CREATING THE OPTIMUM UNDERSEA PROJECT DEVELOPMENT MODEL

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Abstract: This paper examines the strengths and weaknesses inherent to the primary undersea cable development models in use today, including the private model, the traditional consortium, and the "hybrid" consortium. It analyzes the wholesale capacity product, contrasts the competitive aspects of private versus consortium in an example project, and objectively details the disadvantages of both. As a result of the analysis, a new model is introduced and recommended for the future in order to combine the best characteristics of all prior models.

1. Introduction

Before the past decade, undersea cable projects had evolved to become the traditional International voice operator's most treasured strategic assets, with large incumbent telco's owning the vast majority of the worlds existing cables in what we now call the "traditional consortium" ownership structure. New competing operators affectionately nicknamed these cables as "club" cables since it was virtually impossible to become an owner in such cables after the initial parties had already executed the project's Construction and Maintenance Agreement (C&MA). In other words, the only way to obtain capacity at cost was if you were a member of the "club" during the project's inception. In those days, nearly all of the world's cable plans were developed by a very small number of people. The "club" was extremely exclusive and often controlled by government-owned institutions.

Of course, as we all know, the introduction of competition led to the creation of new models in our industry, including the "private" model and the "hybrid" consortium model. Unfortunately, fueled by unrealistic demand forecasts, the explosion of potential customers, and huge performance expectations of speculators, billions of dollars in undersea bandwidth value appeared and then quickly disappeared in the relatively short period between 1996 and 2002.

Although many explanations for these failures have been offered by suppliers, analysts, or other third parties, it seems that very little has been written to express the cable user's point of view. Amazingly enough, multiple capacity resellers have all written down the book value of their undersea assets, but even with near zero-value assets, they still seem to be unable to fully satisfy their customers, the capacity users, with their product offerings. As evidence, one can simply refer to recent activities in each major geographic region. In the trans-Atlantic market, the users are reported to be combining together in order to maximize their purchasing power in order to meet their long-term requirements for capacity[1]. In the Caribbean, a consortium has announced plans to construct a new project[2] connecting many locations that are already served by a regional capacity reseller[3]. In the trans-Pacific market, there are rumors of a Chinese group that is investigating new construction despite the existence of under-utilized cables such as TGN and PC-1. Finally, in the European, Mediterranean, and South East Asian markets, several projects have been completed in order to connect many of the same countries as the original FLAG project. Therefore, despite the continually falling rates, the capacity resellers are only capturing part of the overall bandwidth demand. However, the question remains… Why?

This paper attempts an in-depth commercial analysis of the existing undersea ownership models and compares them to the needs of the capacity users in today's competitive environment. The analysis aims to further reveal and better explain the reasons for the recent failures by highlighting the capacity user's (customer's) perspective within the analysis.

2. Development / Ownership Models

For the reader that might not be familiar with the general characteristics of undersea cable models in use today, a brief overview of each are provided in this section.

2.1. Traditional Consortium Model

In the traditional consortium model, multiple capacity users with reasonably common interests for connectivity throughout a particular geographic region or along a particular route will typically join together by signing a Memorandum Of Understanding (MOU) under which a joint feasibility study is conducted. The members of the MOU work together to finalize the project's configuration, design (ultimate) capacity, initial (lit) capacity, and the ownership/investment structure, including the rules for the use of the project's capacity. The feasibility study under the MOU is typically concluded with the signature of the C&MA. Under

the C&MA, the parties agree to share all of the costs for the implementation, operations, and maintenance of the project. Unit investment costs (cost per Mbps) and/or ownership percentages for each participant are defined in the C&MA.

Before Optical Amplifiers and Wavelength Division Multiplexing (WDM) made it possible for undersea capacity increases, there was a tendency to limit the participation in the C&MA since the project's capacity was limited. During such times, consortium participation was limited to the incumbents and monopolistic carriers of the time. By contrast, some of the more recent consortium projects were very inclusive. Driven by new technology and the inevitable unit cost reductions that come from sharing one network with more and more users, some of the most recent consortiums projects, such as AMERICAS-II, JAPAN-US and TAT-14 were as inclusive as possible. In fact, the JAPAN-US consortium even invited GLOBAL CROSSING to participate before they started the construction of PC-1.

