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Word Count: ~1,900

Simply Complex™

In a move to abandon complexity, resist the temptation to act just to make things simple

Generally, things left to themselves, get out of hand. Children at recess, governments, civilizations, companies, and even product portfolios are among examples. Many times, even with management, these entities can become unweilding and unyielding in their complexity. At the start of a something, there are no initial rules. He who initiates the idea, generally creates the rules going forward. From the big bang of an idea, the rules are created to contain the idea. However, out of the gate, more ideas are added to the original, so more rules are created, mostly to keep other ideas from contaminating the original. Before you know it, the germ of the idea has evolved into many ideas and many rules. There's nothing inherently wrong with this. It's just the way nature works—literally. In nature, the simple usually becomes complex over time (usually until it falls from its own weight and becomes simple again—think of a termite mound). Simple, single-celled organisms evolve to complex multicelled organisms. Simple communities evolve to complex, bio-diverse communities. The infinitesimal germ of matter big-banged itself to a wide universe. And during the process, rules of nature serve as the guide.

Successful companies are successful primarily because they managed their evolution well. They added new ideas, eliminated old ideas, added new rules and eliminated old rules. By streamlining they evolved their path to complexity. They managed the "legacy syndrome" of selectively culling ideas and rules. Rather than choking the present with everything from the past, good companies manage the ideas and rules that will serve them well going forward, leaving constricting baggage behind. Left un- or under-managed, companies suffer the same paralysis that governments suffer with the burden of the legacy syndrome, much like tax laws (which are ideas executed with rules) that are not managed well and grow and grow and grow to complex behemoth policies.

A product portfolio is a microcosmal unit of a company. The same rules apply to the portfolio as apply to the company. Left to itself, the portfolio will grow increasingly complex, eventually collapsing on its own weight. The easy thing to do is add without regard to the legacy syndrome. By adding more stuff to the portfolio, product managers believe, incorrectly, that they are adding more choice for customers. But like a restaurant's menu, just having more to offer is not necessarily better. Having too many pages of food options is as equally infuriating as having too few. Confusing a customer with complexity is not a nice way to treat the people who pay the way.

When a portfolio grows in complexity and the legacy syndrome has grown roots, it's difficult to pull them out. With complexity, it's hard to even see the problems that need to be addressed. The best analytics mask what's working and what's not. Again, it's simply

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easier to not manage the legacy than to manage for optimal performance. However, as the saying goes, “to not decide, is to decide”. Not managing a product portfolio and allowing complexity and the legacy syndrome to manage, is essentially giving up opportunity to be successful by design.

Now that the case for simple has been presented, let’s reverse slightly. A simple company, product portfolio or product, like a one page entrée menu, is not sufficiently differentiated. A product that is simple in its design may lack the barriers to entry for a long life. The key is to find the right balance between simple and complex. Once simple and complex are embraced, finding balance starts with putting simple first. Set the stage with simple and finish with complex. Standardize, minimize and repeat fewer components for the simple portion. Then finish off with complex…Simply Complex™.

Nature has great examples of how companies should operate and product lines managed. No example is more illustrative than the most elegant molecule of all (in our opinion), Deoxyribose Nucleic Acid (DNA). DNA is at the heart of the heart of all living things. The nucleic acid molecule provides the architectural blueprint to make the smallest virus to the largest blue whale, and everything in between. While it is understood that DNA has an oxygenated cousin (RNA), we’ll simplify the discussion and speak to DNA in broadest of terms.

DNA is the epitome of elegance…a lot is accomplished in a simple package. At its foundation, DNA repeatedly uses only two different base pair molecules to make every strand on earth. The pairs are in turn comprised of four different molecules. You may remember them from Bio classes by name and how they are paired: Adenine-Thymine (A-T) and Gaunine-Cytocine (G-C). While there are other molecules in the double helix, they chiefly serve the purpose of structure for the base pairs—and they too are repeated. It’s the two base pairs that create the code for all life as we know it. By arranging these paired molecules in varying sequences of different lengths, DNA creates the infinite code that leads to the biodiversity on our planet. DNA is a business persons dream product…only a few part numbers of raw material, raw materials that come free from recycled matter in the environment, and simple production instructions that can result in an infinitely unique product that is required for life to exist.

Nature trialed and errored its way into the elegance of DNA. We can learn a lesson of Simply Complex™ when designing products or processes. Pursue designs comprised of few, uncomplicated parts and then arrange them with a touch of complexity at the end for variability and differentiation. For an example of how this is implemented, think soft-serve ice cream. A large portion of the support structure is designed around the production of repeatable vanilla ice cream marketed to the masses. Widen the market appeal by mixing a flavor in at the end of the process—in fact add only a few drops of any one of 28 flavors to widen the variety and broaden the appeal. Popcorn production is another example. Start with small corn kernels, volumize with free air, and differentiate at the end with cheeses, caramel, or spices to appeal to a wider market. These products do not start with a customized product, they end with it.

