ARE WE STANDING AT ANOTHER CROSSROADS? THE IMPORTANCE OF EDUCATION AND PUBLICLY AVAILABLE DATA

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Abstract: Almost 20 years ago the submarine cable industry suffered a downturn unlike anything experienced in its recent history. Due to the explosive and sharp growth curve of the dot-com bubble, an increased demand for the newly available remote software-based stock trading and a perception of available investment funds for system developers, the early and mid-1990s were a period of extraordinary growth for the submarine telecommunications industry. To accommodate the sky-rocketing demand for cable, suppliers opened new factories, installers were building new ships and investors were opening their check books to almost any developer with a dream and a business plan – it was a period of easy money and unchecked growth. As with all sharp curves, a down turn was inevitable and at the end of the 21st century, spurred by unprecedented global terrorist activity and the collapse of the dot-com bubble, exaggerated demand models crumbled, over-eager investors deflated, and regional overbuilds became apparent - thus beginning a drought in the industry lasting up to 15 years for some regions.
As the submarine telecommunications industry welcomes new entrants, including OTT providers and offshore energy producers, it is paramount that the industry has a forum that not only advocates for a productive business environment, but also educates new industry entrants and archives historical events for posterity.
As the industry is beginning to see some of the same disruptive factors as in the late 1990s, it is the goal of this paper to identify the types, volume and quality of information available to the industry, present a comparative study between economic, systems and market analysis data publicly available twenty years ago to today and its importance to new systems planning, and provide inference on the trajectory of quality of data thereof.

1. SUMMARY AND INTRODUCTION

Almost 20 years ago the submarine cable industry suffered a downturn unlike anything else experienced in its recent history. Due to the explosive and sharp growth curve of the dot-com bubble, an increased demand for the newly available remote software-based stock trading and a perception of available investment funds for system developers, the early and mid-1990s were a period of extraordinary growth for the submarine telecommunications industry. To accommodate the sky-rocketing demand for cable, suppliers opened new factories, installers were building new ships, and investors were opening their checkbooks to almost any developer with a dream and a business plan – it was a period of easy money and unchecked growth. As with all sharp curves, a down turn was inevitable and at the end of the 21st century, spurred by unprecedented global terrorist activity and the collapse of the dot-com bubble,

exaggerated demand models crumbled, over-eager investors deflated, and regional overbuilds became apparent – thus beginning a drought in the industry which lasted up to 15 years for some regions.

As the submarine telecommunications industry welcomes new entrants, including OTT providers and offshore energy producers, it is paramount that the industry has a forum that not only advocates for a productive business environment, but also educates new industry entrants and archives historical events for posterity.

As the industry is beginning to see some of the same disruptive factors as in the late 1990s, including new industry entrants and technology advances, it was the goal of this paper to identify the types, volume, and quality of information available to the industry, present a comparative study between economic systems, and market analysis data publicly available twenty years ago to today and its importance to new systems planning, and provide inference on the trajectory of quality of data thereof. However, as research was performed, it became clear that archived data and news analysis is limited, even as recent as the late 1990s.

As with all undertakings, this paper's priority has evolved as new information was acquired and expectations were adjusted. While finding a clear lack of publicly available data, the primary assumption of this essay was confirmed – that publicly available data and analysis was a scant resource prior to the crash of 2001. While it was disheartening to not be able to find even a handful of resources still available from before 2000, this author was able to craft a rough outline of the shape of the market, including completed systems and the financing models they utilized.

In the coming sections, you will find an outline and comparison of systems ready for service from 1995 to 2001 and from 2011 to 2019. This paper will explore and outline the financing profiles for both time periods, showing the shift in ownership models and how those owners financed their systems. After setting the stage, this paper will discuss the importance of publicly available data, education and advocacy in and for the submarine cable industry.

For the purpose of this paper, the time periods will be separated in to two distinct categories: Pre-Crash (1995-2001) and Current History (2010-2018). Regrettably, prior to 1995 data accuracy, and memories of the time, begins to wane, and was not of a quality acceptable for analysis.

2. THEN

In the 1980s, optical submarine cable systems were developed. The first transoceanic fiber optic system was the transatlantic, TAT-8, which was ready for service in 1988. Telecommunications with high quality and high capacity became possible, and optical submarine cable networks were extended all over the world. The first generation of optical systems regenerated the optical signal within the submerged repeaters. In the mid-90s regenerators were replaced by optical amplifiers, which allowed the simultaneous transmission of more than one wavelength. Currently, the main method for international telecommunications is the use of submarine cables; 99 percent of international telecommunications is carried over submarine cables.

