

# On the FOREFRONT

A Quarterly Compilation of Outsourcing Best Practices and Case Studies

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## Driving Market Advantage: Scalability

Optimizing the outsourcing equation involves far more than simply finding a company to manufacture products in an area with low cost wages. A skilled contract manufacturer is expert at product commercialization: eliminating cost and inefficiency throughout design and development phase, offering innovative solutions that provide competitive advantage throughout the product's lifecycle, and delivering a level of quality that enhances brand reputation. The total benefits of this type of relationship go beyond cost savings. They can drive market advantage. A critical skillset in this type of partnership is the contract manufacturer's ability to support scalability.

Transfer of work among suppliers ill-prepared for changes in production volumes can be costly. The COVID-19 pandemic has set manufacturing ramp-up speed records, yet the reverse can also be true. Some products take time to gain market acceptance and need a solution strategically "sized" to likely demand. Similarly, manufacturing solutions need to align with end market logistics even as those requirements evolve.



**Forefront's vertical integration provides advantages in rapid product development and commercialization.**

In short, the ability to right size manufacturing solutions and cost effectively support end market solutions is critical.

Forefront Medical has a track record of supporting scalability needs, and routinely helping its customers commercialize new products by providing a scalable solution designed to significantly increase capacity and reduce labor cost as volumes grow.

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## Singapore Technical Centre Broadens Capabilities

Forefront Medical began investing in a Singapore Technical Centre in FY 2020, supported in part, by a Singapore government Enterprise Development Grant. The initial investment included a spiral tube extruder, precision tube extruder with on-line gauging and a braiding machine. The investments have significantly broadened Forefront's capabilities by adding new capabilities in specialty spiral tubes and braided tubes, plus enhancing precision in extruded tubing from +/-0.1mm to +/-0.03mm.

In FY2021, the Technical Centre has been further enhanced, adding capability in automation, IVD technology and microbore extrusion. Investments have been made in automated han-



**New capabilities include braided tubing.**

dling of reagents and assays to support manufacturing of consumables for IVD devices. Ad-

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## Scalability

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In new product development, Forefront Medical's team uses a standardized process in which customer requirements are assessed and a Design Development Plan (DDP) is created. Forefront's team also analyses manufacturing and assembly automation options during this DDP phase, since the ability of the product to meet its volume price target is heavily dependent on the manufacturing and automation strategy meeting cycle times and minimizing labor when production volumes are achieved. While manufacturing processes such as molding, extrusion or metal fabrication and any concomitant tooling are defined by the product design, the automation process can evolve over time as volumes increase.

Forefront's team also utilizes a standard DDP for automation, evaluating the product, its projected volumes, the fixed costs associated with an automated line and the anticipated length of the project to determine if the benefits provided by automation will outweigh the costs.

When product volumes are difficult to forecast, the team will often start the program with more manual assembly volumes, often for the first year. Once volumes become consistent, the team begins the automated production line design process.

Much of the "labor" eventually done by robots can be done by actual production operators until volumes reach a point where the cost of robotics is less than actual labor cost. Once the basic line concept is designed and computer simulated, determining the breakeven point is fairly easy.

Similarly, Forefront's management team

also analyzes the build site region and logistics equation, making recommendations, based on optimum build site and supply chain based product end markets.

### Cost Savings

The ability to lower manufacturing-related costs is often a primary motivation for out-



***In cases where volumes do not yet justify the cost of automation, Forefront Medical can use highly trained production operators.***

sourcing. However, in order to achieve the lowest total cost of ownership (TCO) it is important to consider what drives cost in the product commercialization process. Here are some key cost drivers to consider:

- Unnecessary design iterations
- Regulatory hurdles related to materials qualification
- Excessive secondary processing related to poor mold design
- Manual labor in processes that can be cost effectively automated
- Defects related to poor design for manufacturability or lack of process control
- Inefficient logistics

- Poor alignment between tooling choices and projected volumes
- Communications failures between the customer's team and the contract manufacturer's team.

In short, achieving lowest TCO requires a robust process for collaboration in the product development phase. Most unnecessary costs are driven by lack of understanding of the impact of design choices on qualification or manufacturing costs. Consequently, selecting a contract manufacturer able to keep design choices aligned with optimum manufacturability goals will result in larger cost savings.

As part of the new product introduction (NPI) effort, Forefront collaborates with its customers on identifying any needed suppliers; risk management; machine, tools and process validation; product bio-compatibility and stability validation; sterilization validation including sealing integrity; and packaging ship testing.