In any case, the primary advantage of the traditional consortium model is the financial or commercial strength. With many capacity users actually investing in and owning an individual share of the project, the financial risk is much less. In addition, since the actual unit costs are normally determined by dividing the project's total cost by the committed long-term capacity demand of the consortium, the consortium model project will most likely have the lowest unit costs for its users.

The primary disadvantage of the traditional consortium model is its dependence on the resources of its own members. Inevitably, the project's landing stations are controlled by select consortium members despite the obvious conflict of interest, leaving project access to be negotiated among rival operators in private arrangements. In addition, the financial procedures, the network administration procedures, and the procurement are typically managed by large, costly committees consisting of representatives of the consortium members. Often, this complicated and costly management structure represented 20% or more of the owner's total capital budget for the project.

2.2. Private Model

In the private model, a single company plans, funds, implements, operates and maintains the cable project as a private owner. Although there are various flavors of the private model, this paper treats the privately-owned cables of retail (consumer or business) telecom service providers differently than cables developed and funded specifically for wholesale capacity offerings. In this paper, the private model is assumed to mean that the project owner's business plan is dependent upon offering capacity on a wholesale basis in order to generate a return on the investment. In general, all undersea cable operators fall into this category if they represent themselves as a "Carrier's Carrier", "Capacity Provider", "Bandwidth Provider", "Capacity Reseller", or anything other than a retail telecom service provider.

The private model for wholesale capacity sales is a relatively new model that seems to have developed primarily as a result of deregulation. As in any other regulated industry, private entrepreneurs generally view deregulation as a business opportunity, provided there is confirmed demand for a related product or service. In the case of undersea cables, once private licenses and governmental approvals for the construction and operation of undersea cables can be obtained, it then becomes possible to create business plans to support investment. This was the case with the ambitious business plans of several companies.

The primary advantage of the private model is the independence with which the project can be developed, implemented, and operated. Private owners typically own their landing stations and can include access within their pricing. They can also manage procurement, administration, operations, and maintenance in a much more cost-effective and timely manner.

Unfortunately, as history has shown, the primary disadvantage of the private model is the financial or commercial weakness. The private model developer, having taken all of the risk alone with typically little or no long-term usage commitments from the capacity users, builds its project and then attempts to create the wholesale market for its products and services in the process. Relying primarily upon the demand and market share projections of third party analysts, the private owner decides its wholesale rates. The initial wholesale rates, being based only upon the fraction of the demand that the private owner believes it can capture, must be high enough in order to provide a return. As a result, the private model's wholesale pricing will always be higher than the unit costs in a consortium where the consortium's committed capacity demand exceeds the projected wholesale capacity demand assumptions of the private owner.

2.3. Hybrid Model

The hybrid model is probably the least used model

in the industry, having only been attempted with ARCOS-1 in the Caribbean region to the knowledge of the author. In theory, the hybrid model is supposed to combine together the best elements of the traditional consortium and the private model.

In the case of ARCOS-1, the majority of the project is owned by an individual company, which currently provides wholesale capacity to the market. Since the private ownership in the project is larger than the consortium ownership, the private owner is able to bring management efficiency to the project. However, it is at greater financial risk to the private owner, which makes the private owner's position in the hybrid model similar to the private model.

Interestingly, very few of the landing stations are owned by the private owner on ARCOS-1, but are instead owned by landing station providers. Although this practice probably helps to insure that backhaul connectivity exists for the project, it might result in backhaul monopolies similar to the traditional consortium model in the locations which are not under the control of the private owner. However, if the private owner agrees to use the landing station provider as the exclusive sales agent for each location, then this loss of physical control at such landing stations would be mitigated. Otherwise, the private owner may end up competing with the landing station providers in such locations without any control over access, backhaul, or collocation at the landing station.

3. The Wholesale Capacity Product

Prior to the construction boom under the private model in the last decade, wholesale capacity was not as readily available for purchase as it is now. Obviously, the objective of the private model was to productize undersea network capacity and many different commercial arrangements have since been introduced in an attempt to satisfy the perceived wholesale capacity market.

