



FAILURE IS AN OPTION

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EXECUTIVE SUMMARY

From an early on mining failure to a thriving operation today, 3M has proven itself to be a powerhouse innovator of new products. 3M possesses a rare combination of an empowered and engaged workplace culture combined with a commitment to innovative rigor to develop products that serve customers around the world. It relishes risk, embraces failure as a learning mechanism critical to the development process, and has a long-term view of what it means to be successful. Many lessons can be learned from 3M with the most powerful being that failure is an acceptable option.

Keywords: 3M, innovation, workplace culture, start-up, product development, organizational development, risk, leadership

Failure is an Option

Since its founding in 1902, “3M has been the poster child of innovation and breakthroughs in R&D and product development” (Boh, Evaristo, & Ouderkirk, 2014, p. 351). Minnesota Mining and Manufacturing (3M) started its innovative history with industrial abrasives and adhesives (Boh, Evaristo, & Ouderkirk, p. 351). Today, it has thousands of innovative products being used throughout the world. The following discusses failure as a tool, the perseverance of 3M to innovate, what makes 3M successful, the qualities found in the 3M workplace and how it can be applied in other organizations.

WHAT DOES FAILURE MEAN?

To study the history of 3M is to study what it means to fail, learn, repeat, produce, and fail again until a product is developed that will serve a viable customer base. The company’s marketing material champions this idea. “But our success and longevity were not apparent from the start. We tried. We failed. We tried something new. Repeat cycle. Innovation and perseverance drove our founders, and it continues to drive 3Mers today” (3M History). Failure has been a part of 3M’s history from the start.

3M was founded as Minnesota Mining and Manufacturing Company in 1902 in Two Harbors, Minnesota (Tieberg, February 17, 2020). 3M began with a fail as it originally attempted to mine corundum which is used in sandpaper. However, after starting operations, it discovered that its mineral deposits contained anorthosite instead (Tieberg). Early investors and a commitment to keep trying kept 3M in business until it finally turned a profit in 1916 due to the success of its first original product, the “Three-M-ite abrasive cloth” (Tieberg). The initial fourteen years was a complete financial failure, but 3M did not give up its focus on innovation and delivering products for clients. It learned how to innovate and develop successful products through its failure. 3M’s failure made it better and stronger and ready to meet client product demands of the future.

Today, through a sustained culture of innovation, learning from failure and a commitment to “scientific discovery,” 3M has pioneered thousands of products such as Scotch Tape, Post-it Notes, Scotchgard and Thermo-Fax (the first photocopier) (Tieberg, February 17, 2020). From its humble beginnings, 3M is now an innovative and thriving Fortune 500 global powerhouse (Tieberg). 3M now boasts operations in 70 countries and sales in 200 (3M History). In 2014, 3M “reached an innovation milestone with the issuance of its 100,000th patent” (3M History). As an innovative pacesetter with about 3,000 new patents currently being issued per year, 3M has no plans to abandon its organizational culture of innovation, change, and acceptance of failure (3M History). For 3M, today’s failures feed the thriving and innovative products of the future. Failure and the subsequent learning from those failures is 3M’s chosen innovative product development process.

THE PERSEVERANCE OF 3M TO INNOVATE

3M innovates by “leveraging” the expertise of its inventors who are a combination of both specialists and generalists (Boh, Evaristo, & Ouderkirk, 2014, p. 352). 3M is a model of persistence and perseverance. It often allows its specialists to focus years seeking a single innovation in a particular area. It has defined its specialists as individuals “willing to bash” up an innovative idea or technology “again and again” (Boh, Evaristo, & Ouderkirk, p. 353). This commitment to this way of working is not unique to 3M as General Electric, at least in its early days, did the same. “For example, Edison recombined ideas from both the telegraph and the telephone transmitter to generate a new idea that led to the invention of the phonograph” (Boh, Evaristo, & Ouderkirk, pp. 349-350). The perseverance and persistence to stick with its innovative processes for over 100 years place 3M in a small class of innovative and successful companies.

