

Why and how has GE built and sustained innovation?

A Profile of GE's policies and management practices which contribute to its entrepreneurship and innovation

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Corporate Innovation Online

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Innovation Management Center



- Strategy is the science and art of using the resources of the business to execute approved plans as effectively as possible.
- Management practices is to do or perform habitually, customarily, in order to acquire or polish a skill
- Policies; a plan or course of action, as in a business, and intended to influence and determine decisions and actions
- Culture; a prevailing condition or set of attitudes in human affairs; behaviour patterns and beliefs

'An innovative climate is not just a sentimental need. It has powerful business implications and can bring real results. There's a reason why companies like Google and Apple have such a breathtaking record of rapid innovation; you need to look no further than their climate. A climate of innovation ensures that you'll have the inherent ability to not just innovate with an occasional flash of brilliance, but to do so continuously. That's an extremely important strategic advantage to have in a fast-moving marketplace that's overcrowded with competitors'. Source; Future Link.

Executive Summary

Founded in 1889, and consolidated into the General Electric Company in 1892, GE has a well established reputation as an outstandingly innovative company.

Thomas Edison, who founded the firm, established policies and introduced management practices which fostered a culture for innovation. While GE's innovative performance has experienced both good and difficult periods, influenced by each successive leader, there is no doubt that the company's policies and practices, which have made it so entrepreneurial and innovative, can be traced to the early influence of the founder.

Over the most recent decades – the focus of this Profile, GE has experienced 2 leadership regimes; Jack Welch, from 1981 to 2001 and since 2001, Jeff Immelt.

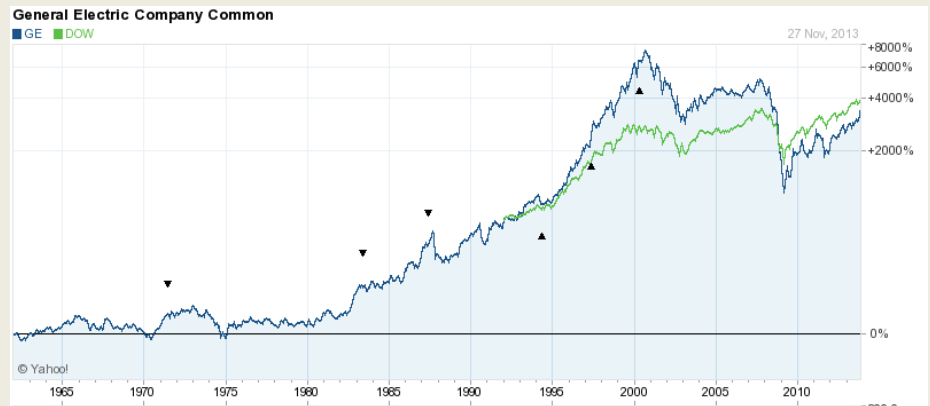
GE's culture for innovation – the product of its policies and management practices - is currently undergoing a reshaping under Immelt – as it did under Welch – but with a difference emphasis.

Immelt is taking steps to swing the emphasis back to what one would consider to be GE's traditional innovation – i.e. with a greater emphasis on embracing new ideas and organic growth and not so much on the achievement of short-term financial results.

GE is often looked upon as a bell-weather of the U.S. economy. GE stock, over the long term – since first listing on the NYSE - ends up behind the DOW but had a period of

stellar performance in the 90s and into the early 2000s.

Under Jack Welch up to 2001, GE stock had a wonderful ride in terms of its stock price but more importantly, from a management perspective, it was viewed as the company to be with if one wanted good management experience.



Strategic planning methodologies were developed and applied in GE. It was known as a great training ground and spawned a cadre of executives who now find themselves in senior roles in America's business.

Our first Profile of GE was completed in 2009¹ well after Jeff Immelt's assumption of the CEO role but, occasioned by the publication of his book². The book's publication provides a perspective on innovation in GE during and insight into the then current thinking of its CEO; Jeff Immelt.

This Profile documents the culture of GE from the time of Edison, the founder who set the corporation's tone for innovation.

Those following Edison have maintained the culture. For some at GE it proved difficult for some managers to actually articulate the

¹ <http://www.corporateinnovationonline.com/innovation-culture-profiles/>

² The New GE Way, by David McGee

culture of GE. They knew what it wasn't but could not so clearly state what the culture was. Culture is often latent and tracks below the surface.

There is a suggestion that during Welch's time, the culture shifted away from an emphasis on technology to achieving financial performance. This is in the process of being redressed by Immelt.

GE, under Immelt has increased spending on R&D from the 5% of revenue range to 6%, again reinforcing the revised direction which senior management has taken. GE now, in contrast to the time under Welch, has been restored to top 10³ filers of patents in the U.S.

A major theme of most recent publications on GE clearly point out that there has been a concern respecting the size of the organization and the management challenge of such a large organization. As the global roll out continues with ever more physically far flung operations growing at astonishing speeds, a new approach to management is required and is apparently underway. Entrepreneurship and innovation are receiving more attention than ever.

The new theme⁴ is referred to as 'Simplification'. Immelt's recent examination of venture capital organizations and how they manage their investments provides insights into upcoming changes in policies and management practices.

- Take on fewer 'things' but do a better job and choose those with a bigger impact

- Position decision makers closer to the action and do delegate responsibility and accountability
- Remove the sense of a 'headquarters' and layers of 'checkers'
- Move faster on decision making – but keep accountability intact

These initiatives result to some extent from his time spent with venture capitalists – those persons used to small but potentially rapidly growing market and business dynamics. Avoiding bureaucracy and arrogance is the intent – and with the objective of reducing the ratio of 'selling, general and administrative expenses (to below 16%).

The 'Simplification' initiatives is a recognition that 'GE was becoming too complicated'⁵. Restoring entrepreneurship and innovation is clearly Immelt's intent; a focus on customers, people and solving problems.

A performance measure of innovation and entrepreneurship in GE is the statement that 'About one-third of our infrastructure revenues comes from business we weren't in a decade ago'. Strategically, GE is positioning itself as an 'infrastructure company'.

Our first Profile set out Immelt's objectives. In our opinion he has followed through on those well-expressed intentions and by so doing has again righted the GE ship.

Our summary ranking of GE is set out in Appendix A. With few exceptions, GE ranks close on with our 'Best of Breed' when it comes to policies and management practices encouraging entrepreneurship and innovation.

³ GE Annual Report; 2012

⁴ ibid

⁵ ibid

Background to GE's culture – the product of its policies and management practices

Why is it important to understand the why and how of innovation in a company the size and scope of GE?

In Peter M. Senge's book, *The Fifth Discipline*, he points out that⁶ one of the distinguishing differences between the public and the private sector is that the latter, 'is the locus of innovation in an open society'. GE, being of the size that it is, represents a major source of new ideas and products globally and has done so for well over a century. We therefore need to understand how this powerful and influential company has built and sustained entrepreneurship and innovation⁷ over its history.

GE's overall organization and divisional structure needs careful examination in order that one can better understand innovativeness and the effect that policies and management practices have on the culture for innovation.

With a company of the overall size and scope of GE, and given the size of individual divisions, there may well be more than one innovative culture in place. Our research is unable to note differences among business units and focusses on the totality of GE.