Antarctica remains the only continent yet to be reached by submarine telecoms cable. In 2017, the Arctic received its first significant submarine cable system. Future such

systems, both regional and transoceanic, are in the planning stages. The goal of a northwest or northeast Arctic passage seems within reach.

In recent years, many submarine cable projects have been progressing in the world. Communication infrastructure with higher speed and larger capacity is required to support the rapid growth of the Internet and video transmission, and so demand for new submarine cables is increasing. This trend is expected to continue for the foreseeable future.

3. SYSTEMS RFS BY YEAR 1995-2001

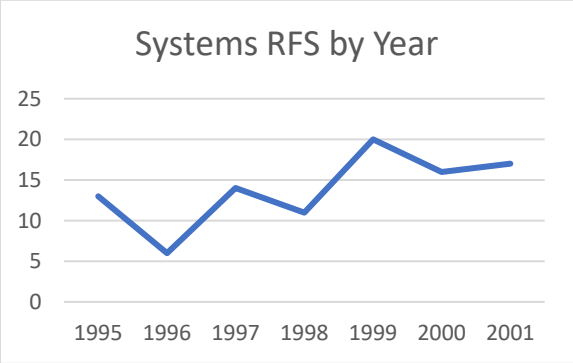

Figure 1: Systems RFS by Year

The 1990s were a period best characterized by steady, sustained growth and technological advancement. The typical system development time was roughly 18-24 months from conception. As seen by the alternating pattern in figure 1, every other year saw systems ready for service in leaps. The first signs of system stagnation started in 2001, which represents the edge of the proverbial cliff for the submarine cable telecoms market. Michael Ruddy of Terabit Consulting identified the cliff edge in issue #2 of the Submarine Telecoms Forum magazine in 2002 with "Although the three-year period leading up to 2002 saw the highest levels of investment in undersea cable systems ever, 2001 proved to be a major disappointment for the industry, and was marked by massive layoffs, downsizing, devaluation, and bankruptcy. Consequently, the undersea cable industry enters 2002 with bated breath and low expectations." Ruddy placed the blame for the industry's decline on the creeping effects of the global economic slump at the time.

4. ECONOMIC FACTORS

With what began as a market decline during the Dot Com bubble bursting throughout most of 2000, was solidified with the terrorist attacks visited on New York in 2001. When the dust had settled in 2002, the Dot Com bubble wiped nearly $5 Trillion in market value from the US Stock Exchange, a large portion of which was supported by telecoms sector applications ranging from hardware manufacturers to software and carrier providers. The submarine cable market sometimes feels insulated from the woes of the global economy because of the perception that the demand drivers for system development exist outside of the regular ebb and flow the global economy experiences. In 2001, the first signs of the global economy affecting the niche telecoms markets was seen; financing became harder to come by and regional carriers began to address more realistic capacity demand growth.

In regard to financing, Ruddy offered a prediction in system financing based on the economic realities in 2002.

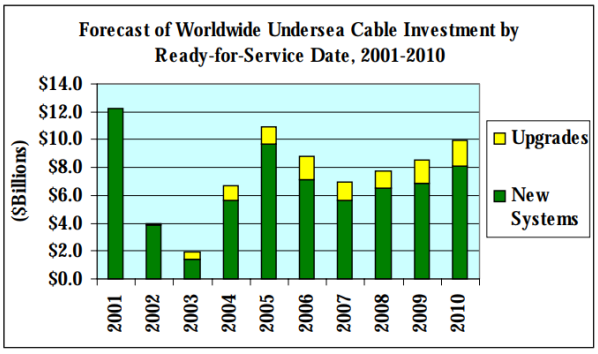

Figure 2: Forecast of Worldwide Undersea Cable Investment by Ready-for-Service Date, 2001-2010. Published in Submarine Telecoms Forum, Issue 2.

Ruddy was one of only a very small handful of people even publicly discussing, in writing, the actual state of the industry. Because of the great lack of news sources prior to 2001, conversations about the health of the industry were held to board meetings, personal conversations, industry conferences, and paid reports – specifically, situations where the contents of the discussion were limited between the parties having the conversation. Ruddy's article, published in Issue 2 of the newly founded Submarine Telecoms Forum magazine, stated in no uncertain terms the trials that the submarine cable industry was about to face, that the industry must be prepared for a very lean period.