3.1. IRU Capacity

Prior to Optical Amplifiers and WDM, making it possible for undersea capacity increases (upgrades), the Indefeasible Right of Use (IRU) was used in order to transfer capacity usage rights to others without transferring the actual ownership rights. This helped to avoid complex financial calculations and political problems that would have been necessary to account for ownership adjustments in the traditional consortium C&MA. At the time, the value of IRU capacity was stable because additional capacity in the cable could not be created. This has since changed, and now the value of IRU capacity is subject not only to other competitive options in the marketplace, but also to upgrades.

Many private owners apparently assumed that the IRU would be an attractive method for the capacity users to purchase wholesale capacity from them and that they would be able to keep most or all of the upgrade benefits for themselves. Unfortunately, most capacity users expected "upgrade proof" prices or some form of "upgrade rights" before investing in assets with a potentially unstable value.

Today, most capacity users view the IRU as nothing more than a pre-paid, long-term lease with little or no recourse available for network performance problems. Some operators even refuse to purchase IRU capacity as a matter of policy unless they are given visibility and influence into the private company's operations, especially if the project has not been completed yet or if it has a short operating history. In some cases, capacity users have requested seat(s) on the private company's board of directors as a precondition for an IRU investment.

For existing projects with network performance issues, the most demanding capacity users will insist upon the Service Level Agreement (SLA) to protect themselves from paying for service during outages. Unfortunately, an SLA does little to protect the capacity user under an IRU purchase arrangement. This is why the more sophisticated capacity users normally avoid purchasing the IRU in favor of the lease.

3.2. Leased Capacity

The commercial popularity of leased capacity has grown because (1) it provides the flexibility to renew in the future at [presumably] lower rates in the market, (2) it provides the freedom to select multiple network providers for better diversity, and (3) it allows the capacity users to serve their customers with short-term contracts in markets where longer-term investment opportunities are not available or not commercially attractive.

Perhaps the greatest advantage of leased capacity is the ability to link a network performance SLA to the lease, providing the capacity user with some financial protection during network outages. The capacity user typically does not pay the provider during outages according to an agreed credit arrangement. This allows the capacity user to further limit financial risk, but it obviously increases the financial risk for the provider.

Unfortunately, leased capacity is typically much more expensive than ownership or the IRU over the longer term. In addition, leased capacity is similar to the IRU in that ownership benefits are not typically provided with a lease since the rental fees do not include any long-term benefits.

3.3. Lease-to-IRU Capacity

The Lease-to-IRU capacity offering is probably the newest commercial structure to be introduced by the wholesale capacity providers. Essentially, this can be described as either an IRU with financing or a lease where a portion of the rent applies toward a future IRU conversion option.

Of all of the wholesale capacity products available today, the Lease-to-IRU structure provides the most flexibility to the capacity user. The capacity user can mitigate the risk of the lump sum payment on an IRU, but still have the IRU conversion option available at the end of a lease, with the lease period itself serving as the network performance SLA testing period. If the performance is not satisfactory during the lease period, then the capacity user is still free to seek other alternatives. If it is satisfactory, then a portion of the lease payments will normally apply toward the IRU conversion option.

4. Model Analysis (Private versus Consortium)

This section of the paper attempts to illustrate the commercial issues facing both a private developer and a consortium with a simplified example project.

4.1. The Example Project

In order to be fair to both models, it is assumed that the example project configuration and costs are the same for both models. However, in order to illustrate how insignificant the ultimate (or design) capacity capability in the project is in the market, it will be assumed that the private model project has an ultimate design capacity that is double that of the consortium project.

For the sake of simplicity, both projects will have just two landing points and only two fiber pairs operated in a collapsed ring configuration. (Author's note: As voice continues its migration from circuit-based networks onto packet-based networks, physical ring diversity becomes less and less attractive. Because of this, the most sophisticated capacity users today have no desire to invest in physical rings.) As indicated earlier, if the private project is assumed to support a maximum of 96 wavelengths per fiber pair, then the consortium project will be limited to 48 wavelengths per fiber pair. Since 10 Gbps terminals are assumed, this will set the maximum capacity for the private project to 960 Gbps and the consortium project to 480 Gbps.

As for the project costs, a total capital cost of $100M and an annual O&M cost of $5M is assumed for both models. Finally, it will be assumed that there is a projected five year capacity demand of 64 STM1 circuits (or 10 Gbps) in the market that each project will attempt to serve.

