

# *INVENTIVE TALENT*

## **Inventive Talent Survey™ of Innovation Leadership**

### **Technical Report**

**Development and Psychometric Support**

**March 2014**

# Inventive Talent Survey™ of Innovation Leadership: Its Development and Psychometric Support

*The game is changing. It isn't just about math and science anymore. It's about creativity, imagination, and above all, innovation.*

Business Week, 2005

*The research reveals that companies fundamentally mismanage their innovation talent.*

Harvard Business Review, 2009

We are evolving from a knowledge-based economy to an innovation economy. What was once central to corporations – price, quality, and efficiency – is fast being shipped off to lower-paid, highly trained Chinese and Indians, as well as Hungarians, Czechs, and Russians. Increasingly, the new core competences are creativity and innovation. Smart companies are now harnessing innovation to generate top-line growth. A recent survey by PricewaterhouseCoopers revealed 97% of CEOs rated innovation as a top priority for their business.

Despite the growing awareness that innovation is the only sustainable source of competitive advantage in this highly volatile and competitive global market, less than a quarter of companies report satisfactory innovation performance (Harrington & Voehl, 2012). While there is no shortage of ideas for the inspiration of creativity (e.g., suggestion boxes) and advice on innovation leadership best practices (e.g., knowledge management and organizational learning), companies need to formulate a strategic, integrated approach to drive and implement it (Microsoft, 2013). Improving innovation isn't going to happen simply by increasing R&D spending (Accenture, 2011). To the contrary, innovation is highly dependent on corporate culture, organizational processes, the talent involved, and technological support (Chatman & Cha, 2003; Wang, Guidice, Tansky, & Wang, 2010). And, perhaps most importantly, successful innovation requires effective leadership. Without great innovation leaders, there is no innovation (Oke, Munshi, & Walumbwa, 2009).

The establishment of the integrated innovation organizational framework requires a standardized process to measure these salient elements. This technical report overviews the development and psychometric support of an online instrument designed to assess the key characteristics of organizational innovation.

## Review of the Innovation Literature

Organizations can innovate in a variety of different ways. Some companies innovate from the bottom-up such as 3M, while others innovate from the top-down. Some do it radically; others do it incrementally. Still others innovate in product; whereas, others innovate in process, customer service, or business model. Further, individuals, teams, and organizations differ in their creative problem-solving styles.

Regardless of how innovation occurs or whatever problem-solving style is used, the most innovative organizations of the 21<sup>st</sup> Century will employ rigorous talent management and leadership practices designed to ensure it is optimized. The purpose of our review of the literature was to identify what are these talent management and leadership practices.

The following three online search engines were used to examine the literature: (a) ProQuest, (b) EBSCOhost, and (c) PsycINFO. Both academic and practitioner-oriented journal publications were investigated. More than 280 articles addressing innovation were located. Each article was analyzed with the specific purpose of identifying potential factors that might influence innovation success. Subsequently, a content analysis was conducted to categorize these factors. This process led to the identification of six broad areas and 30 themes.

A 126-page comprehensive summary of the literature review is available by request from Inventive Talent Consulting, and a representative sample is appended to this report.

The table below presents the results of the content analysis developed after the literature review.

Factors	Themes
<b>A. Enterprise Innovation Leadership</b>	1. Differentiated Strategy 2. Strategy Alignment 3. Passion 4. Resources 5. Trust
<b>B. Team Innovation Leadership</b>	6. Metrics 7. Conflict 8. Decision Making 9. Development 10. Accountability
<b>C. Technical Talent Focus on Innovation</b>	11. Expertise 12. Experience 13. Mentorship 14. Influence 15. Knowledge Sharing
<b>D. Innovation Code of Conduct</b>	16. Risk taking 17. Collaboration 18. Work Environment 19. Recognition 20. Values

<b>E. Innovation Infrastructure</b>	21. Structure 22. Technology 23. Career Support 24. Commercialization 25. Rewards
<b>F. Reputation for Innovation</b>	26. Competition 27. Customer Focus 28. Track Record 29. External Reputation 30. Intellectual Property

## Instrument Development and Pilot Testing

The 30 themes provided the initial conceptualization of the assessment framework. Three survey items were developed for each of the themes. The instrument used a 5-point Likert rating scale, ranging from *Strongly Disagree* (1), *Disagree* (2), *Neither Agree nor Disagree* (3), *Agree* (4), to *Strongly Agree* (5).

This 90-item instrument was pilot tested on a sample of participants recruited from eight different companies throughout the United States. These companies represent five industries, including electronics components manufacturing, medical device component manufacturing, furniture manufacturing, packaging, and non-profit service. In total, 526 employees completed useable surveys. The following table summarizes the distribution of job functions for the responding employees.