It is, however, interesting to note the difference in management practices (in this case reward mechanisms in the financial services SBU versus the balance of GE)

⁶ *The Fifth Discipline*, p 15.

⁷ As an aside to his book, Senge also notes the difference in the terms used; "invented" - when it works in the laboratory, an "innovation" when it can be practically replicated and if it is sufficiently important it becomes known as "basic innovation" and a new industry is created or an industry is transformed dramatically. His reason for so stating is to make the point that 'learning organizations'

between those in the financial industry where the horizon is usually less than a year - and financial rewards mirror this time frame - and the industrial sector where returns from new products or new business models are realized only after several years of effort. Short-term versus long-term thinking, and the type of reward systems, are two Factors which can influence the culture of any organization.

Management practices need to reflect the reality of the business sector but such differences can also be disruptive to having a common vision within the organization.

While the book, *The New GE Way*, focuses on the changes which Immelt has introduced since he took office in 2001, it is very instructive to compare this recent period with the two decades under Jack Welch's leadership. While the economic times have only recently changed (since mid-2007) and have required unanticipated responses, many issues addressed by Immelt are the same as would have been addressed by Welch during his tenure. How each has handled the common issues is an indication of the strength of the fundamental culture within GE.

While leaders are the makers and the contributors to any company's culture, culture is something akin to a large ocean liner, often taking a long time to turn or change its speed. Culture, since it is well rooted in the whole corporate structure and its people, does not change direction that quickly. One should therefore not expect rapid change in the culture of an

have been invented but 'have yet to be innovated'. So it is with regard to understanding why some companies are innovative and others are not. One-offs are often found but hard to replicate. By parsing successful organizations, such as evidenced in this and other Profiles, it is hoped that replication may be encouraged. Replication but modified to suit individual organizations!

organization comprising 300,000 people. But there have been changes.

GE's culture, back in the late 1880's, according to Magee⁸, was to hire the best, promote from within, train them well, and build on an existing foundation. Magee describes the culture in GE⁹ as follows; 'can be described as having similarities of a church: the minister may change, bringing different initiatives and leadership styles, but the congregation sticks to the same ingrained, foundational guiding principles'.

Welch's style of innovation was that of transforming a company - GE - through the acquisition (or sale) of divisions. Typically, an acquisition was followed by the application of a very short – at best medium-term – approach to extracting profit from each new acquisition. His style¹⁰ is well articulated by Magee;

- Sell old-line businesses.
- Acquire number one and two businesses in segment or businesses which strengthen GE's number one or two businesses in the segment.
- Cut costs and jobs.
- Eliminate bureaucracy.
- Cultivate bottom-up employee initiative.
- Push management hard from the top down to outperform expectations.

Innovation yes, but not in the usual sense of the word as it relates to experimentation, R&D, idea generation, investment, risk taking, and a culture which fosters innovativeness above many other values.

Immelt's style is apparently different. Immelt's approach to fostering innovation is, as the first step, to 'prepare the

organization to innovate¹¹ or in so many words, creating a 'culture' where innovation can take place. Only after this is done can one 'pick the right places to innovate and make them pay. Having a growth culture, according to Immelt, means that 'you have to have a way of nurturing people and not make them fight so goddamn hard'¹². The style seems consistent with the need to encourage organic growth and was perhaps less important when the emphasis was on growth by acquisition.

Contrast the styles of Welch and Immelt; Welch 'pushed managers, sometimes lashing verbally', Immelt 'typically coaches and coaxes managers'¹³.

Can one describe the culture of GE? Magee notes¹⁴ 'When discussing the culture of a company with long-held internal convictions and traditions like GE, the concept can come off as esoteric. What exactly is this cryptic notion that one company of more than 300,000 employees actually possesses such invisible and tangible qualities as being a learning culture or an innovation engine?' 'Mention GE's culture to long-time company employees, however, and they'll nod in agreement, as if everyone knows what the other is talking about'. They 'know the dynamics of the company's culture because they have lived it' and 'they are taught it through reinforced training throughout their careers'. Osmosis is at work!

Apparently the company believes so strongly in their culture that the 'promote-from-within' is a means of ensuring that the culture is carried forward from one generation of leadership to the next; that one who has 'lived it' is better able to sustain 'it'. 'Shared knowledge gained along

⁸ The New GE Way, p. 14.

⁹ Ibid, p. 31.

¹⁰ Ibid, p. 13.

¹¹ Ibid, p. 108.

¹² Ibid, p.137.

¹³ Ibid, p. 135.

¹⁴ Ibid, p.133.

the way made them far more valuable to the company than the hiring of someone without that advantage'¹⁵. Learning is the force that drives the culture¹⁶.

Immelt learned the culture from osmosis¹⁷ and can articulate his version in 'three things';

- Integrity,
- Performance,
- Change.

It is, according to Immelt, these three 'things' that are the foundation of the culture of GE and while other things may change, these values do not. 'Constant reinvention' according to Immelt is one of the cultural values of GE¹⁸.

Which of GE's policies and management practices contribute to the company's innovativeness?

Are there some management practices which can be improved?

How does GE's practices compare with other innovative companies?

In this Profile, it is our intention to explore and elaborate on GE's policies and management practices which relate to entrepreneurship and innovation.

¹⁵ *ibid*, p. 167.

¹⁶ *ibid*, p. 169.

¹⁷ *ibid*, p. 134.

¹⁸ *Ibid*, P. 147.

Objective and Methodology

The objective of this review is to identify which of the historic and current policies and management practices employed by GE support, or detract from, a culture for innovation and which of these practices are similar or different when compared to those of other innovative companies.

The overall purpose of this and other Profiles is to contribute to a better understanding of entrepreneurship and innovation with a view that other organizations would consider the adoption of similar practices for their own betterment.

This Profile is based on an examination of several publically-available sources.

- Jeff Immelt and The New GE Way, David Magee – author, published by McGraw Hill,
- GE Annual Reports,
- Investor presentations,
- Breakthroughs!; a book published by Rawson Associates, and based on an international study of innovation by Arthur D. Little, Inc.,
- The Fifth Discipline, Peter M. Senge, published by Currency Doubleday,
- Innovate Like Edison, Michael J. Gelb and Sarah Miller Caldicott, published by the Penguin Group,
- Game-Changer, A.G. Lafley, Ram Charan, published by Crown Business.
- Information at the Tesla Museum, Belgrade, Serbia.

Attribution is provided by the addition of footnotes.

The anecdotal information drawn from these sources has been structured according to 25 Factors. The choice of Factors is based on earlier in-depth research¹⁹ into the policies and management practices of highly-innovative companies. Each Factor impacts the culture for entrepreneurship and innovation.

The rationale behind breaking out practices and policies in this manner is a recognition that achieving and sustaining an appropriate environment for entrepreneurship and innovation is complex. Rarely is it one Factor which makes a difference; rather success or failure is based on the effective implementation of a combination of Factors. Each organization, of course, creates its own situation by placing its own emphasis on one Factor or another.

¹⁹ Arthur D Little Inc., research in the 1980s and available at <http://www.corporateinnovationonline.com>

GE's overall performance according to the 25 Factors which make up this Profile.