4.2. Typical Private Plan & Issues

In the private model, the primary business objective is assumed to be capacity resell for a profit. Accordingly, private developers typically create and capitalize a privately-held company with a mixture of equity and debt as the private investors will not normally take all of the risk alone.

In order to market this debt, the private company must create a business plan that shows how the company will repay the debt while still generating profits for its investors. In order to do this, the private company follows a reasonably predictable path to develop a business plan as follows:

Step 1 – Determine Costs

This step is typically completed first because it is relatively easy to obtain cost estimates from suppliers. Any costs not provided by the suppliers are then determined or assumed.

Step 2 – Develop Revenue Projections

A market study is purchased or created in an attempt to determine the total demand for bandwidth for at least the next five years. The company then projects its market share or sales expectations using various parameters, such as population, the number of fixed or mobile lines, the number of Internet users, etc. The expectations are normally adjusted to account for existing or future competition as much as possible. Finally, sales expectations and pricing are multiplied together in order to obtain the company's revenue projections.

Step 3 – Calculate Profitability

With costs determined and revenues projected, a simple subtraction exercise will help the company to determine the income available for service of the debt. Obviously, the company will eventually need to generate a large enough income on paper to exceed the debt servicing obligations and become

profitable.

Although this recipe for success seems simple enough, the private company is actually at a serious disadvantage before it even begins construction. In order to illustrate this disadvantage clearly, the consortium model will be examined and then a complete financial analysis will be provided to compare both models.

4.3. Typical Consortium Plan & Issues

In the consortium model, the primary business objective is assumed to be the construction of a common network to be shared on an ownership basis by all of its capacity users. Accordingly, one of the capacity users typically takes the initiative to develop an initial project plan which is then shared with many other potential capacity users. Once there are enough potential capacity users interested, the project then begins to follow a reasonably predictable path, but quite different from the private model. The typical consortium approach is described in the following steps:

Step 1 – Determine Demand

When the idea for the project has gained enough interest, the capacity users will normally agree to conduct a formal feasibility study under an MOU, as mentioned earlier. The MOU provides a framework for the feasibility study to be conducted, and it normally includes:

- The establishment of an "Interim Management Committee" (IMC) or something similar, which is like a board of directors in a company
- A formal methodology for making IMC decisions
- The countries or locations that the project is anticipated to serve
- The designated "Landing Parties" (in older projects)
- A list of the "Initial Parties"
- The method for admitting "Additional Parties"
- The process for withdrawal from the MOU
- The plan for creating "Subcommittees" or "Workgroups" to perform certain functions under the MOU
- Any other important principles or rules that were agreed with respect to participation in the project, the project configuration, etc.

Under the MOU, each MOU Party submits its expected capacity requirement across the agreed route(s) in a process that is called the Data Gathering (DG). Typically, the MOU Parties will agree to conduct the DG exercise to cover their long-term future demand. It was not unusual for this period to exceed 10 years in the older consortium projects, but 3 – 5 years is more common in the most recent consortium projects.

Step 2 – Determine Costs

The IMC will typically establish a Procurement Group (PG) that is responsible for developing the project's budgets. With budgets provided by the PG and results from the DG exercise discussed earlier, the MOU Parties can then calculate their respective unit costs for capacity in the project.

Step 3 – Finalize Project & Sign Agreements

Prior to executing agreements, the MOU Parties will typically adjust the project plan based upon the calculated unit costs in order to maximize their project benefit. For example, if the unit costs for capacity are too high, the MOU Parties could agree to install additional initial capacity in the project for a nearly insignificant incremental cost, resulting in much lower final unit costs when the extra (reserve) capacity is distributed to the project's owners.

Once any final adjustments to the project plan are incorporated into the agreements, the MOU Parties will then finalize their own internal approvals and schedule a signature date for the agreements, typically including the C&MA and Supply Contract. After signature of these agreements, the project becomes reality with all of the costs shared by its signatories according to the terms of the C&MA. (Author's Note: It is very rare for a project MOU to be signed that does not result in the signature of a C&MA, but it is the C&MA that makes the project real and not the MOU.)

