

A BETTER WAY TO ASSEMBLE THE PUZZLE PIECES OF THE NETWORK FOR MROS



Whether they're independent or owned by airlines, most providers of aviation maintenance, repair, and overhaul (MRO) are wrestling with network challenges. Particularly over the past five to seven years, their international footprints have grown through a combination of acquisitions, joint ventures, partnerships, and one-off organic expansions to accommodate individual customers. Managing this dispersed patchwork of locations – with sharply different economics, cultures, and performance from one to another – has become a huge challenge.

Poorly orchestrated networks create many unfavorable consequences. For instance, different divisions within a network unknowingly bid on the same work. Asset efficiency and asset allocation is sub-optimized compared with what could be achieved through strong central coordination. Managers worry more about the profitability of the individual facility or capability than of the whole entity. Incentives are rarely tuned to optimize workflows throughout the network. Besides these hard asset and process issues, cultural differences among the facilities in a widespread, poorly integrated network can cause poor communication or even active infighting. In a recent Oliver Wyman survey of MRO executives, more than 70 percent of respondents with three or more physical locations cited managing the complexities of a global network as one of their three most pressing challenges.

MRO providers face challenges in the short and medium term around balancing customer preferences, balancing capacity, and optimizing the economics of each facility. Over the longer term, challenges center on building out the industrial and capability footprint optimally. Ultimately, optimizing each type of challenge involves balancing a series of trade-offs. This paper discusses these tradeoffs and proposes a business model to optimize MRO networks. It also looks at the organizational factors that must be addressed to successfully implement the model.

SHORT-TERM CONSIDERATIONS

Short-term issues are usually most impacted by the type of work being done. Consider a US-based, low-cost carrier with a fleet consisting primarily of regional jets. Maintenance for a regional jet airframe will likely have to be done in the United States, even though labor rates there are significantly higher than in some Asian or Latin American locations. It is simply impractical to fly a small jet long distances for a task that requires a relatively small number of person-hours. To serve any given customer, then, MRO providers need only a few locations.

For other types of work, MRO providers have more latitude. Maintenance of a small avionics component can be shipped almost anywhere at low cost, and the provider can dip into replacement inventory to give the customer while the component is being repaired. The challenge in this case becomes determining the best

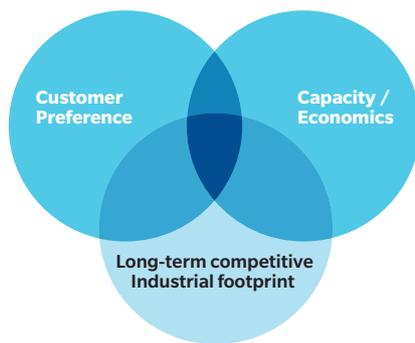
locations to build a couple of centralized, large-scale facilities for such work.

It's useful to view these issues through the simple lens of a venn diagram, as shown in Exhibit 1. The MRO provider's main challenge in the short term is balancing customer preferences (for a facility nearby, low prices, and so on) with available capacity and the economics of performing work in a particular center. As we noted earlier, the latitude to choose different facilities will be greater for components such as avionics than for airframes. (There will also be long-term considerations for the industrial footprint, which we will discuss shortly.)

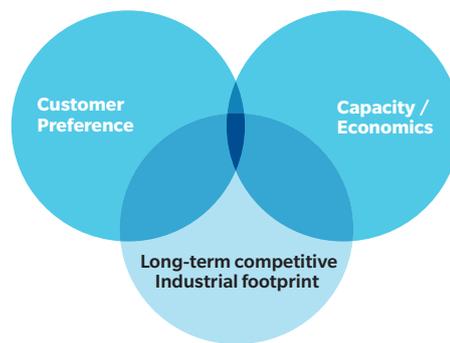
Once you establish the basic feasibility of using certain facilities for a particular MRO job, there are three main categories of consideration: customer preference, capacity, and economics. (See Exhibit 2.)