GE's policies and management practices are similar to other innovative companies which have been profiled using the same 25 Factors. GE was not part of the original research²⁰ which established the 25 Factors as important contributors to entrepreneurship and innovation.

There is a positive correlation, i.e. GE practices fit well, with 19 of the 25 Factors deemed to impact entrepreneurship and innovation. Each of these Factors are elaborated upon in the balance of this Profile.

With the objective of making the company even more innovative, GE's new leadership (since 2001) has made the following key decisions which impact the culture for innovation and entrepreneurship.

- Made a very significant make-over and investment in the Global Research center and in new research locations globally.
- Committed to organic growth and less emphasis on growth by acquisition.
- Turned the culture from a 'push people' to a 'coax'-out-of people value.
- Lowered market (Wall Street) expectations meeting quarter-on-quarter revenue and profit goals.
- Emphasized organizational arrangements that result in cross-fertilization of ideas.

GE, while a different company today than it was under Welch, is a company which continues to value highly its innovative culture; i.e. being at the forefront of

innovations where it serves its strategic business interests.

We examined GE's performance relative to each of the 25 Factors but note first of all the 6 Factors which one could not render an opinion due to a lack of anecdotal evidence or other information.

- **Factor #3; Tolerance of mavericks.**
There is little reference to the role of mavericks per se in the innovative process in GE. This is in contrast to a number of other innovative companies which we have researched, e.g. 3M, where it is often stated that mavericks play a key role in the innovative process. Innovative companies often make special mention of the role of mavericks; not so from GE.
- **Factor #7; Use of career ladders and recognition of innovators and Factor #14; Availability of reward mechanisms for innovation.**
While other innovative companies have a number of monetary and non-monetary (awards, honors, etc.) rewards specifically dedicated to innovators, this does not seem to be the case in GE. By contrast companies such as 3M and John Deere single out innovators for recognition and rewards and have done so for decades.
- **Factor #17; Management expectations regarding loyalty to the company versus personal development.**
While Edison seemed to take a personal interest, at least in his closest circle of collaborators, and other companies such as Google and 3M have enunciated a position on the use of 'personal time', the well-known 15% policy, GE's does not have an articulated policy on this

²⁰ <http://www.corporateinnovationonline.com/about-us/original-research/>

issue.

- **Factor #21; Ability of retain innovators.**
There is little or no anecdotal evidence to understand whether innovators stay with or leave GE. This is not surprising since the retention of innovators is difficult to measure and would not, in most cases, be available through public sources. We just don't have good information on this Factor.
- **Factor #25; Degree to which employee organizations encourage innovation.**
There is no anecdotal evidence to allow the author to understand the role of employee organizations within GE.

Should more information become available (and contributions through the web-site blog are encouraged), this could add to or subtract from this correlation.

The section which follows sets out the basis for providing comment on each of the 25 Factors.

GE's policies and management practices, organized according to 25 Factors, which support or detract from entrepreneurship and innovation.

Factor #1: Emphasis on short-term versus long-term profits.

Summary

GE has been around since 1889 (technically 1892) which, in most respects, is evidence

that its leadership has over the years taken a longer-term view and has not been unduly focused on the need for short-term (quarterly) profit gains. Under Jack Welch however, with his emphasis on growth through acquisition and the application of 'the GE way' to newly-acquired companies, the emphasis shifted to the encouragement of short-term market-demanded profits. The new regime, under Immelt, has switched course and is reemphasizing a more balanced view of profits; with less emphasis on the need for quarter-to-quarter betterment.

Edison²¹, according to the authors, states that his view was that 'success is a function of perseverance, a perseverance driven by aligning passions with long-term goals.

In the early days of GE, Immelt says that GE was viewed by investors almost solely for the longer term with innovation as the driving factor²².

GE is described as a growth- and bottom-line focused company but at the same time reference is made to the balance with the creative side of the business²³. One example relates to decisions taken in the Energy side of the business. Quarterly results drove Welch during his time and there was little room for investments which represented dubious short-term prospects²⁴.

Shareholder expectations were to be met; no question. Because of the vagueness attached to future profits, entry into the wind business was delayed in spite of much effort on the part of some executives to make it happen. The attitude was to let others do the money-losing experimentation²⁵ and to follow in later if the business panned out. This strategy was consistent with Welch's practice over the 20-year period, namely to make

²¹ Innovate Like Edison, p49.

²² The New GE Way, p. 69.

²³ *ibid*, p. 49.

²⁴ *ibid*, p. 50.

²⁵ *ibid*, p. 51.

acquisitions but not, so much, seek internal organic growth.

Immelt is more patient than Jack Welch and 'is looking for the breakthrough and (they) will be rewarded according to one employee²⁶.

Immelt received significant criticism from analysts when, in 2008, GE missed and did not recognize a single quarterly earnings miss²⁷. Welch at the time was highly critical of Immelt's action. Such a reaction puts in focus a key issue facing GE at all times; how to balance off the short-term interests of the stock market (which under Welch was a central theme of his management style) with the longer-term interests of GE as it takes initiatives which obviously have a multi-year planning horizon.

When Immelt took over GE in 2001, 'GE's culture was well established, with both a short-term and long-term focus²⁸ in spite of Wall Street's analyst preoccupation with quarterly results.

More recently²⁹ states that GE is 'committed to long-term thinking despite volatility in the current environment'. As if to emphasize the point, Immelt states that 'we want investors to see GE as a safe long-term investment'. Thinking long-term is not just for the company but also the investors and, one presumes, a tertiary message to Wall St!

Factor #2: Extent to which management explicitly looks for innovation.

Summary

GE has, over its history, always stressed the need for innovation but the degree of emphasis has varied, particularly in the last

30 years. Immelt is looking for 'breakthrough' innovation in its strategic sectors as a priority whereas Welch was much more focused on the need for financial results than growth through innovation.

Edison 'was the original master of the rigorous, disciplined innovation process, but he also was a wizard when it came to promoting and maintaining a culture of innovation'³⁰.

It is interesting to contrast the management style of the two leaders; Welch and Immelt. For Welch, one of the reasons for investing heavily in Crotonville, was that he could have well-trained employees so that he could push them to do better³¹ thus sparking more innovation. For Immelt, the reason for Crotonville seems to be more related to having good people whom you can coax, or having first created an innovative climate, are able to reap the benefits from their own initiative; 'a lot of what we do has to be about the future'.

Immelt's move to emphasize ideas, which are focused on longer-term growth objectives, along with the need to achieve quarterly results, may have upped the ante on pressure in the organization³². Most business people would agree that, on a relative scale, it is easier to cut costs or improve margins than it is to be consistently successfully innovative.

GE's culture broke to the surface when Immelt rolled out his plan for investment in clean technology and reduction of greenhouse gas emissions; the reaction, on the part of his senior executive team, was that 'it was flimsy and soft, more vague than tangible and thus against the

²⁶ *ibid*, p. 105.

²⁷ *ibid*, p. 4.

²⁸ *ibid*, p. 67.

²⁹ GE Annual Report 2012

³⁰ *Innovate Like Edison*, p. 11.

³¹ *The New GE Way*, p. 79.

