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Fusing Strategic Thinking and Transformational Leadership to Harness New Product Development (NPD) Team Dynamics for Innovation

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Strategisen ja transformationaalisen johtajuuden hyödyntäminen tuotekehitystiimin innovatiivisessa toiminnassa - Tapaus kansainvälinen energia-alan organisaatio

Tiivistelmä

Väitöskirjassa tutkitaan uusien tuotteiden kehittämistä kansainvälisessä energia-alan organisaatiossa yhdistämällä teollisuuden prosessiin (ts. tuotekehitys) johtamisen konsepti (ts. transformationaalinen johtajuus), jota tuetaan strategisella ajattelulla (ts. kognitiivinen prosessi). Muodostettua teoreettista viitekehystä arvioidaan kyselyn avulla. Kysely tunnistaa innovatiivisuuden näkökulmasta organisaation heikot toimintatavat.

Viitekehystä testataan tutkimalla organisaation kyvykkyyttä kehittää uusia tuotteita seuraavien tutkimuskysymysten avulla: 1) Miten tehokkaasti organisaatio hyödyntää trasformationaalista johtajuutta ja 2) strategista ajattelua tukeakseen uusien tuotteiden potentiaalin toteutumista? 3) Minkälaisia ovat uusien tuotteiden kehittämisen prosessit? 4) Kuinka tehokkaasti tutkittava organisaatio hyödyntää transformaationaalista johtajuutta, strategista ajattelua, uusien tuoteideoiden potentiaalin suunnittelua ja mukautuvaa toimintatapaa? 5) Mikä on eri konseptien (transformationaalinen johtajuus, pseudotransformationaalinen johtajuus, strateginen ajattelu ja organisaation uusien tuotteiden kehittämisen käytännöt) suhde toisiinsa tapausorganisaatiossa?

Tutkimus nosti esiin huomiota vaativat alueet organisaation uusien tuotteiden kehittämistoiminnassa Suomen, Englannin ja Norjan yksiköissä. Näitä alueita olivat esimerkiksi sisäisen viestinnän kehittäminen, tietojohtaminen, ideoiden synnyttämisen hallintajärjestelmä ja henkilöstön vaikutusvalta. Tutkimus osoitti, että kehitetty kysely löysi kehittämisalueet onnistuneesti ja yhdisti tehokkaasti teoreettiset näkökulmat yhdeksi työkaluksi.

Asiasanat

Strateginen ajattelu, transformationaalinen johtaminen, projektinhallinta, innovaatio, uusien tuotteiden kehittäminen

Title of publication

Fusing Strategic Thinking and Transformational Leadership to Harness New Product Development (NPD) Team Dynamics for Innovation

Abstract

This dissertation epitomized New Product Development (NPD) team dynamics in a European multinational energy sector organization by evaluating research findings gained through fusing industrial process (i.e. new product development) with management concept (i.e. transformational leadership) supported by strategic thinking (i.e. cognitive process) to evaluate, through a practical employee survey, the diagnostic capability of the proposed extended theoretical framework to highlight weak areas in organizational new product development team practices to support innovation.

This research endeavor tested the proposed linkage or extended framework by examining organizational new product idea generation capability through five research dimensions: 1) How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential? 2) How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential? 3) How adaptive is this organization in designing supportive new product development processes? 4) How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization? 5) What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?

The research outcomes highlighted the gaps in the subject organization's NPD initiatives through drawing attention to the grey areas present in the overall corporate strategic leadership environment of its three targeted work locations (i.e. Finland, the UK and Norway). Such areas include the potential of the company's internal communication system, data collection and record keeping capability, management's approach to the potential of new idea generation and employees' empowerment. The referred areas are directly linked to the subject company's new product development innovation initiatives and operational growth. Hence, they must be handled effectively. Consequently, the study proved the validity of the proposed theoretical framework as being a prudent diagnostic tool as well as having effective constructs linked together to support the model's extension.

ACKNOWLEDGEMENT

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Abbreviations

IC	Individualized consideration
ICT	Information communications technology
II	Idealized influence
IM	Inspirational motivation
IS	Intellectual stimulation
NP	New product
NPD	New product development
P-TL	Pseudo -transformational leadership
OS	Operating system
SOPs	Standard operating procedures
SIT	Systematic inventive thinking
ST	Strategic thinking
STQ	Strategic thinking questionnaire
TL	Transformation leadership

Working definitions

Key concepts	Definition	Source
Climate	*Organizational climate is defined as the recurring patterns of behavior, attitudes and feelings that portray life in the organization. It is also described as the shared perception of "the way things are around here".*	Isaksen, and Ekvall, (2007); Reichers, and Schneider, (1990).
Communication	*Communication in the organization is the process of one-to-one or interpersonal communication, between individuals. Such communication may take several forms. Messages may be verbal (that is, expressed in words), or they may not involve words at all but consist of gestures, facial expressions, and certain postures ("body language"). Nonverbal messages may even stem from silence.*	Johnson (1976).
Creativity	*Creativity is defined as a process of producing novel and worthwhile products. Actually, no single concept of creativity can fully cover all aspects of endeavor. Creativity demands cognitive and non-cognitive skills, curiosity, intuition, and perseverance. The process of creative solutions making may either take place through discovery, in a flash or it may spread over a period of decades.*	Mumford, (2003).
Early client involvement	*Bringing the product design team(s) into direct contact with the potential users, at the initial stages of product development process instead of merely hearing or reading about them through human intermediaries.*	Gould and Lewis (1985)
Employee empowerment	*Employee empowerment is merely the effective use of a managerial authority and is a productive approach to maximize all-around work efficiency.*	Stewart, (1994).
Idealized influence	*Idealized influence is referred to as the leaders´ capacity to lead his or her followers by setting examples, based on high moral and ethical grounds.*	Bono and Judge, (2003); Podsakoff, Mackenzie and Bommer, (1996);
Individualized consideration	*Individualized consideration elucidates that a leader must achieve his or her follower´s maximum potential through coaching or mentoring, during a process of helping and refining their skill potential.*	Whitener, (1997); Bass and Steidlmeier, (1999); Dirks and Ferrin (2002).
Inspirational motivation	*Inspirational motivation is defined as the leader´s ability to install a desire in their followers for a cause*	Bass and Avolio (1990; 1993).
Intellectual stimulation	*Intellectual stimulation is defined as leader's capacity to encourage its team members or the followers to think out of the box and generate new ideas.*	Bono and Judge, (2003); Jung and Avolio, (1999); Kirkpatrick and Locke, (1996).
Market intelligence,	*Market intelligence is the information relevant to a company's markets, gathered and analyzed specifically for the purpose of accurate and confident decision-making in determining strategy in areas such as market opportunity, market penetration strategy, and market development.*	Cornish, (1997).
New product development (NPD)	*New product development is defined as a vital function for the success, survival and the renewal of organizations.*	Brown and Eisenhardt, (1995).
Organizational culture	*Organizational culture represents the collective values, beliefs and principles of organizational members and is a product of such factors as history, product, market, technology, and*	Needle, (2004).