EXHIBIT 1: NETWORK OPTIMIZATION FRAMEWORK

SIGNIFICANT SCOPE FOR NETWORK OPTIMIZATION (E.G., AVIONICS, CORE LRUS)



LIMITED SCOPE FOR NETWORK OPTIMIZATION (E.G., AIRFRAME)



- Short/intermediate-term operations
- Long-term footprint and capability development

EXHIBIT 2: SHORT AND INTERMEDIATE-TERM OPTIMIZATION CONSIDERATIONS

CUSTOMER PREFERENCE	CAPACITY/FEASIBILITY	ECONOMICS
<ul style="list-style-type: none"> Is the location of existing facilities consistent with the existing customer network? To what extent does the customer have preference for fulfillment throughout the network? What is the customer's level of price elasticity for each fulfillment option? 	<ul style="list-style-type: none"> Capacity: Does capacity exist within the existing network to support additional volume in the short to intermediate-term? Capacity: How will available capacity be affected by other demands over the short/intermediate-term? Capacity: Where is capacity underutilization driving financial underperformance? Feasibility: To what degree is the work sensitive to the proximity in which it is performed? Feasibility: Is there more than one "practical" fulfillment location within the network? 	<ul style="list-style-type: none"> What are the pricing options for the customer for different fulfillment locations? What are the margin differences for work across the network? How significant is the impact of the customer origination point (location) to the economics of fulfilling the work (e.g., transportation, logistics, etc.)

Customer preference. For any particular type of work, customers vary in their preference for where it should be fulfilled. Turn-time and price typically matter most, but quality systems, confidence in local management, service levels, and accessibility also influence their choices.

Capacity. Capacity utilization changes dynamically. In certain areas of the business, such as line replaceable unit repair, it has a substantial impact on the profitability of the work. Having a clear view into the capacity utilization of each part of the business, across the entire network, is vital for the executives making commercial fulfillment decisions at contract signing or work acceptance.

Economics. Each facility in a global network typically has its own profitability model, based on costs for labor, real estate, and energy, as well as the supply of skilled talent. The basic economics can vary greatly from facility to facility, and these differences can be magnified depending on where the work originates. Thus, even though a facility in the continental United States might make 2 percent margins for a given service, while one in Latin America can boast 25 percent margins, there's a limit to how many additional facilities can be located in lower-cost regions, because of labor and facility supply constraints. Executives need to understand the economic realities of various fulfillment options in order to optimize enterprise earnings. In the case of local partnerships, for instance, the facility selection process must take into account partner interests.

LONG-TERM CONSIDERATIONS

Over the long run, other considerations surface around how to design the optimal global footprint. These factors, outlined in Exhibit 3, include capturing regional demand, optimizing cost structure, and developing centers of excellence or scale economies.

The goals in designing the global network should be to expand opportunities for geographically sensitive work and to fulfill the work across the network in a way that maximizes economic value to the enterprise. Because much of the work is geographically sensitive, reaching

ambitious growth targets will require incremental investment in facilities, whether direct, subcontracted, or through partnership. The optimal equation is minimal invested capital and maximum enterprise profitability for the target level of current and future revenue. To achieve that, MROs need to eliminate as much capability redundancy across the network as possible (for non-geographically sensitive work) and focus their investments in large-scale centers of excellence or in regional centers.