³² *ibid*, p.91.

corporation's culture'³³. Despite the negativity, Immelt proceeded with the 'ecomagination' initiative. To quote Immelt; the 'team that knows when to lead, and they also know when to follow, and that's a real trick'³⁴. In this case the leadership was clearly due to Immelt and not others – until after. This further demonstrates the emphasis which the leader places on innovation and change.

GE is attempting to establish an educational system within GE which inspires creative thinking and gives GE the 'ability to innovate must be valued again'³⁵, a clear indication that the direction of the firm, pre Immelt, did not sufficiently support the notion of innovation as defined by current management. GE goes on to state that the company is 'first and foremost, a technology company' and that the company will 'continue to invest increasing amounts in R&D to develop innovative solutions'.

Factor #3: Tolerance of, or for, mavericks.

Summary

GE does not make reference to the role of mavericks in its organization per se, which is in some contrast to the many references one can find when studying the history of other innovative companies such as 3M and Google.

Welch 'built a company over two decades run by leaders cultivated as revolutionaries, able to wake up the organization... and that the 'evolutionary process would continue under Immelt'³⁶ yet GE was in need of a makeover. It is generally acknowledged that the business model at the time was in dire need of retooling and in handing over the mantle to Immelt, Welch said "Blow it up"³⁷. Sounds like the terms which a

'maverick' would use but other than this there is little to suggest that GE places any emphasis on mavericks per se.

While constant change is apparently embedded as a tenant of culture of GE, why, if change is constant, did the model need to be dispensed with so aggressively? What had happened to the culture for innovation during the Welch's two decades?

Factor #4: Degree to which planning emphasizes rationing of resources versus identifying opportunities.

Summary

GE has, under the new regime, placed significant emphasis on the need to work on identifying and developing ideas and opportunities.

Edison³⁸ 'was always optimistically looking for opportunities and seeing the possibilities of new directions for improvements'.

GE's Immelt, while significantly raising investment in R&D has now switched (some might say too much) the pressure point in the organization from an emphasis on quarterly results to an expectation that spending on R&D will generate good solid business ideas. His program, for example, 'forces³⁹ leadership to deliver three idea proposals each year and deliver these to 'a high-ranking employee gathering which fosters innovation internally'. The idea is to encourage the growth of proposals which would not survive an annual review per se and to keep the good ones going until they can enter a more normal review cycle. This results in a culture where 'people are passionate about their ideas for growth'⁴⁰.

³³ *ibid*, p.115.

³⁴ *ibid*, p. 117.

³⁵ 2008 Annual Report.

³⁶ The New GE Way, p. 67.

³⁷ *ibid*, p. 148.

³⁸ Innovate Like Edison, p 54.

³⁹ The New GE Way, p.88.

⁴⁰ *Ibid*, p.89.

Immelt is ‘pushing us to examine our investments in R&D to make sure we have enough’ according to John Rice⁴¹ - a clear indication of an emphasis on filling the innovation pipeline by identifying opportunities and not rationing resources.

Immelt makes a point to commit time to innovation. He ensures that he attends a monthly “Commercial Council” meeting with sales and marketing executives. They discuss growth strategies, brainstorm ways to reach new customers, and evaluate bold ideas that the company calls “Imagination Breakthroughs”.

GE’s (May 12, 2009) announcement that it will invest upwards of \$100 million to build a new factory in upstate New York that will make sodium-based (in contrast to lithium-ion type batteries which are probably less risky technologically) is an indication that GE has, and will invest in new opportunities with a full understanding of the risk profile.

Factor #5: Tolerance for failure.

Summary

For GE, failure needs to be defined. Missing ones stated, and agreed-upon financial goals, is regarded as a failure and the consequences are significant. Over its history, however, the notion of failure has been looked upon more as a learning experience.

For Edison⁴² ‘there was no such thing as failure. He viewed all outcomes as fascinating opportunities for learning’. Churchill’s comment that ‘Success is going from failure to failure without loss of enthusiasm’⁴³ represents an equally optimistic view of the meaning of failure.

⁴¹ *ibid*, p. 106.

⁴² Innovate Like Edison, p37.

⁴³ *ibid*, p.75.

⁴⁴ The New GE Way, p. 24.

Under Welch, if you missed your numbers⁴⁴, for whatever reason, you could expect criticism to be leveled in spades and this was often provided in front of your peer group of senior executives. Did this engender fear? What about tolerance for failure? This style of management speaks to the culture during the two decades preceding Immelt. GE’s results-oriented culture⁴⁵ meant that a miss brought consequences.

Failure in achieving financial results, where one said that they would be achieved and committed to specific goals, has been little tolerated, under both Welch and Immelt; ‘doing what you say you are going to do, there’s just nothing that replaces that, and we don’t apologize for that. We are a tough-minded, performance-oriented company’⁴⁶.

The performance culture implies that employees take failure, in the sense of not fulfilling expectations, hard⁴⁷.

Immelt has carried forth the tradition of Jack Welch when he adopted Welch’s philosophy of ‘Embrace fear, don’t fear it’⁴⁸.

Factor #6: Emphasis on management of people and their interactions.

Summary

In a company the size of GE it is widely recognized that special measures are needed to encourage the broadest and deepest interactions amongst people. Accordingly, whether under Welch or Immelt, enabling mechanisms have been initiated and are broadly supported.

GE’s leadership training center at Crotonville, with its emphasis on cross-

⁴⁵ *ibid*, p. 25.

⁴⁶ *ibid*, p. 139.

⁴⁷ *ibid*, p. 142.

⁴⁸ *ibid*, p. 4.

company⁴⁹ and cross-functional training is an excellent example of encouraging, facilitating if you like, the interaction of people. The cross-x message is not lost on employees who, in their career, will have several opportunities to attend Crotonville. This emphasis is stated as being indicative of GE's culture. Since it is so fundamental to the culture, and while it would be tempting to reduce the cost of this facility in tough economic times, this has not been done.

Magee describes GE's culture as 'the strength of its beating heart, found at the company's leadership training center in Crotonville, New York⁵⁰. The center 'brings employees of all disciplines to one place so together they can find the common good and goals- the culture'. Immelt has, according to Magee, added to this process by bringing in customers to join in the collaboration. The center is a means of facilitating the culture 'the culture learns how to quickly and easily move across barriers for mutual benefit'.

While the expressed desire is to run the whole company as if they were a large number of individual businesses, a number of integrating mechanisms have been put in place to 'manage people and their interactions', i.e. to encourage integration and exchange of information. These enablers include; the corporate executive council, the leadership center, the global research facility, the use of cross-fertilized teams, and the commercial council.

One of the most recent developments which came out of the commercial council's benchmarking against the world's best innovative companies was a set of five necessary leadership traits, one of which was to 'energize teams through

inclusiveness and connection with people, building both loyalty and commitment'⁵¹.

GE conducts a survey (GE Opinion Survey) every two years to tap into the opinions of its employees; a practice followed by some but not all of our highly-innovative companies. DSM does the same. Employee ratings were high except in two areas; customer alignment and complexity which has led to the 'Simplification' initiative. Employee input is valued!

