



The Vitality Index, and your rate of new product development

Introduction

In an increasingly competitive world, with technology cycle times getting shorter and shorter, a company's ability to drive research which results in successful new products is a critical element. Companies need to innovate and bring continuous flow of new products to market. New products is a function of two major activities: marketing / product marketing which identify what new products are needed and drive the NDP (New product Development) and market requirement plans; and effective R&D, aligned to creating products which buyers or potential buyers need and will pay for and can deliver those products on time and to budget. R&D spend is simply a financial ratio of how much any given company spends on R&D, but management want to know more than that – how much of the R&D spend produces new products which are launched, grow and produce new revenue streams for the company? This is what is called the Vitality Index. This Application Note explains what it is, how it's measured, and why it's significant.

The Vitality Index

The Vitality Index was first believed to have been formalised by 3M. It measures the rate at which a company is able to develop and get sales from their new products. If a company is able to get lots of new products to market and those products sell, their Vitality Index will be higher. The actual definition of what is a 'new product' is dealt with later, but essentially they are the 'question marks' and 'stars' on the [BCG product portfolio matrix](#).

There are typically two ways to calculate the success of new products producing revenues:

1. \$ spent on R&D / \$ in revenue from new products (a very simple measure), measuring return on R&D spend
2. % of revenues coming from new products (this is the normal formula for Vitality Indexes)

There are also two different terminologies in use: the Vitality Index (VI), and the New Product Vitality Index (NPVI). The VI or NPVI are the same, and are calculated by the % of sales in a given year from new products introduced within a defined period of time / prior defined sales years (= 'N').

Some examples

[3M](#) is probably the most well-known example, and a company that really makes a point of being innovative and driving innovative new products. 3M's NPVI was 32% in 2011. 3M use a 5 period for their calculation, so for them, N=5 years. Considering that 3M has over 55,000 products, this means that nearly 1/3rd or nearly 18,000 new products were developed, launched onto the market, and delivering revenues within the last 5 years!

[Ingersoll-Rand](#) is another company which pays great attention to the VI, though they actually call the innovation revenues, or revenues coming innovation which they measure as the total revenues delivered by new products introduced over the last three years.. In 2011. new products and services (introduced within the last three years), contributed 23% to the company's \$14.8bn revenues, up from 13% in 2008.¹

What defines whether a new product is new?

The definition of what is new is entirely up to the company keeping the score. At 3M for example, not all of the new products are necessarily entirely new products, and many of their new products are improvements on existing products. For example, sandpaper is a major product of 3M, but was invented over 100 years ago, and every year there are improvements, with the sandpaper of today being very different from the product of 100 years ago, so 3M include changes, modifications and improvements to existing products.

[Reckitt Benckiser Group](#) (RB) is another company which prides itself on its innovation. Some of that innovation is for major new products, but they also claim they make a formula change every 8 hours², so new products can also be products which have been 'tuned', improved or adjusted.

What is more useful is to see how the VI grows and improves within one company, because this shows how dynamic NPD is, and how effectively they are using their research over time. For example at 3M, their NPVI has grown by over 50% over the last 6 years, but R&D spend (spend as a % of revenues) has remained steady at around 5-6%, so their NPVI proves that 3M is getting more bangs per \$ of R&D investment each year and that their R&D spend is very effective.

What should your VI be?

In the same way that it's difficult to know whether one is exactly comparing like with like between companies, it's hard to determine whether there is a benchmark or target which would have universal meaning. Innovation rates in some industries or products are naturally slow or long, whilst others are faster and shorter. Similarly, some industries need to invest high % of their revenues on R&D spend (telecoms, Software, IT, pharma, etc who may spend 15-25%), whilst others spend only 1-3%, so direct comparisons are very difficult and often meaningless.

Similarly, it depends upon the business model: HP, which depends heavily on R&D to drive new products, spent 4.6% of its revenues on R&D in 2014 producing \$73.7bn of revenues, whereas Dell Computers is spending much less (2.2% of revenues on R&D) for similar revenues (\$62bn), but in Dell the innovation is often outside the actual products or design.

What is arguably more important than the absolute number is that:

1. Each company sets a target which has 'stretch' (e.g., 3M has a target to raise their NPVI to 40% by 2015)
2. Companies in similar industries can benchmark themselves against each other – if they can get the data
3. The Vitality Index or rate of new products coming to market and producing revenues improves every year (although note, experience shows that this gets more difficult to sustain each year – in the first few years that a company starts measuring its VI, there will be lots of new ideas and some 'low hanging fruit'. But after 3-5 years products which were part of the VI become cash cows and more new products are needed to maintain the vitality)

Also, it will depend upon what a company's 'N' is. High tech companies will have more recent, newer product ranges with less legacy products, so some companies use the last 3 years as the period which they measure whereas other companies use 5 years.

BASF for example, the German Chemical company which makes a lot of publicity about how innovative it is, operates in the essentially conservative and relatively slow moving chemical industry. BASF state their aim is that "In 2020...to generate around \$30bn of our sales (current sales in 2014 were around \$€74bn) and €7bn of our EBITDA with the help of innovative products that will have been on the market for less than 10 years"³, so here N=10, and if sales grew to say €90bn by 2020, this would be around 30% of their revenues coming from what they define as new products.

