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Information Superiority from Product Leadership

by Richard Veryard

An earlier article in *Cutter Business Technology Journal* (*CBTJ*) described the concept of information superiority and outlined how it could support organizations in achieving *customer centricity*. Customer centricity or intimacy is one of a trio of strategic value disciplines, along with product leadership and operational excellence, that emerged in the early 1990s. In this *Executive Update*, we turn our attention to *product leadership*.

Recap: Information Superiority

Information superiority is based on the idea that the ability to collect, process, and disseminate an uninterrupted flow of information will give you operational and strategic advantage. The advantage comes not only from the quantity and quality of information at your disposal, but also from processing this information faster than your competitors and/or fast enough for your customers.

Information superiority involves the following capabilities:

- Rich data gathering
- Sense making (situation awareness, model building)
- Decision making (evidence-based policy)
- Rapid feedback (adaptive response and anticipation)
- Organizational learning (knowledge and culture)
- Effective collaboration

The Idea of Product Leadership

In *Harvard Business Review*, Michael Treacy and Fred Wiersema define product leadership as striving to produce a continuous stream of state-of-the-art products and services. They identify three challenges for achieving product leadership:

1. **Incorporating creativity** — including openness to ideas from outside the company
2. **Accelerating the product lifecycle** — turning creative ideas into commercial reality
3. **Always looking beyond your existing product range** — understanding the limitations of your products in addressing customer needs, striving for both incremental and radical improvements

In this *Update*, we look at how product intelligence helps address these challenges, as well as the general business improvements that improved product data and insight can drive.

Improved Product Data and Insight

Before looking at the use of product data and insight, let's look at what this data and insight should or could include. Most companies collect some product data and use it to generate management information and analytics. However, they aren't always making full use of the data they have, and they may neglect other opportunities to collect relevant data about their products and their competitors' products.

As illustrated in Figure 1, the goal of product intelligence is to get a 360-degree view of the product space. Product intelligence entails collecting relevant data from as many sources as possible, including newer types of sources. Table 1 shows some possible examples. Companies may feel that data from their own transaction systems is more reliable and complete than data from external sources. Nevertheless, useful insights can often be gleaned even from data with a lower confidence rating.

Understanding the Product

Understanding the product starts with *identification* and *classification*. It also includes conceptually taking the product apart and putting it back together again. Many companies lack a comprehensive and joined-up view of their existing products. This may be for various reasons, including fragmented systems and processes, often involving an uncoordinated mix of commercial off-the-shelf software (COTS), multiple business units operating in different markets, and a history of M&As.