When one visits the Tesla Museum in Belgrade, one is struck with the singular success which Tesla had with the advancement of his ideas and by the difficulties which he experienced in bringing his inventions, some of which presaged Edison's, to market. Both were endowed with intellects of the first order but Edison was, by all accounts, more of a promoter and most importantly was able to work with other collaborators. Edison, according to Gelb and Caldicott⁵² 'gained the edge in the market place and in the public mind due to his ability to assemble a team of collaborators and develop a systematic approach to innovation'. Edison was by all accounts, a very effective manager of people and their interactions. Tesla was not.

Factor #7: Use of career ladders and recognition of innovators.

Summary

There is not much anecdotal evidence that GE recognizes innovators in any particular way. Unlike 3M and P&G, along with other innovative companies, there does not seem to be a range of non-monetary recognition of innovators per se. Patents held, where GE has traditionally scored high on a global basis is important for GE but this does not

⁴⁹ *ibid*, p. 78.

⁵⁰ *ibid*, p. 56.

⁵¹ *The New GE Way*, p. 160.

⁵² *Innovation Like Edison*, p. 39.

link to a transparent award system for patent originators.

Welch was quick to reward, with generous bonuses and stock options, those in the organization who made or exceeded their numbers⁵³. Based on what we know of Welch's style, this type of reward was probably not extended to those managers who had to take a longer-term view. For decades GE used its top-pay and stringent hiring requirements to hire as well as any company in the world⁵⁴ but this again was not focused on innovators per se.

Factor #8: Tolerance for variance from the corporate norm.

Summary

GE management has long stressed the importance of taking chances and encouraging change.

Welch 'built a company over two decades run by leaders cultivated as revolutionaries, able to wake up the organization... and that 'evolutionary process would continue under Immelt⁵⁵. GE, however, was in need of a makeover. Immelt has carried forth the tradition of Jack Welch when he adopted Welch's philosophy of 'Embrace fear, don't fear it'⁵⁶. Differences, or tolerances from the corporate norm were, while not necessarily encouraged, were not discouraged.

Of the three cultural 'things' that make up the stated culture of GE; integrity, performance and change, there is 'zero tolerance' for an integrity violation⁵⁷, a cultural value which has been GE's for as long as the company has existed. Immelt has taken the 'integrity' value one level

higher and made it clear that, for his management team, one strike and you are out.

Passion can be seen as 'pushing people out of the safe zone'⁵⁸ and it is one of Immelt's greatest fears that the lack of courage in this regard could stultify innovation. He encourages people, on a personal level, to take risks, and to get over mistakes and move on. Sometimes, he said, the company's sometimes uptight (culture) past may inhibit its imaginative future.

Factor #9: Tolerance for risk (in the planning process).

Summary

GE has a fair tolerance for risk when dealing with investment and product decisions. Specific programs are in place to mitigate the chance that potentially important projects are not downgraded simply because of their risk profile.

One of the most recent developments which came out of the commercial council's benchmarking against the world's best innovative companies was a set of five necessary leadership traits, one of which was to 'take risks on people and ideas'⁵⁹. Immelt 'puts a premium on risk taking...not pulling the plug too quickly on good ideas⁶⁰ and may take on investments which are not likely to make returns for five years.

GE, in introducing, under Immelt, a requirement to bring forth so many new ideas per year, have introduced⁶¹ a 'annual ideas standard', a concept that, since it is so pervasive throughout the organization helps to shift the risk profile from relatively few in the organization to the whole. In

⁵³ The New GE Way, p. 15.

⁵⁴ *ibid*, p.94.

⁵⁵ *ibid*, p. 67.

⁵⁶ The New GE Way, p. 4.

⁵⁷ *ibid*, p. 136.

⁵⁸ *ibid*, p. 161.

⁵⁹ *ibid*, p. 160.

⁶⁰ *ibid*, p.100.

⁶¹ *ibid*, p.94.

other words, since everybody is involved, the possible stigma of failing is less and the tolerance for risk in the planning process is higher. 'I want people to take more risks, solve bigger problems' states Immelt on his desire to have this culture present.

Factor #10: Degree of formal communication within the organization.

Summary

GE places emphasis on trying to break down communication barriers.

According to Gelb and Caldicott, 'Edison's second circle (as different from the first circle which represented Edison's inner collaborators) allowed him to be only "two clicks away" from communicating with any employee in the organization⁶² - to use a modern vernacular. What was equally important was that members of this second circle comprised a widely diverse set of backgrounds.

Immelt learned early on that 'direct honesty and clarity⁶³' were effective in dealing with union employees and apparently was good, early in his career, at giving motivational speeches to union workers. Immelt thus showed an interest in and an ability to reach beyond organizational levels to get the job done and to seek clarity in communications through direct contact. Immelt's desired style is to get close to GE employees and, for example 'on the factory floors of GE's many business operations around the world⁶⁴. He has doubled his time on investors and on internal communication.

The Leadership Centre in Crotonville is, in part, designed to break down the communication barriers which often arise in

large companies. Executives, remaining in the program for three weeks, get a chance to mingle with a wide variety of others, all from GE, and as a result of making these contacts increase their willingness to make contact within the organization

Approaches to simplicity, have allowed the free flow of ideas⁶⁵.

Factor #11: Use of independent work groups.

Summary

GE makes extensive use of teams and independent work groups to accomplish its objectives. There are many examples ranging from top level groups to working groups assigned to address significant corporate issues and new initiatives.

Nowhere is the importance of the use of special work groups more recognized than with the efforts to cross-fertilize than in the appointment of 'research and technology teams including GE employees from multiple disciplines to work on the same project'⁶⁶. Examples of cross fertilization are provided; the lotus leaf for one (a concept for a new material), and the transference of health-care imaging technology to use in baggage scanning is another example. Apparently not much of this cross fertilization was done under Welch. The cross-fertilization of research was marginal under Jack Welch⁶⁷.

Marketing teams arrive at the Research Centre to meet with scientists and talk about market needs⁶⁸.

The development of organic light emitting diodes (OLEDs) is yet another example of putting in place a group to carry out a

⁶² Innovate Like Edison, p.151.

⁶³ The New GE Way, p. 21.

⁶⁴ *ibid*, p. 71.

⁶⁵ *ibid*, p.205.

⁶⁶ *ibid*, p.98.

⁶⁷*ibid*, p.100.

⁶⁸ *ibid*, p.99.

specific project, in this case a cross-functional team under the oversight of the research center. Adding an outside partner to this effort, namely Energy Conversion Devices, added another dimension of knowledge to the effort and allowed, or at least facilitated, their application to a government agency for additional funding.

Immelt put an in-house team together⁶⁹ to get feedback on green initiatives and study greenhouse legislation and made use of an outside consulting group in the process. The result was a significant increase in funding for R&D on clean technologies and the reduction of its own greenhouse gas emissions.

Factor #12: Degree to which management decisions are made with input from the rest of the organization.

Summary

GE is characterized as a company which takes its time and applies considerable resources to any major decision. Investment decisions are taken only with careful input from a wide range of personnel in internal functional groups. The culture is definitely one of careful and close attention to detail.