	strategy, type of employees, management style, and national culture.	
Product idea generation	*The innovative activity linked to the process of new product idea generation is always associated with an individual´s knowledge base. In addition, it is also possible that a designer (or, perhaps, an observer during the overall product development process) identify a new area of research while focusing on his own.*	Weisberg, (1999); Dorst and Cross, (2001).
Product innovation activity	*Product innovation activity can take any form out of the following three or a combination of the :* *I**ncremental innovation** can be reflected through industrial product improvement; in the case of **variety innovation** - it can be viewed as product styling or restyling; and finally, in the case of a **radical innovation** new capability it can be seen as the introduction of a new version of the product or service.*	Jevnaker, (2005).
Pseudo transformational leadership or dark leadership	*Pseudo-Transformational leadership also termed dark leadership is defined as highly self-serving, inspirational leadership behaviors that are unwilling to encourage independent thought in subordinates, and offer little caring for one's followers more generally.*	Howell and Avolio, (1992); O'Connor et al., (1995); Taylor (2014); Barling, Christie, and Turner, (2008).
Reflecting	*Reflecting is explained as a skill to process information or the knowledge set to apply it according to the situational requirements through practice.*	Schön, (1983); Pisapia et al. (2005).
Reframing	*Reframing is defined as a cognitive tool or skill to collect and arrange the information or knowledge set to define the situational realities.*	Morgan, (1986); Bolman and Deal, (1994); Pisapia et al. (2005).
Strategic thinking	*Strategic thinking is defined as a process that involves collection, combination and filtration of information to generate new, relevant, focused and feasible ideas and strategies.*	Batty and Quinn (2010).
Supportive leadership	*Supportive leadership is a category where the leadership (or the managerial leadership) displays development orientation through individualized attention towards the satisfaction of their followers' or subordinates' personal needs through initiatives.*	Bass, (1985; Bass and Avolio, (1995).
Systems thinking	*Systems thinking propagates the logic that the unified whole is superior to its individual parts. Contrary to the traditional systems thinking approach, modern theorists emphasize that in systems thinking the whole is primary and the parts are secondary.*	Capra, (2002); Pisapia et al. (2005).
Transformational leadership	*Transformational leadership is characterized as the leader's ability to articulate a shared vision of the future, intellectually stimulate employees, and attend to individual differences in the work force.*	Lowe, Kroeck, and Sivasubramaniam, (1996).
Trust	*One party's willingness to take risks by being vulnerable to the actions of the other party based on the expectation that the other party will perform a particular action significant for the trusted party, irrespective of the ability to either monitor or control that act.*	Mayer, Davis, Schoorman, (1995)

1 INTRODUCTION

Corporate risks whether social, economic, competitive and technical are considered strong sources that force industrial leaders to continuously rethink, redesign and to innovate their products as well as service styles for sustainability (Collerette et. al, 2002). The quest to implement lean, rapid and profitable new product development processes has never been greater. To deal better with shorter product life cycles (Griffin, 1997), intense market competition and more demanding customers, companies are struggling to innovate knowing that market failure is not an option and winning with new products is not easy. According to surveys conducted in 1997 (Griffin, 1997; Ozer, 1997), new products introduced during the period of five years from 1992 to 1997, contributed as much as 50% of the total revenues and profits, though at the same time, the new product failure rate remained high. To be more specific, an estimated 46% of the resources that companies devote to the conception, development and launch of new products go to projects that do not succeed and either fail in the market place or never make it to the market (Ottum, and Moore, 1997).

This dissertation holds evaluative information on a case study survey that attempted to explore the significance of transformational leadership and strategic thinking capacity building initiatives in a Finnish energy sector organization. This transformational process was evaluated through the feedback received from the subject company's product development teams or associated operational workforce with reference to new product development idea generation process.

According to Pettigrew (1990) while aiming to accomplish theoretically sound and practically useful research on procedural phenomena, it is essential to explore at least three key concepts and their interconnections through time; namely the content of the phenomena, the allied processes and the context in which they occur. The current research study is an effort to evaluate the interconnection among the three concepts *new product development, corporate potential* development through *transformational leadership (Bass and Avolio, 1990)* by harnessing *strategic thinking* capability of the workforce. In addition, adequate emphasis is given to evaluate the concept of Pseudo transformational leadership or dark leadership as well to further refine the research findings from leadership biases.

This introductory chapter leads further toward detailed information about the research study in terms of its objectives, chosen methodology and instrumentation, data collection and analysis, participants' feedback, a discussion

of the survey findings and finally a conclusion comprising of the accomplished goals and suggestions for the target organization in addition to the contribution the study offers to development of science by fusing and extending the theoretical concepts.

1.1 Background

Taking the lead in introducing innovative products by crafting effective product development processes through new product ideas (Griffin 1997; Ozer 1997; Ottum, and Moore, 1997) from the external environment (i.e. customers, suppliers, competitors, policy formulators etc.) as well as internal resources (i.e. connecting designers, marketers, engineers, accountants auditors etc.) is today´s greatest challenge for industries while coping with tough global competition. Modern industries engaged in product development have adopted at least some form of stage-and-gate based new-product processes (Cooper, 1990) to develop and offer new products that are innovative, can resolve major client related issues and promise value to the users by being considered as the top drivers of new product development (NPD) success and profitability.

The quest for new ideas to create exceptional products originates with a deeper level of understanding about the customers' desires. In addition, the traditional NPD model, in which companies are exclusively responsible for coming up with new product ideas and deciding which products should ultimately be marketed, is increasingly being challenged by innovation management academics and practitioners (Fuchs and Schreier, 2011; Cone, 2006; Lakhani, 2006; Pitt et al., 1996; Chesbrough, 2003; Von Hippel and Katz, 2002). It is desired that a new product or service must hold a "wow" factor or `aha moment` (Dorst, and Cross 2001) by offering something that is missing from the range of products already available in the market. However, conceiving such a new product idea seems beyond the reach of most companies today.

The above requires that the entire new product development team- technical, marketing, and the organization´s operational teams tactfully collaborate, design and lead a new product development strategic plan internally while additionally interacting with real customers/users, and learn their desires, problem areas, needs as well as challenges. The above referred strategy is much different from merely depending on the sales and marketing teams to obtain market demands and requirements, which is often criticized for being filtered, biased, and incorrect (Cooper, 1994). This results in connecting the industry with its

