

PRODUCT INNOVATION: WHY A STAGE-GATE®¹ PROCESS IS CRITICAL TO NEW PRODUCT DEVELOPMENT

Innovation is many times born out of a multitude of failures punctuated by one instance of success. Thomas Edison famously said, "I have not failed, I've just found 10,000 ways that won't work."² But Edison was not a shoot from the hip inventor. A reading of the historical record tells us that he did have a well-designed process for developing his products. Edison built an entire laboratory at Menlo Park, New Jersey around it. The lab was designed to create a controlled relaxed environment in the quiet suburbs of New Jersey that would spark ideas for new products that were



both innovative and useful to the general public. It was the first laboratory devoted solely to new product development.

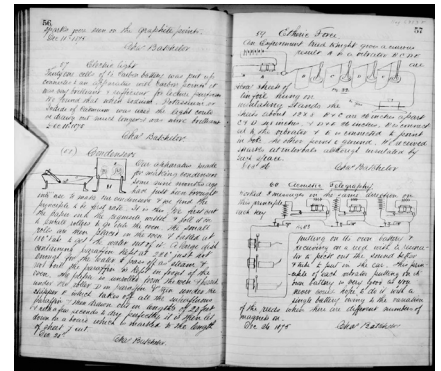
Tom and his development team recorded every experiment in full detail, including drawings of the product design, in the notebooks that were kept at the lab. Every material they used in their development process was recorded along with how it performed or failed to perform. By copiously tracking their new product development (NPD) path, they were able to avoid repeating previous failed attempts, whether they were working on the phonograph, light bulb or movie projector.³

Contemporary newspaper accounts estimated that Edison's lab contained over eight thousand different types of chemicals along with enumerable solid materials that defied the writers' imagination of their possible productive uses. Edison said, "I never did anything worth doing entirely by accident.... Almost none of my inventions were derived in that manner. They were achieved by having trained myself to be analytical and to endure and tolerate hard work."⁴ Thus he created an environment with the right tools and an innovative process that led to the creation of inventions that made him world famous.

Edison also understood that his products had to be marketable to customers. A wave of new customers were becoming available due to the industrial revolution of the late 1800's which created real disposable income for workers, which further created the demand for new products, especially products that could improve their life experience. He made it clear in another one of his famous quotes; "I never perfected an invention that I did not think about in terms of the service it might give others... I find out what the world needs, then I proceed to invent."⁵

In today's world of NPD, it is more important than ever to systematically track development stages and key decision criteria. Time and money are irreplaceable resources so expending them wisely and efficiently is essential. While there are many best practices concepts for formulating an effective NPD process, the singular issue for many companies who are struggling to develop new innovative products is that they lack a well-designed product development process.

Major product development giants like P&G, Corning, Exxon and 3M have adopted solid product innovation processes that include within it some type of stage-gate process. These companies are leaders in the development of products whose brand names are well known world-wide.⁶ In order to efficiently and effectively develop new products for the



marketplace with speed and agility, whether development is insourced or outsourced, we would highly recommend implementing a Stage-Gate process approach for Innovation and NPD teams.

WHAT IS A STAGE-GATE PROCESS?

A stage-gate (sometimes referred to as phase-gate) process is a framework for tracking product development from an idea to the distribution of finished product by dividing the development process into distinct stages separated by decision points known as gates. Stages are the areas where work is done based on a prescribed project development plan.

The gates are where the observations and data collected from the work completed in the stages are considered for the decision as to whether or not to proceed to next stage in the development process. This may include adjustments to the project plan, adding additional resources, adjusting the design of the product, sourcing of materials or even a decision to kill the project entirely.

The detailed elements in the stages will vary from company to company but generally include ideation, scoping, product design, development, engineering, manufacturing readiness and tooling, samples, testing, product launch and post launch support.⁷



STAGE-GATE PROCESS SUCCESS CRITERIA:

For companies considering or using stage-gate process, there is benchmark data that validates that companies who have a proven track record of success in bringing innovative products to marketplace share a common set of attributes. Five of the most recognized attributes for a successful process are as follows:⁸

- Customer driven focus
- Upfront activities
- Tough go/kill decision points
- Truly cross-functional teams (no walls)
- Top management involvement

For any organization to be successful in general, these attributes are very important, but for new product development, they are critical success.

The customer needs to be centric in the product development process. As Edison told us, find out what the world needs, then invent it. Marketable products need to solve a problem for customers, or potential customers. Voice of the customer data is instrumental in validating the use case that a product offers the benefits and outcomes that are unique or are superior in quality of any competitors. A satisfied customer is not only the best customer, they are also a repeat customer!