Edison ‘valued the importance of working with others’⁷⁰ and knew that ‘he needed a trustworthy team of collaborative employees to ...complement his talents’. Over the early years he directly supervised the small, but growing team of highly skilled (educational credentials were not stressed) individuals who made up the team. Cross-training and diversity of talent were important ingredients to GE’s success.

GE can be characterized as a company which takes its time in making major

decisions. ‘Such careful consideration is part of the analysis process for GE. GE moves carefully through fact-finding and information-sharing to invest wisely in new businesses’⁷¹. GE, in contrast to several other high flying companies (Enron, Tyco and Vivendi) makes its acquisition decisions ‘with decidedly more conservative processes and disposition’⁷²... made only through careful study’.

Immelt’s style is to ‘listen to them’ referencing GE employees and the desire to get to know them and to understand the situation⁷³.

Immelt, while he could make acquisitions since GE generates a lot of cash, does not do so ‘using instead GE’s deep accounting department to scale value’⁷⁴. He goes on to state how ‘we comb through details..we look at people like it was not some big obscure company’.

GE’s approach to innovation is to seek input from organizations which it can connect with⁷⁵; a clear indication of a further desire to have as much input in investment decisions as possible. A mapping process is in place which forces GE managers to identify where they need to be connected to outside organizations.

Factor #13: Formality of the decision process.

Summary

GE has formal management practices in place for making key decisions.

Edison⁷⁶, according to the authors, ‘taught his people to use his approach to experimentation’ and‘carefully examine their underlying assumptions’ ...trained to

⁶⁹ The New GE Way, p.114.

⁷⁰ Innovate Like Edison, p.149.

⁷¹ The New GE Way, p. 53.

⁷² *ibid*, p. 48.

⁷³ *ibid*, p. 74.

⁷⁴ *ibid*, p. 81.

⁷⁵ *ibid*, p.198

⁷⁶ Innovate Like Edison, p69.

'execute assignments'... and made 'the process of innovation more systematic and reliable'.

Factor #14: Availability of reward mechanisms for innovation.

Summary

There is no anecdotal evidence to suggest that GE has reward mechanisms in place for innovation per se. and monetary rewards seem focused on rewards for financial performance. Edison, the founder of GE, seems to have placed more emphasis on providing rewards for innovation than has been the case with recent management. There has also been a shift in the culture from rewarding individuals to awarding groups but these rewards are oriented toward financial and operating performance, not innovation per se.

Welch was quick to reward, with generous bonuses and stock options, those in the organization who made or exceeded their numbers⁷⁷.

GE 'rewards executives for leadership excellence and sustained financial and operating performance'⁷⁸. The inference is that the reward system is the best way to 'stimulate innovation and ensure solid execution, while guaranteeing that risks are recognized and managed appropriately over the longer term'. 'Executives who demonstrate an ability to assess and manage risk effectively' are rewarded.

In some contrast to other innovative companies, there is little mention of rewards specifically established for innovations or for innovators, whether monetary or non-monetary.

In some ways, it would appear that GE has strayed from the use of reward mechanisms which were the foundation of the company under Edison. Edison's 'most generous offers (referring to financial incentives of one kind or another) went to those who helped manage the innovation process'⁷⁹. Edison also, like 3M, often made offers to his key people by letting them get deeply involved in his new ventures and allowing them to buy stock in GE. Edison 'carefully leveraged individual rewards for his people'⁸⁰.

Factor #15: Planning orientation versus action orientation.

Summary

GE, by all accounts, is an organization which takes its time and carefully examines any major investment or change in direction. Thoughtful, highly analytical, and perhaps, as a result, a little slow to act, is a characterization of GE's planning versus action orientation.

GE can be characterized as a company which takes its time in making major decisions. 'Such careful consideration is part of the analyses process for GE. GE moves carefully through fact-finding and information-sharing to invest wisely in new businesses⁸¹.

'But for a company like GE, decisions like this are a process .. we study ...we don't follow a whim or a trend⁸².. planned cultivation of innovation is part of the new GE way.. and it is now planned to use this process for developing long-term plans and products for the company. This analogy is interesting as the example given is related to an acquisition rather than 'organic growth'.

⁷⁷ The New GE Way, p. 15.

⁷⁸ 2008 Annual Report.

⁷⁹ Innovate Like Edison, p.160.

⁸⁰ *ibid*, p. 161.

⁸¹ The New GE Way, p. 53.

⁸² *ibid*, p. 59.

A 'lot of what we do has to be about the future' states Immelt when referring to his desire to balance short-term and longer-term objectives⁸³.

GE, in moving forward with plans to invest in clean technologies, demonstrated again its penchant for careful examination of investments; 'This is not a company, after all, that does much of anything without quantifying expected results and benefits'⁸⁴.

GE does not throw darts at new ideas⁸⁵ but carefully considers judges what prospects fit the company's future and, when it invests, offers support.

Factor #16: Attitudes towards merger, acquisition, joint ventures, and divestiture.

Summary

GE has switched from an emphasis on growth by acquisition to organic growth, a switch which has yet to be tested and, by its nature, may take several years to unfold. Only after several years can organic growth be seen to be the provider of better-than-average financial performance.

GE has switched its emphasis more towards trying to achieve growth through internal process; i.e. organically, and not relying so heavily on the acquisition of companies. Similarly, spin-offs of slower-developing businesses have taken place.

Jeff Immelt concluded⁸⁶ that GE could grow faster organically.

GE's performance culture was successfully applied to all or most of the companies which it acquired during the two decades under Welch's regime. The application of the GE culture to the newly acquired

company, which would not have, in all likelihood, the same culture as GE, apparently worked as results above and beyond the ability of acquired company under its prior management were most often exceeded.

GE finds it is better to partner with the number three company than to buy a tiny company or go it alone⁸⁷ making reference to the Welch manner which was to buy and 'GE-size' the acquired organization.

GE makes reference⁸⁸ to 'core processes centered on organic growth, operating excellence and leadership development'..the aim of these processes is to spread best practices across the Company'.

Factor #17: Management expectations regarding loyalty to the company versus personal development.

Summary

There is little anecdotal evidence on this Factor.

Edison was evidently able to bring some balance into the lives of his staff. 'Through flex time, occasional group meetings, midnight luncheons, singing, jokes, and other fun activities, Edison orchestrated a balance between the intensity and relaxation'..'workers who lived nearby were free to come and go at the laboratory as long as the work was done'⁸⁹.

It is interesting to contrast Edison's GE with modern day cultures. Apparently 'Edison did not need non-compete agreements because his process and culture of innovation were leagues ahead of potential competitors'...not needed since 'his people

⁸³ *ibid*, p. 79.

⁸⁴ *ibid*, p. 115.

⁸⁵ *ibid*, p. 200.

⁸⁶ Game-Changer, p 283

⁸⁷ The New GE Way, p.200.

⁸⁸ 2008 Annual Report.

⁸⁹ Innovate Like Edison, p.117.

were remarkably loyal and protective⁹⁰. While there is no mention of the existence of similar agreements, or their equivalent, in today's GE, and since it is now very much a common practice among major corporations, it is likely GE has adopted the modern practice of putting management contracts in place for senior officers and key innovators.

There is no reference to the use of personal time, as there is in 3M and Google, which have fairly explicit statements regarding this issue; i.e. the 15% rule at 3M.

