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Measuring the culture and progress of innovation.

Is it all in the numbers? Can 'culture' be measured? Progress can!

January 17, 2018

This paper sets forth ideas on measures for better understanding whether a corporation has a culture which supports innovation and a means of tracking the progress of innovation.

A framework for measurement is suggested along with examples from well-known and successful companies.

1. Overview

Being innovative is not an end in itself. The goal of innovation is for the corporation to grow, be profitable, and benefit stakeholders while maintaining an acceptable level of risk.

CIO's research on innovation management clearly indicates that there are three major elements which make for success.

- **A culture** in the organization which values innovativeness and where the corporation is driven to be an outstanding competitor in their chosen field of endeavor.

Organizations which start off with a founder(s) who are guided by this desire have a head-start over those coming late to the idea of being innovative. 3M, Starbucks, GE, and of course Apple, for example, began with their culture for innovation infused from the start. Massey-Ferguson¹ did not. RIM (Research in Motion, now Blackberry) was pulled off track mid-way.

- **A strategic direction** which guides the organization to the opportunities as they develop within their current or potential customer community. Strategy and culture need to go hand in hand. Simply relying on a culture for innovation is a recipe for disaster. It is, however, easier to modify the strategy of a company than it is to restructure its culture for innovation. Strategy changes. Culture is deep-rooted.
- **A means of managing the progress of innovation** within the organization. Whereas innovation can be viewed by some as a black art, i.e., that the surfacing of ideas is willy-nilly

¹ Companies researched in-depth by CIO.

Its in the numbers!

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and subject to a lot of luck, more recent examinations of how corporations sustain or develop their innovativeness are revealing the presence of a more systematic management process. Without appropriate measurement of progress, there is little understanding of the need for change nor a direction for developing solutions.

A recent study by Booz and Company² confirms that this latter element is now an important aspect of innovation.

“Few companies succeed at innovation without ensuring that adequate processes are in place to generate new ideas, and that those processes are followed in a disciplined fashion”.

This paper addresses two of the three elements: measuring the culture of an organization and a means of measurement the progress of innovation.

2. Measuring the culture for innovation

Is measurement even possible? Yes, you can!

CIO’s extensive research on innovation management has concluded that among the twenty-five Factors³ which either encourage or discourage innovation, there are several Factors which are more important than others. The relevant Factors are classified into three groups; the ‘must haves’, the ‘desirables’, and, for lack of a better term, ‘others’; not to be forgotten Factors and still important.

The ‘Must Haves’

Based on CIO’s research, eight Factors are deemed to be the most important; F#1; management’s view of on profits, F#2; management’s view of the importance of innovation, F#5; tolerance for failure, F#6; people and their interactions, F#7; career for and recognition of innovators, F#9; tolerance for risk in the planning process, F#12; decision making is broadly based – collaboration and F#14; rewards for innovation. Each of these Factors is discussed below.

Two sources of information provide the data for determining the most important Factors; 1. CIO’s on-line survey and 2. in-depth research of highly successful, idea-intensive companies.

Registrants to the on-line survey provide their opinion on the importance, or not, of each Factor by indicating what constitutes their ‘Ideal’ situation. For example, the average of all registrants responding to Factor #1 (see below), indicates that there is a desire that management’s emphasis be more on thinking longer-term than short-term and that, based on the scale of the response, believe this is an important condition for maintaining a culture for innovation.

Over forty companies’ management practices have also been examined, some in more depth than others, and have provided insight into their approach to innovation management.

² The Global Innovation 1000: Making Ideas Work

³ For a full description of Factors and the scope of the on-line survey, visit the web site.

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Factor	Data from on-line survey (12/01/2018)	Edited data	Extreme left of scale	Extreme right of scale
<i>1. Management's emphasis is on short-term versus long-term profit.</i>	2.2	2.2	Emphasizes very short term	Emphasizes very long term

For each Factor, the data taken directly from the most recent on-line survey is compared to the same data but edited to take account of incomplete registration of opinion which would not show up on the report available to on-line registrants.