Job Function	Percentage
Marketing / Brand Mgt. / Product Mgt.	11.4%
Research & Development	5.4%
Design / Engineering	16.9%
Information Technology	4.6%
Legal	0.4%
Finance / Accounting / Purchasing	6.2%
Supply Chain / Manufacturing / Production	16.7%
Sales	15.3%
Human Resources	4.4%
General Mgt. / Executive Mgt.	11.6%
Other	7.0%

Initially, an item analysis was conducted to identify any poor survey items. One item had inconsistent correlations (i.e., positive and negative) with the other items. Therefore, this item was excluded from further analyses. Principal Component Analysis with Varimax rotation then was performed on the remaining 89 items. This analysis yielded 15 factors with eigenvalues greater than 1.0. However, Factors 8 to 15 had only two items per factor with factor loadings greater than 0.30 and were not considered. Such a decision rule is recommended in the psychometric literature (see Guilford & Fruchter, 1978).

Another Principal Component Analysis with Varimax rotation was conducted forcing a 7-factor solution. The results indicated that each of the factors had similar items with factor loadings greater than 0.30. Consequently, the survey items loading on more than one factor were examined for conceptual themes by reading the content of each item within a factor, similar to what the Principal Component Analysis did statistically. Two subject matter experts in talent management independently performed this conceptual analysis, then deleted items where there was disagreement.

Ultimately, seven items were identified for each of the seven factors. A Confirmatory Factor Analysis then was performed to confirm the resulting factor structure. The fit statistics indicate a “good fit” of this model to the data: *Chi-Square* = 2169.04, *df* = 1106; *RMSEA* = 0.06; *NFI* = 0.96; *CFI* = 0.98; *IFI* = 0.98. The following areas of innovation are represented by the seven factors:

1. **Innovation Index:** This area describes a company’s innovation performance. It can be used as the outcome measure.
2. **Technical Expertise:** This factor assesses whether the company has sufficient technical experts and how well the technical experts are performing.
3. **Career Management:** This facet evaluates the degree to which the company’s career management is supportive of innovation.
4. **Team Leadership:** This factor describes behaviors of team leaders that are conducive to employees’ innovation.
5. **Team Dynamics:** This dimension captures features of a high performing team.
6. **Organizational Dynamics:** This factor addresses organization elements such as resource, structure, technology, and processes that are essential for innovation.
7. **Enterprise Leadership:** This factor relates to the role of top management in innovation management.

The following table presents the factor loadings for each of the seven factors on the *Inventive Talent Survey™ of Innovation Leadership*. As can be seen, the vast majority of the items have factor loaders greater than 0.40. All the seven factors have eigenvalues greater than 1.0. Collectively, the seven factors explained 62.35% of the overall variance.

Survey Item	Factor						
	1	2	3	4	5	6	7
31	0.70						
57	0.66						
58	0.64						
59	0.62						
60	0.49						
61	0.55						
84	0.58						
14		0.79					
15		0.60					
42		0.71					
43		0.72					
72		0.50					
73		0.77					
75		0.61					
21			0.58				
23			0.45				
45			0.41				
53			0.52				
62			0.50				
78			0.22				
83			0.60				
9				0.72			
10				0.58			
16				0.67			
19				0.60			
37				0.72			
38				0.73			
55				0.53			
6					0.39		
7					0.71		
17					0.59		
36					0.53		
40					0.72		
47					0.66		

Survey Item	Factor						
	1	2	3	4	5	6	7
70					0.63		
34						0.53	
46						0.18	
51						0.58	
52						0.66	
64						0.46	
81						0.62	
82						0.56	
3							0.59
20							0.45
33							0.71
35							0.66
50							0.63
63							0.61
65							0.66

Note.  $N = 526$ . All the seven factors have eigenvalues greater than 1.0. Collectively, the factors explained 62.35% of the overall variance. To protect the proprietary nature of this instrument, the specific items are not revealed in the table.

The internal reliability of the new instrument was assessed by the coefficient alpha statistic. Based on psychometric standards, a coefficient of 0.70 or higher indicates an acceptable level of reliability (Nunnally & Bernstein, 1994). As can be seen in the table below, each factor had a minimum reliability of 0.83 (“Team Dynamics”); the overall reliability of the entire assessment was outstanding ( $r = 0.97$ ).

Factor	Alpha	Mean	Std
Factor 1: Innovation Index	0.85	3.26	0.69
Factor 2: Technical Expertise	0.90	3.23	0.75
Factor 3: Career Management	0.88	3.11	0.79
Factor 4: Team Leadership	0.86	3.67	0.76
Factor 5: Team Dynamics	0.83	3.77	0.67
Factor 6: Organizational Dynamics	0.85	2.84	0.79
Factor 7: Enterprise Leadership	0.90	3.43	0.82
<i>Overall Scale</i>	<i>0.97</i>	<i>3.39</i>	<i>0.61</i>

Note.  $N = 526$ . All alpha coefficients are statistically significant at  $p < .001$ .

## Conclusion

The purpose of the current pilot study was to develop a comprehensive, relatively short assessment of an organization's talent management and leadership innovation practices. Initially, a systematic review of the extant literature was conducted to identify potential dimensions to measure. Based on this review, an initial 90-item survey was developed and administered to more than 500 employees from eight different companies located throughout the United States. A series of Principal Component Analyses and subject matter expert discussions reduced the number of survey items to 49 measuring seven dimensions of innovation. Each of the seven dimensions demonstrated high internal reliability.