4.4. Financial Analysis

Today, from the capacity user's point of view, the most important element that drives all capacity purchasing decisions is unit cost. Of course, there are some exceptions to this general statement. For example, sometimes capacity will be purchased for another reason, such as diversity or another strategic reason, but nearly all of the time, the unit cost is the most important element. Accordingly, this financial analysis will focus only on the unit cost.

As mentioned earlier, the private model is at a serious disadvantage before construction even begins. To understand why, it must be kept in mind that at the end of the day, the real difference between the private model and the consortium model is the business objective that drives the

creation of the project. In other words, under the private model, the project must not only attract enough capacity users to cover its costs, it must also generate interest for creditors and hopefully profits for investors.

Using our example project with $100M capital cost and assuming that the private company is formed with a debt/equity ratio of 3:2 (60% debt, 40% equity), it is reasonable to assume that the private company must generate enough additional cash to cover annual interest on debt at 9% as well as providing an average annual return of 30% to its owners. Based upon the example project, the private company needs to sell enough capacity to create approximately $17.4M ($5.4M in interest payments and $12M in shareholder value) in additional cash above and beyond the $5M O&M cost in order to survive for the average year.

Now, since the five year demand is the basis for both models, the private model would hope to capture 20% (1/5th) of the total demand per year during each of the first five years with simple linear demand growth. Therefore, in order to meet its business plan objectives, the private company must generate $22.4M of revenue while turning up an estimated 12 or 13 STM1 circuits for its customers. Rounding up to account for the cost of sales, each STM1 circuit sold or leased must then generate approximately $2M during each year, which works out to about $166.7k per month.

By comparison, the consortium model would hope to capture 100% of the five-year demand with the capacity users purchasing their capacity on an ownership basis according to their individual requirements. According to the normal practice, the $100M project capital cost is divided by the 64 STM1 circuit demand in order to arrive at a $1.56M per STM1 unit cost. In this case, each STM1 circuit includes 1.56% ownership interest in the project and the obligation to pay $78.1k in annual O&M costs. Although each STM1 circuit is generally operable for the life of the project (up to 25 years or more), the costs will be amortized over just five years for comparison purposes in this analysis. Ignoring the cost of money, the $1.56M is divided by 60 months to obtain $26k per month and then $6.5k per month in O&M costs must be added to provide a total of $32.5k per month.

As shown, even if the total demand captured by the consortium model is reduced to 20% (or 12 STM1s), which is the same level as the private model, the consortium model is impossible to beat on a unit cost basis because the equipped but unallocated capacity can be released to the users in the future with no additional cost. Furthermore, in order to serve their own needs, the capacity users are far more likely to upgrade the consortium project than the private project is. Therefore, even though the private project has the greater future potential, it will never realize lower unit costs unless it successfully captures the market demand required to drive the upgrade. For this reason, the ultimate capability of the project is not a significant advantage to the private project in the market. This is why many devalued private cables with large capacity potential may never be fully utilized. Even worse, some of them may have to be abandoned due to low utilization (high O&M cost per Mbps).

In any case, although this financial analysis seems to provide strong support for the consortium model, there are several other factors which cannot be ignored as they weigh heavily into the decision by the capacity user that is considering a capacity purchase or investment.

4.5. Other Factors

As suggested, even though the consortium model is difficult to match on a unit cost basis, there are some serious disadvantages found in the older consortium projects that are currently discouraging for new cable development under the traditional consortium model, including:

A. Agreement Durations – Many of the older consortium projects were built according to a 25 year operating agreement that could not be easily terminated even though the project may have become uneconomical to operate as compared to newer projects.
B. Landing Station Access – The consortium participants were often forced to choose competitor(s) to own and operate the landing station(s), but often had difficulties in gaining access after project completion.
C. Management Structure – Many older consortium projects were developed by very large subcommittees or workgroups which reported into an overall decision-making body. Besides politicizing the decision-making process, this complex structure was also expensive because the participants of many of the workgroups were compensated under the project's budgets.
D. Financing – Up front funding of one's capacity ownership purchase was required because consortium projects do not normally offer any type of financing to the participants.
E. Provisioning Timeframes – Annual forecasting cycles for the provisioning of circuits were common in many older consortium projects and

it was basically impossible to make circuit changes between these fixed periods.