As compared to what the industry experienced, the industry's predictions were overly optimistic, expecting only a two-year lull in system development. It was the hope that regular investment would return in 2004 and build to between $7.5B to $10B on average until 2010.

In reality, it took the industry until 2006 to see even above a $1B per year investment rate, and until 2009 to see anything on par with the invest level of 2002.

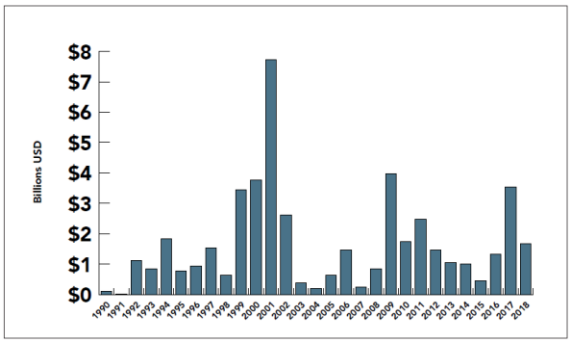

Figure 3:System Investment, 1990-2018. Published in Submarine Telecoms Industry Report, 2018-2019 Edition.

5. NOW

As with the mid-1990s, the submarine cable industry is atwitter with new projects, huge growth demand and new entrants to the market. The last three years, specifically, have been a time of great expansion, suppliers and installers working at near capacity to deliver the systems in development.

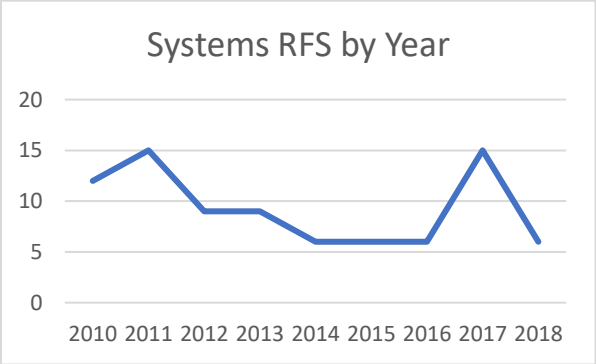

Figure 4: Systems RFS by Year, 2010-2018

6. FINANCING PROFILE

Further differentiating the modern market, the ownership and financing models have seen a surge in private and bank investment as compared to the typical model pre-crash. Before 2001, the vast majority of systems

were financed directly by the planners and consortia that needed the system, a direct financing model that was driven by personal investment and returns through either capacity pre-sales or a wholesale partner.

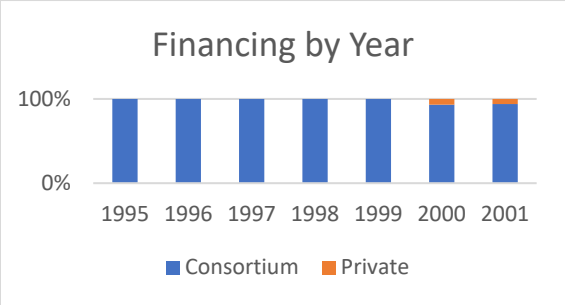

Figure 5: Financing by Year, 1995-2001

With the new wave of owners, and with a substantially different global economy, owners are seeking different investment models, defraying their risk with Multilateral Development Banks (MDB), yet another entrant to the submarine cable market.

MDBs, such as the World Bank and its affiliates are increasingly willing to promote communications infrastructure and to lend in high-risk circumstances where commercial banks will not. MDB interest rates are typically lower than commercial financings and have a more lenient approach to waivers and default scenarios. However, social policy and development goals of those institutions can often impose additional reporting and compliance costs.

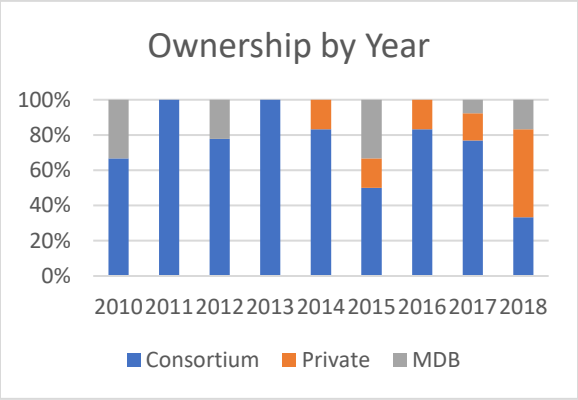

Figure 6: Financing by Year, 2010-2018

7. NEW OWNERS

A new paradigm emerged in 2016, with datacenter and OTT providers stepping into the world of submarine cable ownership. Many of these companies have such large and complex infrastructure requirements that it has become more valuable for them to own their own cable systems rather than buy capacity from a carrier.