customers by making them an integral part in the entire NPD process; scoping, product definition, development, validation, and beyond.
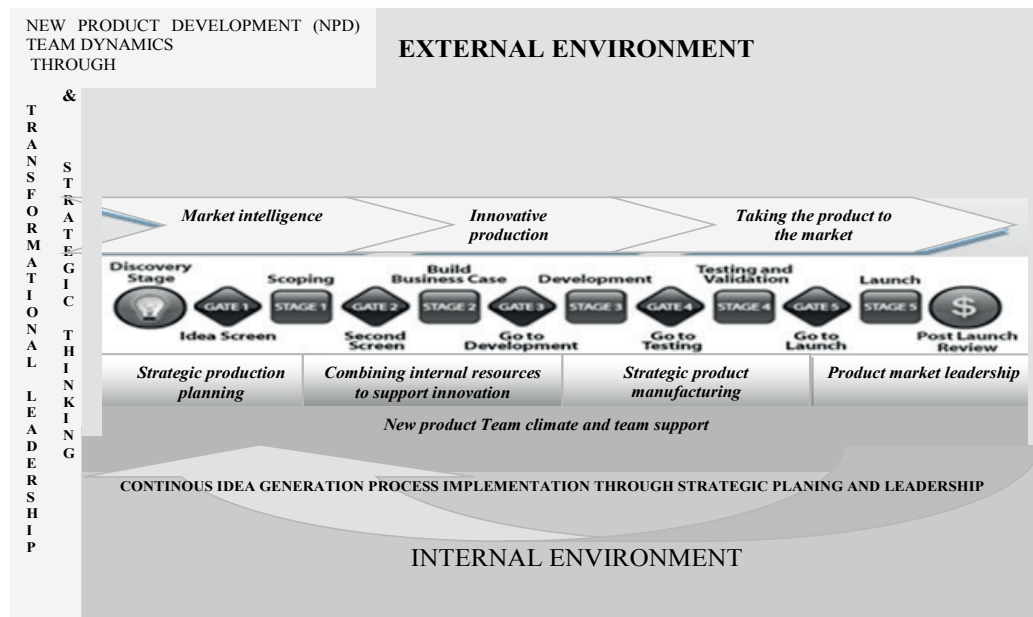
Figure 1. Proposed Stage gate process for new product development

Figure 1 above depicts the targeted NPD process flow that on the one hand ensures the unification of organizational internal resources to guarantee strategic production planning through strategic product manufacturing for ultimately achieving product market leadership, while on the other hand, maintaining up-to-date market intelligence and innovative production capacity building (i.e. market needs, client´s tastes, related economic developments, new inventions and scientific trends (Kazmi, 2012; Kazmi, Naaranoja, 2014; Kazmi, Naaranoja, Kytola, 2015) in the field as well as related political or legal realities, etc.) to attain maximum and up-to-date potential throughout the life cycle of new product development (NPD) process (i.e. stage by stage). Hence, the proposed framework encourages organizational strategy to constantly align its new product development (NPD) team dynamics through transformational leadership to support new product innovation initiatives.

The above theoretical model is proposed with the aim of fusing the earlier frameworks formulated by theorists in the subject fields *(i.e. transformation leadership (Bass, Avolio, 1990; 1992; 1993); NPD team climate and support (Sun et. al. 2012); organizational strategic thinking (Pisapia, et. al. 2006; 2011); pseudo transformational leadership (Barling, Christie, and Turner, 2008),* to present a holistic theoretical vision.

The logic here is that in natural settings (i.e. organizational operations management) controlling the situations to either evaluate human activity or to affect it is not completely possible. In addition, different situational settings foster different behavior patterns and outcomes (Barnard, 1938).

The author, while suggesting the above flow, based her logic on the following;

Modern day hi-tech products are manufactured with the underlined targets of durability and sustainability emphasized. Most products of this type involve lengthy development timeframes due to involving multilevel, highly technical manufacturing processes (i.e. product solutions offered by the aero, marine industry, nuclear as well as civil engineering industries that usually consume years in manufacturing even a single product unit). Therefore, if an industry (i.e. especially the ones mentioned above) fails to have a flexible manufacturing process, where there is ample margin for constantly incorporating new inputs or new ideas (i.e. if not all then, at least the significant ones) then there are certain chances that at the product´s market launch phase, their product may be considered obsolete already.

The above is also true in the light of what John Wybrew cited from Robinson, (1999), `*Today´s business world is in a turbulent process of constant transition from the traditional approach of steady-state mass production to one of the unceasing innovation and the pursuit of creativity in all forms and on a global scale*`. Therefore, the notion can be acknowledged that, `*The foundations of a new generation of high-tech, high-skills industries are `human ideas´ which are the building blocks of innovation that ultimately help building industries"* (Chris Smith cited from Robinson, 1999). In addition, this is in line with Albert Einstein´s understanding that, `Imagination is more important than knowledge`. And therefore in supporting all the above, in today's business, the most significant role associated with a creative (organizational) leader is not to generate all possible worthwhile business ideas but to ensure the creation of such an organizational culture where each and every work team member can enjoy the freedom to generate ideas with confidence and will be acknowledged (Robinson, 1999).

Additionally, it is important to understand that `*there are people in the world who have to create to live – while there are others who live to create – and then there are people who are creative, but don't know what to do with it´ (Lenny Henry cited from Robinson, 1999). As, ´each (one) of us has a different mosaic of intelligences´ (Howard Gardner cited from Robinson, 1999). Therefore, ´it is breadth of vision, the ability to understand all the influences at work, to flex between them and not to be frightened of totally different experiences and*

viewpoints that hold the key´. (Sir John Harvey - Jones cited from Robinson, 1999). Therefore, ´we must enable young people to develop their creative potential to meet the fundamental challenges´ (Robinson, 1999).

In today´s fast growing and vibrant businesses, across the globe, the highest demand is for specialized professional trainings, aiming to polish the skills of the workforce; in particular the powers of communication, innovation and creativity. This is in response to the incessant need for businesses to introduce new products and services by keeping pace with rapidly changing market conditions (Robinson, 1999) to ensure efficiency and profitability.

The above justifies the need of the current research study. The subject study holds specialized focus on exploring the possibility of NPD idea generation capability enhancement engulfing the whole beyond the fuzzy front end stage and the logic behind proposing a stage gate process with a maximized opportunity to add or incorporate new knowledge (i.e. in the form of new idea – extracted either from the external or the internal environment) in the product while being produced, thus exploring the options to maximize flexibility in the manufacturing process while taking control over each production process stage.

This requires good management leadership embedded in strategic thinking capability. Furthermore, genuine efforts to refine the strategic thinking capability of multi-disciplinary work teams require that all the employees linked to the NPD operations, either directly or indirectly, though coming from different knowledge backgrounds, should be made better aware of the strategic corporate goals so that they can effectively communicate, relate and invest their personal capabilities with the new product idea collection (from outside) or idea generation (from inside) process. It is relevant to quote Richard P. Feynman (cited from Robbins, 1999), the Nobel laureate, `*I believe that a scientist looking at nonscientific problems is just as dumb as the next guy — and when he talks about a nonscientific matter, he will sound as naive as anyone untrained in the matter´.*

It is pertinent to mention here that the term 'effectiveness', used throughout this dissertation, the author refers to the degree to which the work objectives are accomplished and the issues were resolved. The term effectiveness, as compared to the term efficiency, is determined without reference to costs and means, doing the right thing. Furthermore, in this dissertation, the term 'adaptive' is used as the form of expression and not as the concept. In addition to above, the following aspects linked to the concepts of strategic thinking and work leadership linked to organizational new product development idea generation initiatives inspired the author of this dissertation to undertake the current research study;

i. **Work teams should master the art and craft of strategic thinking to generate enhanced levels of new product development related work efficiency:** This will automatically trigger the company´s overall productivity. It will be achieved by planning more effectively with an eye to avoid unpleasant surprises attached to the production, more specifically, new product idea generation processes. It will impose a stronger sense of order on chaotic, disorderly production projects and scenarios; making more sensible decisions and outsmarting competitors with greater confidence and ease. It will in addition increase the company´s productivity and sense of achievement for its members at work and at home.