Ranked highest of all the Factors included in the 'Must haves', the Desirables, and 'Others' is, according to the 'Ideals' of registrants, the need for management to pay attention to the management of people; F#6. Effective people management sets a climate which is conducive to innovation. CIO's ranking for 3M⁴ is '5'.

<i>6. Leaders emphasize management of people and their interactions or not.</i>	3.2	3.3	Little emphasis on people.	Very much emphasize people management.
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An analysis of the results for Factor #2, which seeks to question the need for and importance of an explicit interest by management in innovation, provides inconclusive results, i.e. no bias either way. On further examination of the results for Factor #2, the conclusion is that innovation per se had little interest for some respondents while others thought it was important.

<i>2. Management explicitly looks for or has no interest in innovation.</i>	-0.3	-0.4	Explicit objectives for innovation.	Has no interest in innovation.
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Because of researching 3M's management practices, CIO places a value of four on this Factor for 3M. CIO ranks 3M as highest among the companies which have been researched and, for this reason, this Factor is included in the top eight Factors.

The tolerance for failure also provides almost a similar neutral result.

<i>5. Management's tolerance for failure or not.</i>	-0.5	-0.5	Very high tolerance for failure.	Very low tolerance for failure.
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Other research conducted by CIO and others has concluded that tolerance for risk is an essential component of innovation. Without risk there is no innovation. Thus, while the results here are inclusive, this Factor is included in the top eight.

⁴ See full report on 3M available on the web site under 'Research.'

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The data base includes information from all registrants and therefor represents both private and public organizations, information from several countries and as well as from different levels within their organizations. This explains, in part, the neutral result for Factors number two and five. By parsing the results for those registrants who rate the need for innovation highly versus those who do not, further insight is provided.

Registrants who seek ‘management’s explicit interest in innovation’, i.e. paraphrased, seek to work within an innovative organization, account for sixty-percent of total registrants. Factors #2 and #5 values for this subgroup are different from the values associated with total registrants. For this subgroup the scaled ratings are set out below.

Sixty percent of registrants have a strong bias towards seeking an explicit message from management that their organization should be innovative. That is their ‘Ideal’.

<i>2. Management explicitly looks for or has no interest in innovation.</i>	-3.2
<i>5. Management's tolerance for failure or not.</i>	-1.4

Additionally, the tolerance for failure, #5, for this group increases, which is consistent with the sense that innovative involves risk.

The provision of career paths, powers and titles for innovators (F#7) elicited a response which suggests that this is an important Factor for all registrants.

<i>7. Corporation provides career ladders, powers and titles for innovators or not.</i>	2.3	2.3	Innovators have limited career opportunities.	Innovators have careers and recognition.
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<i>14. The corporation has specific mechanisms available for rewarding innovation or not.</i>	-1.6	-1.6	Mechanisms exist for rewarding innovation.	No mechanisms for rewarding innovation.
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Factor #14 elicits a similar response to that for Factor #7, i.e. a desire for more recognition of innovators in terms of rewards, citations or monetary rewards.

Registrants desired more risk assumption in the planning process.

<i>9. Management's tolerance for uncertainty (as distinct from risk) in the planning process or not.</i>	1.6	1.6	Plans have a very low tolerance for risk.	Plans have a very high tolerance for risk.
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Collaboration, represented by Factor #12, was high on the list of desirable characteristics.

<i>12. Management makes decisions with lots of input from the rest of the corporation or not.</i>	2.5	2.5	Little consultation	Lots of input is sought.
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The on-line survey also asks the registrant to ‘scale’ their current situation, i.e., their ‘Reality’, which is most often reported as less than their ‘Ideal’. The gap between registrants ‘Ideal’ and ‘Reality’ is indicative of their satisfaction or dissatisfaction with their situation and the scale of the gap can suggest a course of action for improving the situation.