3M has proven that it can sustain “constant adaptation” (Coyne, 2001, p.21). With the pressures of balancing short-term cash flow and long-term growth goals, it has been remarkable that 3M remains as strong and innovative today as it was 100 years ago. 3M looks a lot like a “living organism” adapting and “transforming their behavior” based on the conditions around them (Coyne, p. 21). 3M has every “intention to live on” the newly developed products rather than to

solely rely on the “discoveries of the past” (Coyne, p. 22). This keeps it fresh, creative, and heavily reliant on its current research and innovation. An innovation gap for 3M of a few years has the potential to ruin the company. Protecting its ability to innovate and change motivates 3M to never let this happen.

By focusing on “fundamentals”, a 3M specialist avoids the common mistake of “becoming tunnel-visioned” (Boh, Evaristo, & Ouderkirk, 2014, p. 353). By contrast, 3M’s generalists “prefer to work in new areas constantly” with multiple projects going on at the same time. The 3M generalist is characterized by constantly learning in a wide variety of areas and then combining new knowledge with previous experience to innovate and create exciting products (Boh, Evaristo, & Ouderkirk, pp. 353-354). By combining these two types of innovators and recognizing the need for both types in the creative process, 3M has been able to develop well over 60,000 products through hard work and perseverance (Boh, Evaristo, & Ouderkirk, p. 351).

WHAT MAKES 3M CONTINUALLY SUCCESSFUL?

As discussed, 3M personnel are allowed to fail as they drive towards creating amazing products for their clients. “Failure is part of the innovative process” and is seen as a learning experience (Conceição, Hamill, & Pinheiro, 2002, p. 32). Learning from failure and management’s support for it provides the freedom for 3M employees to initiate, take a risk, and keep trying (Conceição, Hamill, & Pinheiro, p. 32). This provides a level of baseline job security to everyone willing to take the risk and seek to innovate.

Innovation and “new ideas are built from existing ones” (Boh, Evaristo, & Ouderkirk, 2014, p. 349). By never starting from scratch, pulling technical experts from around the company, and pooling resources allows 3M to be in the enviable position of always having new or improved ideas ready to take to the marketplace. This process empowers 3M to capitalize on its rich prior development, lessons learned, and the latest ideas at the same time.

Obtaining product and idea feedback is conducted through an intense technical audit process. 3M’s technical audit process stresses “open and honest” feedback executed in a way that does

“not stifle 3M’s valuable innovative climate” (Krogh et al., 1988, p. 10). The audit process is looked at as a constructive “tool” with audit feedback viewed as things to consider rather than rules to follow (Krogh et al., p. 10). It is a disciplined process and taken very seriously throughout the organization. It looks at product uniqueness, competitiveness, relationship and fit with core existing products and marketplace potential of new products ((Krogh et al., pp. 11-12). The investment is costly requiring dedicated employees and laboratories to test and evaluate ideas and products (Krogh et al., p. 13). However, based on the results and the success of thousands of marketplace products it is viewed as well worth the investment required to keep it going.

3M has built a tradition of innovation by “having a sense of direction or vision”, staying close to the needs of its customers, and operating at a “vigorous pace” (Coyne, 2001, p. 22). This requires leadership to fully embrace the empowerment of its employees, teams, and business units (Coyne, p. 23). Leadership regularly rewards individual contributions through public recognition in the “technical hall of fame” (Coyne, p. 24).

3M believes in a sales philosophy first championed by a young employee named William L. McKnight in 1907 to “stay close to the customer” (Angle, Manz, & Van de Ven, 1985, p. 56). Staying close to the customers also requires 3M to stay close to the greater marketplace that contains potential partners, suppliers, and competitors. Many conglomerates fail when they develop a wrong relationship with one of these especially when it comes to acquisitions. 3M remains cautious about acquisitions and views them as a cultural challenge that requires a lot of attention and due diligence before undertaking (Angle, Manz, & Van de Ven, p. 64). 3M would prefer to develop talent and products from within its already well-established innovative culture which has over 100 years of proven success.