ii. **Developing a suitable and sustainable new product idea generation team climate:** This is of significance for team performance, and therefore transformational leadership is a critical antecedent of organizational climate. Team climate may also mediate the relationship between transformational leadership and new product development team performance. This will harness the process of industrial product improvement for the target company (e.g. an innovative team climate created by the Google company´s management).

iii. **Leading rather than surviving:** Transformational leadership becomes a strong choice of strategic management to prevail at all levels of the organization (i.e. industrial management, work processes, as well as product offerings). The followers of such leadership style demonstrate high levels of job satisfaction, organizational commitment, creativity and engagement in organizational citizenship behaviors. In addition, with devoted workforce, it will definitely be useful to consider making efforts for developing ways of transforming the organization through innovative product design and smart service offerings.

iv. **Taking the lead over the company´s competition:** Through strategic thinking new product development teams ensure efficient product innovation much ahead of their global competitors since the leading industries see new product development as a proactive process where resources are allocated to identifying market changes and seizing upon new product opportunities before they occur (in contrast to a reactive organizational strategy in which nothing is done until problems occur or the competitor introduces an innovation). For example, Nokia´s move to focus on Symbian (smart phone OS till 2011) or taking the lead in

opting for GSM networks gave it a historic lead in the global telecommunication area from 1990.)

One of the expected outcome of the research is to propose a diagnostic framework to better support the NPD work team´s new product idea generation potential to strengthen the company´s strategic corporate success and effective transformation. To survive the current challenging work life, it is the basic requirement for *´each and every individual to acquire the required skills and ability to adapt and transform the willingness to gain new knowledge and the capacity for overview. The notion that the nations can win with brilliant scientists and technologists alone is nonsense. It's the time that each individual must contribute´ (Robinson, 1999).*

In addition, the current study evaluates the fusion of transformational leadership principles with strategic thinking concept in the case company's work teams associated with NPD related operations at three different geographical locations: Finland, the UK and Norway. Although the concepts of transformational leadership and strategic thinking will be discussed in greater detail later, for now it is sufficient to merely understand that the emphasis of transformational leadership is on the `follower's development and support` to help them reach their ultimate potential` (Taylor 2014, Kazmi, Naaranoja, 2013; Kazmi, Takala, Naaranoja, 2014; Kazmi, Takala, 2011; Kazmi, Naaranoja, Takala, 2013; Kazmi, Naraanoja, 2015; Kazmi, Kinnunun, 2012; Northouse, 2010). Furthermore, strategic thinking is to develop the opportunities offered by challenging external forces and change, it is necessary for industry leaders to comprehend and interpret the future prospects through a systematic cognitive approach into strategic thinking, relying less on wisdom of experience and intuitive guesswork (Kazmi, Naaranoja 2013; Oelkers, Elsey, 2004). Strong management leaders work effortlessly to align the company´s strategy to its culture so that the work teams can comfortably adjust to the corporate mission (Kazmi, Naaranoja, and Takala, 2013).

1.2   Objectives of the case study

The main objective of the current case study is to offer a simplified way in the form of a diagnostic tool to support the industries to develop and design ideal new product idea generation practices by incorporating genuine transformational leadership factors aligned with strategic thinking. This will support the company´s work teams in utilizing the opportunities available in the external as

well as internal environmental to formulate the best conceptual feeds to generate innovative new product and service ideas. This will further support the target company in refining its new product development processes (i.e. extensions and improvements in the company´s traditional stage gate model). Finally, the extremely significant objective of the current case study for the researchers was to collect and study the real-time data from a well reputed energy sector multinational organization to explore the linkage among the selected existing theoretical models (i.e., Transformational leadership, strategic thinking and pseudo transformational leadership).

1.3   Statement of problem

"Look and you will find it. What is unsought will go undetected". Sophocles

A specialized model was created and used in the case study by fusing the concepts of new product idea generation, transformational leadership and strategic thinking as all three concepts serve industry to transform and lead the market challenges effectively.

The research problem set for the study is as follows:

 "How significantly can an industry take advantage of a diagnostic theoretical framework to support its new product idea generation potential when the work processes and work teams are governed by the principles of transformational leadership combined with strategic thinking?"

1.3.1   Research questions

Though an early identification of research questions and constructs are helpful but the question may change or shift during the process of research (Eisenhardt, 1989).The research questions covering the core concepts of the current study (i.e. transformational leadership and strategic thinking to support new product idea generation process) were successfully implemented.

The goals of the study were investigated through five research questions:

> **Research Question 1:** How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?

Research Question 2: How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?

Research Question 3: How adaptive is this organization in designing supportive new product development processes?

Research Question 4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

Research Question 5: What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?

1.3.2 Conceptual framework

Conceptual framework is defined as (Shields et al, 2013) the way ideas are presented and arranged to achieve the purpose of the research project. Furthermore, in a case study research a purely theoretical drive is sufficient but the work obtain extensive appeal if it is grounded in a real-Iife situation (Siggelkow, 2007).

Keeping in view the above definition, the conceptual framework of this case study involves the process displayed in Figure 2. The research process of this study was to explore and evaluate the effectiveness of the linkage between new product idea generation capabilities (Sun et al. 2012) and transformational leadership (Bass and Avolio 1990; 1992) supported through strategic thinking (Pisapia, et. al. 2006; 2011).

Though there are many positives in terms of the selected concepts (i.e. transformational leadership, and strategic thinking), the central advantage is to develop a unified theoretical framework capable of identifying whether an organization is realistically able to develop strong new product development culture (Taylor 2014; Kazmi and Naaranoja 2013; Northouse, 2010).

Furthermore, an organizational culture promoting ethical standards promotes a conducive team climate that ensures effective transformation of work teams into confident leaders, by inculcating the potential of strategically assimilating new

ideas from external or internal environments to harness organizational innovation initiatives.

The above notion led the following research activity into a threefold empirical process that is as follows;
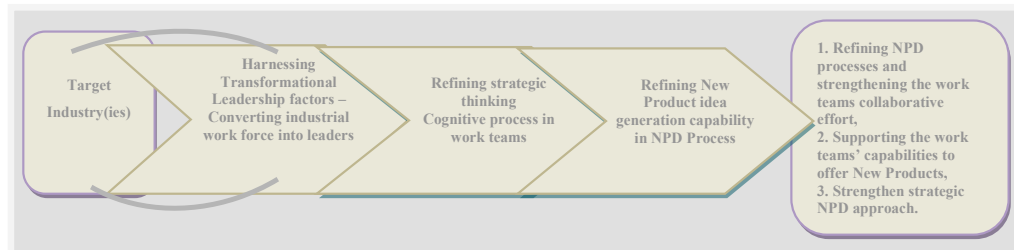
Figure 2.   Reflection of the proposed threefold research process flow

In Figure 2 harnessing transformational leadership factors means that the work managers and experts should learn to better motivate, stimulate and influence their employees to either collect or generate innovative product ideas by installing and refining strategic thinking potential.