Factor #18: Decentralization versus centralized hierarchy.

Summary

GE is committed to a policy of minimal hierarchy and as close to a flat organization as you can get given the size of the global organization. Efforts are made to establish businesses within business.

Welch acted by 'removing layers of bureaucracy'⁹¹. Immelt learned from Welch to find ways to take bureaucracy out of the company such as having fewer meetings and fewer approval levels on decision making that added no value⁹².

"What we try to do is to not run GE as one big company" Immelt⁹³. The idea is not to think about doing business in markets outside N.A. but rather to think about what business is being done in other geographic areas. Fifty percent of the firms business is currently from outside the U.S.

As long as you have the people and the processes you trust, each unit can run as a veritable small company, according to

Immelt⁹⁴. The strategy is to break up the company into individual businesses and initiatives and remove size as an impediment to growth.

We decentralize decision making so that local teams can develop products, marketing approaches, pricing and risk assessment for their own local countries. This removes levels of bureaucracy and facilitates localization⁹⁵.

Immelt has, at the same time that the organization has grown, reduced overhead and bureaucracy⁹⁶. Apparently by formulating the company into growth opportunities, considerably less overhead is required⁹⁷. This comment is not totally understood as the link between opportunities and lower overhead is not clear.

The goal is to create a "limber organization"⁹⁸ unencumbered by deep layers of bureaucracy.

Factor #19: Availability of resources (budget, time, etc.) for new ventures.

Summary

GE is a growth-oriented company and relies on the generation and management of ideas and acquisitions to achieve its performance goals. With the constant announcement of new ventures, product ideas, and the in-place management practices directed at dealing with initiatives, it is clear that GE makes it known to its employees and external partners that it is open for business.

GE's expenditures on R&D close to flat for the 3 years; 2006 to 2008; the time period

⁹⁰ *ibid*, p. 128.

⁹¹ *The New GE Way*, p. 67.

⁹² *ibid*, p. 164.

⁹³ *ibid*, p.177.

⁹⁴ *ibid*, p.183.

⁹⁵ *ibid*, p.187.

⁹⁶ *ibid*, p.203.

⁹⁷ *ibid*, p.204.

⁹⁸ *ibid*, p. 205.

reviewed for our first Profile. On the other hand funds were made available for acquisitions and for the new ventures. The announcement to invest \$100 million in upstate New York in a new factory to build sodium-based batteries – not the lithium-ion type now more familiar to the market place, is an indication of the availability of new funds for new and some would say riskier ventures. GE is hoping to attract federal funds to assist in the project and downward adjust the risk profile.

There is a process in place for the evaluation of new ventures and probably well understood by the management team. Like 3M, the existence of a well understood process facilitates and encourages managers to move ahead with new ideas; the process is known, the criteria have been established, and surprises are minimized.

Immelt's stance on the use of organic growth versus growth by acquisition has probably contributed to a better feeling within the company that bottom-up ideas are more likely to be adopted than under a regime which focuses on acquisitions. To quote Immelt; 'the ability to innovate must be valued again'⁹⁹

Factor #20: Staff versus line involvement in the decision process.

Summary

Little or no anecdotal evidence is available on this Factor. GE makes extensive use of its vast line and staff personnel in all major decision making.

While there is no mention of line versus staff functions, and indeed those terms may well be outdated, there is every indication that GE takes its time and makes use of its substantial internal resources, whether

direct or indirect, in making key decisions. For example; when GE, in moving forward with plans to invest in clean technologies, demonstrated again its penchant for careful examination of investments; 'This is not a company, after all, that does much of anything without quantifying expected results and benefits'¹⁰⁰.

Factor #21: Ability to retain innovators.

Summary

Little or no anecdotal evidence is available on this Factor. There is every indication that GE's practice is to hire well and pay well to retain the best and the brightest but this may or may not apply to innovators per se.

Factor #22: Extent to which company has an innovative tradition.

Summary

GE is a company known for its innovative tradition begun with Edison, continued under subsequent leaders, and re-emphasized under Immelt.

Edison 'functioned as the key idea driver and catalyst behind all the inventions that emerged from his labs, but he relied on his team to translate ideas into innovations'¹⁰¹. The reliance on one person was typical of how companies have their start. Edison, in his later years necessarily delegated parts of the innovation process while keeping a tight control over the process. The rhythm of the organization was beginning to change as new innovators rose into their chosen occupations. The analogy with today's Steve Jobs and Bill Gates are clear, with each organization growing beyond the one-person typically associated with start-ups.

In Breakthroughs¹⁰², which was published in 1986, the research director of EMI

⁹⁹ *ibid.*

¹⁰⁰ The New GE Way, p. 115.

¹⁰¹ Innovate Like Edison, p.137.

¹⁰² Breakthroughs! p. 170.

Electronics, makes reference to the 'enormous technical and commercial resources available to' GE.

GE has been known for its prowess and innovation¹⁰³ and for over a century has been one of the worlds' biggest and best. It has transformed itself, long ago, into a multi-division conglomerate, a long way from its start-up single focus on the electric lamp when under its founder, Thomas Edison. Not only does GE comprise a significant percent of the Dow Industrial average but it is also viewed as a bell weather stock for the U. S. economy. Its industrial focus and profile has, however, been modified in the last 20 years by the initiatives in the finance and media businesses.

GE is known as company which has an innovative tradition going back 130 years¹⁰⁴ and has only experienced the threat, because it is big, of experiencing 'stagnant' and 'old-school' – but the inference is that this has not happened yet there is an implication that, under Welch, GE as an innovative company had fallen behind its earlier glory days¹⁰⁵.

The GE Global Research Centre has been a leading innovator with thousands of patents¹⁰⁶ and was the first company in the U.S. to operate an independent research and development laboratory. It appears that the center was given much less emphasis during Welch's term and mild complacency had crept in mainly because of the emphasis being placed on Crotonville. It was as if 'business leadership' was surpassing 'inventiveness' as the basic culture in GE. Funding the Research Centre from Divisional revenues, along with Welch's push for quarter-on-quarter improvements, was no doubt a contributor

to a new focus on short-term thinking. Immelt seems determined to restore the 'innovative, grow-from-within culture'¹⁰⁷. The Research center is now to 'foster innovation for the entire company' and has been upgraded and funded with this in mind.

Whereas Welch pushed for profits through business leadership and tough goal stretching, Immelt is placing pressure¹⁰⁸ on the organization to deliver ideas – anticipating that this emphasis will provide the growth necessary for success in both patents and profits.

A measure of the desire to restore GE's reputation as an innovative company is the objective of making it the world leader in patents. Until 1986, GE was a leader but on Welch's watch this obviously was not a priority and on his departure the company did not rank in the top 20 of companies holding patents¹⁰⁹.

Immelt's approach to fostering innovation is, as the first step, to 'prepare the organization to innovate'¹¹⁰ or in so many words, creating a 'culture' wherein innovation can take place.

Factor #23: R&D budget levels versus the competition.

Summary

GE has historically spent approximately 5% of its sales revenue on R&D, in line with Deere and P&G but about 50% of IT high tech companies, but most recently, under Immelt, this spending has risen to 6%. R&D spending has been a priority since the founding of the company.

