Benchmarking Process

How to Enhance Network Operators Ability to Reduce Unnecessary Costs and Adopt Best Practices

Prepared by

THE SHPIGLER GROUP
STRATEGY MANAGEMENT CONSULTING SERVICES

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The Shpigler Group is a strategy management consulting firm offering our clients a full range of services. We have designed our practice to add value to our clients' organizations, identifying suitable opportunities and optimal solutions. We deliver custom consulting services to four major industry groups:

- Energy
- Water
- Telecom
- Smart Cities

Our services include financial and operational analysis, business case development, and detailed studies that examine best practices. We listen to our clients and incorporate their input alongside our own industry knowledge, ability, and experience to develop a comprehensive plan that addresses client needs while providing viable options that add value.

The Shpigler Group offers services to clients in a wide range of areas:

- Developing feasibility studies for program implementation
- Performing benchmarking studies to support performance enhancement
- Conducting financial analysis of operations and detailing areas for improvement
- Supporting network design and construction management
- Performing technical research relating to projects or solutions designed
- Conducting management and operational audits
- Implementing go-to-market strategies
- Developing comprehensive and fact-based business plans
- Developing complete network designs and performing economic analysis of chosen models
- Developing detailed operating analysis and managing deployment efforts

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Executive Summary

Benchmarking involves the process of measuring performance of any one of a myriad of possible metrics – cost, cycle times, efficiency – to identify relative performance. Organizations typically benefit from benchmarking efforts by identifying areas where they are strong, where they are weak, and the "best practices" employed by industry leaders. By engaging in a careful and thoughtful process of benchmarking, organizations can gather key information that can help them improve their performance in a number of ways.

While benchmarking can benefit organizations from a variety of industries, telecom operators in particular have found a range of benefits from the process. Part of this stems from the wide variety of elements that can benefit from benchmarking:

- Network planning
- System maintenance
- Network monitoring
- Provisioning
- System engineering

Each of these areas can benefit from benchmarking when appropriate metrics are developed to identify ways to lower costs, reduce cycle times of certain activities, and enhance service levels. However, the process of benchmarking is complicated by the fact that no two organizations are exactly alike, requiring a careful process to ensure "apples-to-apples" comparisons that are useful and instructive.
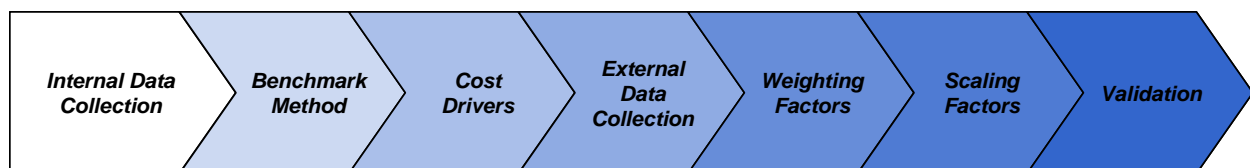
Benchmarking Process

The benefits associated with benchmarking are very clear and far-reaching:

- Gain an independent perspective about how well you perform compared to other organizations
- Drill down into performance gaps to identify areas for improvement
- Develop a standardized set of processes and metrics
- Enable a mindset and culture of continuous improvement
- Set performance expectations
- Monitor organizational performance and manage change

However, how does one engage in the act of benchmarking when no two organizations are alike? How can a process account for inherent differences between organizations...

...when one system features...	...and the other system features...
...fiber installed within the last 5 years...	...network infrastructure that date back to the 1990s?
...a mix of fiber, coaxial cable, and wireless/microwave backhaul...	...an all-fiber network?
...a network build for retail telecom services...	...a network constructed for wholesale access?
...a largely residential customer base...	...a large percentage of usage coming from commercial and industrial customers?
...a city-based system...	...a totally rural system?
...status as a subsidiary of a larger holding enterprise...	...an independent organization?

