supporting technologies had increased from 100% to 180%. What Viva had done by injecting itself in as the third player in the market, was not only deliver the competitiveness expected in an oligopoly over a duopoly, it had also grown the pie for all operators substantially. While Batelco and Zain suffered in the disruption, everyone, including consumers, benefited from a well-timed competitive injection.
THE SUSTAINED ROLE OF BATELCO ENHANCING THE COMPETITIVE TENSION

The injection of competition did not stop Batelco, the incumbent from innovating. For more than thirty-five years, Batelco’s strategy has been focused on innovation and forward thinking, “connecting people and places using the newest telecommunications technologies”. Batelco continuously aims to be an integral part of the evolving telecommunications industry, committed to delivering integrated technology to promote future education, healthcare, smart cities, and smart homes to improve lifestyles. A list of Batelco’s key milestones and achievements can be found in Figure 11.

Batelco has made significant contributions, elevating Bahrain’s prospects in telecommunications and the broader economy. Batelco’s portfolio includes: infrastructure solutions, unified communications and collaborations, routing and switching, IT and physical security, and servers and storage. Batelco provided critical infrastructure to establish a technologically advanced international circuit needed to run a tech heavy Bahrain Grand Prix by 2004. Batelco has continued to establish and maintain infrastructure that enhances Bahrain’s international connectivity, including the Bahrain Internet Exchange (BIX).

In 2016, Batelco also launched an advanced IoT Connected Vehicle Solution to support education and transportation sector requirements, as well as Cloud Productivity Solutions for small and medium-sized businesses in 2016.

During the liberalisation of the telecommunications market, Batelco has expanded globally adopting a diversification strategy. For instance, Batelco operates subsidiaries in Egypt, Jordan and in the channel islands of the United Kingdom. Although the company has been relatively slow to diversify its services compared to other major regional players, partly because of its focus on international expansion, the operator’s recent move is expected to drive overall revenue growth in the future.

In Bahrain, Batelco has retained market leadership in the business customer segment, where it continues to invest. In early January 2013, Batelco announced that it had partnered with security solution providers to launch a mid-range security solutions portfolio for small and medium-sized enterprises (SMEs) in its domestic market. In addition, Batelco entered into a partnership with local employment fund Tamkeen to make its top solutions accessible to small and medium enterprises (SME) through the fund’s Technia Scheme. Under the scheme, Tamkeen provides funding to SMEs to use Batelco’s enterprise IT products and services.

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2001
Batelco launches Speednet – based on ADSL technology

1996
Batelco becomes first Telecommunications Company in the Middle East to qualify for ISO certification (recommended by British Standards Institute)

1995
Batelco join Information Superhighway with the launch of inet

2004
Batelco provide complete telecommunications infrastructure for the first Bahrain Grad Prix

2005
Batelco declared overall winner of Best Business Transformation Category of the Landor Awards (beat Japan Post, Frito-Lay, Smirnoff and Bailey’s)

2008
Batelco (as part of Atheeb Telecom consortium) deliver wireless broadband, data solutions and voice services to Saudi Arabia

2010
Batelco receives ISO27001 certification for eServices – first company in Bahrain to receive eServices ISO certification

2011
Batelco 30th anniversary – customer base crosses 10 million mark

2015
Awarded Best Continuity and Resilience Team by the Business Continuity Institute (BCI) for their achievements in leadership, team operation and business continuity

2015
Awarded Best Continuity and Resilience Team by the Business Continuity Institute (BCI) for their achievements in leadership, team operation and business continuity

2015
World Finance announced Batelco as winner of the Best Corporate Governance award for Bahrain

2016
Batelco launch an advanced IoT Connected Vehicle Solution to support education and transportation sector requirements

2017
Batelco 30th anniversary – customer base crosses 10 million mark

FIGURE 11: BATELCO’S MILESTONES AND ACHIEVEMENTS

SECTION 2 AN INCREASINGLY COMPETITIVE LANDSCAPE
Evolving Stages of Regulation

The TRA has significantly contributed to fostering a competitive landscape creating benefits to consumers and business. As mentioned previously, there were a number of clear steps in building a competitive landscape for Bahrain’s telecommunication industry. The first was in 2002 by breaking up Batelco’s monopoly, creating a duopoly with Zain as an additional licensed operator. Market economics informs us that true competition is almost as unlikely under a duopoly as it is under a monopoly. The next step in 2009, the move to an oligopoly, saw enormous disruption, giving even the biggest sceptics cause to sit up and take notice. Competition had certainly arrived in the industry. So was this job done for the TRA? No, of course not. Not when technology marches apace.

Good regulation is founded on good legislation. Legislation is rarely pre-emptive and tends to respond to new developments in the technological, economic, legal, social, and political domains, or combinations thereof. In high technology industries, the unyielding pace of technological development and the inability for legislation to keep pace has created an agenda across the globe for regulators to become more responsive to both the positives and negatives this pace of change creates.

“Competition helped widen the horizon and improve customer experience and build infrastructure in the country to attract investors indirectly.”

Muna Alhashemi
CEO
Batelco Bahrain
It also takes time to learn from success and failure and to build the management capabilities that sustain success. This is another area that the TRA has an advantage over most in the GCC, being the second oldest regulator in the region. The liberalisation of the market has also meant that the TRA has witnessed more change than regulators in other countries within the GCC and the world (see Figure 14).

Liberalisation of the market helped the community, and helped elevate the standard of service. Competition was effective in ensuring the country is one of the first countries to implement new technology.

Muna Alhashemi
CEO
Batelco Bahrain

**FIGURE 14: KEY MILESTONES FOR REGIONAL AND SELECTED INTERNATIONAL COUNTRIES**

- Telecom regulator introduction
- Launching of GSM mobile technology
- Entry of 2nd operator
- Launch of national broadband policy
- 3G technology
- LTE launch
- Wireless broadband services
- Mobile number portability
- Entry of 3rd operator

*Established in 2002, effectively started operations in 2007*

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The evidence points to strong performance of the TRA in providing regulatory guidance over an extended period of time for Bahrain. In fact, if we consider technological change to be a constant that all countries have to deal with, the evidence points to Bahrain improving its performance across key criteria against the rest of the world. Its move up through the UN’s EGovernment Survey rankings in recent years, from 24th to 11th in two years on the key metric of telecommunications infrastructure, points to the competitiveness of Bahrain’s telecommunications industry. More strategically beneficial, it provides evidence of a strong platform having been built for a globally facing ICT hub, leveraged off a proven telecommunications capability.

Figure 15 provides some insights on how rapidly Bahrain has embraced each of the major telecommunications technological developments before and after the establishment of the TRA. The gap between when a technology was new to the world and when it was introduced in to Bahrain has clearly diminished and become less erratic. This means that since the TRA’s injection into the market, technology adoption has been consistently more rapid than before. This has major implications for consumer surplus and links to the increased competitive landscape since 2003.
The role of the regulator in Bahrain’s telecommunications industry has evolved substantially over its tenure. This of course makes assessing performance more difficult, as it is a moving feast. However, one measure of performance has remained consistent and measurable: consumer surplus. Consumer surplus is defined as the difference between the total amount that consumers are willing and able to pay for a good or service (indicated by the demand curve) and the total amount that they actually do pay (i.e. the market price).\(^{30}\)

While built on supply and demand curves, one of the other indicators of consumer surplus in telecommunications is the speed that consumers gain access to new technology. This depends on consumer adoption rates, but is also dependent on technology access rates (see Figure 15). Each generation of new technology provides benefits beyond price. In the case of telecoms technology, trajectories are particularly aimed at speed of access, which is inextricably linked to spectrum and fibre (data upload and download rates). Successive generations of technology may be disruptive, such as the advent of smartphones, or incremental, such as in telecoms 3G and 4G networks that increase the carrying capacity of network traffic, and hence impact speed of access.