The major challenge is relentless pursuit of simple followed by complex. Sounds easier than it is. If coming up with simple were simple, it was not likely done right. Apple’s Steve

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Jobs, a relentless pursuer of simplicity said “Simplicity is the ultimate sophistication. It takes a lot of work to make something simple, to truly understand the underlying challenges and come up with elegant solution.” Job’s rejection of someone’s version of simple is legendary. Even more difficult is reversing at the end to pursue Simply Complex™. Let’s now discuss a real time example of Simply Complex™.

Dynisco Instruments, Plastics division has a strong, long history. Dynisco serves the plastics industry with a respected pressure sensor. Measuring high pressure in the harsh conditions of temperatures exceeding 750°F is nasty business. We respect the technology that can survive this environment, including those of the competitors. With more than sixty years in business, Dynisco must be doing something right. But with more than six decades of experience, complexity, naturally, had taken root. While Dynisco offers more than pressure sensors, the single line of pressure sensors grew to the look-and-feel of something more complex. Arguably, marketing one product to a specialized industry, Dynisco produces and presents a fundamentally wide variety of variants. Over the years, customer requests have produced the variants (one-offs) and each time a customized variant was produced it stepped further away from a simple, repetitive code. As sensors were customized, that became the branded message. However, during the evolution of customizing one-offs, the complex portfolio became more difficult to manage. The marketing message of the offering had become complex. One type of specialized sensor had more than a hundred data sheets, each with little significant differentiation (key word “significant”). There were many cases of nearly identical products, but with different model codes for regional differentiation. Nearly every sensor evolved to become unique, making it difficult and expensive to track volume, the success of the line, or the financial performance of offerings. The quest to serve customer variation lead to difficulty in tracking what the customer really valued. What was needed was a simpler structure to better serve the customer and the financial goals.

Recently, “need” provided the impetus to change and evolve to Simply Complex™ at Dynisco. Environmental regulations and consciousness became a driver for a new product. Ridding pressure sensors of heavy and toxic metals required a new design and new technology. With a blank slate to work with, Dynisco changed the process and challenged itself to simplify everything—the development process and production process, the product, the model coding, the message—everything was fair game.

The team was created. It was a small team—simple needed to start with simple. Only one person from each discipline served as a lead. Marketing, Sales, Operations, Engineering, and Finance comprised the core team. Each lead was responsible to speak for their entire discipline, but have enough business experience to challenge the broader disciplines. Starting with Voice of Customer (VOC) input, the specs were created and then amped to “stretch goals”. Lofty goals forced the team to think in simple terms. For example, an aggressive lead time goal of less than two weeks to take and ship an order (from lead times that have grown to 12 or more weeks), meant that customizing every unit from the start was not practical. Dynisco simply could not do it the old way. Standardizing, streamlining, and parts reductions required a new, simpler design and processes. The team determined early that the large majority of the product was to be simple, loosely defined as non-proprietary, standard materials, and stockable subassemblies. The remaining design (the sensor tip) would be the touch of complexity that would truly define

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the sensor configuration. Being the smaller aspect of the sensor, Dynisco could manage a stock of variants without a significant financial penalty. So when an order arrives, match a universal subassembly with a unique tip and we have Simply Complex™. Not unlike adding pina colada flavoring to vanilla soft serve ice cream. Not quite the elegance of DNA, but a step closer.

The goal was to simplify the life for customers as well. To do this Dynisco changed the way the product (now called Vertex™) was presented. Rather than many models represented by dozens of data sheets of unique models, we now manage one code, one data sheet, and one price sheet. The new coding system allows the customer to make choices and better track the options they value. By standardizing and streamlining, the average customer can get the product quicker and at a price that is not burdened with the customizing required by another. If a customer needs something special, Vertex™ design can better accommodate the wish without adding more complexity to the foundation product.

Dynisco's Vertex™ and overall portfolio is still evolving—as it should. As Dynisco works harder to install the right amounts and sequence of simple and complex, it will use the elegance of nature and examples like DNA as a guide.

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Michael J. Davis is currently the Director of Product Management for Dynisco Instruments, LLC, located in Franklin, MA. Richard G. DiNitto is founder and President of Sleeman Hanley & DiNitto located in Boston, MA. Simply Complex™ comes from a chapter of a book being co-written by Davis and DiNitto. Both Davis and DiNitto were trained in the sciences and brought that experience to business. Davis has a BA and MS in the biological sciences. DiNitto has a BS and MS in the geological sciences. Both have additional training in finance and business. Both have a combined sixty plus years experience in managing turn-arounds, start-ups, or owning a business. Both have held titles of President, Vice President, General Manager, Director, Manager, and Specialist. Both have taught the sciences and business application at the high school and/or college level. Both have learned to look to nature to guide them in making difficult business decisions during their career.

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