1.4   Significance of the study

The study offers numerous potential benefits;

1.4.1   New knowledge creation

This study is significant in terms of new knowledge creation. There have been no prominent studies on connecting a technical industrial process (new product development) with a fusion of organizational management concepts by extending existing theoretical models, i.e. transformational leadership (Bass and Avolio 1990; 1992) and strategic thinking (Pisapia, et. al., 2006; 2011). This research examines the effects of transformational leadership and strategic thinking principles on refining the new product idea generation potential of a Finnish energy industry, studying its current NPD culture and proficiency at three sites (Finland, the UK, and Norway), highlighting the operational gaps and suggested measures for improvement in its current working practices.

1.4.2 Organizational and global environment

The study holds additional research interest in the sense that the selected study sample was distributed across borders (the UK, Norway and Finland). This aspect even further motivated the idea about evaluating the new product idea generation processes of the work teams through their interaction with different internal and external work environments, which are a mix of varied cultures and practices.

1.4.3 Transformational leadership and new product idea generation capability

The findings of numerous research studies have shown (Bass and Avolio, 1994) that transformational leadership is positively linked to subordinate's work attitudes (e.g., loyalty and commitment: job satisfaction): subordinate's work performance (e.g. sales), the employee's creativity and well-being, as well as financial performance. According to Bass (1985) transformational leaders motivate their followers to achieve performance beyond their expectations by transforming or shaping their thought process (i.e. beliefs and values, etc.) and behavior (i.e. attitudes and attributes, etc.). In the study the researcher attempted to connect transformational leadership, a management concept, with new product idea generation potential, a technical industrial process.

1.4.4 Exemplifying transformational leadership through strategic thinking

Transformational leadership is exemplified as a personality type e.g., Jesus Christ (Taylor, 2014) for his emphasis on `follower development` on the highest ethical standards (Northouse, 2010). Other human examples include Gandhi and Mother Teresa etc.

 In the corporate world, transformational leadership can be exemplified not only as a human personality type but as an organizational process (kazmi, Takala, 2011; Kazmi, Takala, 2012) the corporate strategy or even a company´s star product when fused with strategic thinking. For example, there is the case of the 57 year old McDonald's company's paperless alliance with Coca-Cola, having nothing to fall back on but just `a common vision and a lot of trust` (Gelles, 2014); or then there is the strategic thinking of two college drop–outs, Bill Gates and Paul Allen whose strategic thinking ultimately blended with leadership to create Microsoft, a world IT leader. Another example would be Nokia´s strategic

decision to use Symbian as an operating system (OS) and timely exploiting a market opportunity to opt for GSM system, its market introduction of the 1100 or 3310 models, or its intention to introduce a mid-range TV phone at 3GSM (Virki, 2007) in the mid-2000s that transformed the whole industry into a global market leader in telecommunications industry. Through the study the researcher attempt to exemplify transformational leadership after fusing strategic thinking to the conceptual framework to further evaluate the effectiveness of the conceptual fusion for corporate success in today´s industrial arena.

1.4.5 Fusing strategic thinking to new product idea generation potential

Several theorists consider strategic thinking an umbrella term (Bonn, 2001). Employing strategic thinking enables analysis, exploration, understanding and defining a complex situation and then developing planning actions to achieve the greatest possible positive impact towards a pre-defined goal. Thomas and Carroll (1979) stressed the significance of human cognition and linked their definition of product design thinking to the mental approach or the intent of the product designer, supporting the notion that design occurs when a problem-solver tries to solve the problem or acts as there is some indecision in the aims, initial conditions or allowable transformation. In the study the researcher attempt to connect strategic thinking, a management concept, with new product idea generation process which is considered to be significant part of a technical industrial process.

1.4.6 Industrial processes and management concepts

According to Bonn (2005), both leadership and strategy theorists have consensus on the notion that strategic thinking is needed at multiple organizational levels. The organizational elements support, refine and boost strategic thinking capacity of the work force by combining numerous team´s as well as organizational practices, specifically highlighting human collaborative work patterns compatible with the work environment (Casey and Goldman, 2010). Joseph S. Nye, Jr., (2011) defines contextual intelligence as an intuitive diagnostic skill that facilitates and supports a leader to match the best suited tactics with the aim of intelligently designing innovative ways to cope with the changing environments and settings. Contextual intelligence is a key factor for reformers and leaders to alter their working style and strategies in accordance with the environmental context as well as their followers´ needs and aspirations (Kazmi, and Kinnunen, 2012).

Through this study the researcher attempted to connect multiple management concepts; transformational leadership, strategic thinking, with new product idea generation process which is considered as a significant part of a technical industrial process, which is a rare attempt itself.

1.4.7 Applicability and adaptability

In a case study research one may propose a purely theoretical motivation but it will add extensive appeal if grounded in a real life situation. Furthermore, it is true that an individual research case may not prove a theory, but in few instances, may suffice to falsify theories, since a single counterexample is sufficient to prove that (Siggelkow, 2007). The intention behind conducting such a study is that its research findings be considered useful and applied by other industrial and management researchers. Adaptability is understood as the level to which the findings of one qualitative study can be applied or generalized to other contexts or to other groups (Taylor, 2014; Ary, Jacobs and Sorensen, 2010). It is anticipated that the findings in this study can be effectively utilized and implemented in other countries and cultures.

1.5 Overview of the study methodology

This case study involves an individual Finnish energy sector multinational organization, hence the method of mixed mode analytical technique (i.e. use of a qualitative as well as a quantitative survey tool) supported through descriptive inquiry in addition to statistical analysis (Onwuegbuzie, and Teddlie, 2003) was used. The study evaluated the relational contexts and patterns of inter-connections among three selected research concepts (i.e. new product idea generation potential, transformational leadership and strategic thinking) to carve out analytically proven research findings (Pettigrew, 1990). Hence, to describe significant research findings, the researcher depended, predominantly on statistical data (i.e. Figures, graphs, and tables) and even on survey respondent´s remarks, wherever felt necessary, to support the arguments relying less on experience and intuitive guesswork (Kazmi, and Naaranoja 2013; Oelkers, and Elsey, 2004).

1.5.1 Scope of the study

The target company is a multinational energy sector giant having the roots from the European business sector. The company operates with over 5,000 field

services professionals at more than 160 global locations in over 70 countries. However, the scope of this study takes into account specialized groups of professionals (i.e. representing new product development related work operations and roles) from its three international locations: Finland, the UK and Norway on the basis of their professional expertise and operational relevance. A specialized feature of the selected work locations is that each one of the unit is engaged in different types of product manufacturing i.e., Finland – Power engines, The United Kingdom – Green energy solutions, Norway- Marine products and service solutions.

1.5.2 Plan

The guidelines to form a desired study strategy are as follow:

i.   Selected employees from the target company, the operators and beneficiaries of new product development operations and work practices, were taken as the key consultants/critics to collect the feedback.

ii.   Survey methodology was implemented as a data collection tool.

iii. An online closed ended questionnaire (i.e. quantitative survey tool) along with an interview questionnaire (i.e. qualitative survey tool) formed the survey mechanism.

iv.   A personal interview was held with a representative of the target company to understand the current new product development process and support infrastructure placed in the company.

v.   A project report covering data analysis, discussion and suggestions was prepared and presented to the company´s management representative.