Thus, the *Inventive Talent Survey™ of Innovation Leadership* assesses the following facets of innovation:

- Technical Expertise
- Career Management
- Team Leadership
- Team Dynamics
- Organizational Dynamics
- Enterprise Leadership
- Innovation Index

The “Innovation Index” dimension can be used as a proxy outcome to gauge an organization's overall innovation.

Although innovation is widely acknowledged today to be critical for success in most businesses, fewer than 25% of executives perceive innovation performance in their company is where it needs to be for it to be globally competitive (Harrington & Voehl, 2012). It is hoped that the *Inventive Talent Survey™ of Innovation Leadership* will provide a thematic framework by which organizations can assess the efficacy of innovation and diagnose problem areas to address. In so doing, executive leaders will be able to improve their effectiveness as well as enhance the overall state of innovation in their companies.

## References

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## **APPENDIX: Selected Literature Review References by Innovation Driver**

### **A. Technical Expertise**

**Bassett-Jones, N. (2005). The paradox of diversity management, creativity and innovation. *Creativity & Innovation Management*, 14(2), 169-175.**

- Diversity is a recognizable source of creativity and innovation that can provide a basis for competitive advantage. On the other hand, diversity is also a cause of misunderstanding, suspicion and conflict in the workplace that can result in absenteeism, poor quality, low morale and loss of competitiveness. Firms seeking competitive advantage therefore face a paradoxical situation. If they embrace diversity, they risk workplace conflict, and if they avoid diversity, they risk loss of competitiveness.

**Bigoness, W. J., & Perreault Jr., W. D. (1981). A conceptual paradigm and approach for the study of innovators. *Academy of Management Journal*, 24(1), 68-82.**

- Firms possessing internal technical expertise were found to be more innovative than firms without such expertise.

**Collinson, S. S., & Gregson, G. G. (2003). Knowledge networks for new technology-based firms: an international comparison of local entrepreneurship promotion. *R&D Management*, 33(2), 189.**

- The importance of local champions or figureheads, are all factors that help explain differences across the example regions.

**Gehani, R. R. (2011). Individual creativity and the influence of mindful leaders on enterprise innovation. *Journal of Technology Management & Innovation*, 6(3), 82-91.**

- The mindful consciousness of individuals, including their leaders, plays significant roles in the individuals' creativity.

**Lindorfer, D. (2009). Learning mode: Adapting and innovating is crucial for teams. *Leadership In Action*, 29(5), 8-11.**

- There are four general practices teams can engage in to ensure they are learning as they work: establishing a climate for learning, continually assessing team members' work together, working with a team coach, and managing knowledge effectively. The team leader plays a central role in all of these efforts.

**Marcinkus Murphy, W. (2012). Reverse mentoring at work: Fostering cross-generational learning and developing millennial leaders. *Human Resource Management*, 51(4), 549-573.**

- Reverse mentoring may benefit individuals and organizations.

**Meyer, M. (2000). Innovation roles: From souls of fire to devil's advocates. *Journal of Business Communication*, 37(4), 328-347.**

- Those who have the power to champion innovation are also capable of challenging it, suggesting the existence of a new innovation role held by organizational members who object to innovation adoption or innovation: the devil's advocate.

**Santos, J., Doz, Y., & Williamson, P. (2004). Is your innovation process global? MIT Sloan Management Review, 45(4), 31-37.**

Coordination of the global innovation process is simplified or improved when:

- The necessary knowledge is available mainly in the heads of people who share the same language and understanding of local context. Innovation arises from combining existing technologies and expertise in new ways.
- Assembling the best combinations of technical know-how and market expertise, and enhancing that process substantially by looking far and wide for that knowledge, rather than relying solely on local sources.
- Accessing sufficient diversity of knowledge, which capability becomes crucial as a market matures and a company strives to differentiate itself.
- Identifying the relevant pockets of knowledge from around the world, deciding on the optimal footprint for a particular innovation and using cost-effective mechanisms to move distant knowledge without degrading it.

**Sasser, S. L., & Koslow, S. (2012). Passion, expertise, politics, and support. Journal of Advertising, 41(3), 5-18.**

- Passion (individual intrinsic motivation) is one of the most important factors in predicting creativity, along with industry expertise and knowledge.
- As a stimulus, management support for creativity serves to enhance passion's influence on creativity in this model, while the influence of expertise is suppressed by organizational politics.

**Vincent, L. (2005). Innovation midwives: Sustaining innovation streams in established companies. Research Technology Management, 48(1), 41-49.**

- The companies studied here are using networks of "innovation midwives" that nurture, develop and integrate innovations that may otherwise be rejected by the organization's core.
- These innovation midwives act as translators between the language and culture of the established business and the language and culture of innovation.
- In so doing, they focus their actions to resolve four fundamental challenges: 1) justifying the innovation, 2) finding relevance to the core business, 3) reducing risks, and 4) resolving conflicts.
- Although there were only a few companies involved, the study suggests that finding and cultivating these innovation midwives may prove to be an essential factor for established companies to sustain a stream of innovations.