¹⁰³ The New GE Way, p.1.

¹⁰⁴ *ibid*, p.80.

¹⁰⁵ *ibid*, p.108.

¹⁰⁶ *ibid*, p.85.

¹⁰⁷ *ibid*, p.87.

¹⁰⁸ *ibid*, p.88.

¹⁰⁹ *ibid*, p.106.

¹¹⁰ *ibid*, p. 108.

Edison established a culture at GE which focused on filing patents as a means of protecting its intellectual property. At age 84¹¹¹ Edison applied for his 1,093 patent. While there was a period where Edison became disenchanted with the patent system – because of a perception of insufficient protection for the patent holder – this was put aside and patent filing were resumed in the early 1900s¹¹². The tradition continued for decades establishing GE as one of the top 20 holders of patents globally. That position was lost immediately during the two decades to 2000. Immelt is now focused on restoring GE's reputation in this regard. GE's Annual Report 2008 makes the point that 'patent applications in 2008 were 8% above the level in the prior year'¹¹³. By 2012 GE was back in the top 10 patent filers in the U.S.

GE has, under Immelt, significantly expanded the R&D function. Not only have more funds been spent in the U.S. but there have been research centers established abroad, in India, China and Germany. Immelt 'upgraded the center..through \$100 million..and adding disciplines which did not previously exist'¹¹⁴ as well as adding infrastructure investment. Funding has increased each year since Immelt took over. Part of the increase in funding derives from contributions from GE's partners.

GE's approach to R&D is to make sure that they 'own it' – at least in the priority areas of molecular medicine, nano technology, renewable energy, energy efficiency and environmental technology– and while Immelt states that they are going to own it, they are not there yet¹¹⁵. Immelt's expressed desire to 'own the technology' is reminiscent of Edison's approach to

invention. In reference to his vast library at the West Orange Laboratory, he began 'by reading up everything that has been done along that line in the past'¹¹⁶. He 'never began a round of experiments without first reading everything available on the subjects of his studies'.

One of the most recent developments which came out of the commercial council's benchmarking against the world's best innovative companies was a set of five necessary leadership traits, one of which is to 'develop expertise in a function or domain, using depth as a source of confidence to drive change'¹¹⁷.

Making R&D effective seems to be one of the reasons Immelt appointed the new head of GE Global Research Centre; 'Little's knowledge¹¹⁸ of engineering and understanding of how promising technology comes to market' made him the ideal candidate.

Factor #24: Perception of innovation as increasing or decreasing.

Summary

While GE's reputation as an acquirer of patents declined during Welch's period as CEO, the goal is to now restore the company to the global place which it occupied for decades.

If patent applications is any indication of innovation performance, it is clear that, under Welch, the innovation trend was down even though, or in spite of, the successful financial performance over the same period. It is clear that under Welch, GE as an innovative company had fallen behind its earlier glory days¹¹⁹.

¹¹¹ Innovate Like Edison, p. 42.

¹¹² *ibid*, p.127.

¹¹³ 2008 Annual Report.

¹¹⁴ The New GE Way, p.107.

¹¹⁵ *ibid*, p. 109.

¹¹⁶ Innovate Like Edison, p. 61.

¹¹⁷ The New GE Way, p. 160.

¹¹⁸ *ibid*, p.97.

¹¹⁹ *ibid*, p.108.

Immelt's approach to fostering innovation is, as the first step, to 'prepare the organization to innovate¹²⁰ or in so many words, creating a 'culture' wherein innovation can take place. GE's Annual Report 2008 made the point that 'patent applications in 2008 were 8% above the level in the prior year'¹²¹. The 2012 Annual Report states that GE is back in the top 10 patent filers in the U.S.

Factor #25: Degree to which employee organizations encourage innovation.

Summary

Little or no anecdotal evidence is available on this Factor.

¹²⁰ *ibid*, p. 108.

¹²¹ 2008 Annual Report.

A. Entrepreneurship and Innovation Rating for GE

Leadership	Organization and management of day-to-day affairs	Idea generation and realization	<i>'O'</i> – an outcome of policies and management practices, ?? – no evidence to make a comment BofB refers to 'best of breed'. NR – not relevant	GE Rating-compared to BofB	BofB
Factor			GE's Profile Comments - Summary		
1. Management's emphasis is on short-term versus long-term profit.			GE takes a long-term view of profits	3	3
2. Management explicitly looks for or has no interest in innovation.			GE CEO, Board, and management explicitly look for innovation	-4	-4
3. Management's has tolerance for mavericks or not.			No evidence to conclude either way	??	-4
4. Planning emphasizes rationing resources or identifying opportunities.			Focus is on identifying a nurturing ideas	4	4
5. Management's tolerance for failure or not.			Reasonable position – unless initiative is not done as stated. No specific policy	-3	-4
6. Leaders emphasize management of people and their interactions or not.			Substantial emphasis on people management	5	5
7. Corporation provides career ladders, powers and titles for innovators or not.			No evidence to conclude either way	??	4
8. Corporation is tolerant towards variances from the corporate norm or not.			GE has a fairly strict set of guidelines but not meant to interfere with innovation	-2.5	-2.5
9. Management's tolerance for uncertainty (as distinct from risk) in the planning process or not.			Careful planning is emphasized when dealing with longer-term issues	2	2
10. The style of communication within the organization.			Communication is being improved upon and is informal	-3.5	-4.5
11. Management's discourages or encourages use of independent work groups for special purposes.			GE establishes independent work groups for specific tasks	-5	-5
12. Management makes decisions with lots of input from the rest of the corporation or not.			GE employee survey is evidence of a desire for input on at least this front	5	5
13. Decision process is elaborate and formal versus short and informal.			Now seeking to make the process both short and informal.	3	5
14. The corporation has specific mechanisms available for rewarding innovation or not.			No evidence to conclude either way	??	-4
15. The organization is planning-oriented versus action-oriented.			GE places a strong emphasis on planning but trend is to encouraging an action orientation	??	0
16. Management has an open and relaxed attitude towards mergers, acquisitions, joint ventures and divestitures or not.			Very open attitude to mergers and acquisitions but organic growth is emphasized under Immelt.	0	0
17. Management expects people to be totally devoted to the corporation or makes room for personal development.			No established, or at least ,articulated policy	??	
18. The organization has a decentralized or centralized hierarchy.			Was seen to be too highly centralized but is now trending to remove layers of 'checkers'	-2	-3
19. Resources (budget, personnel, time, etc.) are generally available for new ventures or not.			Resources are available based on project meeting established criteria	4	4
20. Extent of staff involvement (as opposed to line involvement) in the decision process.			Recent comments would suggest that the decision process is to be less encumbered by staff 'checking'.	NR	
21. Innovators tend to stay with the organization or leave.			No evidence on which to comment	'O'	
22. The organization has or has not an innovative tradition.			GE has a substantial reputation for innovation	'O'	
23. The R&D budget is less or more than the competition.			R&D spending has been increased in recent years is above competitor levels	4	4
24. Innovation is perceived as decreasing or increasing.			Innovation is well underway and is a part of the culture	'O'	
25. Employee organizations discourage or encourage innovation.			No evidence on which to make a statement.	??	