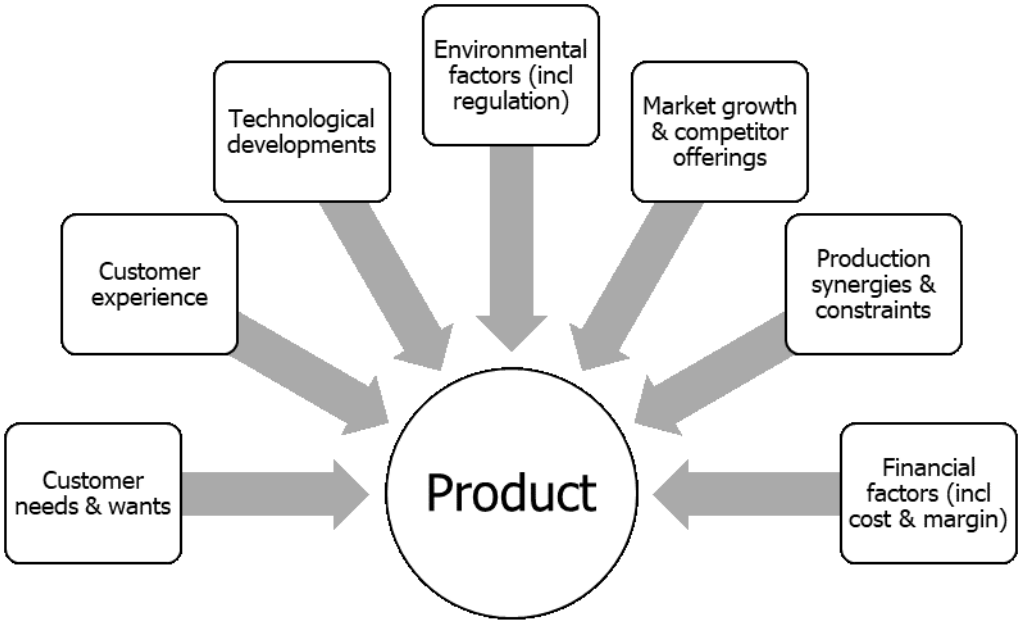

Figure 1 — 360-degree view of product.

Product instrumentation	Build data collection into the product and its support systems (e.g., Internet of Things).
Mass customization	Have customer design a personalized version of the product; aggregated customer choices feed into a broader understanding of customer needs and wants.
Internet buzz/ sentiment analysis	Monitor social media to discover how customers talk and feel about your product and its differentiating features.
Partner ecosystem	Share data with third parties.

Table 1 — New sources of product data.

Meanwhile, products are often sold in different versions and variants. In clothing, for example, the same item may be sold in several different size/color combinations. (For stock control purposes, these are called "stock keeping units" [SKUs]. Many companies refer to their products as SKUs. Obviously, this is not how customers understand product.) For some purposes, these may be counted as a single product; for other purposes, they are counted separately, and this can lead to inconsistencies between systems.

As a result, most organizations will benefit from some rationalization and convergence around the basic product data, possibly as part of a master data management initiative. A key driver of this rationalization would be a conceptual data model that cuts across the company organization, markets, and geographies.

However, it is important that this rationalization does not lose the richness of product data, especially where the data represents different viewpoints on the product. Among other things, the demand-side view of the product (i.e., how the product appears to the consumer) may be significantly different from the supply-side

view (i.e., how the product is produced), and it may be dangerous to confuse these two viewpoints. In some cases, there are several different supply-side products or product versions that appear the same to the consumer. In other cases, an identical supply-side product is given multiple identities to sell into different consumer markets. Some examples from different industries of the consumer view differing from the producer view are:

- The exact properties of agricultural ingredients vary from farm to farm, and at different times of year. Food manufacturers, therefore, vary the mix of ingredients for a given branded product in order to maintain the same consistency and flavor all year round.
- A software product is configured differently (with different components and services) according to the platform/version on which the user wishes to use it.
- A single generic painkiller is sold many times over for different kinds of pain (headaches, backaches etc.).
- Fuel regulations vary by season. What appears to the consumer to be the same fuel may be either winter-grade or summer-grade depending on the time of year.

Traditionally, companies like to organize their products into a hierarchy of categories and subcategories so that different individuals or teams can be given responsibility and decision-making authority for a specified group of products. These categories also drive the placement of products in a physical store or the structure of an online product catalog. Within companies, these categories are presented as unquestioned norms, even if they don't always make much sense to customers.

For example, in a large supermarket, after failing to find maple syrup next to the honey as I expected, I was told I should find it next to the custard, in an entirely different aisle. This placement was the consequence of how the supermarket category team had grouped products together. No doubt the category team had a logical reason for putting maple syrup and custard together, but this logic was not apparent to me as a customer. But the fact that maple syrup is in the same product category as custard doesn't just affect the shelf layout; it may also mean that maple syrup is automatically included in decisions affecting the custard category and excluded from decisions affecting the honey category (e.g., pricing and promotion decisions).

The data-driven approach is quite different. Product clustering can be generated dynamically, based on rich product intelligence. Media publishing and distribution companies (which publish books and sell music, film, video games, etc.) divide their products into genres. Whereas the industry or experts once defined these genres (e.g., in 2013 Netflix employed over 40 people hand-tagging TV shows and movies), they can now emerge organically from the patterns of consumption. Among other things, this clustering provides input to recommendation engines.