**Xie, X., Zeng, S., & Tam, C. (2010). Overcoming barriers to innovation in SMEs in China: A perspective based cooperation network. Innovation: Management, Policy & Practice, 12(3), 298-310.**

- The 'lack of technical experts' is the most important barrier

## **B. Career Management**

**Baer, M. (2012). Putting creativity to work: The implementation of creative ideas in organizations. *Academy of Management Journal*, 55(5), 1102-1119.**

- The relation between creativity and implementation is regulated by individuals' motivation to put their ideas into practice and their ability to network, or, alternatively, the number of strong relationships they maintain.

**Chalhoub, M. S. (2009). Employee growth and development through knowledge management in the global environment: Effects on the competitiveness of firms in a multinational context. *Journal of Knowledge Globalization*, 2(2), 25-46.**

- The framework includes six managerial initiatives, (1) building intellectual capital by involving the employee in managerial decisions, (2) training and career path development based on multinational mobility, (3) stimulation of employee involvement in innovation and new product development (NPD) through organized research and development (R&D) (4) stability of employee tenure, retention, and sense of belonging through intellectual advancement (5) involvement of the employee in customer-centered practices and (6) external knowledge management across multinational offices and geographic markets. Results showed that initiatives (1), (2), (3), and (4), are positively and significantly correlated with company performance. The fifth component was not found significant, and the sixth was found negatively correlated.

**Katona, Z., Zubcsek, P., & Sarvary, M. (2011). Network effects and personal influences: The diffusion of an online social network. *Journal of Marketing Research (JMR)*, 48(3), 425-443.**

- An individual who is connected to many adopters has a greater adoption probability (degree effect).
- An interesting counterintuitive finding is that the average influential power of individuals decreases with the total number of their contacts.

**Lindbom, D. (2007). A culture of coaching: The challenge of managing performance for long-term results. *Organization Development Journal*, 25(2), P101-P106.**

- Coaching must become part of the organization's identity by including it in core competencies and behavior expectations. Strategic goals must reinforce this culture and processes and resources must be provided to assist effective coaching. These steps and a true commitment to feedback can lead to a culture of coaching.

**Rodríguez-Escudero, A. I., Carbonell, P., & Munuera-Aleman, J. L. (2010). Positive and negative effects of team stressors on job satisfaction and new product performance. *Journal of Product Innovation Management*, 27(6), 856-868.**

- First, product managers should make every effort to reduce role ambiguity to minimal levels, ensuring that team members fully understand their role requirements and have adequate information about their job.
- Second, rather than reducing the level of role conflict to zero, managers must take into account the positive effect that moderate levels of role conflict have in product quality.
- Finally, management should put some pressure on the team members and make sure they understand that there is a sense of urgency.

**Tyagi, R. K., & Sawhney, M. S. (2010). High-performance product management: The impact of structure, process, competencies, and role definition. *Journal of Product Innovation Management*, 27(1), 83-96.**

- The performance of a product management organization is driven by structural barriers in the organization, the quality of marketing processes, roles and responsibilities, and knowledge and competencies. The findings suggest that structural boundaries and interfaces are the biggest impediment to effective product management, followed by clarity of roles and responsibilities. The research highlights the importance of organization structure and effective human resource practices in improving product management performance.

## **C. Team Leadership**

**Amar, A. D., Hentrich, C., & Hlupic, V. (2009). To be a better leader, give up authority. *Harvard Business Review*, 87(12), 22-24.**

- Innovation and efficiency can increase when executives relinquish some of their authority and give employees some autonomy in their jobs.

**Buijs, J. (2007). Innovation leaders should be controlled schizophrenics. *Creativity & Innovation Management*, 16(2), 203-210.**

- This means that innovation leaders need to show a special kind of leadership. This leadership must be balanced, people-focused and must include a high tolerance for ambiguity and paradoxes.
- They have to be nice and nasty at the same time. In short: innovation leaders should be some kind of controlled schizophrenics.

**Castro, F., Gomes, J., & de Sousa, F. C. (2012). Do intelligent leaders make a difference? The effect of a leader's emotional intelligence on followers' creativity. *Creativity & Innovation Management*, 21(2), 171-182.**

- The findings confirmed a positive relationship between leaders' EI and employees' creativity.
- At an EI's sub-dimensions level, the current research showed an association between creativity, on one hand, and self-encouragement and understanding of own emotions, on the other.
- Finally, no mediating effect of climate was observed. The absence of a mediating effect is interesting, since it suggests a direct link between leaders' EI and employees' creativity, regardless of the climate.