The upfront activities are important as this is where the analysis is conducted that answers the golden question: Should we build it? The elements that go into answering this question are market research studies, voice of the customer surveys, competitive landscape, resource requirements, and materials sourcing, etc. The key here is that no development is even started until this question is satisfactorily answered.

Having tough decision points to continue or kill a project are there to ensure that the merits of moving a project forward is based on empirical data and inputs. The company needs to allocate resources to the project and make competent

decisions on whether or not to continue funding the project. There are proven criteria that need to be part of the decision process:⁹

- Strategic fit for the organization
- Product and Competitive Advantage
- Marketability
- Mechanical Feasibility
- Core Competency/Synergies
- Financial Reward/Risk

NPD teams need to be cross-functional. Representatives from all parts of the organization should be part the development process. Avoid the siloed approach that is poison to any NPD process. Executive, Marketing, Engineering, Operations, as well as other key stakeholder groups must be included in the process. A stage-gate process integrates the departments and ensures that roadblocks are removed from the development process. Additionally, management needs to avoid loading too many projects into the development team's pipeline that dilutes focus and over extends resources.

Lastly, if top management is not fully engaged or committed to the projects, they will ultimately fail having expended valuable resources with no ROI. The executive team needs to be fully engaged and provide support for the process. The executive team should also demonstrate balanced oversight of the NPD team as to be sure not to stifle the creative process¹⁰ within the team. NPD requires a free and unencumbered ideation process for the development of innovative products.

VALUE OF IMPLEMENTING A STAGE-GATE PROCESS:

A well designed and well implemented stage-gate process can ensure that resources are not wasted on product development failures that will negatively impact the revenue and profits of the company. Furthermore, multiple product failures will create doubt in the marketplace of your quality standards which will cause losses in market share or worse.

The value of using a stage-gate process has been borne out in benchmark data that shows companies with a formal product innovation process are 2.5 times more successful in launching new products than their competitors, which generally translates into an increase in customers, revenue and profits.¹¹

Another important benefit of using a formalized NPD system is speed to market. By properly matching the development and production of product with the demand creation of marketing efforts tied to the launch date. Meeting publicized launch times is very critical for success of any sales team and associated ad campaigns. Slippage from anticipated launch dates seriously hinders customer confidence and may bring them to look for alternative sources. Slippage of timely new product launches for companies that use some type of stage-gate process is 17% versus 35% for companies that do not.¹²

For any organization that is developing products, a stage-gate process provides a systematic approach NPD that creates discipline and accountability for each department and member of the team. The upfront activities criteria helps ensure that the NPD process is aligned with the strategic business goals and go-to-market plan. The stage-gate process is designed to assist companies in making hard decisions to stop or move forward based on real-time data versus the emotional decision process that the pride authorship attitude can bring to many NPD processes.

IN CONCLUSION:

One of major differences between the time period in which Thomas Edison developed his products and today's fast paced world, is the warp speed at which things happen. As we look at product development throughout history, technology advances have moved generally fast. It took just forty years to go from the Wright Flyer to jet aircraft, and just another twenty years to put a man in orbit, then just seven years after that to put one on moon.



Just twenty years ago, the iPhone®, iPod® and flat screen 4K/3D TV's were still just a dream. For 60 years television's used CRT (Cathode Ray Tube) technology until 2007, when flat screen TV's sales finally surpassed CRT TV's. Now try to find a CRT TV one today!

With the social media outlets of today, consumer trends and feedback from the marketplace are nearly immediate. The appetite for new products and technology drives both the B2B and B2C marketplaces. The instant gratification that drives today's marketplace that says, "I just got to have that!"