Overall, and when completed for a single organization, a business unit or total company, the results can unveil areas of satisfaction or dissatisfaction and act as a guide to improving the management of innovation by focusing on particular initiatives.

The ‘Desirables’

Three Factors, with lesser ratings than the above ‘must halves’, address the characteristic of communication, decentralization and investment in research and development; F#10; intra-firm communications, F#18; little hierarchy, decentralized decision making, and F#23; research and development spending and consistency.

<i>10. The style of communication within the organization.</i>	-1.1	-1.1	Communication is highly informal.	Communication is highly formal.
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<i>18. The organization has a decentralized or centralized hierarchy.</i>	-0.9	-0.9	Highly decentralized hierarchy.	Highly centralized hierarchy.
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<i>23. The R&D budget is less or more than the competition.</i>	1.8	1.8	R&D spending is much less than the competition’s spending.	R&D spending greatly exceeds competition’s spending.
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Factor eighteen addresses the issue of bureaucracy in the organization, often brought about by a resistance to delegating decision making within the organization.

Delegation⁵ per se is now being recognized as impacting organizational productivity and innovation. For the first time in its history, the WEF⁶ has included ‘delegation’ in its assessment. Within the 11th pillar, which addresses ‘business sophistication’, there is one element which has caught CIO’s attention, namely, the ‘willingness to delegate’. Respondents to the WEF survey are asked ‘how do you assess the willingness to delegate authority to subordinates. A rating of ‘1’ is to be not willing at all and a rating of ‘7’ means very willing to delegate to ‘business management heads and lower-level positions’.

⁵ For a discussion of the importance of delegation, visit the web site.

⁶ World Economic Forum

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For the last several years, at least since 2012-2013, the rankings have not changed much. Canada was ranked 8th in the 2012-2013 report and is currently rated 11th. The U.S. is ranked 9th. Year after year, Nordic countries are in the top ten. New Zealand slips in at 6th currently and Qatar is 7th. Mexico is 67th. The ‘willingness to delegate’ is but one of nine elements that contribute to a country’s overall ranking for the 11th pillar: ‘business sophistication’.

Countries such as India – 56th, Russian Federation – 78th, Argentina – 93rd, Armenia⁷ – 105th, and China – 48th, have not yet, according to this report, learned much at all about delegation.

The ‘Others’

Two other Factors make the cut; 1. whether the organization is action or planning oriented and 2, the use of independent work groups – a proxy in many ways for the presence of a decentralized organization.

Factor #15 results are inconclusive, but a further examination of registrant’s opinion indicates that approximately fifty-percent of registrants entered a ‘0’ indicating no opinion – or not relevant – for this Factor.

<i>15. The organization is planning-oriented versus action-oriented.</i>	-0.3	-.3	Organization is prone to planning and analysis.	Organization is prone to action with little planning.
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<i>11. Management discourages or encourages use of independent work groups for special purposes.</i>	-1.6	-1.7	Use of independent work groups is greatly encouraged.	Use of independent work groups is greatly discouraged.
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Factor #11 results are clearly a proxy for whether delegation is an issue. The existence of independent work groups, at least those with significant and defined responsibilities and accountabilities, are an indication that the organization is willing to delegate and has an objective of limiting bureaucracy.

There are eleven other Factors measured by the on-line survey but none of these were ranked as highly as the thirteen Factors noted above.

Appendix A sets out the full number of Factors involved in the on-line survey. Three Factors, #21, #22, and #24 are intended to set out the ‘outcomes’ of the current situation i.e., measuring the registrant’s opinion of whether the organization has a reputation for innovation, whether this

⁷ Armenia is admittedly a small country, but personal experience led to its insertion in this paper as is also the case with Argentina (see an earlier report on innovation in Argentina versus Canada).