With consumer surplus as one of the key reasons for any regulator’s existence, the performance of the regulator itself can be judged by the lag between the advent of an enabling technology globally and its launch and uptake locally. To test the performance of the TRA in delivering a consumer surplus, we can assess both price and non-price consumer benefits. The actual price of access is an obvious indicator. Another is penetration of technologies. That is, the speed of uptake of each successive technology. Then the combination of penetration and pricing (against international benchmarks) provides insights into the extent that the benefits of both technology development and regulation have permeated through to consumers.

Between the years 2008 to 2014, consumers have saved BD74 million as shown by the Consumer Surplus study published in March 2016, proving that the TRA policies and framework are achieving its desired objectives.

Nasser Al-Khalifa
Deputy General Director
Telecommunications Regulatory Authority
Kingdom of Bahrain

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THE TRA’S ACHIEVEMENTS

The TRA has built strong capabilities to achieve international leadership, providing Bahrain with a strong reputation in the GCC and elevating its recognition globally. Internationally, the TRA is a strategic partner in the International Telecommunications Union (ITU). The TRA is leading the GCC’s development of region-wide market indicators and statistics to ensure decision makers have access to the necessary information required to develop appropriate policies. A number of the TRA’s achievements are outlined in Figure 16.

FIGURE 16: TRA MILESTONES AND ACHIEVEMENTS

2006
TRA grants two WIMAX licenses to Zain and Menatelecom

2013
TRA commenced licence award process for 4G mobile services – both Batelco and Zain launched their commercial Long-Term Evolution (LTE) services

2014
TRAs Chairman Dr Mohammed Al Amer wins the Best Telecom Regulator Leader in the SAMENA Region Award

2014
Mr Adel Darwish, Manager of Market and Competition, TRA, led the working group at the World Telecommunications Development Conference

2014
ITU selected Bahrain as one of the Arab region’s Centres of Excellence (CoE) with a focus on Internet Governance for 2014-18

2014
TRA was at the forefront of global development of spectrum usage

2016
Ranked 24th on the UN E-Gov Development Index “Top 50 performers in e-participation in 2016” (tied with UAE as highest ranked GCC)

2016
General Director of TRA, Mr Mohammed Bubashait received the Leading CEO for Excellence award at the 11th Leading CEO awards ceremony

2016
Ranked 32nd on the UN E-Gov Development Index “Top 50 performers in e-participation in 2016” (tied with UAE as highest ranked GCC)

2017
Industry Recognition Award in Customer Experience Management at the Middle East Summit


A COMPETITIVE LANDSCAPE RESULTS IN AN INCREASING APPETITE FOR DATA

The evolving nature of Bahrain’s telecommunications industry created a vibrant mix of players, as illustrated in Figure 17 and 18. By 2015, the industry comprised of several large licensed operators, as well as niche operators. These are signs of the industry starting to fragment, as operators such as MenaTelecom focuses mainly on supplying fixed line broadband service. With flexible but stable future returns, licensed operators have continuously and heavily invested in infrastructure to keep pace with technological developments and expand their offerings.

<table>
<thead>
<tr>
<th>COMPANY NAME</th>
<th>OWNERSHIP</th>
<th>MARKET</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bahrain Telecommunications Company</td>
<td>Bahrain Mumtalakat Holding Co (36.7%), Amber Holding Ltd (Catman Islands) (20.9%), Social Insurance Organizations (20.6%)</td>
<td>Mobile, fixed line (local, domestic, long distance, international), data, internet</td>
</tr>
<tr>
<td>Zain Bahrain</td>
<td>Zain Group - Mobile Telecommunication Company (54.8%), Sh. Ahmed Bin Ali Al Kalifa (16.1%), Gulf International Bank (8.5%), Other (20.6%)</td>
<td>Mobile, fixed-line telephony (local, domestic long distance, international), broadband internet</td>
</tr>
<tr>
<td>VIVA</td>
<td>Saudi Telecommunications Company (STC) (100%)</td>
<td>Mobile</td>
</tr>
<tr>
<td>Kalaam Telecom</td>
<td>ABQ Investments Limited, Ali Zaid Al Quraisha and Brothers Company</td>
<td>Fixed line (local, domestic, long distance, international), data, internet</td>
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<tr>
<td>Lightspeed Communications</td>
<td>Kalaam Telecom (100%)</td>
<td>Fixed line (local, domestic, long distance, international), data, internet</td>
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<tr>
<td>Mena Telecom</td>
<td>Kuwait Finance House (100%)</td>
<td>Fixed line (local, domestic, long distance, international), data, internet</td>
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<tr>
<td>Nuetel Communications</td>
<td>Almatrook Group</td>
<td>Fixed line (local, domestic, long distance, international), data, internet</td>
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**FIGURE 17: KEY PLAYERS: BAHRAIN TELECOMMUNICATIONS INDUSTRY**
### SECTION 3: ENTERING AN ERA OF DRASTIC CHANGE - MOVING TOWARD AN ECOSYSTEM

#### FIGURE 18: KEY PLAYERS IN BAHRAIN’S TELECOMMUNICATIONS SECTOR AS AT EARLY 2016

<table>
<thead>
<tr>
<th>COMPANY NAME</th>
<th>NATIONAL FIXED</th>
<th>INTERNATIONAL CALLS</th>
<th>MOBILE</th>
<th>INTERNET</th>
<th>LEASED LINE</th>
<th>OTHER DATA SERVICE</th>
<th>OTHERS</th>
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<tr>
<td>2Connect W.L.L.</td>
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<td>Ascentech Technical Services</td>
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<td>Batelco</td>
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<td>Bahrain Internet Exchange</td>
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<td>Bahrain Broadband Company W.L.L.</td>
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<td>BT Solutions LTD</td>
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<td>Equant Global Network - Foreign Branch (EGN BV)</td>
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<td>Etisalcom Bahrain Company W.L.L.</td>
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<td>Gateway Gulf Company B.S.C. (Closed)</td>
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<td>Value added services</td>
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<td>Golden Sands Electronics and Phone</td>
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<td>Bulk SMS</td>
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<tr>
<td>Gulf Electronic Tawasul Company</td>
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<td>Kalaam Telecom Bahrain B.S.C. (Closed)</td>
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<td>IMC</td>
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<td>Mena Telecom W.L.L.</td>
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<td>Moving Gulf Telecom W.L.L.</td>
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<td>Mobitel Communication W.L.L.</td>
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<td>Bulk SMS</td>
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<td>North Star Technology Company W.L.L.</td>
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<td>Nuetel Communications S.P.C.</td>
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<td>Orbit Data Systems Company W.L.L.</td>
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<td>Rapid Telecom W.L.L.</td>
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<td>ViaCloud W.L.L.</td>
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<td>Viva Bahrain B.S.C.</td>
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<td>Zain Bahrain B.S.C.</td>
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<td>Zajil Information Technologies International W.L.L.</td>
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SECTION 3: ENTERING AN ERA OF DRASTIC CHANGE
MOVING TOWARD AN ECOSYSTEM

From the discussion so far, a question arises: does the portfolio of operators provide a sufficient supply for the ever-increasing need of ‘data-hungry’ customers, especially with Bahrain’s long-stated aspirations of being an international ICT hub? There is a big difference between being the enabling technology for 1.4 million people to 114 million people. That is a big leap!