Addressing the inherent differences between different types of organizations creates challenges for any benchmarking effort, but with a thoughtful approach, useful comparisons can still be developed. From years of experience in the field of benchmarking, our team has developed a seven-step process to benchmarking to ensure the development of quality metrics that are educational and actionable:

Internal Data Collection → Benchmark Method → Cost Drivers → External Data Collection → Weighting Factors → Scaling Factors → Validation

Each step in the process is critical to ensure that the benchmarking process yields an "apples-to-apples" comparison between organizations:

- Internal Data Collection – gathering granular data from the target organization
- Benchmark Method – developing a specific approach to benchmarking that splits out key distinctions in operations in a way to facilitate the development of valuable comparisons
- Cost Drivers – identifying the drivers of performance so that comparisons are not made on non-actionable crude measures that are hard to adjust (e.g. total cost, headcount) but rather on specific drivers of each area of measurement (e.g. circuits provisioned, miles of fiber)
- External Data Collection – gathering specific data from benchmark organizations according to the benchmark method established
- Weighting Factors – performing calculations for each organization's cost drivers in a way to normalize results and yield calculations that are meaningful
- Scaling Factors – identifying the levels of performance of each organization in each area measured, adjusted for scale
- Validation – reviewing all of the results to ensure accuracy, identifying industry best practices, and developing a plan to close identified gaps
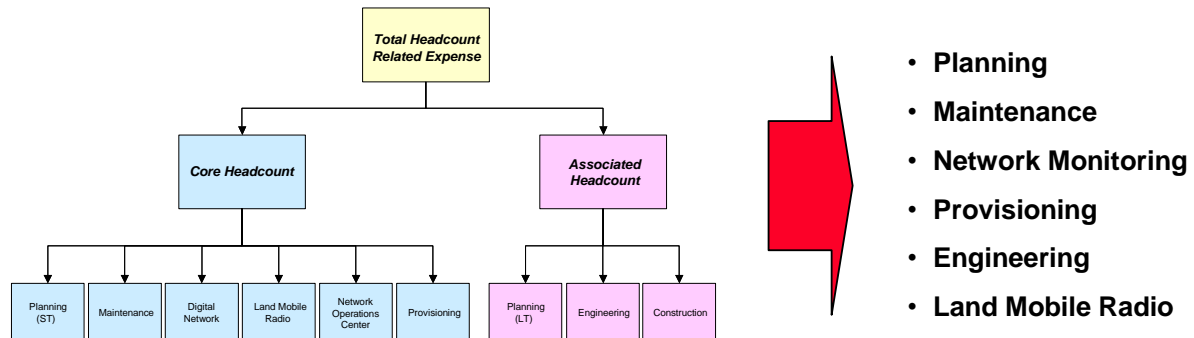
Data Collection and Benchmark Method

Data collection lies at the heart of any benchmarking effort, and there is a definitive need not just to gather data, but rather to focus on useful data. A first step in the process typically involves conducting interviews with key stakeholders and subject matter experts to develop a thorough understanding of the key processes, work functions, and output levels of the groups being benchmarked. In doing so, it is possible to develop a thorough understanding of the task at hand and to assess the organizational structure and work output of the groups to be benchmarked.

This first step can uncover some key learnings about the requirements of the benchmarking process. For example, a recent benchmarking effort of the telecommunications transport operations of one organization revealed that its outputs depended on a number of other groups, including long term planning, and engineering – ones that existed outside of the established organizational structure. Additional interviews within the company revealed a number of other associated portions of the organization, including "core" groups that were within the direct control of the benchmark activity, and other "associated" groups that had additional indirect impact. The overall organization that needed to be considered looked like this:
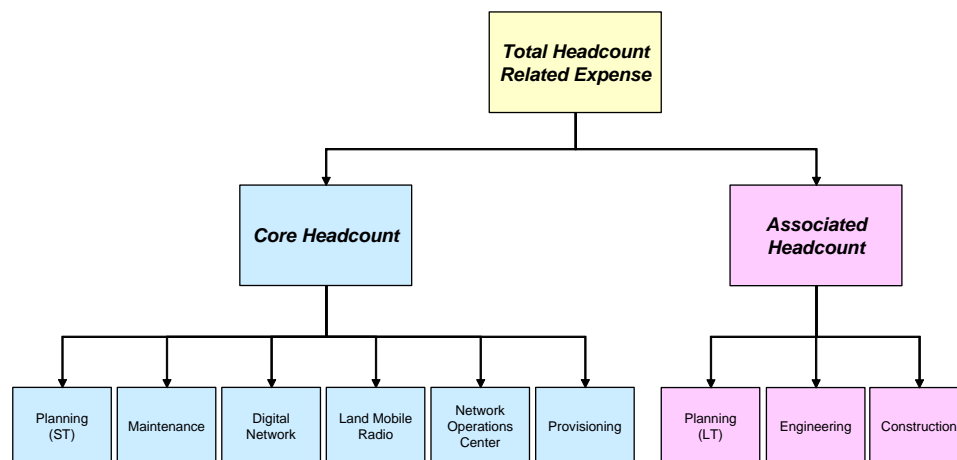
Next, it is necessary to develop a methodology for the overall benchmarking effort. Given that each organization has a different amount of work that it generates on an annual basis, applicable cost drivers would need to be established for each organization. Going through the process, it can become apparent that establishing benchmarks by organization often does not result in meaningful results. Since each organization is structured differently, the groups involved – although featuring common group names in many cases – feature different mixes of work types. As a result, it is often helpful to utilize an activity-based benchmark methodology to establish distinct work functions that are common to all companies involved in the