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is getting better or worse, and whether innovators are leaving the organization. Taken together, these three Factors provide further insight into the dynamics of the organization.

3. Measuring the progress of innovation

Without measurement an organization is blind to progress.

No one would disagree with the idea that the corporation exists to maximize returns for its shareholders having due regard for its full spectrum of stakeholders. Not every corporation chooses to be innovative and that is an acceptable strategy although fraught with potential problems over the longer term.

Copying, or being by desire an imitator or follower, is an alternative to being innovative. Knowing one's own strategy is key.

Most of the companies which CIO has researched want to be the leader in their chosen field. Only one company which was researched, Massey-Ferguson, chose deliberately to be a follower (of John Deere in particular). The strategy was successful for about 150 years until the company succumbed and its brand bought out. RIM (Research in Motion and now named Blackberry) is, as this article paper is being written, attempting to recover its innovative mojo after leading the pack during the early introduction of a new generation of phones.

Innovation, as it is used in this paper, includes the full range of ideas which percolate within a company and need to find a way to surface and be implemented.

Ideas and change come with risk. The four quadrants (next page) suggest a range of low to high-risk dependent upon the intended focus of the investment. Investment, while usually thought of in monetary terms includes all resources: time, thought and even emotional energy.

Why worry about metrics of innovation? Phil McKinney⁸ perhaps summed up the situation when he stated:

⁸ Phil McKinney.com

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If you set the right metrics, then you're going to have people doing the right actions. Consistency in producing and measuring the innovation metrics will eventually take hold. It eventually will become part of the corporate culture, but you can't give up. Because people work to metrics.

In other words, metrics play to and impact the culture in the organization.

Decisions concerning metrics work to impact the culture for innovation but gaining the culture takes time and a discipline. Losing an innovative culture takes much less time.

Choosing the right metrics is key to measuring innovativeness. Anyone who has gone through an individual performance review, or business unit review, knows full well the

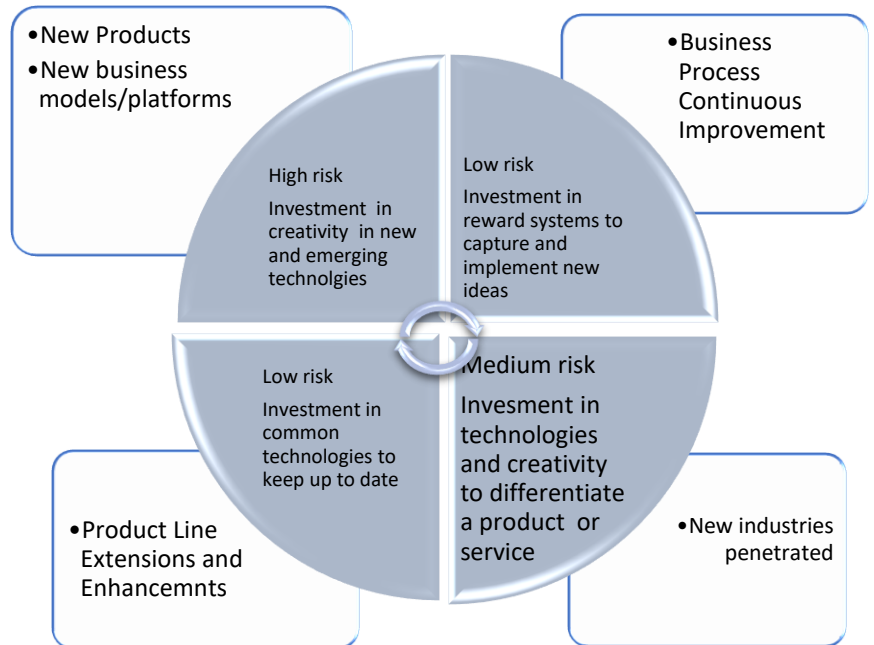
importance of metrics – whatever they may be. Metrics determine your perceived performance within the organization, the chances of being promoted and extend quickly to the determination of compensation. At the CEO level, especially in these days of short-term thinking, the focus is on share appreciation and growth. Metrics matter at all levels in the organization.