FIGURE 19: MOBILE INDUSTRY MENA REGION STATS BY END OF 2015

- 114 MILLION MOBILE INTERNET USERS
- 149 MILLION SMARTPHONES
- $122 BILLION CONTRIBUTION TO GDP FROM THE MOBILE INDUSTRY
- 1.2GB AVERAGE MONTHLY DATA USAGE PER PERSON
- 421 MILLION MOBILE CONNECTIONS
- $15 BILLION IN REVENUES FROM DIGITAL COMMERCE

TRENDS

An increasing consumer, business, and government appetite for data is a substantial driving force behind future trends. Bahrain’s Government and the TRA have started to make changes to embrace these trends. Yet, several challenges require further attention.

Consumer demand for telecommunications services is continuing to evolve as innovative applications and content constantly sweeps through the region. Many of these are spectrum-hungry applications, demand increased network capacity. At the same time, the new online business models that are being introduced by content and application providers are being used by consumers as complements to, and increasingly as substitutes for, the voice and messaging services offered by traditional telecommunications licensees.36 Traditional voice is almost dead.

The demand for and use of mobile data services in the MENA region accelerated in 2012 and 2013 on the back of a combination of 3G and 4G network investments, the take-up of smartphones, and the growing consumption of online content in the region. Although this trend is set to continue over the medium term, operators must expand their portfolios of non-voice services independently or through partnerships with suitable content providers to sustain revenue growth.37

The dominance of online content by over-the-top (OTT) players is the root of the ongoing debate on net neutrality in developed markets in Western Europe and North America. Although most MENA markets are still at the early stages of the mobile data boom, operators must proactively develop the right strategies to maximise growing demand for non-voice services among consumers.38

Mobile operators also have the opportunity to develop a wide range of crossover services for different sectors of the economy, considering the services gap in some of these sectors and the near universal ownership of mobile phones among adults and adolescents in the region. There are a number mobile crossover services already on offer in the region.

However, the biggest growth opportunities in three of those services over the long-term are m-commerce, m-health, and m-government services.39

A major trend is the increase in mobile technologies and applications. It entails new development opportunities for the poorest and the most vulnerable, and it is driving initiatives to promote sustainable development and new ways of providing services.40

The emphasis on data is also creating a shift

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toward horizontal rather than vertical service provision by telecoms operators. This means applying technology and infrastructure as an enabling technology for critical industries, such as health, education, banking, finance, tourism, and manufacturing. The shift to horizontal also means that telecommunications technologies now have to articulate more extensively with those industries. To achieve effective articulation, telecoms operators have to gain a deeper understanding of the standard operating procedures in these industries, their technology needs, and the trends that continue to emerge to improve productivity and the user/customer/patient experience.

Figure 21 provides some indication of the complexity of any industry and what they face in capturing the opportunities offered by the Internet of Things.

Almost all the challenges in Figure 21 place load on national telecommunications infrastructure. Where international connectivity is essential, more and more extensive infrastructure is required for companies to seamlessly deliver their innovative products. In this way, telecommunications is an essential platform and enabling technology for the ICT that helps deliver innovative manufacturing products to customers in global markets. The complexity of this process cannot be underestimated. It is this complexity that not only means that stresses will be placed on existing infrastructure to deliver, but that the telecoms operators will need to be far more engaged with the industries they support in the future than in the past.
The above-mentioned trends materialise in the changing face of competition, increasing demand, and an ever-growing need for infrastructure to cope and support such growth. The explosion of demand for data services has driven the telecommunication industry, itself largely driven by the success of smartphones and the shift away from traditional communication formats to more efficient data driven formats. In fact, the development of hardware and the proliferation of software supporting access, especially through social media, have created a virtuous circle of growth and penetration in telecommunications and ICT markets. The social media wheel in Figure 22 provides some idea of the extent of this proliferation in highly diverse platforms.

The increasing demand for data has largely been driven by OTT services, such as Google, SnapChat, Instagram, Skype, and YouTube, to mention only a few. Each OTT service places its own demand on telecommunications infrastructure to deliver fast services to hungry users, who also largely see such infrastructure as a commodity, or even a utility that they are prepared to pay as little as possible for. OTTs have seized large global markets (for instance WhatsApp has over 1 billion customers). Figure 23 points to the huge uptake of OTTs across the Middle East.

**Figure 22: The Proliferation of Market Segments in Social Media**
This is great for consumers and to some extent for businesses; however, OTTs have achieved their extraordinary penetration by ‘camping on networks’ at little to no cost. While there is a total revenue gain to the industry for delivering OTT services, the OTTs are gaining extensive access to the market, and to the data of Bahrain’s consumers, without incurring similar costs to operators. In other jurisdictions, such as the US, Google is delivering Google Fiber to homes and businesses, becoming the infrastructure provider as well as fulfilling its many other roles. As such, it is undertaking part of the cost of delivering services to customers and building a more robust business model that is more vertically integrated than most OTTs. In Bahrain, the network operators that have been the focus of legislation and regulation for competition are seeing their revenue streams being affected too by the OTTs, in both positive and negative ways, while still being expected to provide the infrastructure to deliver content to customers through their data networks.

The over-reliance on data subscriptions revenue, owing to a high consumption of online content from third-party providers, is a growing concern to operators. Operators therefore face a challenge to grow revenue from a portfolio of non-voice services.  

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43 Alcatel-Lucent Wireless Network Guardian Network Analytics
This situation may be exacerbated by the fact that all the Bahraini operators are GCC owned – with Batelco 76% owned by the Bahrain Government, with the remaining market capitalisation on the Bahrain Bourse; Viva a subsidiary of STC from Saudi Arabia; and Zain and MenaTelecom funded by Kuwait. No global player has gained a foothold as an operator as they have not been successful in winning licenses for Bahrain, making Bahrain a boutique market.

This doesn’t seem to have affected revenues, but has put pressure on profitability within Bahrain’s telecommunications industry. However, the reality remains that consumers (including businesses) are very price elastic. They are sensitive to prices as they now see what the network provides as a commodity or a utility. While OTTs are after fast access for their customers, and affected by the speed mobile operators can deliver, customers see little of what happens behind the scenes. What they want is the fastest upload and download speeds at the lowest prices. As such, they will be likely to express little loyalty for individual operators. This is not just a phenomenon in Bahrain. Figure 24 shows consumer attitudes globally point to a price elasticity of demand.

**MAIN REASONS FOR CHOOSING THE CURRENT OPERATOR**

- Best prices: 45%
- Best network coverage: 26%
- Best geographical network coverage: 25%
- Most of my family/ friends use it: 22%
- Best customer care: 17%
- Complimentary products or services: 17%
- Latest mobile technology: 14%
- Best choice of mobile devices: 11%
- Best data protection and security: 9%

**FIGURE 24: MAIN REASONS FOR CHOOSING CURRENT OPERATOR**

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IS BAHRAIN READY FOR THE BIG STEP?