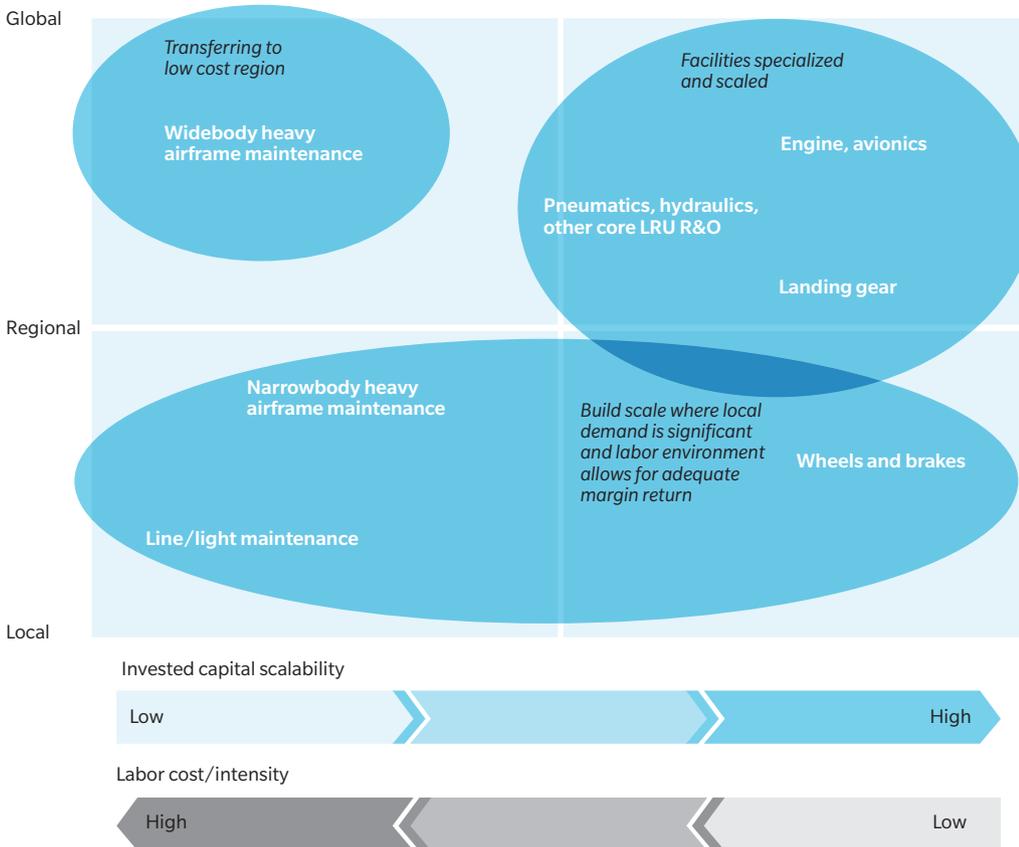
EXHIBIT 3: FACTORS IN LONG-TERM FOOTPRINT AND CAPABILITY DEVELOPMENT

REGIONAL DEMAND	COST STRUCTURE AND INFRASTRUCTURE	CENTERS OF EXCELLENCE/ ECONOMIES OF SCALE
<ul style="list-style-type: none"> Building regional centers of excellence for geographically sensitive work Concentration in areas with high localized MRO spend and major growth geographies For existing capabilities, Europe and North America are generally covered, leaving growing emerging markets a likely target 	<ul style="list-style-type: none"> Underlying labor costs and productivity Facility and overhead costs Availability of labor (professional, technical, etc.) Potential arbitrage opportunities on non-geographically sensitive work (component R&O in US to service Europe on selected components, etc.) 	<ul style="list-style-type: none"> Available economies of scale on test benches, equipment, repair processes, engineering capability, etc. Building centers of technology and process excellence with scale on non-geographically sensitive work

Exhibit 4 summarizes the factors that need to be balanced and the resulting network and capability allocation decisions.

EXHIBIT 4: LONG-TERM CAPABILITY DEVELOPMENT FRAMEWORK

GEOGRAPHIC REACH



BRINGING THE FACTORS TOGETHER

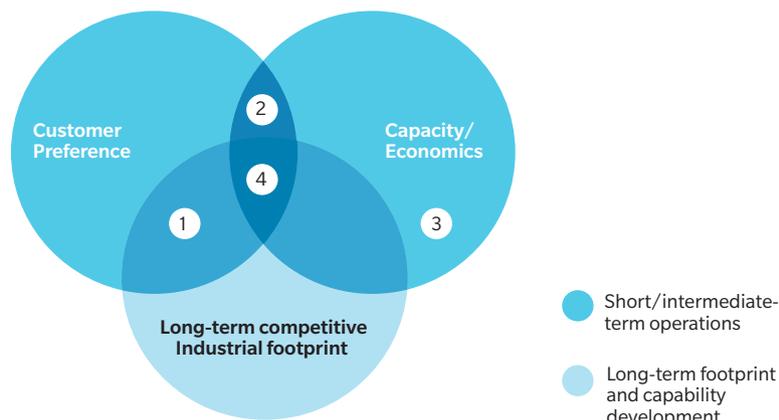
Trying to integrate these various short and long-term factors together constitutes the puzzle that is network optimization. Exhibit 5 depicts the challenge for global MRO players, again using the venn diagram. Different players will start at different points on the diagram (Marked 1 through 4). For example:

- Investment in new or expanded facilities may be wise in the long-term, provided the company can access capital and the benefits outweigh the use of available capacity. (Points 1 or 4)
- In the short term, the network will be optimized where customer demands and capacity and economics are closely aligned. (Points 2 or 4)
- When a company's capacity and resulting economics don't synchronize well with customer demands it will need to convince customers of alternative solutions in the short term, or else lose that potential revenue to competitors. (Point 3) If local demand is large enough, the company should develop a solution over the long term that economically addresses the customer's priorities. (Point 4)
- As should now be clear, point 4 represents the sweet spot where the network meets the needs of targeted customers over the long term, and short-term work is fulfilled using the economically optimal nodes of this network.