THE 3M WORKPLACE: IT'S MOST INNOVATIVE PRODUCT

William L. McKnight who first started serving as president in 1929 and then became chairman of the board in 1949 is credited for creating the workplace culture that “encourages employee initiative and innovation” in a secure and supportive environment (Roepke, Agarwal, & Ferratt, 2000, p. 329). This required that the management of 3M develop tolerance and patience with its employees to find success. 3M regularly develops workplace initiatives such as the “Personal Leadership Curriculum” to “get people to take responsibility, to handle change in the workplace, and to learn to be continually adaptive” (Roepke, Agarwal, & Ferratt, p. 336). Tanis Beadle, a long-time retired 3M employee states: “Personal leadership applies to everybody at every level, including interns” (Roepke, Agarwal, & Ferratt, p. 339).

3M is “today recognized around the globe as one of the world’s most innovative and admired companies” (Conceição, Hamill, & Pinheiro, 2002, p. 30). 3M has a culture of supportive management that encourages employee initiative and innovation (Conceição, Hamill, & Pinheiro, p. 30). Through this top-down encouragement, 3M empowers its inventive employees to succeed.

3M has championed its “innovative spirit” by adopting two fundamental rules: “30%/4 Rule” and the “15% Rule” (Conceição, Hamill, & Pinheiro, 2002, p. 31). The first mandates that 30% of 3M’s sales are from products placed in the marketplace within the last four years (Conceição, Hamill, & Pinheiro, p. 31). The second allows all “technical people” to spend 15% of their time on projects that they choose without needing management’s approval or knowledge (Conceição, Hamill, & Pinheiro, p. 31). These rules complement each other and drive innovation. However, they do not stand alone as they are also combined with four additional creative strategies: products must be oriented to a particular “customer base”, innovations are “shared” throughout the entire company, combinations are actively sought between new technologies and existing

“core technologies”, and new products are secured through “strong intellectual property protection” (Conceição, Hamill, & Pinheiro, p. 31).

3M is constantly looking for new ways to drive the creative process and to never settle for sticking to processes just because they have worked before. For example, starting in 2001, 3M embraced the “2x/3x process” which sought to “double the number of new ideas entering the front end of the commercialization process and triple the commercial impact of products going to full-scale launch” (Stevens, 2004, p. 4). 3M also looks to embrace proven process ideas from outside the company such as Six Sigma (Stevens, p. 4). These new process ideas when combined with the 15% rule enable 3M to continue to be a leader in innovation.

3M looks at workplace knowledge management “more as a cultural and organizational issue than a technological one” (Brand, 1998, p. 17). 3M strongly encourages its employees to access, organize, and share new knowledge across the entire organization (Brand, p. 17). The 3M environment promotes “generosity, freedom, and safety” which, in turn, allows knowledge sharing and innovation to succeed (Brand, p. 17). By motivating its employees to embrace knowledge management, the entire workplace becomes smarter and more innovative. Successful teams of long-standing and loyal employees fuel the knowledge management practices of 3M (Brand, p. 22). In this way, 3M creates a workplace culture of communication and sharing (Coyne, 2001, p. 23).

3M has had a long tradition of “hiring-at-the bottom and promotion-from-within” (Angle, Manz, & Van de Ven, 1985, p. 57). Combining this with a reputation for finding alternative jobs within the company for those valuable employees who have been “displaced”, leads to a high level of job satisfaction and feeling of security within the company (Angle, Manz, & Van de Ven, p. 57). Valuable employees see themselves having an excellent, full, and life-long career at 3M.