In Bahrain the finance and banking industry accounts for 25% of GDP, and telecommunications only 4.5%. However, without a fully functioning and efficient telecommunications industry, the banking and finance industry would not be as competitive in a region where competition for this industry is fierce. The opportunity was seized by regional competitors, particularly Dubai, which has overtaken Bahrain as the banking and finance hub for the GCC. This is helped, at least in part, by the success of Emirates Airlines, with Dubai Airport now the world’s largest. This has occurred at a time when Bahrain’s Gulf Air has struggled for its voice to be heard over Emirates, Etihad, and Qatar Airways. Bahrain has taken solid steps to develop an ecosystem thriving to become an ICT hub, as explained in SECTION 4 in more detail.

GAMBLING ON THE LONGEVITY OF AN ENABLING TECHNOLOGY

The pace of technological change makes it difficult to make strategic technology decisions in the industry. Calling (or phone) cards became a hugely popular means of connecting locally and particularly internationally in the early 2000s. WiMax technology supporting interoperability across fixed and mobile services was another development that became popular in the early 2000s, and was usurped by other technologies as its spectrum limitations became increasingly obvious as demand exponentially grew. Technologies wax and wane rapidly. The cost of keeping up with technological developments in a space where margins can be squeezed by competition sets the strategic challenge. The need for a producer surplus, providing margins sufficient to reinvest in future infrastructure developments, is essential to the strategic outlook of market operators. Prospects of rapid expansion through internationalisation, with the expressed desire for Bahrain to be an ICT hub in the near future, have to be weighed against very similar targets for adept and well-resourced competitors in Abu Dhabi, Dubai, Oman, and Qatar.

For Bahrain, the reality that GCC-based companies own all its telecoms operators is a double-edged sword. Zain, Viva, and MenaTelecom’s owners have stakes in multiple countries in the region. This enables each of these players to avoid putting all their eggs in one basket. Even Bahrain’s own Batelco has major shareholdings in telecommunications companies in Egypt, Jordan, and Kuwait, and minor holdings in Yemen and Saudi Arabia.

As discussed throughout this case, the real competition may not be among the operators at all, but from the OTTs. The concern about OTTs camping on the network is real. Their margins are substantial. What drives growth for OTTs drives expansion for the operators. However, if profitability is disproportionately shared to the benefit of OTTs, then the operators will be disinclined to extend their investment without the likelihood of returns. This may be an issue for Bahrain, but is also one that all GCC competitor countries are facing. The first to find the balance may well be the first to achieve the dream of a successful, internationally facing ICT hub.

a closer look...
MOUNTING PRESSURES TO UPGRADE NATIONAL INFRASTRUCTURE

Given the growing need for additional spectrum, it will be necessary for the Bahrain Government to release and allocate new frequencies for use in offering mobile telecommunications services and for the TRA to allot and assign these frequencies pursuant to Article 42 of the Telecommunications Law as and when appropriate.45

As demand for spectrum resources increases, so too does the need for infrastructure to support new radio frequency-based networks and services. The trend globally is to encourage the sharing of radio sites, towers, and other passive infrastructure by mobile network operators. As of July 2015, there were 1590 masts in the Kingdom, out of which 187 sites were being shared by the licensees providing wireless services – just 12%. The Bahrain Government considers that this level of sharing should be increased to enhance the efficient roll out of network infrastructure.46

Government has concluded that Bahrain is presently disadvantaged by the inability of its providers of mobile services to create infrastructure that complies with Long Term Evolution (LTE) standards in a technically efficient manner. LTE is a technical standard within a range of technologies that may be described as Post 3G. Post 3G technologies typically make highly efficient use of radio spectrum, and have higher data throughput capabilities than the 3G technologies that were deployed in Bahrain.47

Services provided by means of LTE based systems are now available in neighbouring states. Lack of efficiently provided Post 3G based services is likely to deprive citizens of attractive mobile functionality, and diminish the external perception of Bahrain as a leader in the adoption of technical innovation, especially in comparison with neighbouring states.48

In the Fourth National Telecommunications Plan (NTP4), the Bahrain Government identified the provision of access to ultrafast broadband services across the Kingdom to be imperative for both economic and social development. The plan called for the establishment of a National Broadband Network (NBN), based on fibre optic technology to deliver this capability, but did not specifically assign responsibility for deploying the NBN to any particular operator.49

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PREPARING FOR THE FUTURE: SEPARATING THE INCUMBENT INTO INFRASTRUCTURE AND RETAIL DIVISIONS

The purpose of establishing the TRA was to shift Batelco from being the industry to being a player in a more competitive and agile industry. This was fine for the early 2000s. The role of the TRA has evolved substantially since then, and under NTP4 is culminating in the structural separation of Batelco into NetCo, an infrastructure utility, and RetailCo. For NetCo, the future holds the rolling out of a single fibre optics network and being at the forefront of the exchange infrastructure on which the GCC’s most advanced international ICT hub will be founded. RetailCo will remain an important retail player in Bahrain’s competitive landscape.

This is the plan, and is contained in NTP4. However, with the missteps experienced with NTP3, all stakeholders are waiting to see whether RetailCo delivers or whether the structural separation of NetCo and RetailCo is in name only. There is a healthy scepticism as to whether Batelco will remain principally the same. For the sake of Bahrain telecommunications industry, and all the consumers and organisations that rely on telecoms, the desire is for strong, genuine competition.

Bahrain’s Government considers that a single NBN infrastructure to deliver ultra-fast broadband products and services is preferable and efficient for a country of the size, population distribution, and topology of Bahrain. This single network will be owned by a separate legal entity, which shall be legally and functionally separated from the incumbent operator, Bahrain Telecommunications Company (Batelco). NetCo will supply wholesale products and services to all licensed operators in the Kingdom on a non-discriminatory basis, and it will be awarded the right to deploy the NBN and to supply these wholesale products and services. It will also continue mast sharing across operators to drop sunk cost of CapEx infrastructure.

Although some progress has been made during the past three years, fibre coverage and take-up in Bahrain has not kept up with government aspirations, despite the advantages that the Kingdom enjoys as a result of its high population density and urbanisation.

Currently, limited roll-out and take-up of fibre services have restricted the wider adoption and development of locally-originated and hosted-online content and applications, thereby slowing down the process for the development of the so-called ‘Internet of Things’, as well as of cloud technology and other developments necessary for a ‘Smart Kingdom’. As already noted, government will therefore prioritise, as a core policy, the deployment of a fibre-based NBN to enable advancements in this area. Complementary policies that promote non-discriminatory access to Internet content and applications via both fixed and mobile broadband services will contribute to the development of the Internet eco-system and promote user take-up.

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CHALLENGES

The culprit appears to be identified as the Third National Telecommunications Plan (NTP3), or to be more precise, issues with the partial implementation of this plan, rather than its construction. While the creation of NetCo was a clear objective of the NTP3, several hurdles arose around separating the infrastructure services from the incumbent. Such difficulties were similarly experienced in other countries, such as the United Kingdom when establishing Open Reach.