1.5.3 Strategy

To accomplish the desired project objectives, a mix mode survey having an online questionnaire and email based interview questionnaire was carried out to involve employees, users and beneficiaries of the subject new product development team culture, as consultants and critics to evaluate the level of success at hand and in the global teamwork scenario. In addition, the study was initiated with in-person meetings (or through electronic media and communication systems support) held between the subject company representatives to understand the support infrastructure provided by them to the work teams.

The project is recorded as a case study and analyzed with established literature in a project report as well as in this dissertation.

1.5.4 Application tools

The following tools were utilized to gather and analyze the research data:

i. Two sets of separate questionnaires (i.e. one closed ended with 50 questions and one open ended with 10 interview questions, covering all related theoretical concepts) were developed, distributed and the responses were collected from the study sample.

ii. A university email server was utilized for all rounds of the email survey.

iii. Microsoft Word was utilized for report writing along with Microsoft Excel for survey response calculation, comparative analysis and review.

iv. Adobe Acrobat was utilized for Pdf reading and writing assistance.

v. Relevant and required statistical formulas were utilized for quantitative research analysis.

1.5.5 Scheme of the dissertation

In today´s fast-paced technological transformation and challenging global competition, companies are often required to swiftly offer innovative products (Allocca, and Kessler, 2006) to the marketplace. This challenge can be coped with through harnessing organizational new product development idea generation capability (Kessler, Bierly, and Gopalakrishnan, 2000).

The work on linking multiple management concepts, i.e. transformational leadership and strategic thinking with technical concepts, i.e. new product development, is the current need. Chapter 2 sheds light on the purpose of having organizational NPD related management operations evaluation to enforce an act of constant balancing between the NPD teamwork and organizational potential building. A detailed literature review involving the key study concepts (i.e. those mentioned above) is presented to build the study´s foundations and framework. Chapter 3 presents the research methodology and design of the study. Chapter 4 describes the research data collection process in detail. Chapters 5 and 6 provide quantitative and quantitative data analysis in detail to highlight the study outcomes. Chapter 7 presents a detailed list of recommendations on the basis of

the study´s results. Chapter 8 offers discussion of the results. And the final, chapter presents the study conclusions, in addition to highlighting strengths, limitations, and future avenues of study. The arrangement of this dissertation is described below:

Theoretical Grounding   **Practical**

INITIAL POSITIONING
Chapter 1: Transformational leadership, strategic thinking for NPD idea supports.

RESEARCH PLAN
Chapter 1: Research background, research problem and presentation of objectives.

LITERATURE REVIEW
Chapter 2: Definition of key study concepts (i.e. transformational leadership, strategic thinking and NPD idea support).

RESEARCH FRAMEWORK
Chapter 2: Description of study model and framework preparation.

RESEARCH METHODOLOGY
Chapter 3: Research methodology and design description.

FIELD RESEARCH
Chapter 4: Field study work involving data collection.

CASE ANALYSES
Chapter 5 and 6: Analysis of quantitative and qualitative data analysis of the case study.

RECOMMENDATIONS
Chapter 7: Detailed list of recommendations on the basis of the study´s results.

CASE ANALYSES
Chapters 8 and 9: Final discussion of the results and concluding remarks on the case study.

Figure 3.   Outline of the dissertation

Summary of Chapter 1 - Introduction

New product development is highly significant in the current global industrial scenario. This chapter has shed light on the purpose of having an organizational NPD related management operations evaluation to enforce an act of constant balancing between the NPD teamwork and organizational potential building. It presents the scope of case research, its anticipated objectives, methodology and agenda in some detail.

2   LITERATURE REVIEW

This chapter provides background support through literature references to develop the readers´ understanding about the main research domains (i.e. new product development idea generation through transformation leadership and strategic thinking) mentioned in this study. An additional aim of this validated description is to link the technical/ industrial operation of new product development to organizational management challenges with specialized focus on transformational leadership supported through strategic thinking. The chapter is subdivided into two segments. The initial part attempts to define and connect the core concepts of transformational leadership and strategic thinking (Kazmi, Naaranoja, 2015) with new product development through innovation and ideation as the study domains. Later, the section delineates briefly the earlier field study references which, partially serve as a theoretical framework to the subject research program.

2.1   New product development and innovation

Duggan (1970) defines industrial design as a multifaceted activity, and though not easy to define comprehensively, it can be understood as an industrial design activity (Heskett, 2001; Sparke, 1983, Jevnaker, 1998; Leenders et al., 2007; Murray and O'Driscoll, 1996), generally linked to product development in the manufacturing context. It can be any factor or the combination of more than one among creation of products (Cooper and Kleinschmidt, 1995) or services that reach beyond style, integration and application of new technology, activities that enhance or create new markets or the activities that enhance and guard brands (Jevnaker, 2005; Brockhoff, 1994; Cooper and Kleinschmidt, 1995). Industrial design is considered inextricably a part of innovation that can make a contribution in three broad categories of overall industrial innovation activity (Jevnaker, 2005), for example, in the case of ***incremental innovation*** - it can be reflected through industrial product improvement; in the case of ***variety innovation*** - it can be viewed as product styling or restyling; and finally, in the case of a ***radical innovation*** - new capability it can be seen as the introduction of a new version of the product or service. Being innovative is significant in generating new ideas in product development. In short, the ideas for new products can be obtained from (Hill, and Westbrook, 1997; Chermack, and Bernadette 2007; Westhues, Lafrance and Schmidt, 2001; Chiesa, Coughlan, and Voss, 1996) basic research using the SWOT analysis (i.e. evaluating the strengths,

weaknesses, opportunities, and threats involved in a project or in a business venture).