**De Stobbeleir, K. E., Ashford, S. J., & Buyens, D. (2011). Self-regulation of creativity at work: The role of feedback-seeking behavior in creative performance. *Academy of Management Journal*, 54(4), 811-831.**

- Employees' cognitive style and perceived organizational support for creativity affected two patterns of feedback seeking:
  - The propensity to inquire for feedback and
  - The propensity to monitor the environment for indirect feedback.
- Feedback inquiry related to supervisor ratings of employee creative performance. These results highlight the importance of employees' self-regulatory behaviors in the creative process and show that feedback seeking is not only a strategy that facilitates individual adaptation, but also a resource for achieving creative outcomes.

**Kelley, T., & Kelley, D. (2012). Reclaim your creative confidence. Harvard Business Review, 90(12), 115-118.**

- The trick is to overcome the four big fears that hold most of us back: fear of the messy unknown, fear of judgment, fear of the first step, and fear of losing control.

**Lee, F., Edmondson, A. C., Thomke, S., & Worline, M. (2004). The mixed effects of inconsistency on experimentation in organizations. Organization Science, 15(3), 310-326.**

- Individuals under high evaluative pressure were less likely to experiment when normative values and instrumental rewards were inconsistent in supporting experimentation.
- In contrast, individuals under low evaluative pressure responded to inconsistent conditions with increased experimentation.

**Lovelace, K., Shapiro, D. L., & Weingart, L. R. (2001). Maximizing cross-functional new product teams' innovativeness and constraint adherence: A conflict communications perspective. Academy of Management Journal, 44(4), 779-793.**

- The effect of task disagreement on team outcomes depended on how free members felt to express task-related doubts and how collaboratively or contentiously these doubts were expressed.

**Mollick, E. (2012). People and process, suits and innovators: the role of individuals in firm performance. Strategic Management Journal, 33(9), 1001-1015.**

- Variation among individuals matter far more in organizational performance than is generally assumed. Further, variation among middle managers has a particularly large impact on firm performance, much larger than that of those individuals who are assigned innovative roles.

**Randolph, W., & Sashkin, M. (2002). Can organizational empowerment work in multinational settings? Academy of Management Executive, 16(1), 102-115.**

Strong evidence suggests that empowerment comes to life and has positive impacts on performance and efficiency when managers use the following three interrelated keys:

- Share accurate information,
- Create autonomy via boundaries, and
- Replace hierarchical thinking with self-managed teams.

**Seravalli, G. (2011). Conflict, contract, leadership and innovation: An interdisciplinary view. Journal of Knowledge Management, Economics & Information Technology, 1(6), 74-121.**

- Leadership is required to progressively manage the conflicts that occur between contrasting visions of how best to proceed that emerge from different specializations, legitimized through a shared commitment.

## D. Team Dynamics

**Badke-Schaub, P., Goldschmidt, G., & Meijer, M. (2010). How does cognitive conflict in design teams support the development of creative ideas? *Creativity & Innovation Management*, 19(2), 119-133.**

- Design teams, even in a laboratory environment, encounter a considerable amount of cognitive conflict.
- The high innovation and high functionality groups used a more competing and a more compromising style, whereas groups rated low on the same parameters used a more collaborating style.
- The high rating groups on both creativity components used a more associating and rejecting behavior style; the high innovation groups also generated more new ideas than the low innovation groups.
- The low rating groups on both innovation and functionality tended to repeat ideas more frequently.
- The main finding is that, in contrast with reports in previous research, the groups with higher innovation and functionality scores collaborated less than their peers in the low rating groups on these parameters.
- The authors interpret these results as signifying that creative performance in teams is not achieved mainly by agreement but needs cognitive confrontation.

**Denti, L., & Hemlin, S. (2012). Leadership and innovation in organizations: A systematic review of factors that mediate or moderate the relationship. *International Journal of Innovation Management*, 16(3), 1240007-1-1240007-20.**

- The relationship between leadership and innovation appears strongest in organizations that have a supportive culture for innovation and where organizational structures are de-formalized and de-centralized.
- Furthermore, teams that are heterogeneous and work on complex tasks have the highest capability for innovation. Such teams require supportive and non-controlling leadership that includes them in decision-making.

**Dew, R., & Hearn, G. (2009). A new model of the learning process for innovation teams: Networked nominal pairs. *International Journal of Innovation Management*, 13(4), 521-535.**

- Nominal groups (members don't communicate verbally) of six significantly outperform interactive groups of the same size. More importantly, however, the results showed no significant difference between the productivity of nominal groups of six and hybrid groups comprised of three interactive pairs, where each pair operated separately to complete the same puzzle in parallel with the rest of the group. This suggests that structuring innovation teams into networked, nominal pairs may be just as productive as purely nominal group structures.

**Guoquan, C., Chunhong, L., & Tjosvold, D. (2005). Conflict management for effective top management teams and innovation in China. *Journal of Management Studies*, 42(2), 277-300.**

- Several streams of strategy research have argued that conflict and diversity promote top management team effectiveness. This study proposes that how top management teams manage conflict can greatly contribute to their effective leadership of organizational innovation.
- Cooperative conflict management promotes productive conflict and top management team effectiveness that in turn result in organizational innovation.
- Results support the theory that conflict management can contribute to making top management teams effective even in the collectivist culture of China.