However, the slow execution has come at a cost. Other countries close to home have been able to attract major ICT and telecommunications industry players, with the most notable being Dubai in the UAE. Dubai has aggressively sought to attract major ICT and telecommunications industry players through initiatives such as establishing the ICT City, which has attracted Apple and Google, among others, in deals that include cheap real estate, low tax status, and infrastructure support. Yet despite such obvious actions to attract major players, Dubai is failing to deliver. This is seen, at least in part, to be caused by the limited competition evident in its two operators. This has allowed practices that those outside the country would consider to be anti-competitive.

One example provided:

Rather than block a website, the UAE telecommunications duopoly are believed to be lowering the bandwidth to an extent that renders any Internet call unviable… The [UAE’s] TRA’s policy of blocking Internet websites and services was likely a factor behind the UAE’s fall to the lowest category of Internet friendliness as per the classification of Paris-based Reporters Sans Frontières. 54

The key to Bahrain’s success in achieving its goals as being an ICT hub is having a single NBN. 53

Mohammed Hamad Bubashait
General Director
Telecommunications Regulatory Authority
Kingdom of Bahrain

The assessment also highlighted the reality that:

Competition in Bahrain’s ICT market is fierce, with the main industry players competing for market share with a rising number of internet firms offering communications and data services... the Bahraini market is too small to support growth across small and medium-sized enterprises, so a strong IT infrastructure has a key part to play in enabling these businesses to scale up quickly in preparation for expanding into neighbouring GCC markets.55

Despite the identified limitations, Bahrain is well positioned, economically, politically, and geographically to benefit from a growing wealth creation in the GCC and MENA countries.56

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ACHIEVING BAHRAIN’S ECONOMIC VISION 2030: THE CENTRAL ROLE OF AN ICT HUB

The government aims to future proof the economy by maintaining Bahrain’s position among the top countries (globally and regionally), according to ICT indices. The National Telecommunications Plan 4, released in 2016, supports the goal to become a leading regional hub for Internet businesses, content, and applications by 2018. The following objectives are aimed at achieving the transition to a Smart Digital Kingdom:

- establishing appropriate support and incentives to promote ICT investment
- building capacity within the ICT sector using skilled human capital
- training programs and capacity building to develop the Bahraini knowledge base, talent, and entrepreneurs in the Internet space.

ESTABLISHING AN INTERNATIONAL ICT HUB

Two of the major drivers for the ICT hub as part of Bahrain’s overall vision are to achieve seamless connectivity for Bahrain’s consumers, companies, and government beyond the country’s borders; to ensure those from outside Bahrain have better access to Bahrain’s industries, while ensuring control over critical issues of cyber security and cyber safety; and achieve economies of scale that are unlikely with a focus only within Bahrain. Attracting international players to Bahrain, such as Amazon, requires the strategic expansion of the supporting infrastructure necessary for a regional, rather than a national hub. The demands on spectrum that will come with the attraction of international players and regional traffic have to be planned for, infrastructure built, tested, and implemented prior to 5G coming into play. This is clearly the issue that is so difficult to grapple with: 5G will dramatically expand data demand and increase mobile penetration, which is already over 200%. The leap in demand that comes with a regional hub must be catered for before it comes, or it cannot become reality. This all has to be achieved while reducing access fees in the market. Achieving price reduction, while increasing the quality of service, is an almost impossible duality of tasks.

Positioning Bahrain as a leader in the GCC and as an international telecommunication industry, as part of the country’s overall vision, has largely been achieved, thanks to liberalisation, which has resulted in Bahrain becoming the most economically free country in the MENA region ranking 18th globally based on the 2016 Index of Economic Freedom issued by the Heritage Foundation and Wall Street Journal. Bahrain has jumped in the league tables, achieving consistently strong improvements in its position in the GCC. Now its challenge is to benchmark itself against the world’s best, as it has already taken the mantle of GCC leader in telecommunications.

Strength in the ICT sector is necessary if Bahrain is to be able to attract investment into the country and become a regional ICT hub. A first step has been made through the liberalisation of the telecommunications industry and other markets, such as finance. To insiders, it is hardly surprising that Bahrain won the “Global Best to Invest Award” in 2016, which recognised Bahrain as the top country to invest in per capita in MENA.

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The journey ahead requires evolving regulatory frameworks to mediate competing interests of operators and consumers, which has been challenged through offerings from OTTs, as well as advanced infrastructure to achieve both international connectivity and enhanced capacity, to cater for the growing demand of mobile data.

The inability of Bahraini telecommunications operators and internet service providers to access redundant and resilient international capacity at reasonable prices represents a key impediment to the Kingdom’s ability to develop as a regional business and ICT hub and meet the core policy objectives set out in this Plan.62

The rise of the machine
- Smart cars
- Smart homes
- Medical services and demand
- Smart cities
- Patients tracking systems
- Smart societies
- The rise of the machine
- Digital economy evolution
- Everything as a service
- Data intelligence
- Data-driven economy
- Data is the new oil
- Privacy, security & authentication
- Always connected, any service, anywhere, any device
- Advanced customer support services, call centers, service every & assurance
- Cost efficient & high-quality of service
- Medical services and demand
- Voice, video, messaging, presence
- Smart homes
- Interactive multimedia communication
- Smart cars
- Soft Taxis (BCT)
- Smart cities
- Smart hospitals
- Smart societies
- The rise of the machine
- Virtual hospitals
- The rise of the machine
- M2M & IoT services
- eHealth app services
- Smart data analytics
- Smart data analytics
- Service platforms
- Data center infrastructure
- Facilities and cloud-based services
- IT services
- Capability building and knowledge centers

The inability of Bahraini telecommunications operators and internet service providers to access redundant and resilient international capacity at reasonable prices represents a key impediment to the Kingdom’s ability to develop as a regional business and ICT hub and meet the core policy objectives set out in this Plan.62

However, concerns remain about reaching this goal:


SECTION 4  CREATING AN ICT HUB: A FUTURE OUTLOOK
ICIT IN BAHRAIN  NETWORKED, AMBITIOUS, WORLD-LEADING

**E-GOVERNMENT ONLINE SERVICES**

- **1st** highest in the GCC

**INNOVATION DRIVEN**

- **39th** highest in the region
  - Bahrain moves up from places and is now listed as ‘Innovation Driven’.
  - It joins Germany, Singapore and the US, and ranks 39th worldwide.

**ICT DEVELOPMENT**

- **27th** in the world
  - 70% of the ICT workforce is comprised of Bahrainis

**NETWORK USAGE**

- **30th** in the world for networked readiness
  - 8th in the world for internet usage globally

**MOST LIBERALISED TELECOM SECTOR IN THE GCC**

- **14th** in the world for e-participation
  - 91% of population use the internet

**FIGURE 27: ICT IN BAHRAIN**
BUILDING NATIONAL CAPABILITIES: A TELECOMMUNICATIONS ACADEMY

The aspiration of building an internationally facing ICT hub requires Bahrain’s capabilities to be globally competitive. The capability building process will in part depend on the physical infrastructure the country can establish. However, competitiveness is not founded on technology alone, but also on the ability of people to use and enhance that technology. If national capabilities are to be built, it requires high-level coordination, spanning individual initiatives. Such coordination has to be driven at a national level and have national governance to orchestrate the human, physical, and technological capital.

The growing demand for a highly skilled workforce to service the impending ICT hub has culminated in the vision of a Telecommunications and ICT Academy for Bahrain.63 The Academy would provide a foundation for developing Bahrain’s human capital, complementing existing initiatives and filling a current gap. An Academy creates a critical junction between the high-level of literacy and education in Bahrain64, 65 and the hands-on training already offered by operators.