Since 1999, Equinix, for instance, has spent some $17 billion in capital on building capacity and server infrastructure to store data, and connect with partners, cloud providers, and networks. Datacenter providers (Equinix, Digital Realty Trust, and Interxion) will continue to benefit from submarine cable construction activity.

The dramatic growth in demand is creating significant challenges for telecommunications companies, Internet Service Providers (ISPs), and OTT Providers. The top segments of many markets are becoming dominated by large OTT players, such as Google, Amazon, Microsoft, and Facebook. They have become key stakeholders and require large amounts of bandwidth between their datacenters in various continents.

Datacenter and OTT providers were the driving force behind 43 percent of systems that went into service for the period 2016-2018.

For the period 2019-2021, 40 percent of planned systems are being driven by datacenter and OTT providers. This indicates that currently observed levels of datacenter and OTT driven systems will continue. As systems driven by major datacenter and OTT providers have a much greater chance of being implemented – due to the high financing threshold of these companies –

readers can expect this percentage to increase as new cables are announced and other projects die off. Without these kinds of backers, future systems will have a much harder time proving their business case and securing funding.

While the top tier datacenter and OTT providers are continuing to develop new systems, there are numerous other companies in this part of the Information Technology sector. A second wave of these companies may decide they need similar infrastructure plans and follow in the footsteps of their respective market leaders. This could trigger a second wave of datacenter and OTT driven systems and allow the submarine fiber market to continue enjoying its current level of activity even after the top tier providers begin to reach the end of their infrastructure buildout plans.

8. PUBLICLY AVAILABLE EDUCATION AND ANALYSIS

A wickedly capitalistic industry, the submarine cable industry often rewards hard work and new ideas with short success followed by competition and rivalry – there is typically very little time allowed to rest on one's laurels. This is a dynamic market, one driven by global forces while also being a global driving force itself. Prior to the crash of 2001, this industry rarely spoke in open, recorded forum about the hardships it faced. Compelled by the need for a recorded history of the industry, several organizations and publications have sought to fill the void, each in its own unique corner of the industry. This industry has publishers whose interests range from supplier and owner analysis, to capacity wholesale and post-market data, and yet there is still no single place to approach and learn, from the ground up, what this industry does and how it does it.

It's known that this industry has no specific skill set or identifiable program to fast track employment; that most individuals "wind up" in this industry, find themselves here after an apprenticeship. Fewer still are legacies of their parents, having grown up around the business of cables. Simply put, the industry lacks specific and accessible education opportunities and outreach to a new generation of cable engineers, marketers and innovators.

Education and level of expertise are the single greatest dividing factors in the industry. During the research for this paper, the articles that were catalogued were authored by some of the same minds that are leading the conversation in publications and conferences today. This data point, while flattering for the authors, poses a chilling thought – has the industry truly not added any new thought leaders since the authorship of these articles?

The crash of 2001 was a significant blow to companies in and around the submarine cable market. The recession of 2008 less so, but still painful. No market downturn is desired, but the negative impacts of such can be mitigated if they can be predicted. Today, as compared to the late 1990s, there is an extraordinary amount of data freely available in this industry. If compelled to, an individual can search and find the status of systems in development, who supports them, their driving factors and what the likelihood of their completion is.

9. CONCLUSIONS AND HOPES

What's the point of it all? Data, public discourse and the honesty to address the issues facing this industry will be the compass points that lead this industry through the coming troubles. Disruptive

market forces, coupled with economic and geopolitical uncertainty, threaten this industry again, but with accessible data and ample educational resources, the effects of the next downturn may be lessened – whether it comes in a year's time or next week.

It's customary to end a paper with conclusions and firmness, however the future is no more certain than the predictions written in Issue 2 of the Submarine Telecoms Forum magazine discussed earlier. Instead, this paper is concluded with a hope that the public discourse, accessible data, burgeoning educational opportunities, and a recent invigoration to address the market climate is enough to blunt even the harshest downturn.

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