F. Decentralized Management – Management responsibilities in the project were typically divided up and assigned to different parties in the project, so circuit orders would be sent to one party while billing was with another party.
G. Competitive Issues – Openly providing your competitor(s) with your capacity activation plans in the older consortium projects was always a concern for which there seemed to be no solution.
H. "Customer" Service – Customer service in the older consortium projects was non-existent. In fact, without a qualified person to decipher the consortium documentation, it was nearly impossible for new entrants to fully know or understand everything about the project.

Most of these issues were resolved by the private and hybrid capacity resellers, however, to their dismay, various other issues developed to plague them, including:

A. Financial Visibility – The capacity user is not typically provided any visibility into the private company's financials. For IRU capacity investments, the capacity user will not know how the proceeds from the sale will be used.
B. On-Demand Purchasing – Ironically, the private and hybrid model's most damaging problem came from the model itself. An offer of capacity on-demand automatically discourages the purchase of more capacity than is required and puts pressure on capacity users to conserve bandwidth in many cases.
C. Inequitable Pricing – The concerns that a competitor might obtain a better price has caused many capacity users to implement very careful negotiation and purchasing procedures, making it much more difficult for resellers to close on capacity purchases.
D. Network Performance – With different network options available and no maintenance visibility, some type of performance assurance was needed in order to give the provider an incentive to properly maintain the project. Hence, the SLA (as discussed earlier) was developed and it introduced yet another obstacle or complication to the sales process.
E. Operational Visibility – Some capacity users have insisted that resellers provide real-time network management system data connections in order to insure operational visibility as a condition of the capacity purchase.

Naturally, most of these issues do not apply in the consortium model. As owners, the capacity users have full visibility into the costs, management, maintenance, and operations of the project. They have the opportunity to influence project decisions and the right to participate in project upgrades.

Not surprisingly, as history has shown, the private and hybrid model have not been successful (in accordance with their original business plans). In hindsight, it is easy to explain these failures with an analysis of the capacity user, including their historical perspectives and current expectations.

5. The Capacity User

This section of the paper provides an abbreviated analysis showing how the capacity user's perceptions and expectations have evolved with recent history in the industry.

5.1. What is a Capacity User?

In general terms, this paper assumes that a "Capacity User" is basically an entity that incorporates the capacity purchased into its own network in order to support the sale of retail telecom services, including voice, data, and Internet offerings to consumers or businesses. Resellers or other unlicensed entities that would use the capacity for their own internal needs are therefore not considered a part of this group.

5.2. Before "Wholesale Capacity"

Prior to the introduction of wholesale capacity sales vis-à-vis the private and hybrid models, the capacity user (a.k.a. "the customer") generally invested in traditional consortium cables on an ownership basis. Capacity ownership provided them with the facilities they required in order to support their retail telecom services offerings. At the time, the unit cost of the capacity was not a major concern since the return on the consortium ownership investment was typically about one or two years at most and all owners had essentially the same unit cost.

5.3. The Introduction of "Wholesale Capacity"

Deregulation with its resulting competition then changed the entire industry, bringing the private and hybrid models into existence. However, the expectations of the established capacity users for their primary markets did not change, except in one important aspect: the unit cost of the capacity suddenly became very important with increased competition.

When the private and hybrid models emerged, some of the capacity users decided to give the new

options a try. For certain routes, the capacity users felt they had no other choice. But in almost all cases, the capacity users regretted the cost of the capacity they purchased or leased because as the rates dropped, it hurt the early adopters the most. Some were locked into expensive long-term leases while others helplessly watched the rapid decline of value for their capacity already purchased. In various companies around the world, the individuals responsible for the purchases were blamed for making poor decisions.

5.4. The "International Cable Planner"

As just one small portion of this small, specialized industry, the undersea cable capacity user group (a.k.a. "international cable planners" or "club cable members") has always been a very close-knit group, trusting and relying upon each other for decades as the virtual "board members" of multiple consortium cables throughout the world.

These individuals typically participate in the various committees of the consortium structure, creating, implementing, and operating the project together with others in similar roles employed by their employer's competitors. Everyone wears at least two "hats" as they work both for the benefit of their employer and the benefit of the project.