What sort of data would help a supermarket decide where to put the maple syrup as well as whether the affinity with honey is more relevant than the affinity with custard? There is a lot of behavioral history that can provide clues about the customer's view of the product and, therefore, help align the internal view of

the product with market requirements. Examples of this rich behavioral data within our maple syrup example include:

- **Search data** — observing how customers look for products online or in the store.
- **Co-purchase data** — what products are commonly bought with maple syrup? (In some cases, a specific group of products bought together might indicate a customer following this month's cake recipe.)
- **Substitution data** — what products does the customer buy or accept when maple syrup is out of stock?

Some forms of product intelligence allow us to decompose products, understanding which product features have the greatest impact on perceived value, customer selection, or customer satisfaction. Companies can use sentiment analysis to track how the market views specific features, either positively or negatively, as well as assess the strength of feeling in service and support interactions. This kind of insight is used not only in sales and marketing, but also in product development. Value-engineering techniques such as quality function deployment (QFD) have been around since the 1960s; improved access to rich product data and insight now makes these techniques much more powerful and effective.

One of the most important objectives of product intelligence is understanding how your product fits into the customer's world so you can develop improved solutions to the customer's requirements before someone else does. It's also crucial to understand any aspects of the regulatory environment that might affect product design, sales and marketing, or pricing. For example, regulators might regard some links between products and services as anticompetitive.

Navigating the Product Mix

So far, we've covered understanding one product at a time. But product intelligence needs to be able to look across many products — both your own and those of your competitors (see Table 2). For most companies, product leadership isn't about having a single world-beating product but rather about having a reasonable mix of product offerings to provide good coverage of a company's target markets. A fundamental question here is, "How many different products should we have?" Some companies go overboard in developing a

Overlapping markets	Do different products compete for the same customer? To what extent could a new product steal market share from an existing product?
Competitor analysis	Which competitor products are seen as equivalent to which of your products?
Product differentiation	What, if anything, differentiates this product from that one? What is the actual/perceived value of these differentiators?
Product substitution and replacement	Are there any detectable patterns of replacement, where a customer switches from product X to product Y? Are there any common triggers for such product switches?
Price differentials	What is the optimal price ratio between basic product and premium version?

Table 2 — Comparing products.

large number of similar products, while others try to avoid overlapping products altogether for fear of cannibalization. How do we get the balance right between these two extremes? A data-driven approach to the optimal product mix replaces unreliable experience and intuition with advanced multidimensional analytics, comparing the financial and logistical consequences across a large set of possible combinations: Here are some examples of the complex interdependencies between product sales volume:

- Introduction of product P_n affects demand for products P_1 to P_{n-1}.
- Changes in demand may affect logistical costs or volume discounts from suppliers.
- Synergies between different products may create potential cost savings.

For example, changes in the number of units delivered and sold will affect unit costs as well as revenues. Many companies estimate profit margins per product, and they use these estimates to prioritize and incentivize sales and marketing; however, if they don't dynamically recalculate these margins to reflect changing sales volumes, the resulting actions will be suboptimal.

However, emphasis on present-day revenues and margins and preference for acting on stable and predictable data might lead companies to prioritize the "cash cows," which require little investment and are consistently profitable, while neglecting products with higher growth potential but greater uncertainty. And these future-oriented products will usually need further development, whether incremental improvement to improve performance and margin or more radical change to capture new market opportunities.

Accelerating Product Innovation

Much of the product intelligence we've discussed so far can be applied simply to managing the current product portfolio more effectively. But as Treacy and Wiersema make clear, product leadership is primarily focused on innovation, both incremental and radical. A standard three-phase model of technological innovation combines product innovation, process innovation, competitive environment, and organizational structure:

1. **Fluid phase** (exploratory)
2. **Transitional phase** (convergence on solution)
3. **Specific phase** (focus on costs and performance)

Traditionally, these phases have been separated, both in time and in organizational structure. In many organizations, there isn't even a common language across the enterprise for discussing product and process innovation, let alone shared data and intelligence.