Several operators already provide skills development for Bahrain nationals and international citizens critical to ensuring a well-functioning industry. However, to shift to a new trajectory to support the ICT hub, it will require a more holistic national approach, rather than the elemental approach currently in place.

Several initiatives are already in place. For instance, Batelco plays a continuous role in supplying and maintaining high standard ICT skills, as demonstrated in an earlier section (see section 2, The sustained role of Batelco). Other operators also invest heavily in developing and retaining talent in the industry. For a number of years now, Zain has run an internship program for ICT students from the University of Bahrain, Bahrain’s largest and most prestigious university. These internships are a yearlong and fully paid. Yet such programs remain largely wedded to a single operator.

A Telecommunications and ICT Academy will join these initiatives, making it central to establishing an ICT hub. Specifically, it will provide two benefits: first, it will offer tailored ICT skills programs, to attract talent from the region and beyond, and second, it will address a current gap in building a value chain of human capital development in Bahrain. Enhancing the skill development is critical to building capacity for an ICT hub. The Academy will also contribute significantly to achieving Bahrain’s economic 2030 vision by providing the brainpower to boost economic activities in related industries.

THE TRA’S ROLE IN TURNING FUTURE INTO REALITY

Consumers, developing an ever-increasing appetite for data, and challenges posed by the recent influx of service offerings from OTTs, contributed to blurring traditional industry boundaries. Bahrain is determined to succeed in the transition to becoming an ICT hub in the region and globally, building on its existing leading role. Yet there remain some hurdles that may require attention.

The difficulty facing the Bahrain telecommunications industry, while not unique, requires it to balance the desired open market approach with a light hand of regulation. Responsiveness in legislation and regulation is key to ensuring a competitive landscape that supports rapid technological development by reducing uncertainty for those in the markets, and for those eyeing entry. It is very difficult to transition from a statutory monopoly to a competitive landscape with at least three key operators, and an increasingly large number of OTTs, quickly and without structural dislocation. The TRA is part of a national goal to establish Bahrain as the ICT hub for the GCC. Its preeminent position in telecommunications has been confirmed through a range of metrics and international awards and evidence-based publications. A competitive, agile, and, responsive industry provides the foundation for a globally competitive industry.

As such, NTP4 has been highly responsive to both industry and consumer needs in its focus on the technology and supporting infrastructure that will enable international competitiveness. The responsiveness in NTP4 has been recognised in an assessment by Oxford Business Group:

“The NTP also seeks to enhance Bahrain’s status as a regional ICT centre, as it strengthens electronic communications security and boosts the international connectivity of the country’s telecoms networks.”

Indicative of the ever-changing landscape, a major change in the NTP4 has been a move to separate legislation, regulation, and enforcement in Bahrain’s telecommunications space. Under NTP4, Bahrain’s Ministry of Transportation and Telecommunications will take over the implementation of the plan. This allows the TRA to resume its lean regulator status, with only 65-70 staff, which is significantly lower than other regulators in the GCC and the world (see Figure 28).
<table>
<thead>
<tr>
<th>COUNTRY</th>
<th>REGULATORS</th>
<th>EMPLOYEES (2016)</th>
<th>REVENUE (USD), MILLION</th>
<th>AV CONNECTION SPEED (MBPS)</th>
<th>AV PEAK CONNECTION SPEED (MBPS)</th>
<th>AV PAGE LOAD TIME BROADBAND (MS)</th>
<th>AV PAGE LOAD TIME MOBILE (MS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Australian Communications and Media Authority (ACMA)</td>
<td>446</td>
<td>$620.7 (AUD 835,0)</td>
<td>8.8</td>
<td>43.8</td>
<td>4,128</td>
<td>5,111</td>
</tr>
<tr>
<td>Bahrain</td>
<td>Telecommunications Regulatory Authority (TRA)</td>
<td>60 to 70</td>
<td>$7.7* (BD 2,919,4)*</td>
<td>-</td>
<td>-</td>
<td>4,751</td>
<td>4,989</td>
</tr>
<tr>
<td>Qatar</td>
<td>Communications Regulatory Authority (CRA)</td>
<td>&lt;200</td>
<td>$2,764.5* (QAR 10,064,0)</td>
<td>8.4</td>
<td>89.2</td>
<td>4,215</td>
<td>5,182</td>
</tr>
<tr>
<td>South Korea</td>
<td>Korea Communications Commission (KCC)</td>
<td>-</td>
<td>$11,933.7** (14,0347,0 KRW)</td>
<td>29.0</td>
<td>103.6</td>
<td>2,140</td>
<td>2,803</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Office of Communications (OfCom)</td>
<td>799</td>
<td>$153.4 (GBP 123,7)</td>
<td>14.9</td>
<td>61.0</td>
<td>2,694</td>
<td>3,893</td>
</tr>
</tbody>
</table>

**FIGURE 28: COMPARATIVE DATA ON TELECOMMUNICATION REGULATORS’ PERFORMANCE**

However, given the need to sustain increasingly deep relationships with industry operators, and to balance this with integrity, the TRA will need to consider its funding platform. The TRA has always been a lean (and some may say mean) machine. Staff numbers have never moved beyond 70; a very small organisation compared to regulators in the GCC region and globally. However, examples such as Qatar demonstrate that a large and cumbersome regulator does not present the optimal business model in the current industry. Lean and mean will be the future, as it was the past, for the TRA.

To maintain the lean approach, the TRA has also undertaken a very innovative outsourcing strategy. Outsourcing major tasks has often been seen as a fast track to eroding an organisation’s core capabilities. The TRA uses consultants extensively, many of who are international, so that a global perspective is achieved. The adage ‘develop the brain, outsource the muscle’ has been infused across the TRA since its establishment. This has enabled the TRA to be innovative, build its internal capabilities so that it can effectively lead the Bahrain telecommunications industry, and lead among the GCC.

The TRA is continuing to build on its leadership, which was recently recognised by the highly prestigious MENA HR Excellence Awards: Employer of the Year award across public sector organisations in the MENA region. The award recognises government entities for their commitment to supporting employees at all levels, through talent retention, employer branding, learning and development, CSR activities, health and safety, and diversity and inclusion. An independent panel of experts judge the awards.

The TRA needs to be seen to be able to talk more to businesses, and needs to be more outwardly focussed.”

Mohammed Hamad Bubashait
General Director
Telecommunications Regulatory Authority
Kingdom of Bahrain

Develop the brain and outsource the muscle.

Tariq Al Saffa
Board Member
Telecommunications Regulatory Authority
Kingdom of Bahrain


a closer look...

KEEPING UP WITH THE PACE OF THE INDUSTRY: SHIFTING THE FACE OF A REGULATOR

There is substantial evidence that the TRA is a leader, not just within the boundaries of Bahrain’s telecommunications industry, or the country’s borders. The effectiveness of the TRA is evidenced in Bahrain’s international performance in the eGovernment Survey and in a myriad of awards and statistics that have increased in numbers in recent years.

‘Develop the brain and outsource the muscle’ is a catchcry for the TRA’s General Director. Developing a highly skilled management team, and using consultants to undertake specialty projects on an ad hoc basis, is how the TRA remains at 65-70 staff, while still fulfilling its duties. Internal policies that support developing the brain include: regular attendance by staff at global conferences, facilitating regular consultations, and offering position papers to ensure stability and reduce uncertainty in the market.