**Isaksen, S. G., & Ekvall, G. (2010). Managing for innovation: The two faces of tension in creative climates. *Creativity & Innovation Management*, 19(2), 73-88.**

- The Debate dimension is described as reflecting a more productive idea tension.
- The Conflict dimension suggests a more non-productive personal tension.
- Relatively higher levels of Debate, and Lower levels of Conflict are more conducive to organizational creativity and innovation.
- Negative tension associated with Conflict and increasing the positive aspects associated with Debate.

**Kratzer, J., Leenders, R. J., & van Engelen, J. L. (2006). Team polarity and creative performance in innovation teams. *Creativity & Innovation Management*, 15(1), 96-104.**

- Foremost in the conceptualization phase of R&D efforts polarity (conflict potential) positively influences the creative performance of R&D teams.
- Whereas at lower degrees of complexity or in situations later in the development cycle polarity (conflict potential) negatively impacts the creative performance of R&D teams.

**Miron-Spektor, E., Erez, M., & Naveh, E. (2011). The effect of conformist and attentive-to-detail members on team innovation: Reconciling the innovation paradox. *Academy of Management Journal*, 54(4), 740-760.**

- Including creative and conformist members on a team enhanced team radical innovation, whereas including attentive-to-detail members hindered it.
- Creative members enhanced task conflict and hindered team adherence to standards. In contrast, conformists reduced task conflict, and conformists and attentive-to-detail members enhanced team adherence to standards.

**Nemeth, C. (1997). Managing innovation: When less is more. *California Management Review*, 40(1), 59-74.**

- Research in social psychology suggests that flexibility to changing circumstances and innovation is better served by a “culture” that not only tolerates, but welcomes dissent and minority views. Such dissent—even when wrong—stimulates better decision making and innovation. Thus, the proper harnessing of dissent may provide a mechanism for creating unity without uniformity and for igniting the “spark” of innovation.

**Sethi, R., Iqbal, Z., & Sethi, A. (2012). Developing New-to-the-firm products: The role of micropolitical strategies. *Journal of Marketing*, 76(2), 99-115.**

- If the product development team wants to reduce resistance to products with market newness, it needs to build a coalition of supporters that can help it during the review process. Similarly, if the team seeks to minimize resistance to products with technology newness, it should frame the product in terms of the firms’ existing products, strategies, and competitive thrusts.
- However, such framing increases resistance to market newness. If products continue to be resisted, they must be compromised (i.e., modified as a concession) to win approval. If the team wants to reduce the degree of compromise, it should initially develop the product in hiding. Products that are compromised perform poorly in the marketplace.

## E. Organization Dynamics

**Barone, M. J., & Jewell, R. D. (2013). The innovator's license: A latitude to deviate from category norms. *Journal of Marketing*, 77(1), 120-134.**

- Innovation credit, a form of customer-based brand equity. Innovation credit provides brands with the license or latitude to use strategies that violate category norms without the penalty (in the form of impaired attitudes) that consumers are shown to levy on less innovative brands.
- Innovative brands are granted the license to employ non-normative strategies without sanction. Under certain conditions, innovative brands not only escape the penalty associated with using atypical strategies but are actually rewarded for utilizing such approaches.

**Bolívar-Ramos, M., García-Morales, V., & Mihi-Ramírez, A. (2011). Influence of technological distinctive competencies and organizational learning on organizational innovation to improve organizational performance. *Economics & Management*, 16670-675.**

- Top management should foster new technologies to improve technological distinctive competencies and organizational learning, since both have positive effects on organizational innovation and organizational performance.

**Büschgens, T., Bausch, A., & Balkin, D. B. (2013). Organizational culture and innovation: A Meta-analytic review organizational culture and innovation: A meta-analytic review. *Journal of Product Innovation Management*, 30(4), 763-781.**

- Hierarchical cultures emphasize control and an internal orientation and are less likely to be found in innovative organizations.
- Managers that follow a (radical) innovation strategy should establish a developmental culture in their organization.

**Christiansen, J. K., & Varnes, C. J. (2007). Making decisions on innovation: Meetings or networks? *Creativity & Innovation Management*, 16(3), 282-298.**

- Innovation projects actually consist of myriad actions, negotiations, and micro-decisions in the effort to create strong networks, leaving few decisions for the official gate and portfolio meetings.
- Successfully establishing stable networks and successfully filling the templates for their projects leaves little room – and requires little intervention – for decision makers at portfolio meetings, where approvals are sought rather than decisions made.
- Gate and portfolio management meetings are, in some instances, better viewed as checkpoints rather than as decision meetings, decision making is displaced from the meetings, and the use of gate and portfolio management systems have created a number of mandatory templates which must be dealt with by the project managers.