Every measurement of innovative output will have its detractors, but as long as the business model remains the same from year to year, even the simplest of measurements can provide a degree of insight into the effectiveness of innovative activities.

Its relatively easy to measure the innovativeness of some companies but as companies grow and become more complex, the task becomes much more difficult. Other measures are needed, at least at the overall corporate level. No doubt simpler measures can be used in distinct divisions, business units or for individuals, but such information is seldom reported publically.

3M, a company which CIO has researched⁹ at some length and which has, since its inception, emphasized the importance of innovation, gets more complicated to analyze with simple metrics at the corporate level. The complexity, however, has not stopped 3M from emphasizing what it believes are measures of its commitment to measuring the progress of innovation.

- 3M emphasizes its innovativeness in terms of; patents awarded, technology platforms of which there are 46 globally, researchers employed (2,673 in the 2011 report).



⁹ See Profile of 3M at <http://www.corporateinnovationonline.com>

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- The company currently publishes a report on its ‘culture of innovation’ replacing an earlier document entitled ‘A Century of Innovation which was discontinued during McNerney’s watch.
- 3M reports its awards for everything from science initiatives to business awards.
- 3M earned a top spot on Booz & Company’s list of most innovative companies for the third consecutive year, ranking No. 3 behind Apple, and Google. Booz & Company, a global management consulting firm, surveyed nearly 700 innovation leaders from companies worldwide to determine which companies those leaders see as the most innovative companies in the world, in 2011.
- 3M was named among the top 50 of “The World’s Most Attractive Employers” in a survey conducted by research firm Universum. More than 160,000 undergraduate business and engineering students worldwide participated in the survey in 2010.
- 3M has been selected for inclusion in the 2008/09 Dow Jones Sustainability Index that tracks the performance of sustainability-driven companies worldwide. 3M has been included in the index every year since its inception in 1999.

That 3M chooses to report on these rewards and recognitions is evidence of its inherent innovativeness and, by implication, its own measurements of the progress of innovation.

Phil McKinney provides a full expose of 3M’s use of metrics around research and development spending and its relationship to gross margin.

This is what I call the “3M Metric”. 3M is famous for pushing their executives to embrace the new by putting in place a metric that reinforces the need to constantly re-invent itself. So, what constitutes a new product? Rather than describe what it is, it’s easier for me to describe what it isn’t. It’s not the next generation of an existing product (the next year’s model of a car or laptop doesn’t qualify) or a line extension (a new flavor of soft drink doesn’t qualify).

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It is hardly useful to repeat here what McKinney has already set out; except for one key metric; “percent of revenue from products launched in the last XX years”; a very common measurement of innovativeness¹⁰. The Product Vitality (NPVI) is a good measure of the introduction of new – not legacy – initiatives.

Gross margin divided by spending on research and development is a metric which has been also used by HP ¹¹, but this is a different story. *Why gross margin? The theory is that if you build a better mouse trap, the customer will reward you with a margin premium which will show up in gross margin.*



Picking the right metrics can be made easier by closely analyzing their use by the competition. Find a comparable company and use their choice of metrics as your starting point.

Appendix B sets out examples of measurements which relate to the risk associated with four different types of investment in innovation.

In CIO’s experience such a comparison is one of the best ways of introducing almost any kind of change; i.e. by recognizing a potential threat from the competition.

The Olympic skier Jean-Claude Killy said it best, "The best and fastest way to learn a sport is to watch and imitate a champion."

This is a starting point, not the end of the process of selecting an appropriate metric.

John Deere emphasizes its expanded product range and performance enhancements to its engines as well as rewards received from external sources.