But in the real world, of course, a host of other factors may come into play. Short-term optimization tends to happen at a very local level and incorporates existing contracts with third-party vendors. Long-term decisions may be constrained by capital availability, political upheavals, channel conflict, and technical requirements.

EXHIBIT 5: NETWORK OPTIMIZATION CHALLENGE

SIGNIFICANT SCOPE FOR NETWORK OPTIMIZATION (E.G., AVIONICS, CORE LRUS)

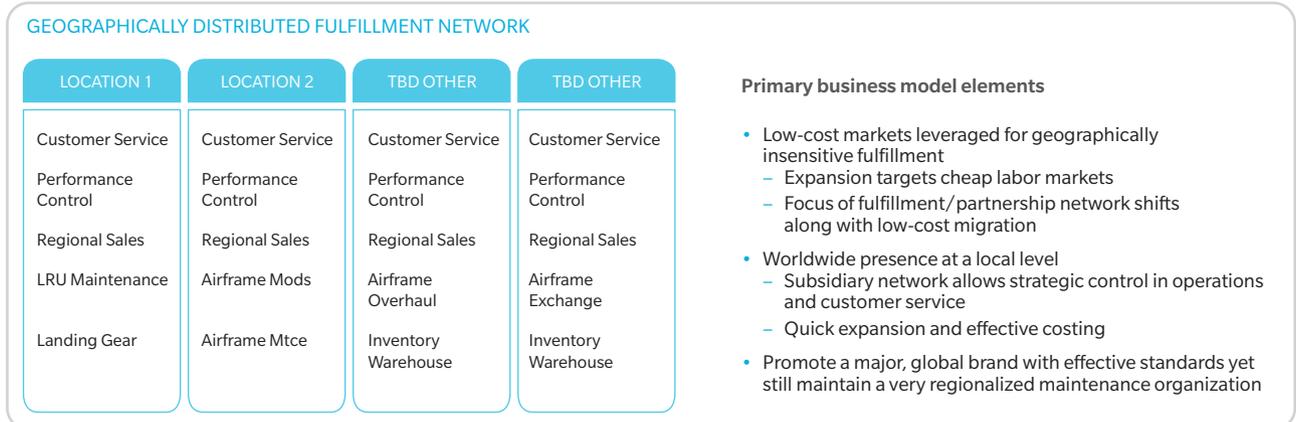
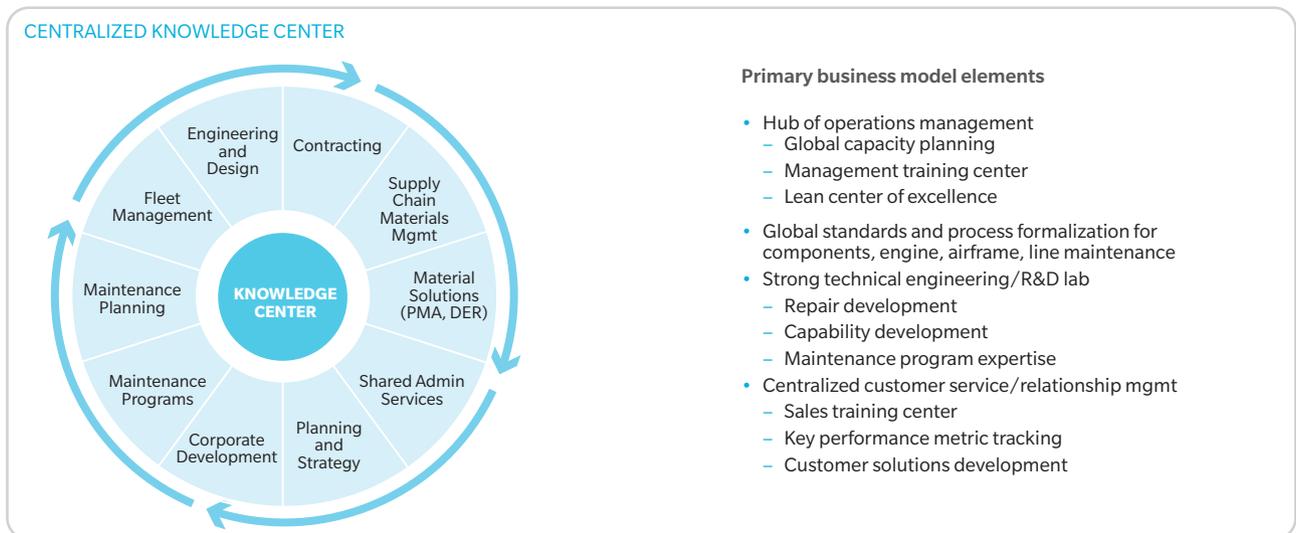