**Freeman, J., & Engel, J. S. (2007). Models of innovation: Startups and mature corporations. *California Management Review*, 50(1), 94-119.**

- Creativity is enhanced in organizations that work in teams with shifting job responsibilities versus the bureaucratic structure of large corporations. However, established companies have more of the discipline required to execute a strategy and bring a product to market. This paradox between creativity and discipline can be solved if corporations build organizational units protected from the structures used to generate discipline.

**Gibb, J., & Haar, J. M. (2010). Risk taking, innovativeness and competitive rivalry: A three-way interaction towards firm performance. *International Journal of Innovation Management*, 14(5), 871-891.**

- The authors found high risk taking and innovativeness to be linked to higher firm performance, irrespective of the extent of competitive rivalry.

**Harrington, J., & Voehl, F. (2010). Innovative problem solving: The next big thing. *International Journal of Innovation Science*, 2(3), 113-121.**

- Creativity is the process of generating something new that has value to an organization, group or individual. Innovation is the process of generating a new mindset to produce something that has significant value to an organization or an individual or to society in general. The operative word that distinguishes innovations from creativity is significant. Innovation is the successful implementation of a new concept or product. Innovation is the sustainable process that provides a significant competitive advantage.

**Jain, R., & Juneja, V. (2011). Role innovation behavior of managerial personnel in Indian banking and insurance enterprises of public sector: An empirical study. *South Asian Journal of Management*, 18(3), 69-99.**

- Incremental innovations are an important source of change in organizations and innovations in this sense are easier to implement provided culture of innovation prevails in organizations.
- Innovation is itself the cause of further innovations and the accumulated impact of incremental innovations would eventually develop the culture of innovation, generate access to key resources and create a competitive orientation, which would in turn lead to the creation of radical innovation.

**Landry, R., Amara, N., & Becheikh, N. (2012). Evidence on innovation failures in manufacturing industries. *International Journal of Business Strategy*, 12(2), 16-35.**

- Project failures generate knowledge spillovers that may be captured in other innovation projects.

**Lerner, J., & Wulf, J. (2007). Innovation and incentives: Evidence from corporate R&D. *Review of Economics & Statistics*, 89(4), 634-644.**

- Short-term incentives appear to be unrelated to measures of innovation.

**Manimala, M. J., Jose, P. D., & Thomas, K. (2005). Organizational design for enhancing the impact of incremental innovations: A qualitative analysis of innovative cases in the context of a developing economy. *Creativity & Innovation Management*, 14(4), 413-424.**

- An important factor that enhances the impact of innovations is that organizations should have a deliberate innovation strategy and corresponding organizational structures and processes.

**Prather, C. W. (2008). Use mistakes to foster innovation. *Research Technology Management*, 51(2), 14-16.**

- An organization must evaluate its policies and practices whether they restrict individual decision-making and freedom. It should ask whether its people are afraid of the consequences of failure that risk-taking becomes just a concept. Leaders should also know how to handle mistakes in a way that would foster innovation.

**Shipton, H., West, M. A., Dawson, J., Birdi, K., & Patterson, M. (2006). HRM as a predictor of innovation. *Human Resource Management Journal*, 16(1), 3-27.**

- Results reveal that training, induction, team working, appraisal and exploratory learning focus are all predictors of innovation. Contingent reward, applied in conjunction with an exploratory learning focus, is positively associated with innovation in technical systems. Furthermore, training, appraisal and induction, combined with exploratory learning focus, explain variation between companies in product and technological innovation above and beyond the main effects observed.

**Sorescu, A. B., Chandy, R. K., & Prabhu, J. C. (2003). Sources and financial consequences of radical innovation: Insights from Pharmaceuticals. *Journal of Marketing*, 67(4), 82-102.**

- A large majority of radical innovations come from a minority of firms.

**Tushman, M., Smith, W. K., Wood, R., Westerman, G., & O'Reilly, C. (2010). Organizational designs and innovation streams. *Industrial & Corporate Change*, 19(5), 1331-1366.**

- The senior team's ability to attend to and deal with contradictory internal architectures is a crucial determinant of a firm's ability to exploit in the short term and explore over time.

**Van Wijk, R., Jansen, J. P., Van Den Bosch, F. J., & Volberda, H. W. (2012). How firms shape knowledge to explore and exploit: a study of knowledge flows, knowledge stocks and innovative performance across units. *Technology Analysis & Strategic Management*, 24(9), 929-950.**

- Contrary to expectations, depth of units' knowledge stocks was not fostered by vertical knowledge inflows, but instead by decentralizing units.
- Depth of knowledge contributed not only to exploitative innovations, but also to exploratory innovations.

**Wang, S., Guidice, R. M., Tansky, J. W., & Wang, Z. (2010). When R&D spending is not enough: The critical role of culture when you really want to innovate. *Human Resource Management*, 49(4), 767-792.**

- A culture emphasizing outcomes and stability leads to lower levels of innovation irrespective of financial and human resources invested.

**Wheatley, K. K., & Doty, D. (2010). Executive compensation as a moderator of the innovation — Performance relationship. *Journal of Business & Management*, 16(1), 89-102.**

- Implementing an innovation strategy and using a high percentage of bonus compensation will lead to greater performance.