Establishing proper coordination between different organizational functions and levels is an essential component of organizational intelligence. As thought leader Chris Argyris explained many years ago, errors and unpleasant truths about products are often hidden and blocked in dysfunctional organizations. Argyris's solution to this kind of dysfunction is what he called "double-loop learning:"

> *When the plant managers and marketing people were detecting and attempting to correct error in order to manufacture Product X, that was single loop learning. When they began to confront the question whether Product X should be manufactured, that was double loop learning, because they were now questioning underlying organization policies and objectives.*

Product design is obviously an important aspect of innovation and, thanks to techniques such as QFD, there are many opportunities to feed relevant data and insight into the design process. The Design Council's Double Diamond model describes a four-step design process, alternately divergent/expanding and convergent/focusing, and offers a good view of the relationship between creativity and implementation (see Table 3).

In his analysis of the Double Diamond model ("The Challenges of Using the Double Diamond Process in Industry"), Thomas Macfarlane notes the importance of data gathering, idea generation, and testing. Macfarlane suggests some key challenges for a data-driven approach to product innovation:

- Lack of diversity in data gathering.
- Lack of openness (i.e., reluctance to share ideas for fear of releasing commercially sensitive information).
- Bias toward incremental rather than radical innovation because many sources of product data reference existing products and their commercial performance; incremental innovations may appear as lower risk.

Big data can amplify these challenges in several ways:

- Marginalizing any views or weak signals that aren't supported by large quantities of data.
- Limiting access to full data to specialists inside the organization.
- Overloading designers and decision makers with not-quite-relevant data — especially if much of the external data has a lower confidence rating than internally generated data. This can sometimes lead to procrastination and inertia, as if waiting for enough high-quality data to justify radical action.

Discover	Understanding and exploring the problem space	*Divergent*
Define	Establishing and agreeing on the requirements	*Convergent*
Develop	Exploring a wide range of alternative solutions	*Divergent*
Deliver	Refining and implementing the selected solution	*Convergent*

Table 3 — The Double Diamond model: alternating divergent and convergent thinking.

Technological research	Providing opportunities for radical innovation
Product portfolio	Pursuing how many different products
Product design/value engineering	Matching product to customer demand; designing products to optimize value for money
Pricing and promotion	Generating sales
Production and supply	Achieving economies of scale and scope
Compliance and quality	Maintaining customer satisfaction and regulatory compliance
Business partnerships	Leveraging third-party expertise and offerings

Table 4 — Potential business benefits from improved product intelligence.

Advanced product intelligence includes a search for leading indicators to break through this inertia. For example, when car manufacturers create "concept cars," they can gauge which aspects of the "concept" generate the most positive Internet buzz, as well as track influence paths (e.g., which posters express original opinions and how widely these opinions are copied and disseminated).

Conclusion

There is growing awareness among business leaders of the competitive advantages that can be obtained by exploiting data and information across the organization. In this *Update*, we examined several areas where product intelligence can improve the productivity and effectiveness of your business processes and contribute to achieving product leadership (see Table 4). Product intelligence is, therefore, an important form of information superiority for commercial organizations.

As mentioned at the beginning of this *Update*, product leadership was identified many years ago as an important value discipline for the successful business, and researchers highlighted three critical challenges for achieving product leadership: (1) openness to external ideas, (2) acceleration of the product lifecycle, and (3) constant striving for improvement beyond the existing product range.

In this *Update*, we've explored some ways in which data and intelligence can help to address these challenges. The intelligence capabilities used in data-driven enterprises and their effects, which deliver product leadership, are listed in Table 5, together with some key recommendations. However, the role of information superiority in driving business transformation is not limited to product leadership.

In an upcoming *Update*, we will look at the third of the three value disciplines: *operational excellence*.

Product Leadership Challenge	Intelligence Capabilities	Key Recommendations
Creativity — openness to ideas from outside	• Rich data gathering • Sense making • Effective collaboration	• Engage entire workforce • Leverage partner ecosystem
Accelerating innovation — faster cycle from idea to reality	• Decision making • Rapid feedback	• Foster data-driven design • Perform sentiment analysis for early indication of market reaction
Striving for incremental and radical improvements	• Organizational learning	• Employ double-loop learning

Table 5 — How information superiority answers the three challenges of product leadership.

About the Author

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