John Deere received several medals presented at Europe’s largest farm equipment show, eight awards from a leading U.S. agricultural-engineering group and a gold medal earned at an international competition in France. The recognized technologies pertain to advanced steering, tractor implement automation and crop harvesting logistics, among other areas. In addition, the John Deere 7280R was named tractor of the year by European farm-magazine editors.

Both John Deere and 3M make extensive use of external sources for recognizing innovativeness, at the corporate level. The complexity of their organization did not deter either of these companies from communicating the importance of innovation. Rewards are consistent with their

¹⁰ ibid

¹¹ Phil McKinney.com

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internal reward philosophy, i.e. using non-monetary rewards is at least as significant a recognition as monetary.

4. Other measures

Other measures requiring surveys or extensive analysis.

There are a variety of ways of measuring innovativeness at least as seen by stakeholders, customers and even employees. Here are a few; some better than others.

- Surveys that provide customers opinion of your company's innovativeness and its brand image – as compared to the competition.
- Financial analyst rankings and feedback from investor relations broadcasts to the media.
- Stakeholders' (in this case suppliers, investors, etc.) opinions on the 'innovativeness' of your company compared with their opinion of the competition.
- New sales to new customers - marks the rate of new customer acquisition reflecting the efforts to enhance the brand.
- Measurements of incidence, or rate of increase, of attractive, internally generated investment opportunities (the size of the pipeline) which come under review by senior management and the Board.
- Increase in the value of intellectual property generated from internally-sourced ideas; augmented by acquisitions of IP from other organizations. The information could be broken out by IP for existing versus new product initiatives.
- Share price premium attributed to the company's reputation for innovativeness.
- Conducting an analysis focused on employee retention and ease of attraction.
- Collaborations and partnerships reflecting the company's reputation for its innovativeness.
- The percentage-of- time key executives/Board members spend on innovation as a specific topic of a meeting, seminar or workshop.

For more ideas about improving the management of innovation, please visit the web site; www.corporateinnovationonline.com

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Appendix A. Outline of questionnaire used in CIO's on-line survey. *The survey is no longer available, but results are online.*

Appendix B

Factor - Question	Extreme left of scale	Extreme right of scale
1. Management's emphasis is on short-term versus long-term profit.	Emphasizes very short term	Emphasizes very long term
2. Management explicitly looks for or has no interest in innovation.	Explicit objectives for innovation.	Has no interest in innovation.
3. Management's has tolerance for mavericks or not.	A lot of tolerance.	Very little tolerance
4. Planning emphasizes rationing resources or identifying opportunities.	Very much rations resources.	Focus is on identifying opportunities.
5. Management's tolerance for failure or not.	Very high tolerance for failure.	Very low tolerance for failure.
6. Leaders emphasize management of people and their interactions or not.	Little emphasis on people.	Very much emphasize people management.
7. Corporation provides career ladders, powers and titles for innovators or not.	Innovators have limited career opportunities.	Innovators have careers and recognition.
8. Corporation is tolerant towards variances from the corporate norm or not.	Corporation highly tolerates differences.	Corporation has little tolerance for differences.
9. Management's tolerance for uncertainty (as distinct from risk) in the planning process or not.	Plans have a very low tolerance for risk.	Plans have a very high tolerance for risk.
10. The style of communication within the organization.	Communication is highly informal.	Communication is highly formal.
11. Management's discourages or encourages use of independent work groups for special purposes.	Use of independent work groups is greatly encouraged.	Use of independent work groups is greatly discouraged.
12. Management makes decisions with lots of input from the rest of the corporation or not.	Little consultation.	Lots of input is sought.
13. Decision process is elaborate and formal versus short and informal.	Process is short and informal.	Process is elaborate and formal.
14. The corporation has specific mechanisms available for rewarding innovation or not.	Mechanisms exist for rewarding innovation.	No mechanisms for rewarding innovation.
15. The organization is planning-oriented versus action-oriented.	Organization is prone to planning and analysis.	Organization is prone to action with little planning.
16. Management has an open and relaxed attitude towards mergers, acquisitions, joint ventures and divestitures or not.	Very open attitude to mergers and acquisitions.	Very closed attitude to mergers and acquisitions.
17. Management expects people to be totally devoted to the corporation or makes room for personal development.	Insists all time and effort are devoted to corporate objectives.	Really encourages personal development.
18. The organization has a decentralized or centralized hierarchy.	Highly decentralized hierarchy.	Highly centralized hierarchy.
19. Resources (budget, personnel, time, etc.) are generally available for new ventures or not.	Few resources are ever available.	Resources are generally available.
20. Extent of staff involvement (as opposed to line involvement) in the decision process.	Little staff involvement in decisions.	Lots of staff involvement in decisions.
21. Innovators tend to stay with the organization or leave.	Innovators stay with the corporation.	Innovators leave the corporation.
22. The organization has or has not an innovative tradition.	Corporation has not tradition of innovation.	Corporation has a fine reputation for innovation.
23. The R&D budget is less or more than the competition.	R&D spending is much less than the competition's spending.	R&D spending greatly exceeds competition's spending.
24. Innovation is perceived as decreasing or increasing.	Innovation is decreasing rapidly.	Innovation is increasing rapidly.
25. Employee organizations discourage or encourage innovation.	Organizations encourage innovation.	Organizations discourage innovation.