A BETTER BUSINESS MODEL FOR MULTINATIONAL MRO PROVIDERS

Based on Oliver Wyman’s extensive work in the MRO industry, we believe that the natural result of an optimization exercise will be, for most providers, a center-led business model that includes regional centers of excellence. This model has several characteristics:

- Certain functions and capabilities concentrate at the group or enterprise level, notably commercial sales, intellectual property and repair development/ engineering, and select administrative functions.
- Regional centers of excellence are built to scale, to fulfill regionally-sensitive work or to be the single center for non-regionally sensitive work.
- Regional centers reside in areas with major regional demand and where it’s possible to realize a hefty cost arbitrage among geographies. Such clusters exist in North America, Latin America, Central Europe, Southeast Asia, Middle East/North Africa, and China.
- Regional managers maintain significant levels of autonomy and operational control.
- Commercial activities are led at the group level, although many commercial employees work in the regions, and incentives focus on maximizing enterprise value, not regional revenue.

EXHIBIT 6: LONG-TERM CAPABILITY DEVELOPMENT FRAMEWORK



This business model, depicted in Exhibit 6, allows MRO providers to balance and govern short and long-term network optimization issues. This model borrows from leading multinationals in the industrial sector that have been dealing with this challenge since the emergence of large-scale globalization.

By contrast, models that push commercial activities to the business units often result in intra-organizational dueling in the market place. Models that centralize too many activities at the corporate level create bureaucracies that inhibit the creativity and agility needed to compete effectively.

REALIGNING THE ORGANIZATION, THE TOOLS, AND THE PEOPLE

Reducing the inevitable friction among the network pieces is key to a successful center-led business model. An organization that has grown primarily through acquisitions, joint ventures, and partnerships will likely consist of pieces spread around the globe with quite different cultures, behaviors, and even business processes. Reinventing the business model provides a compelling reason to rationalize these pieces and make them more congruent. And that congruence should apply not just to the formal organization and the formal processes, but also to the informal culture.

For the formal organization, congruence should reflect the following practices:

- Business development and commercial responsibility aggregate at the enterprise level. Even though the sales force is distributed geographically, team members report to a group-level position.
- Performance and sales incentives promote enterprise-level earnings. The commercial organizations obtain work regionally and then distribute it throughout the global network in the most economical way.
- Regional centers maintain operational autonomy and cost-competition with one another. By competing for current work and for expanded capabilities, they have incentives to optimize their own performance.
- Customer service and relationship management should be handled at the regional level. Employees on the ground best know how the customer wants to do business day-to-day, and they should have the autonomy to resolve issues without having to make time consuming check-ins with the center.
- Big capability development decisions are made at the group level. This supports long-term optimization

across the network, ensures minimal redundancy of capabilities, and discourages sub-scale capability development at the regional level.

- Processes and related tools should support the formal organization. As noted earlier, attaining short-term optimization depends on the ability of executives making fulfillment decisions to have a clear, up-to-date view of utilization and profit data. Some leading providers have invested in tools that provide near real-time visibility into capacity utilization.

Turning to informal culture, recognize that local habits won't disappear, despite a globalizing world. But while respecting local variations, it's also critical that the culture of every facility focuses on operational excellence.

In addition, the center must be seen as a fair arbiter of capability development, making decisions based on facts not geographic favoritism. Any whiff of favoritism can impede progress on regional operational improvements. Performance improvement and margin potential must be perceived as the primary factors in capital allocation; otherwise, local facilities will have little motivation to participate in the effort.

In summary, MRO network providers should seek to optimize their network by finding the best balance of customer preferences, capacity and economics as well as the industrial and capability footprint. As decisions are made based on the key criteria, the short and long-term implications must be considered. Implementing a MRO center-led business model that incorporates regional centers of excellence will help MRO providers place the pieces in their MRO network.

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For more information please contact

Chris Spafford

+1 214 244 3524

christopher.spafford@oliverwyman.com

Ken Aso

+1 214 720 1135

ken.aso@oliverwyman.com

Olivier Fainsilber

+33 1 45 02 32 63

olivier.fainsilber@oliverwyman.com

www.oliverwyman.com

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