Forefront also operates a U.S. Technical Center to make it easier for U.S. customers to communicate with personnel in a time zone convenient to their normal work schedule. Forefront's management team, program management team and engineering team are fluent in English and multiple Chinese dialects, ensuring that project discussions are fully understood at all levels of the manufacturing process.

This comprehensive set of support capabilities helps ensure that customers are able to leverage the expertise of Forefront's team and that the team fully understands all customer requirements from the earliest stages of the project. As a result, both sides are able to collaborate on developing an optimized solution.



## Technical Centre

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divitive manufacturing (3D printing) capabilities have also been enhanced.

The goal to provide enhanced support for companies wishing to manufacture within the region, particularly those who are part of Singapore's medtech R&D hub. According to the Singapore Economic Development Board, more than 30 global medical technical companies are carrying out research and development efforts related to technology and product development in Singapore. The diversity of Singapore's population has made it an excellent option for clinical trials, as study participants can be recruited from a broad base of races and ethnicities. This can be particularly important when differences in patient physical characteristics may require adjustments to a design. Additionally, this strong focus on the medical sector helps ensure that companies pursuing product

development there have a local supply chain with the appropriate regulatory registrations and product quality standards.

Singapore's ease of doing business, intellectual property protection laws and legal system based in English Common Law further increase its attractiveness. Additionally, Singapore has 20 implemented free trade agreements (FTAs) with 31 trading partners, including the U.S.



**Forefront has made significant investments in tubing extrusion equipment in the Technical Centre over the last year, including this braiding machine.**

and the E.U. While, the criteria for classifying a product as Singapore origin may vary slightly by FTA and will require a separate process for each agreement, most products will qualify as Singapore origin under multiple FTAs, provided the product's HS code transforms during the final assembly and packaging process and there is at least

25 percent regional value content from Singapore. The Singapore Free Trade Agreement with the U.S. (SGFTA) also qualifies it as a "designated country" under the Trade Agreements Act of 1979 (TAA). As a result, products qualifying as Singapore origin under SGFTA can be sold as TAA-compliant, which can be important for products sold to U.S. government entities such as the Veteran's Administration. Products made entirely in China are not TAA-compliant.

Forefront's Technical Centre is already supporting several customers leveraging these advantages.

## A Voice of the Customer Driven Corporate Culture

The contract manufacturing business model is based on the concept that companies who outsource manufacturing are able to better focus their resources on product development and marketing. In a perfect world, a contract manufacturer becomes either an extension of its customers' manufacturing capability or their total manufacturing capability. In either case, the contract manufacturer also becomes an extension of its customers' reputations since it shares responsibility

for product quality and availability.

At Forefront Medical, we take those responsibilities seriously. It drives the investments we make in infrastructure and personnel. We feel that listening to the voice of the customer (VOC) is especially critical in the medical industry as companies in this industry are challenged to continually reduce cost without sacrificing quality. Our VOC analysis indicates that our customer base is looking for six key areas of support:

- An ability to provide a scalable solution, tailored to project requirements
- A commitment to continuous cost reduction through efficiency improvements, automation and economies of scale
- A level of vertical integration which enables one stop shopping

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# On the FOREFRONT

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Forefront Medical Technology focuses exclusively on the medical device industry and thoroughly understands the needs of this market. As a specialty contract manufacturer with a focus in disposable diagnostic, drug infusion and medical device systems, Forefront Medical has extensive expertise with injection molding, extrusion, assembly and packaging of specialty medical disposable devices. In addition, Forefront Medical Technology's technical expertise extends into collaborative product design and development, rapid SLS prototyping, in-house tool making and isolated clean rooms for manufacturing, assembly and packaging. Capabilities also include sterilization and global logistics to provide one integrated source for the total supply chain. This world class supplier has the expertise to custom design a new product... or redesign the current one...from a conceptual drawing into a completely manufactured, packaged and sterilized product, ready for global shipment.

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## Corporate Culture

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- Consistent compliance with quality and regulatory standards
- The technology expertise to add value via materials and engineering recommendations
- The ability to support compressed time to market requirements and fast market growth.



**Forefront Medical continues to invest in resources to ensure it is able to support its customers' requirements for responsiveness, quality and innovation.**

Forefront Medical's team strives to differentiate itself by providing solutions that address these six areas of support. Our internal culture further

reinforces this through six core values:

- Integrity
- Innovation
- Customer focus
- Continuous improvement
- Accountability.

As a contract manufacturer, we offer both low cost manufacturing locations and manufacturing locations where we lower cost via automation, engineering innovation or a smarter approach to logistics. Our goal is always to succeed as a business by helping our customers achieve their goals. This win-win approach helps all parties grow.

- Quality performance