



Design to Deliver: A Game Changer for the Discrete Manufacturing Industry

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Manufacturing order backlog is on the upswing, competition is fierce and customers are unrelenting in their requirements. How do manufacturing companies keep up the pace? With supply chain services coming of age and clients looking for further value adds, it is time for the industry to redefine itself and look at new strategies. Engineering Services has been on a sustained evolutionary path and is now a mature service capable of addressing many of these challenges, both from a cost perspective and with greater depth of resources than is typically available to a manufacturer. Design to Deliver (D2D) is a component of Engineering Services adopted by many industrial companies that accelerates speed to market, reduces cost of goods sold, and sustains technology leadership levels.

Is Art to Part the Same as Design to Deliver?

Art to Part is not a new concept. It involves supplying all services required to translate a concept into a product. Traditionally, industries have subcontracted the art to part activity to first-tier suppliers. However, the advent of outsourcing has taken the supply chain a leap beyond this approach. Design to Deliver (D2D) brings in a new breed of provider with specific expertise and experience in integrating product engineering, development and supply chain services. Such providers are helping manufacturing organizations achieve a higher level of flexibility, something that has been missing in the traditional supply chain for a long time.

Why Design to Deliver?

Industrial organizations have been around for the last three centuries and will be around for many more. Smart organizations aim to be the prime mover in their individual space, creating niche business models that can be copied but never replicated. D2D helps enable such innovative business models. It has been successfully applied in new product

innovation, new market localization, and value engineering exercises. The D2D approach directly impacts speed to market, cost of goods sold, and helps retain technology leadership in this rapidly shrinking world.

The Five Keys to a Vibrant D2D Ecosystem

While protecting business interests on one hand through innovative business models, manufacturing organizations must also constantly augment their shareholder interests on an operational level. A successful D2D ecosystem, therefore, encompasses both “hard” and “soft” factors. The hard factors relate to process, product and industry; the soft factors relate to human capital and intellectual capital. For the sake of brevity, geographical factors have not been considered in this paper.

From a working standpoint, product engineering, product development, strategic sourcing, supplier/part/process/tool qualification, supplier quality management and operational procurement are the drivers of the D2D environment.

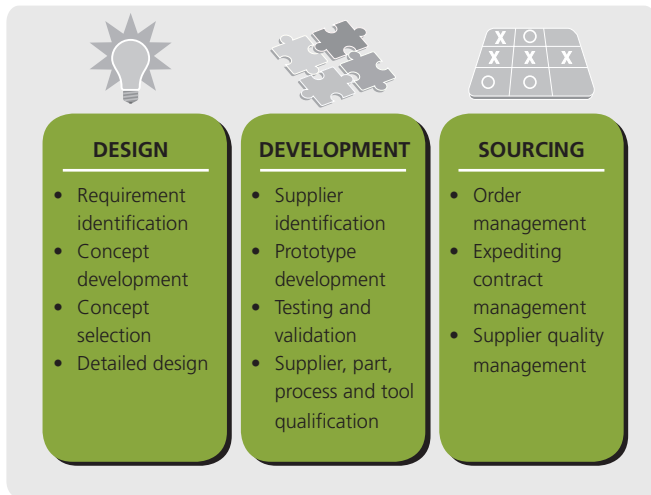
HARD FACTORS IN D2D

Process

In order to outsource any traditional process, it is crucial to understand the value chain and what can be replicated outside the organization's current boundaries. D2D begins with a well-thought-out process methodology that uses appropriate tollgates to control outcomes in the most desirable and effective manner. A mutually agreeable communication plan effectively helps sustain rigor in execution.

Identifying the existing process is done through detailed value stream mapping exercises and stakeholder interviews, which are then superimposed on the provider's D2D framework. This prevents missing linkages or process exceptions during execution. A detailed governance model identifying roles and responsibilities for all stakeholders is another effective tool that contributes significantly to project success.