Since the late 1970s, 3M has focused on developing the leadership of “line managers” and creating a professional human resources team to recruit, develop, and retain employees (Angle, Manz, & Van de Ven, 1985, p. 61). 3M has found the strength of its culture and human resources practices strong enough to travel from Minnesota to around the world even into

countries such as Russia. 3M has been operating and innovating products in Russia since the 1950s (Grachev, Rogovsky, & Bobina, 2006, p. 810). It has helped launch new companies and create partnerships throughout the country because of how it manages its people and assimilates its technology into products that will meet the needs of customers within Russia (Grachev, Rogovsky, & Bobina, p. 810). 3M incorporates “a system of strategic pillars” which are vision, goals, values, and growth drivers into its operations in Russia (Grachev, Rogovsky, & Bobina, p. 812). The same successful practices of leadership, human resource management, and innovative vigor that make 3M a success in the United States has translated well to Russia. This gives 3M the confidence it needs to take its operations to and be competitive in any part of the world. The 3M way simply works.

DISCUSSION OF 3M’S SUCCESS AND APPLICATION

The 3M story of success is hard to beat. It is not one particular process or idea that makes 3M work, but the tapestry of many individually good practices being combined to form the complete innovative and business model that makes 3M successful. Early on, as a start-up, 3M assembled an investment team and individuals committed to a large “runway” to give 3M the time it needed to be successful. Ries (2011) states “the true measure of runway is how many pivots a startup has left: the number of opportunities it has to make a fundamental change to its business strategy” (p. 160). 3M had the vision to surround itself with both investors and leaders who were willing to give a lot of freedom for 3M to pivot until it could develop the first few successful products.

The early failures were not wasted efforts. They were critical to teaching the initial team of employees and investors a workable innovative process. One that would define the company. This alignment and commitment to get the process right above short-term profits is critical. Learning and spending the time to develop the beginning of the research pipeline is fundamental for any aspiring product development company. Today, Apple is a good example of a company that has struggled in its past with getting the process right, but when it finally got things straight amazing products were produced.

3M puts as much emphasis on its workplace culture as it does on the innovation process itself. It looks to develop both, and this is a primary reason why it remains so successful today. When processes and procedures dominate too much in an organization then the “business systems become overly rigid and thereby fail to take advantage of the adaptability, creativity, and wisdom of individual workers” (Ries, 2011, p. 277). At 3M, the individual and the team efforts are celebrated when a new successful product has been launched. Too often, organizations fail to recognize the individuals and teams that achieve success. This is a missed opportunity to reward the successful and to motivate others to persevere so that they too will be successful.

Taking a risk is rewarded at 3M. Its product development pipeline was built one risk acceptance at a time. The only risk that 3M recognizes is to lose its way and that to stop failing, learning from the failure, or striving to develop the next great product.

3M does not focus on its competitors which allows it to be completely customer-centric in the development of its products. Similarly, Starbucks was able to achieve marketplace success in much the same manner by almost completely ignoring the competition. Howard Schultz, the CEO of Starbucks, states “Starbucks has never felt threatened by the mom-and-pop coffees stores” even though Starbucks on the surface would look to compete with them (Schultz & Yang, 1997, p. 192). Starbucks just views them as helping to enlarge the marketplace for all. 3M with its pace, vigor, empowered individuals and innovative processes competes only with itself and its historic pace of development. 3M will be around as long as it keeps going the way it is, not by some outside competitor knocking it out. 3M knows this and works every day to preserve this stratospheric marketplace advantage.

Finally, the workplace culture of recruiting young and promoting from within allows employees to be invested in 3M for the long-term. This creates an enormous amount of corporate and organizational knowledge. Employees can build deep and well-connected networks with others in the organization. This creates opportunities to share knowledge, collaborate, and help each other out. The strength of 3M is its empowered and engaged workforce combined with its proven product development processes.

CONCLUSION

Oster (2011) discusses the importance of aligning a project (or product strategy) with organizational strategy (p. 166). At 3M, this alignment is on full display. With leadership's full support employees are empowered to fail, learn, develop, fail again, repeat, and finally launch a customer in-demand product. It is 3M's commitment to creating a dynamic and engaged workplace culture combined with a creed to innovative product development excellence that has paved the way for success for 3M. It is willing to invest in long runways as it seeks new products and is constantly looking to shake up the products it brings into the marketplace. From humble beginnings to a dominant product developer, 3M has shown the world that failure and learning from that failure is an option.

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