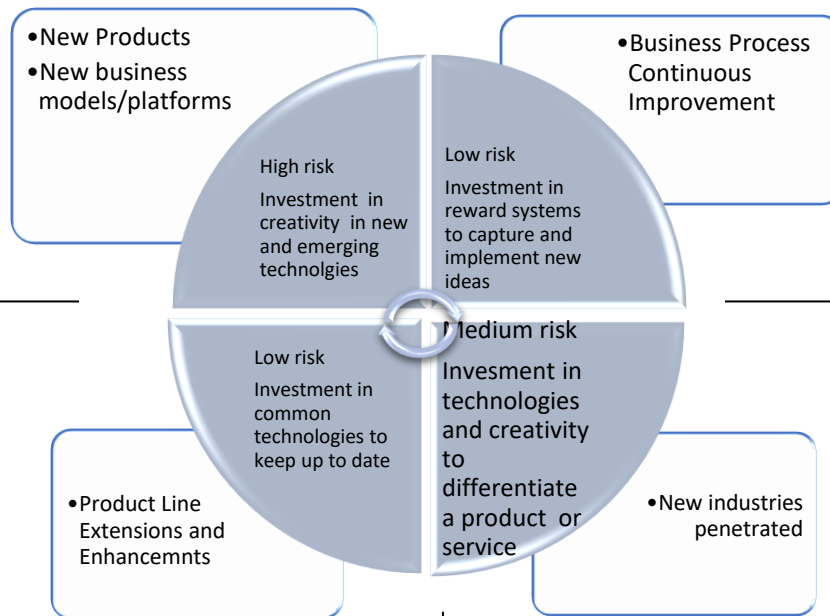
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Measures of Innovativeness – Examples in 4 Quadrants

- Patent applications
- Patents achieved.
- Ability to hire Stem personnel.
- Number of 'breakthroughs'
- Rewards from external sources
- Publications in prestigious journals
- Licensing fees derived.
- New products as a % of current offerings
- Dropping under- performing products

- Reduction in cost per unit
- New technologies adopted.
- Service levels improved.
- New customers added in existing markets.
- Revenue per employee
- Revenue per units of production
- Measurable quality improvements



- Ideas generated and, in the pipeline.
- Ideas generated and implemented.
- New markets entered.

- Number of collaboration linkages
- Stakeholder (employees, suppliers, customers) surveys
- Results of 'exit' interviews with innovators
- Risk profile at target level