Steps in a D2D process include:



Product

Creating differentiation through products requires intensive innovation at both the client and provider ends. Product innovation is an outcome achieved through rigorous adoption of contemporary methods such as patent studies, competitive analysis, teardown studies and breakthrough thinking methods like Structured Inventive Thinking. The organization should also consider the importance of subject matter expertise and consulting the right people for the solution. For example, only a castings commodity subject matter expert can recommend the features that would be possible during manufacturing, thereby saving precious design time.

Industry

While industries are classified in multiple ways, in a D2D environment the classification is driven by supply and demand. For simplicity, this article considers two broad classifications: Build to Stock and Build to Order. These two environments are significantly different, from the design process to delivery and service management of the finished products.

In a Build to Stock environment such as mass production of automobiles, appliances, or white goods, the design process is driven by frequent application of repeatable processes. New technology development is almost independent of the current

products. The design cycle time is very well managed, with well-controlled changes, and the product is almost modular. From a supply chain perspective, a high fulfillment rate is the key driver.

In a Build to Order environment such as capital goods or heavy equipment for aircraft and defense, the design process is driven by the custom application required by the customer. The design cycle time and costs associated with development are much higher, as each custom application design and development can be considered a new product. Sometimes these drive technology development and innovations. The supply chain is challenged with the same metrics as with Build to Stock; however, the volumes are lower and more dependent on macro-economic conditions.

Both these industries pass their respective challenges to the Engineering and Supply Chain communities. Service providers utilize the D2D ecosystem to intelligently identify what is needed and point the team toward the appropriate design and development process. The depth and resources provided by the D2D environment optimize the speed to market and increase the product monetization benefits.

SOFT FACTORS IN D2D

Human Capital

Managing technology experts requires a mature organization. A nurturing environment is needed, one that allows directional growth coupled with systemic interventions to help constantly drive excellence in human capital. Career-planning is an important exercise that will help the provider identify the right talent to invest in, current talent gaps, and necessary interventions in sync with the overall strategy. With this knowledge the provider can develop and implement operational plans tailored to client needs.

Most service provider organizations invest in domain expertise; however, industry-focused expertise is very critical when it comes to creating a mature D2D environment. A mix of talent, both from the domain as well as the related industry, is critical to success.

Intellectual Capital

With world GDP expected to reach \$90 trillion by 2020, the next wave of growth will be created by:

- **Environmental concerns:** Environmental deterioration and the need for greener technologies will drive a paradigm shift to renewable energy sources. Technologies in this industry will evolve the fastest in the coming decade as growing and mature economies strive for greater independence from fossil fuels and riskier technologies such as nuclear powers
- **Emerging middle class:** The spending power of the emerging economic middle class will outstrip the existing middle class in developed economies. This group is expected to be choosy in addressing their needs compared to the existing population. This shift will drive organizations to create products that best fit the new requirements. Understanding these needs and designing products that address this group will require tremendous intellectual capital that must be generated from scratch

- **Militarization will follow industrialization:** The growth acceleration in Brazil, Russia, India, and China (BRIC) will prompt greater spend on militarization to protect their vibrant economies. Newer and cost-effective technologies will drive creation of new local intellectual capitals
- **“Soft” innovation:** Creative businesses that innovate by modifying existing products into premium offerings will have first adopter advantage in the coming decade. Everything from food to appliances, transportation, entertainment, recreation and utilities will see innovation from creative manufacturers. These progressive companies will invest in “soft” innovations as they push an increase in consumption by creating new/unaddressed experiences customers are willing to pay for

All of these factors point to a decade of innovation and novelty. A systematic investment in creating and protecting intellectual capital is a prime requirement for a healthy D2D ecosystem.

Keeping the Supply Chain Flexible

Each of the five factors we have discussed is essential to establishing a successful Design to Deliver environment. Each is equally important and must be fully addressed by the organization and the provider in order to build an innovative and flexible framework capable of addressing evolutionary challenges in the global economy. Service providers must constantly improve the D2D ecosystem for manufacturers, bringing continuously upgraded expertise and depth of resources to the table. For their part, manufacturers must leverage every possible advantage in order to keep ahead of customer demand, shorten time to market, and continue to grow. Seizing the opportunities offered by D2D for greater flexibility and speedier product development is a smart way to attain competitive advantage in an increasingly demanding marketplace.