As a group, these individuals have always continued to learn and to share their experiences with each other. In fact, upon joining this group, one of the first lessons to be learned as a new "Club Cable" member is that "There are no secrets." Accordingly, many recent experiences in the last few years with the purchase of capacity under the private or hybrid models have been shared throughout the group and have influenced the perceptions and expectations of the capacity user.

5.5. Perceptions & Expectations (Buyer vs. Seller)

One of the most significant differences in the perception of the capacity user (buyer) versus the (private model) capacity seller is in the valuation of capacity itself. Under the private or hybrid model, the valuation of capacity is determined by estimating the price for which it can be sold in the market. Unfortunately, the club cable members (which still handle the vast majority of capacity acquisitions around the world) normally value capacity relative to network potential unless the capacity includes ownership rights. For example, if the $100M network is capable of providing a maximum of 960 Gbps, but it is only initially equipped at 10 Gbps, then in the mind of the typical capacity buyer, the future potential of the network must be discounted from the value if it will not be transferred in the sale. For this reason, the price of IRU capacity will always be too high in the mind of the typical capacity buyer unless it is based upon something near to the fully equipped cost of the network.

Another interesting perception difference is the belief by the capacity seller that the capacity buyer actually wants to lease capacity or to purchase an IRU. In reality, most capacity purchases are in support of long-term business opportunities for the capacity buyer. Accordingly, most buyers prefer leasing capacity about as much as an average family prefers renting a house rather than owning. Basically, it is viewed about the same as burning cash and does not make sense unless one is extremely short on cash or credit (and therefore unlikely to survive anyway!).

But ironically, despite all of the significant economic advantages, it is unlikely that the average capacity user will be enthusiastically jumping back into the consortium model at it exists in the vast majority of consortium cables today. The traditional consortium model has too many inherent problems that cannot be resolved easily when competitive participants join together to create a common solution without unbiased advice and support. So if the existing consortium, private, and hybrid models all have problems, then what model should be used in the future?

Conclusion: As illustrated in this paper, the existing consortium, private, and hybrid models all fail to offer the capacity user an optimal solution. Therefore, a new model is recommended for consideration. This new model must incorporate the commercial strength of the consortium by providing the direct ownership and diversification of financial risk to meet the expectations of the capacity users. At the same time, the new model must also include the private model's open access, centralized management structure, and "customer" responsiveness in order to be successful in today's competitive markets. In order to differentiate this new model from previous models, this new model has been named the Virtual Consortium™ Model ("VCM")[4], or alternatively, it may also be called the Open Consortium™ Model ("OCM")[5]. Either way, it provides the optimal solution by bringing together the following positive attributes from each of the earlier models, as follows:

<u>From the Consortium Model</u>

- Open Equity Participation – This attribute provides the maximum incentive for long-term participation and

insures that the project will attract long-term demand forecasts from the capacity users in order to achieve lower unit costs.

- Other Ownership Benefits – This attribute would include visibility in the management and operations of the cable project with the right to influence decisions as a "shareholder" according to the ownership percentage. It also includes the right to participate in future upgrades in accordance with the pro-rata cost of such upgrades.

From the Private Model

- Open Landing Stations – This attribute allows competition vis-à-vis any participant or provider to enter into the landing stations for the provision of onward connectivity to other locations and thereby curbs monopolistic practices in the provision of backhaul.

From the Private & Hybrid Models

- Centralized Management – This attribute provides a cost-effective management structure to the model, allowing the overall project costs to be reduced. It also creates an organization that is "customer" focused, helping to improve provisioning timeframes, maintenance activities, and general responsiveness.
- Outside Financing – This attribute could optionally bring third-party financing into the model, providing the participants with the possibility of reducing the initial capital requirement or creating more flexible payment options.

The key to successful implementation of this new model is the creation of a carrier-neutral and vendor-neutral entity that is staffed with highly qualified resources specializing in undersea cable planning, implementation, operations, and maintenance. Since many capacity users are now having difficulty justifying such resources in-house, the carrier-neutral entity is actually able to satisfy the common need by providing a centralized and cost-effective resource group to perform the required work for all of the capacity users without any bias or hidden agendas. The carrier-neutral entity is completely free to explore all of the options more fully and to provide recommendations to the capacity users for decisions on items that used to be difficult, including the ownership structure, the network configuration, the supplier(s), landing stations, provisioning timeframes, backhaul networks, etc.