Measuring R&D effectiveness:

As already stated, the VI / NPVI is clearly a measure of a company's ability to get new products into markets and contributing revenues, thus in effect being a measure of R&D effectiveness, but in practice there are 5 other metrics typically used for measuring R&D:

1. **R&D spend as a % of sales revenues:** (R&D \$ spend divided by revenues). This is often called an 'input' metric, because it measures only what is going into R&D
2. **Comparable competitive spend:** What comparable competition are spending as a % of sales revenues
3. **R&D Headcount:** because people are usually the largest cost in R&D, the number of people working in R&D is a key metric. This is also an input metric. However, the number of people *per se* doesn't tell you very much, so variations would be the sales revenues divided by the # of people in R&D which gives the revenues derived per person in R&D, and this changes the metric from an input to an output metric
4. **'New products released':** which simply measures the total number of new products launched in the defined period, usually the most recent trading year. Again, there is the question of what constitutes a new product
5. **Patent rate / number:** Many companies will report the number of new patents they file every year, and certainly patents should be a consequence of innovation, so there must be some link. But this metric needs careful attention, because there is little correlation between patents applied for and patents granted (China for example accounts for 10% of all patent files with the European Patent office, but only 2% of patents granted), so the ratio there is only 20% and even a patent successfully filed is no guarantor of revenues. Richard Mulsby, Director of Public Affairs for the US Patent & Trademark Office, for example said "There are around 1.5 million patents in effect and in force in this country, and of those, maybe 3,000 are commercially viable. It's a very small percentage of patents that actually turn into products that make money for people"⁴ (0.2%)

How to increase your Vitality Index?

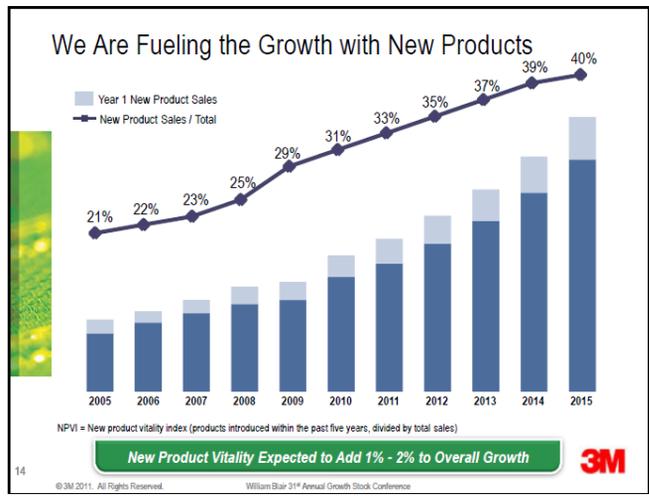
At the heart of the Vitality rate is innovation. But innovation has no intrinsic value unless it creates products and services that customers want and buy, so that innovation must be applied to domains and topics where customers need something more or better.

So the innovation has to be linked to and derived from a deep understanding of the market, and this means that numerous actors are involved in creating Vitality. Typically this should start in Marketing, who have the responsibility for identifying needs and translating them into demands, thus driving the R&D to a clear commercial output. Similarly, great designs are worth nothing if they arrive on the market too late, too little or over-specified, or if Marketing and Sales are unable to organise and mobilise the ramp to achieve superior TTV. So whilst the Vitality Index is often said to measure innovation and ability to develop products, it is really all about the ability of a company to commercialise its ideas and intellectual capital, and it needs all the parts of the process to pull together:



Conclusions and Recommendations

The rate of change, increase in velocity, shorter product life and cycle times, and increasing competition mean companies have to develop a constant flow of new products. However, developing a flow of new products is only one part of the puzzle. Products need to be delivered to the market on time (TTM), launched successfully and ramped up in volume to capture significant market share before the competition do (TTV), costs have to be controlled (TTP) and customers have to want and buy the new product (TTP). If all of this works, then the company can expect to see significant growth and a flow of new revenues streams, hopefully at higher margin than the previous generation, such as 3M are projecting to experience:



3M presentation at William_Blair31stAnnual Stock conference 2011

R&D have a significant role to play in this (the 'bangs per buck' for money invested in R&D), but marketing, sales, engineering, application / field engineers, manufacturing, distribution and so on, all have their part to play as they also impact the ability of the company to commercialise its products. At the heart is a culture and spirit of innovation, rather than just R&D. At the core is finding and addressing customers needs. This requires a cross-functional, integrated approach to product development and commercialisation.

References / sources:

- 1 Article Innovation Drives Growth at Ingersoll Rand <http://www.industryweek.com/innovation/innovation-drives-growth-ingersoll-rand>
- 2 <https://www.rb.com/innovators/the-innovation-story-at-rb>
- 3 Page 25 of BASF Annual Report 2014
- 4 <http://www.bloomberg.com/bw/stories/2005-11-09/avoiding-the-inventors-lament>

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