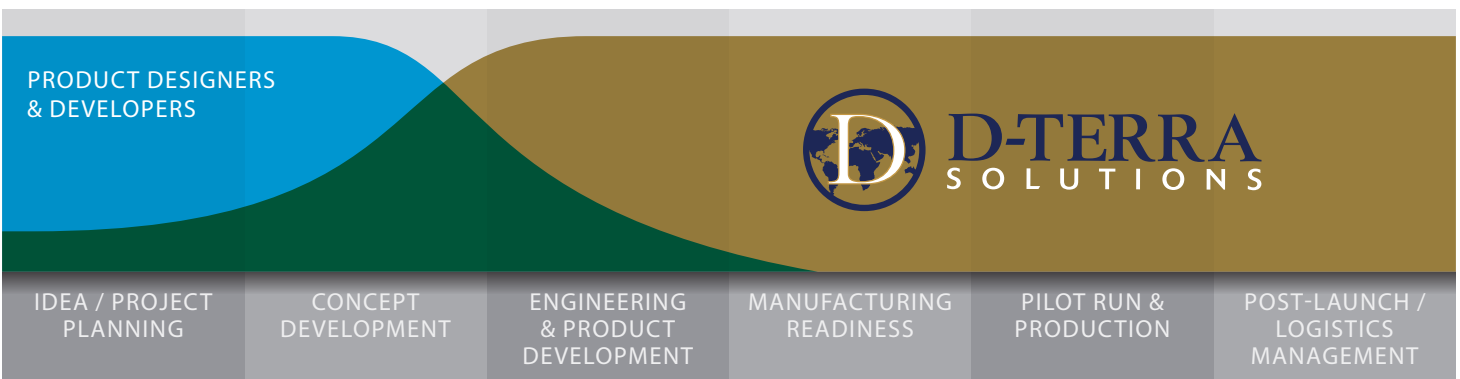
When one thinks of the first mobile phone that was introduced in 1983 by Motorola, it was heavy and not easy to carry on your person. It took them just thirteen years to deliver a lightweight palm sized mobile phone with the introduction of in the StarTAC®¹³ in 1996. The clam shell design was the first of its kind. When compared to the development of the flat screen TV technology, this would appear to be lighting fast. Just eleven years later they would be bested with the first generation iPhone®¹⁴ which was introduced in June of 2007 and is already is on its seventh generation model with features that the first generation iPhone buyers could not imagine.

Now as technology continues its advance toward the imaginary world of Tony Stark (of Iron Man comics and movie fame) and Jarvis (his intelligent speech based computer), we are most likely going to see the development of 3D hologram product engineering replacing 3D printing and hologram computer interfaces replacing the mouse, keyboard and touch screen within the next decade helping to produce new generations of products.¹⁵

What will be the next best thing that everyone just has to have? So if a company has aspirations to be the company that produces the next best thing, then we believe a stage-gate process is essential for that organization to deliver new innovative products with the speed to market that keeps customers loyal to its' brand. Otherwise, a company might find itself in a position that Thomas Edison would describe this way: "Unfortunately, there seems to be far more opportunity out there than ability.... We should remember that good fortune often happens when opportunity meets with preparation."¹⁶

ABOUT D-TERRA SOLUTIONS, LLC.

D-Terra Solutions is a product development, manufacturing and global supply chain Company with expertise that spans product design, planning, engineering, procurement, production and international logistics. We facilitate and manage comprehensive solutions—from product design to finished goods delivery—that enable our clients to sharpen your focus efficiencies and your time to market thereby reducing your investment cost while helping you realize revenue sooner. Our stage-gate process expertise make it easier to bring innovative products to market faster than your competitors. You can expect to grow your market share and sustain your brand value and competitive edge in the marketplace.



¹ Stage-Gate® is registered trademark of the Product Development Institute, Inc.

² www.thomasedison.com/quotes

³ Randall Stross, The Wizard of Menlo Park, (Crown Publishers, New York)

⁴ www.thomasedison.com/quotes

⁵ www.thomasedison.com/quotes

⁶ Scott J. Edgett and Michelle Jones "Ten Tips for Successfully Implementing a Stage-Gate® Product Innovation Process", pg.1, 2013

⁷ Arena, 2016's Best Practices for NPI & NPD, pg.1-3

⁸ Scott J. Edgett, "Idea-to-Launch (Stage-Gate®) Model: An Overview", pg. 1, 2015

⁹ Scott J. Edgett, "Idea-to-Launch (Stage-Gate®) Model: An Overview", pg. 2-4, 2015

¹⁰ Scott J. Edgett, "Idea-to-Launch (Stage-Gate®) Model: An Overview", pg. 2-4, 2015

¹¹ Robert G. Cooper And Scott J. Edgett, New Product Development, (Product Development Institute, 2005), p.5

¹² Robert G. Cooper And Scott J. Edgett, New Product Development, (Product Development Institute, 2005), p.5

¹³ StarTAC is a registered trademark of Motorola, Inc.

¹⁴ iPhone and iPod are registered trademarks of Apple Corporation

¹⁵ Marvel Studios, Iron Man 1-3, 2008-2013

¹⁶ https://www.goodreads.com/author/quotes/3091287.Thomas_A_Edison