**Wyld, D. C., & Maurin, R. (2009). Keys to innovation: The right measures and the right culture?. *Academy of Management Perspectives*, 23(2), 96-98.**

- Patents should be regarded as an input measure and a precondition for making such innovations happen.
- However, innovation cannot occur without real corporate commitment. In that light, the level of a firm's R&D employment was found to be positively correlated with the production of radical innovations, and ultimately, outstanding market performance.

**Zhou, K., & Li, C. (2012). How knowledge affects radical innovation: Knowledge base, market knowledge acquisition, and internal knowledge sharing. *Strategic Management Journal*, 33(9), 1090-1102.**

- A firm with a broad knowledge base is more likely to achieve radical innovation in the presence of internal knowledge sharing rather than market knowledge acquisition.

## **F. Enterprise Leadership**

**Balas, A. N., Colakoglu, S. N., & Gokus, O. (2012). Examining the relationship between the three components of market orientation and innovativeness in export ventures. *International Journal of Entrepreneurship*, 161-17.**

- Being focused on consumers discourages risk-taking and innovativeness, while having a focus on competitors has the opposite effect and encourages willingness to take risks, which in return promotes innovativeness in exporting firms.

**Farson, R., & Keyes, R. (2002). The failure-tolerant leader. *Harvard Business Review*, 80(8), 64-71.**

*"The fastest way to succeed," IBM's Thomas Watson, Sr., once said, "is to double your failure rate."*

- While companies may grasp the value of making mistakes at the level of corporate practices, they have a harder time accepting the idea at the personal level. People are afraid to fail, and corporate culture reinforces that fear.

Common practices among failure tolerant leaders:

- These leaders break down the social and bureaucratic barriers that separate them from their followers.
- They engage at a personal level with the people they lead.
- They avoid giving either praise or criticism, preferring to take a nonjudgmental, analytical posture as they interact with staff.
- They openly admit their own mistakes rather than trying to cover them up or shifting the blame.
- And they try to root out the destructive competitiveness built into most organizations.
- Above all else, failure-tolerant leaders push people to see beyond traditional definitions of success and failure. They know that as long as a person views failure as the opposite of success, rather than its complement, he or she will never be able to take the risks necessary for innovation.

**Harrington, J., & Voehl, F. (2012). Innovation management: Part 1: A breakthrough approach to organizational excellence. *International Journal of Innovation Science*, 4(4), 231-244.**

- Fewer than 25 percent of the companies believe innovation performance is where it needs to be if they are to be successful in the competitive global marketplace.

**Hirshleifer, D., Low, A., & Teoh, S. (2012). Are overconfident CEOs better innovators? *Journal of Finance*, 67(4), 1457-1498.**

Firms with overconfident CEOs:

- Have greater return volatility
- Invest more in innovation
- Obtain more patents and patent citations, and
- Achieve greater innovative success for given research and development expenditures.
- However, overconfident managers achieve greater innovation only in innovative industries.

**Soliman, F. (2011). Modelling the role of human resources management in the innovation chain. *International Employment Relations Review*, 17(2), 1-20.**

- The primary role of Human Resources Management (HRM) in innovative organizations is to create a climate for innovation. This means HRM and the innovation leaders should be aware of any deficiencies in the learning processes. This is necessary because learning and creativity are essential foundations for innovation.
- The innovation chain begins with transformation into knowledge-based, then into a learning organization, and finally into innovative enterprises.
- Both learning and innovation gaps are also related to knowledge gaps. The learning gaps are shown to comprise of five types of gaps, namely: problem solving gaps, experimentation gaps, learning from past experience gaps, learning from others' experiences gaps, and transferring knowledge gaps.
- The role of an innovation leader is shown to be overlapping with HRM's role in areas such as coaching, motivating and rewarding.

**Talke, K., Salomo, S., & Kock, A. (2011). Top management team diversity and strategic innovation orientation: The relationship and consequences for innovativeness and performance. *Journal of Product Innovation Management*, 28(6), 819-832.**

- Top management team diversity, measured as heterogeneity in educational, functional, industry, and organizational background, has a strong positive effect on a firm's innovation orientation. A strong proactive focus on emerging customer needs and on novel technologies then lead to a portfolio of new products with higher market newness and technology newness, which both increase firm performance. The results therefore emphasize the importance of Top management team characteristics as antecedent for innovation strategy and innovation outcomes.

**Tushman, M. L., Smith, W. K., & Binns, A. (2011). The ambidextrous CEO. *Harvard Business Review*, 89(6), 74-80.**

- Firms thrive only when senior teams lead ambidextrously -- when they foster a state of constant creative conflict between the old and the new.
- Successful CEOs first develop a broad, forward-looking strategic aspiration that sets ambitious targets both for innovation and core business growth.
- They then hold the tension between innovation unit demands and core business demands at the very top of the organization.
- And finally they embrace inconsistency, allowing themselves the latitude to pursue multiple and often conflicting agendas.