Factors such as market and consumer trends, R&D departments, competitors, focus groups, etc. are ingredients for obtaining insight into new product lines or product features (Jevnaker, 2005; Brockhoff, 1994; Cooper and Kleinschmidt, 1995).
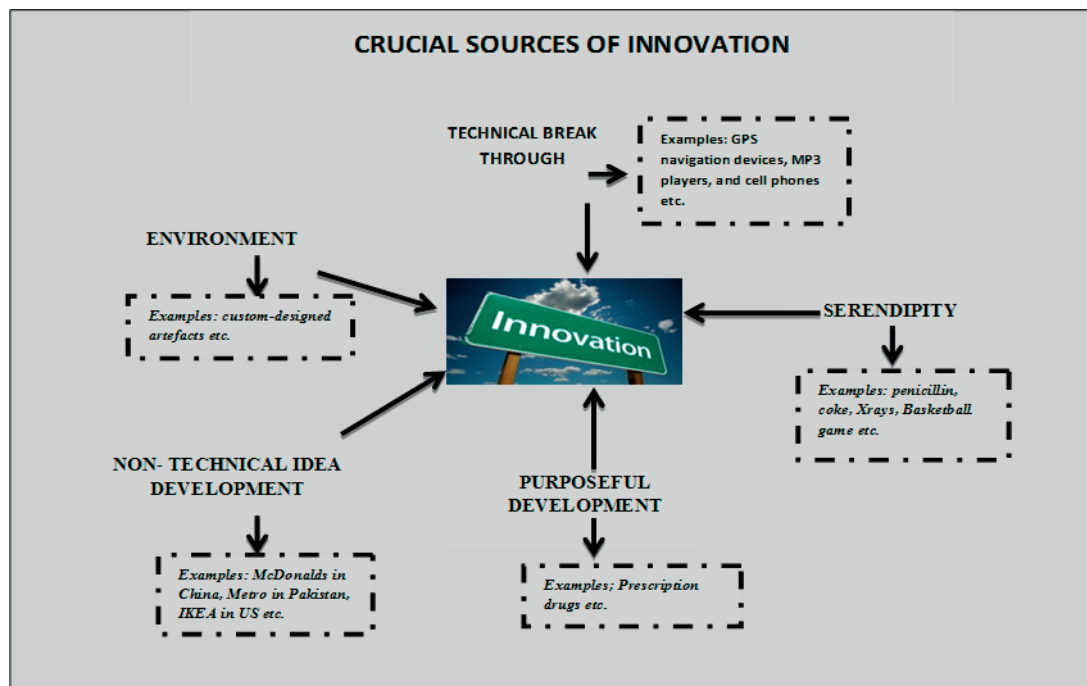
Figure 4.   List of crucial sources of innovation

Figure 4 above, presents the main sources of innovation along with their examples. Whatever category an innovation activity belongs to, the process of new idea generation is always connected to an individual´s knowledge base (Weisberg, 1999; Dorst and Cross, 2001) and it is also possible that a designer (or, perhaps, an observer during the overall product design phase) will identify a new area of research while focusing on his own. To comprehend the phenomena of new product development, it is significant to understand the NPD stage and gate process in the light of theoretical support.

2.1.1   New product development stage and gate process

New product development is defined as a vital function for the success, survival and renewal of organizations (Brown and Eisenhardt, 1995). According to several independent research studies (Jaruzelski, Kevin, and Rakesh, 2005) i.e. Product

Development and Management Association, AMR Research, Booz-Allen and Hamilton (1982) around 70-85% of leading companies in the United Sates follow the stage-gate model to drive their new products to the market and there is almost the same trend in the rest of the world. Stage-gate system is a cutting-edge operational road map for the implementation of a new-product project from idea to launch stage (Shahid and Nabeshima, 2007).
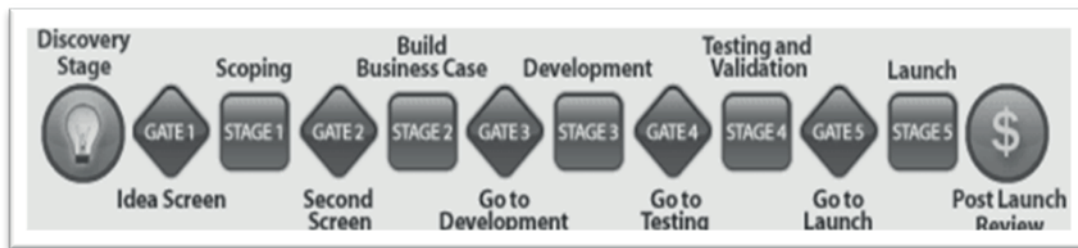
Figure 5.   New product development Stage gate process

The stage-gate process bifurcates new product development activities into stages, separated through management decision gates (Booz-Allen and Hamilton, 1982). As Figure 5 above depicts the usual sequence of the NPD process starts with the product or service idea discovery stage. After passing the idea screening gate and entering the next stage, the product idea enters the scoping stage, and if cleared, it crosses the second gate to be established as a `business case`. After becoming a viable business case, the product idea passes the third gate for product `development´. A product development, being a prototype, goes through `testing and validation`. After passing the test and going through the required validation, if necessary, it crosses the final gate for `product launching. The final stage is the `post launch review` stage that records the overall success or failure of the company through the market feedback on the product (Jaruzelski, Kevin, and Rakesh, 2005; Shahid and Nabeshima, 2007). The NPD stage gate process, defined above, highlights its interconnectivity with the various organizational segments (i.e. though scattered operationally, geographical and hierarchically). Therefore, in the next section the author discusses the concepts of organizational internal and external connectivity with reference to product innovation, in the light of theoretical support.

2.1.2 Product innovation, internal-external connectivity

According to management theorists (Black, 2000) organizational systems closely resemble human system that fails to function properly unless all of its individual units interconnect to form a whole (i.e. with internal and external environments)

and function harmoniously. In other words, organizations are understood as environments representing complex combinations of disciplines or work factors, strategically interconnected with each other to form systematic internal processes as a whole. To develop opportunities offered by challenging external forces it is essential for organizational leaders to comprehend and interpret the future by using a systematic and cognitive approach to enforce strategic thinking by relying less on mere experience and intuitive guesswork (Oelkers, Elsey, 2004). According to Song and Parry (1997a), subjective scales will allow the comparing of companies' performances on a macro-level taking into account their particular industry, time horizons, economic conditions and goals. It is highly significant to understand the connection between internal and external organizational environments with reference to the new product development process especially linked to new product idea generation. Brown and his research fellows (1995) proposed that the factors, namely, a well-executed new product development process, the logical use of cross-functional teams and frequent, political and task-oriented communications, are positively related to the new product success phenomena.
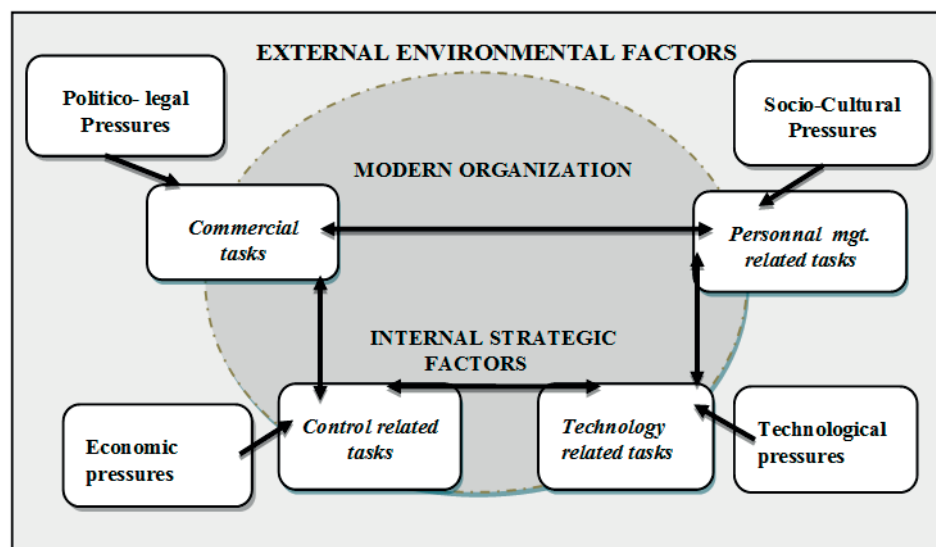
Figure 6.   Organizational external and internal environmental factors

Figure 6 above represents a simplistic contextual map of the organization´s internal and external factors to justify it as an interconnected and multidisciplinary whole. The broader internal environmental operations of an organization usually include; commercial operations, personal management operations, control and supervisory functions and technology based operations etc. However, the external environment of an organization mostly faces four types of pressures: politico-legal, socio-cultural, economic and technological. In

addition, numerous management studies (Katz, Allen, 1981) reveal that departmental teams, well-equipped with specialized skills, only in their core work domain and having weak or no skill potential in other work disciplines hinder the internal coordination and innovative efficiency within the organization (Kazmi, Naaranoja, and Takala 2013).