benchmarking effort. In the example above, we might consider developing a benchmarking approach that focuses on specific work functions rather than organizational titles:

- **Planning**
- **Maintenance**
- **Network Monitoring**
- **Provisioning**
- **Engineering**
- **Land Mobile Radio**

Comparing Internal Data to External Data

Once benchmark areas are established, it is then necessary to develop specific definitions for each activity. For example, the function labeled as "Network Planning" might be common to each company involved in the benchmarking effort. However, there exists a high likelihood that each company includes different responsibilities within the network planning function, thereby making comparisons difficult. Instead, we might consider establishing a common definition of network planning to include:

- Planning for specific customer-requested projects when no infrastructure is already in place
- Prioritizing projects
- Evaluating performance of network
- Analyzing needs for network upgrades and replacements
- Conducting technical support for optical, microwave, MUX, and power supply units
- Verifying procedures for each piece of network equipment
- Developing lab tests to ensure integrated systems function appropriately
- Evaluating viability of next generation equipment
- Serving as liaison for customer calls
- Training for technical support
- Providing strategic network planning involving ten-year time horizons
- Certifying equipment
- Planning frequency and circuits
- Planning network synchronization
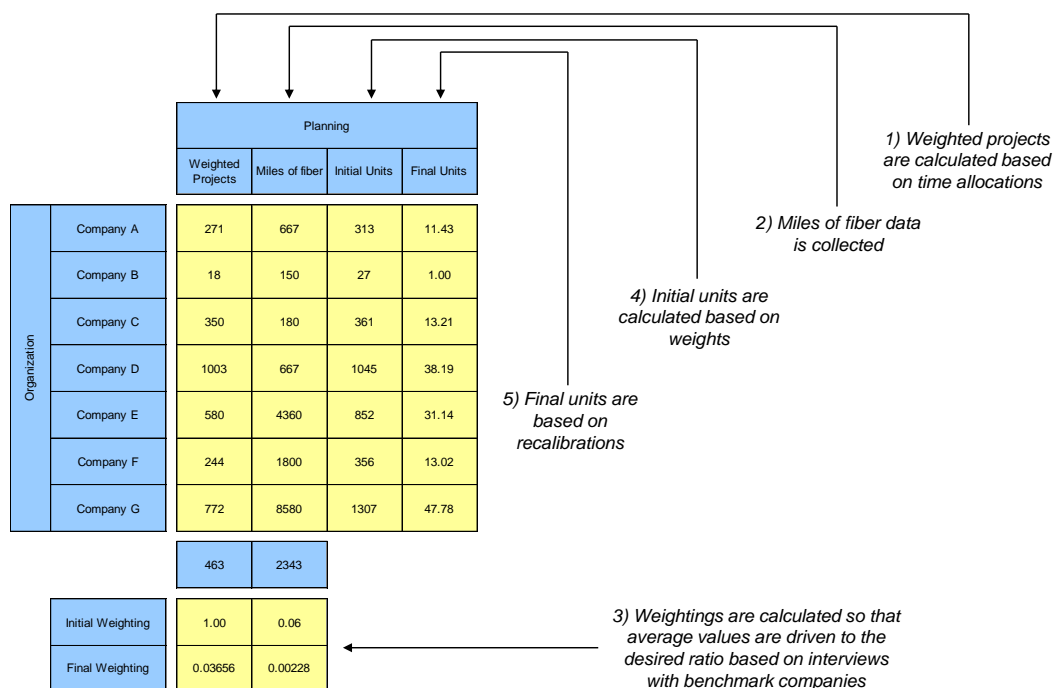- Monitoring technology evolution in industry