The carrier-neutral entity is then installed as a special, non-voting party to the MOU in order to specifically provide its specialized resources for the owners' common use during the feasibility phase. When the project enters into the implementation phase, the carrier-neutral entity cost-effectively leads the procurement implementation efforts on behalf of the project's owners, overseeing supplier management, project management, quality assurance, permitting, licensing, and landing station selection/development as required. With a small team of resources dedicated to the project, the cost of project implementation (i.e. supplier management, quality assurance, etc.) can be significantly reduced. Naturally, these cost reductions are passed along to the benefit of the project's owners.

And finally, after the project is complete, the carrier-neutral entity, as a non-voting party to the C&MA, performs the common functions required to operate and maintain the project, reporting directly to the project's management committee (or "board of directors") for any decisions that are required. These functions would include the traditional management committee coordinator; network administrator; central billing party; network maintenance authority; assignment, routing and restoration role; and finance and administration roles; which are all provided more efficiently, cost-effectively, and without any bias to the benefit of all of the owners by a single entity.

Because of the new model's flexibility, the VCM/OCM is not just limited for use with new project construction. It may also be used for other opportunities, such as a consortium purchase of a private project or even project integration opportunities. As a macro level example, project integration could include the use of some existing assets (i.e. dark fiber or wavelengths) together with new construction. At the micro level, this might mean facilitating asset swaps with individual consortium members (i.e. landing facilities, backhaul connectivity, or city-center collocation) in return for ownership in the project. Either way, the model makes it easier to maximize the use of existing assets while minimizing costly new construction, but without compromising the possibility for a reasonable competitive valuation provided through the carrier-neutral entity for any such assets which may be purchased by the project consortium.

Today, the first consortium ever assembled under this new VCM/OCM is still searching for any limitations in the model as it explores development opportunities in the Caribbean region. This consortium, which calls itself the Trans-Caribbean Cable Network (TCCN) consortium, is living proof of the viability of the new VCM/OCM. Membership in the TCCN consortium has grown to more than 50 regional operators and all of its members have a common objective to conduct a joint feasibility study in order to develop the best solution(s) for their future undersea connectivity requirements throughout the Caribbean. During the feasibility study, TCCN explored several options, ranging from the purchase of private assets for consortium use to new construction, as well as some variations in between. TCCN is presently preparing to execute agreements that will result in some new segment construction, some existing segment upgrades (dark fiber purchases), some bulk backhaul purchases, and some asset swaps. The final execution of the TCCN agreements will both confirm and announce the availability of the VCM/OCM as a new undersea cable development/ownership model for use in other regions around the world.

Accordingly, this paper submits and recommends this new model for consideration by all of the capacity users in the world because this model combines all of the positive attributes of all prior models into a single new development model, thereby creating the most optimal solution for the capacity users operating in openly competitive markets than any other model in history.

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Biography of the Author

With 13 years in the undersea cable industry, Mr. Crawford has worked on more than 15 different undersea cable projects around the world, gaining experience in all aspects of undersea cable network design, planning, construction, operations and maintenance. Formerly with AT&T Submarine Systems (now Tyco Telecom), AT&T Communications, Pacific Gateway Exchange, and New World Network, Mr. Crawford now serves as the President of Trans-Caribbean Cable Company Ltd. and Telequity Group LLC. Mr. Crawford holds a BSE in Marine Systems Engineering from the United States Merchant Marine Academy and a MBA in Business Administration from the University of Pheonix. He also is a proud father of three and has a current rank of LCDR in the U.S. Naval Reserve.

Notes:

[1] Telegeography article published on July 5, 2005.
(http://www.telegeography.com/cu/article.php?article_id=7939&email=html)

[2] Trans-Caribbean Cable Company press release on May 20, 2005.
(http://www.trans-caribbeancable.com/docs/PR%2005-20-2005.pdf)

[3] New World Network, the majority owner and reseller of ARCOS, list of landing points.
(http://www.nwncable.com/page.asp?c=3&s=10&l=1)

[4] Trademark of Telequity Group LLC, the parent company of Trans-Caribbean Cable Company Ltd.

[5] Trademark of Telequity Group LLC, the parent company of Trans-Caribbean Cable Company Ltd.