The evidence points to the TRA being the leading regulator in the GCC. It is also highly regarded by the operators.
The telecommunications industry has evolved rapidly globally, which was responded to by shifting regulatory frameworks adopted and enforced by the TRA. Despite the focus on increasing the number of mobile operators from one to at least three, the TRA has focussed on a new phenomenon in a burgeoning digital market – OTT operators. An unresponsive regulator, slavishly following its 2002 brief, may well have overlooked the emerging dynamics in the industry. The move from voice to digital, and the pervasive digitisation of telecommunications has created substantial opportunities that have been captured globally by the likes of Netflix, Google, Skype, WhatsApp, YouTube, Twitter, and Instagram. While consumers benefit from the new services and additional offerings, increasing service from OTTs creates acute challenges that a regulator cannot ignore. Free services offered by OTTs, such as file sharing and voice and data download, compete directly with services that remain the bread-and-butter of licensed operators. The impact on the telecommunication industry is profound and manifests in four ways. First, it creates a revenue loss for licensed operators, and in turn, lowers the fees generated to a regulator. Second, OTT players tend to use existing networks – rather than build their own – but hardly pay any fees to run their services. Such behaviour has resulted in the stigma of ‘free-riders’ or ‘campers’. Despite OTTs camping on existing networks for free, there is little evidence supporting any violation of licensing agreements. Third, an increase in mobile data causes an additional burden on the infrastructure, sustaining the uptake of services offered by OTTs. Fourth, doubts over future investment in a country’s infrastructure arise due to the challenges of operators to maintain revenue streams and the reduction of licensing fees paid to the TRA.72 There is no easy solution on how to balance these tensions while still ensuring progress and adoption of technological advancements in LTE networks (4G and 5G), which support any integrated service at the heart of an ICT hub, such as e-commerce, e-health/m-health, and e-education.

In a recent response to address the above mentioned tensions, the TRA outlined a clear argument in favour of letting competitive drivers decide over the future of OTTs rather than a drastic decision of a regulatory body. It refrains from taking actions so that it fosters rather than stifles innovation in the evolving telecommunication industry, while allowing licensed operators to use accepted industry practices and tools to adapt their offerings to an evolving demand.

The current situation is a phase of an evolving environment that will ultimately result in a new structure of the telecommunication industry at a global level as well as in the Kingdom of Bahrain.73

THE NEED TO DEVELOP AN INDEPENDENT INFRASTRUCTURE COMPANY: ESTABLISHING NETCO TO ENSURE A FAST AND SUSTAINABLE INFRASTRUCTURE ENABLING A WELL-FUNCTIONING ICT HUB

The lynchpin of an ICT hub is a well-resourced and continuously advancing infrastructure, supporting the network that sustains the traditional telecommunication industry, but also spanning across other industries.

The challenge of the NTP remains the breaking-up of the incumbent Batelco into two separate and independently run companies. One company has the remit to run Bahrain’s infrastructure (NetCo), with the other in charge of maintaining and growing Batelco’s existing service in the network. Such shifts are radical and were observed in other countries, including the United Kingdom (2006) and Australia (2012). For instance, British Telecom was split into BT and Open Reach and the Australian incumbent was split into Telstra and NBN, with the latter companies in charge of the infrastructure. The radical dismantling of both BT and Telstra were coupled with the governments’ drive to enhance respective nation’s telecommunications infrastructure.

At present, the creation of an advanced infrastructure is strongly tied to the roll-out of a network running on fibre-optic. Fibre-optic provides the basis for latest LTE networks, which already sustain 4G and will be the basis for 5G. While there is strong agreement and support about the need to enhance Bahrain’s infrastructure, the larger question remains unaddressed: what is the most appropriate execution model for NetCo?

The United Kingdom and Australia offer some brutal insights. Despite a clear and strong mandate from government, the roll-out of fibre-optic has seen severe delays in both countries. The delays are largely caused by huge costs caused by an inefficient coordination of plans. In Australia, it was recently announced that more than 1.5 million homes and business would no longer receive upgrades to cable Internet connections since the rollout has been costlier than initially anticipated. The average cost for an upgrade was estimated at $1,600 (AUD per household), whereas the actual cost exceeds $3,558 (AUD per household).74

As a result, the affected homes and businesses will receive a slower ‘fibre-to-the-node’ connection, as initially set out by the Australian Communications and Media Authority’s mandate. Almost worse news about the execution of fibre-optic rollout was reported in the United Kingdom. Despite an investment of £1.7bn by government and local authorities, who aimed to bring superfast broadband to over 95% of the United Kingdom by 2018, fibre-to-the-premise services are presently only available to two percent of premises.75 In recent media releases, Ofcom (the regulator in the United Kingdom) has stated that Open Reach is taking too long to install leased lines and is not providing adequate certainty that the services will be provided by the date first given to the customer. This is because the average time that it takes to install an upgrade has increased from 40 to 48 days since 2011. Insights from the United Kingdom and Australia may prove useful and emphasise the need for a clear plan and detailed, realistic courses of action to achieve the Bahrain Government’s mandate.

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74 Business Insider (2016), This is the state of the NBN since the Coalition took power. Retrieved from www.businessinsider.com.au/this-is-the-state-of-the-nbn-since-the-coalition-took-power-2016-5
RECOGNITION AND SUPPORT FOR AN INDEPENDENT TELECOMMUNICATION INFRASTRUCTURE COMPANY

The support for an independent infrastructure among CEOs of licensed operators was overwhelming. During interviews, executives signalled a willingness to share the initial costs to ensure an integrated infrastructure. Such views indicate the strong connection and belief in supporting the community to create benefits for multiple stakeholders ranging from customers, to competitors, to industries that are supported by the telecommunication industry. Through the interviews conducted for this case study there were glimpses of the deeper involvement needed by telecommunications operators to fully service these industry. One example from Zain points to the consideration of the tertiary education industry, coupled with a strategic recruitment strategy for the company. For a number of years now Zain has run an internship program for ICT students from the University of Bahrain, Bahrain’s largest and most prestigious university. These internships are a year-long and fully paid. Unsurprisingly many of the students who undertake the internships go on to become Zain employees. This program also points to the Zain’s commitment to Bahrain in taking a lead in the education of Bahrain best and brightest university students.
FUTURE OPPORTUNITIES FOR BAHRAIN’S TELECOMMUNICATION INDUSTRY ENABLING THE ICT HUB

The transition to a Smart Kingdom creates opportunities to become an ICT hub to cater for Bahrain, the GCC, MENA and the global community. In particular, it offers the potential to realise the following initiatives:

**MOBILE BANKING/M-COMMERCE** - the take-up of m-commerce services in the Middle East has been muted, partly due to limited operator interest, in view of the strong performance of traditional services. Many m-commerce deployments in the region have targeted migrant workers looking for a quick and efficient way to send money to family and friends in their respective countries. However, there is strong case for development of m-commerce solutions for the domestic market, especially for person-to-business transactions, considering the limited potential for person-to-person transactions in the region. Some operators have invested in the near-field communications (NFC) technology for cashless P2B transactions. Although there are opportunities for this service in markets with high uptake of high-end mobile devices, such as the GCC states, BMI believes m-commerce solutions that leverage the growth of e-commerce in the region have the strongest potential.76