By comparison, the term "Engineering" might involve:

- Collecting information for equipment installation
- Developing network designs
- Verifying plans of the planning group
- Developing calculations for equipment, including propagation and specifications
- Developing standards of installation procedures

Once these common definitions are in place, data can then be gathered through interviews of the other benchmark companies. Through this process, quantitative data should be gathered at the same time as information related to operational practices, organizational structure, and work processes.

Benchmarking Analysis

Once the data is collected from each organization, it is necessary to calculate appropriate weightings to apply to work outputs in order to make appropriate cross-company comparisons. Interviews with key subject matter experts should reveal the relative importance of different cost drivers. As a result, appropriate weighting factors can be developed. Below is an illustration of a multi-step approach in comparing different elements across seven distinct companies to develop a common benchmark level:

Planning			
Weighted Projects	Miles of fiber	Initial Units	Final Units

Organization	Weighted Projects	Miles of fiber	Initial Units	Final Units
Company A	271	667	313	11.43
Company B	18	150	27	1.00
Company C	350	180	361	13.21
Company D	1003	667	1045	38.19
Company E	580	4360	852	31.14
Company F	244	1800	356	13.02
Company G	772	8580	1307	47.78
	463	2343		
Initial Weighting	1.00	0.06		
Final Weighting	0.03656	0.00228		

1) Weighted projects are calculated based on time allocations

2) Miles of fiber data is collected

4) Initial units are calculated based on weights

5) Final units are based on recalibrations

3) Weightings are calculated so that average values are driven to the desired ratio based on interviews with benchmark companies

A key component of this analysis depends on the establishment of appropriate weightings for each benchmark function. For example, establishing a benchmark of system maintenance is likely to most heavily be influenced by the number of network elements within the service territory. However, consideration should also be given to the number and size of capital projects and the overall size of the network footprint. By contrast, network monitoring is likely to be a more balanced mix of capital projects and network elements.

Moreover, it is typical to make adjustments for scale. As the scope of operations grown, it is natural for efficiencies to exist in areas of purchasing and operations. If two organizations have the same cost per unit of work output but one company is significantly smaller than the other, we would probably consider that company to be more efficient since they are able to achieve the same performance level without the benefit of scale. Scale curves adjust for this effect.

Scale curves represent the effect of size disparity in network operations and exist between a minimum of 50% and a maximum of 100%. An organizational function that features a unit cost being reduced to 50% for each doubling would suggest a function driven purely by fixed cost and no variable cost; a steady 100% level upon doubling would represent all variable cost and no fixed cost. The specific scale curve rate can vary by function, but most commonly lies somewhere between 60% and 80%. Graphically, comparing benchmark companies on a scale curve might look something like this:

Provisioning
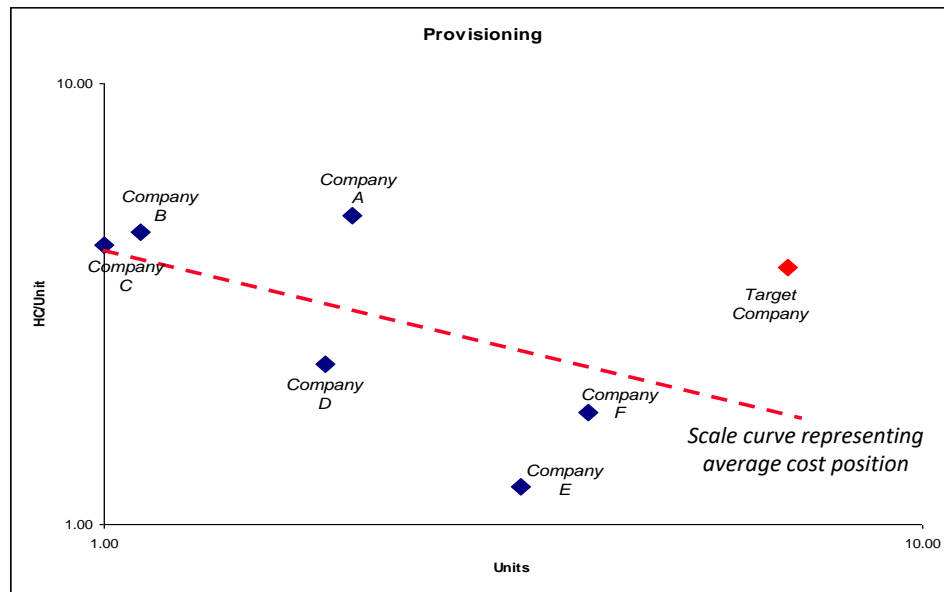
Validation

Throughout the benchmarking process, it is important to make choices that support the delivery of useful information. The validation phase is a key step to ensure that the results of the study stem from the best use of data that aligns with process objectives. For example, some elements within the benchmarking process that should be examined include:

- Quantity vs. Quality – It is often beneficial to gather data from a larger group of target companies so as to ensure that data from one or two companies that could be considered outliers do no skew the results. However, it should also be considered that quality can overcome quantity; that is, getting a deeper look into a smaller target group can yield ever greater benefit.
- Nature of Operations – All telecom organizations are inherently different, requiring the careful parsing of data to ensure valid comparisons. However, all benchmark targets should fundamentally be involved in similar scopes of operation. For example, comparing an independent local telco to a Fortune 500 long haul network provider is not likely to result in useful comparisons.
- Control for Uncontrollable Factors – There will often exist a number of factors that challenge the basis for benchmarking. For example, if a telecom provider is interested in benchmarking cost levels for network provisioning and the labor rate is loaded at very different rates, the resulting benchmark results will be affected by factors that cannot be accounted for. In this situation, a metric common to all organizations, like staffing levels, can offer more insight into the issue.
- Function vs. Organization – Since each organization is likely to be structured differently, benchmarking organizational groups is likely to result in comparisons of unlike activities and functions. A better approach is to benchmark the functions (e.g. provisioning, network planning, engineering) based on a common set of definitions across all organizations.

Summary

There are a number of results that can stem from a benchmarking process. For example, many of our clients have found that:

- Some telecom organizations have discovered ways to reduce staffing required for short-term planning through the use of automated software programs.
- In provisioning and engineering, the use of cross-trained teams often creates some natural efficiencies, leading to higher overall work outputs being generated by relatively smaller staffs. In some scenarios, it is possible to face challenges in this area due to labor agreements that limit the gains that could be realized through the adoption of cross-training practices.
- Efficiency can be gained by combining the functions of planning and engineering. For some organizations, the combination of these two areas in particular leads to a natural handoff of activities – capital projects can effectively be iteratively processed as needed within a single group without excessive delays in transitioning from one department to another. Furthermore, the natural transition of work between these two functions appears to result in better human resource planning as workflows can be anticipated more quickly.
- The use of extensive certification processes will always be an issue as it relates to overall efficiency. While the goal of certifying large number of technology platforms may be a desired goal, the benefits may fall short of the cost of achieving them. Given that technology platforms can change rapidly, engaging in extensive investigative processes may well result in suboptimal uses of human resources. Furthermore, it is possible to engage in long time cycles associated with such activities that may negate any potential gains.
- Reduction in network planning can result in short-term savings, but most commonly results in suboptimal results over the long-term.

Regardless of the functions being compared, the process of conducting a detailed benchmarking process can yield valuable insights to any organization. Where a company is strong, best practices can be identified and reinforced. Where a company finds itself farther away from best-in-class levels, specific gaps can be identified and updated work processes can be developed. In the end, fact-based analysis should always serve as the foundation for solid decision making.