Zain, Orange, and Etisalat are among the leading m-commerce service providers in the region. In August 2013, Zain selected French software vendor eServGlobal to deploy an end-to-end mobile money solution across its group operations. The partnership involves the deployment of a complete m-commerce platform with key services such as m-wallet, m-banking, bill payment, merchant payment, electronic top-up, micro finance, salary disbursement, and peer-to-peer money transfer. Etisalat launched its ‘Flous’ m-commerce service in Egypt in June 2013. The service was introduced in partnership with MasterCard and the National Bank of Egypt (NBE). Orange offers m-commerce services Jordan and Egypt. With the operator also present in Tunisia, Morocco, and Iraq, it expects to extend the service to those markets in future.77

**M-HEALTH** - The opportunity for m-health in MENA is driven by the rapid rise in ‘lifestyle’ related health problems, such as obesity and diabetes. Given the high penetration of mobile phones in the region, governments, pharmaceutical firms, healthcare professionals, and other stakeholders are making efforts to leverage the mobile technology to provide efficient patient care and information dissemination. In January 2014, the UAE’s Ministry of Health signed an agreement with the country’s two mobile operators - Etisalat and du - to develop an m-health program. The program aims to support patients with diabetes or those at risk, as well as those with cardiovascular and respiratory diseases. In Jordan, The Royal Scientific Society has supported an initiative where rural users can text questions on maternal and early childhood health to doctors, as well as receive SMS reminders about their children’s vaccination dates.78

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In many other cases in the region, operators have been at the forefront of developing m-health solutions, often in partnership with third-party healthcare solution providers. In 2012, Ooredoo (formerly Qtel) launched an m-health service that allows diabetic patients in Kuwait, Iraq, and Palestine to use their mobile phones to receive personalised alerts and information on exercise and diet. The operator is rolling out the service in other markets. In 2013, the company’s domestic rival Vodafone Qatar partnered with Weill Cornell Medical College Qatar to launch a mobile app, available in English and Arabic, to promote exercise and healthy eating. Alongside a calorie counter, the app also uses a traffic light system to indicate how healthy or unhealthy different dietary choices are. In 2012, Mobily partnered with drug maker Sanofi to launch Sanofi’s iBG star device, which measures blood glucose using apps on the iPhone, iPad and iPod.

E- (AND M-) GOVERNMENT - m-government is still in its infancy in MENA. However, the potential is enormous, considering the strong interest from governments and other institutions. In January 2014, the Jordanian government revealed phone users sent 2.1MM text messages in 2013 to enquire about public services under the e-government SMS service program. Public service enquiry through SMS almost doubled in 2013, from 1.083MM messages in 2012. Residents can enquire about 40 public services, which are provided by 27 different public agencies, using SMS. The government agencies also sent 16.5MM messages to mobile subscribers in 2013 to raise awareness about certain issues and highlight services provided by them.

BMI expects other governments in the region to make stronger commitments to m-government services in view of its potential to improve public service delivery. As a result, operators must make efforts to develop solutions to maximise the opportunities from the service. Although it is still uncertain how operators will monetise the m-government services apart from data subscription and usage fees, there is potential to generate new revenue streams over the long-term after a significant proportion of phone users adopt the service as their preferred method of assessing government services. Operators could also use the service to improve customer satisfaction and reduce churn, a situation that makes service differentiation a key area of competition for operators.

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The conclusion to this case study is that the future is bright but challenging. Bahrain must keep pace with technological progress, which is driven by an unquenchable consumer and business thirst for data. The challenge is never ending. The shape of change in telecommunications, and more broadly in ICT, according to Moore’s Law, is exponential. The challenge for any telecommunications regulator and more particularly for regulators in countries that lead their regions and stand tall globally, such as Bahrain, is that missteps are to be avoided. Self-regulation in an industry where a statutory monopoly had been created in the past to help build the industry is unlikely to happen. If it did happen, other market distortions would affect the efficiency of the industry and the extent that it can continue to deliver consumer surplus through an open competitive market.
The Telecommunication Regulatory Authority (TRA) of the Kingdom of Bahrain commissioned the case study. Primary data sources were interviews held with representatives from key actors in the telecommunications industry during a field trip in Bahrain, September 2016.

Additional data was sourced from publicly available documentation produced by the TRA and other reputable organisations.

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<th>ORGANISATION</th>
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<tr>
<td>TRA</td>
<td>Mohammed Hamad Bubashait</td>
<td>General Director</td>
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<td>Deputy General Director</td>
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<td>Faisal Al Jalalama</td>
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<td>Acting Director Legal Affairs</td>
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<td>Taiba Mohamed Al Binali</td>
<td>Acting Director of Consumer Affairs and Media</td>
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<td>Sabah Al Kubaisy</td>
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<td>Viva</td>
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<td>Zain</td>
<td>Mohammed Zainalbedin</td>
<td>General Manager</td>
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TABLE A1: LIST OF INTERVIEWS
Damian Hine is an Associate Professor in Innovation and Commercialisation at UQ Business School in Australia.

He is an evolutionary economist who focuses on innovations that enhance firm growth. His work lies at the crossroads of innovation and strategy, in the field of dynamic capabilities. Damian’s research employs novel quantitative modelling techniques on large data sets (both primary and secondary) to offer new insights on innovation and knowledge creation and exchange.

As well as publishing two books, one on BioEntrepreneurship and Innovation, Damian has published journal articles in Nature Reviews Drug Discovery (the 5th highest impact factor journal in the world), Trends in Biotechnology, Journal of Small Business Management, Industrial and Corporate Change, and more than 30 other articles in varying publications. He has also written white papers for Telstra (Australia’s largest telco) on manufacturing opportunities in Asia, as well as papers for State and Federal Government agencies. He was also recently commissioned to write a national report on the financing and investment impediments facing the Australian Biotechnology Industry for the McKell Institute.

Damian has been invited to lead projects on innovation and commercialisation by governments in Chile, Brazil, and France. He has been appointed to write papers on innovation for the OECD (on the future of the global biotechnology industry) and for UNESCO, and is currently leading World Bank projects in Indonesia and Vietnam.

Damian has led national research projects with funding totalling more than $5M, including national grants in Australia and China, and from the EU. He is currently the International Consultant on Vietnam’s National Innovation Training Program, funded by the World Bank.

Paul is a Senior Lecturer in strategy at UQ Business School in Australia.

He is a qualitative research specialist in the field of strategy and an expert in case study design. His research focuses on strategic practices as organisations identify and tackle challenges arising in the internal and external environment. Suited to investigating such strategic practices, Paul is an expert in longitudinal single-case based research design, which he has employed in several research projects, including higher education, reinsurance, oil and gas.

Paul’s work has received several awards from leading academic associations, such as the Academy of Management, the global, leading professional body in academe. His research has appeared in the world-leading journals, including the Academy of Management Journal and Organization Science, and has featured in the national and international news, including ABC News - The Business and The Economist. His recent book Making a market for acts of God has been a best seller, and a finalist for the George R. Terry Book Award, selected by the Academy of Management for making the most outstanding contribution to the advancement of management knowledge.

Paul currently serves as Incoming President (elect) for the Strategising, Activities and Practices interest group, which is part of the Academy of Management. He also serves as Senior Editor at Organisation Studies, a Financial Times top-40 journal.