An organization´s internal strategic potential, in addition to specific external factors, is considered most vital in determining its innovative capability to sustain, develop and grow on the basis of its innovative product ideas, services or introduction of new work processes.
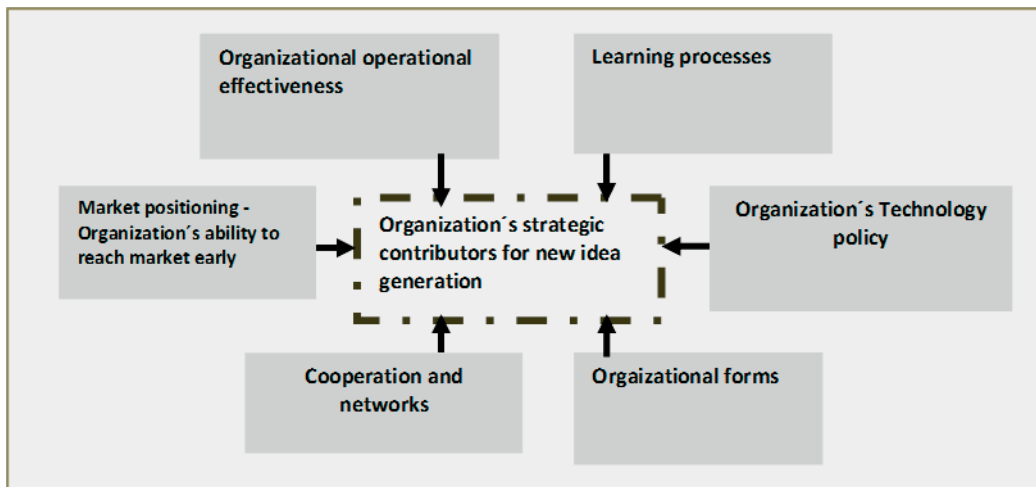
Figure 7.   Organization`s strategic contributors for product idea generation

In a real life scenario, we see only a few organizations, among the very many taking the lead through their innovative products or services, or their ways of working, though facing the same external pressures and opportunities and this confirms that they have something really distinctive within them to justify the uniqueness. The few elements of novelty that emerge from the above pursuit are mentioned in Figure 7 above.

2.1.2.1   Organizational operational effectiveness

Professional inadequacies namely; poor planning and financial judgement, greatly hamper the process of new product idea generation capability of an organization (Barber et al., 1989). Nooteboom (1994) suggests that factors like insufficient delegation, the high turnover of managerial staff, as well as managerial deficiencies seriously affect an organization's operational effectiveness. According to Oakey (1991), excessive dependence on word-of-mouth sales without real and well-coordinated marketing efforts is considered

one of the serious causes of professional inadequacies. This further hinders the process of new idea generation, sometimes linked to an overall new product or service generation or a unique idea related to the organization´s working process.

NPD performances are interconnected among various factors (De Weerd-Nederhof, 1998) to strike a balance between organizational operational effectiveness (OE) (De Weerd-Nederhof. 1998; Chiesa et. al., 1996;de Brentani and Kleinschmidt, 2004; Swink 1996; Yam et. al., 2004; Leenders and Wierenga, 2002; Kessler and Bierly, 2002; Griffin, 1997; Chiesa et. al., 1996; Thomke, 1997; Clark and Wheelwright, 1993; Iansiti, 1993; Griffin and Page, 1993) and its ability to handle new product strategic flexibility (SF) (De Weerd-Nederhof, 1998). The former is divided into two sub parameters: 1) Fit with market demands and 2) Fit with firm competencies while the latter deals with the productivity, speed and the flexibility of the process.   NPD performances are associated with the organization´s operational effectiveness

Product concept effectiveness is managed through the aspects namely: i) ´fit with market demands, i.e. customer satisfaction, timeliness, product price, product quality (Chiesa et. al., 1996), sales and profit effect (de Brentani, Kleinschmidt, 2004), and ii) `fit with firm competencies, i.e. R&D/ manufacturing integration (Swink, 1996; Yam et. al., 2004), R&D and marketing integration (Leenders and Wierenga, 2002) and depicts the combining process between the new product idea conceptualization and the company´s strategic goal. NPD development process effectiveness covers the organizational operational strategic transformational leadership by combining the process elements of speed (Kessler, Bierly, 2002; Griffin, 1997), and productivity and cost (Iansiti, 1993; Kessler and Bierly, 2002; Clark and Wheelwright, 1993) and NPD process flexibility (Chiesa et. al. 1996; Thomke, 1997). i) The element of ´speed´ is linked to NPD schedule (Kessler and Bierly, 2002): development time (DT), concept to customer time (CTC), total time (TT) (Griffin, 1997), and the speed and commitment of NPD decision making process (Griffin and Page 1993). ii) Productivity and cost: the possibility of lower development budget (Iansiti, 1993), cost related to budget and comparative to competitors (Kessler, Bierly, 2002), engineering hours, cost of materials and tooling (Clark and Wheelwright, 1993). iii) NPD process flexibility, average time and cost of redesign or upgrade enhancement (Chiesa et. al. 1996; Thomke, 1997), the ability to change specifications at later stages or change adaptability (Thomke, 1997). NPD performances associated with an organization's strategic flexibility including future product concept effectiveness involves; anticipating market demands by focusing on product market options (Johnson et al., 2003) that further includes windows of opportunity (de Brentani, Kleinschmidt, 2004) and proactive market

orientation (Narver et. al., 2004), while the concept of capacity building is linked to the acquisition of resources (Kessler et al., 2000) and the deployment of those resources effectively (i.e. integration of required resource strengths and their application (Yam et. al., 2004).

Future development process effectiveness involves; anticipating time constraints including the elements like anticipating total time (TT) (Griffin, 1997), and anticipating the speed and commitment of the new product development decision making process (Griffin, and Page 1993).

It additionally includes; anticipating productivity constraints namely; anticipated costs related to budget and competitors (Kessler and Bierly, 2002), anticipated engineering hours, cost of materials and cost of tooling (Clark, Wheelwright, 1993), and lastly; anticipating the need for process flexibility which involves the elements of anticipating average time and cost of redesign as well as alterations in product specifications (Thomke, 1997).

2.1.2.2   Learning process

In a general sense, the methods for "Ideation" (i.e. new idea generation) have been broadly categorized into two groups: 1) intuition – e.g., brainstorming, role-playing, metaphors, synaptic, and 2) logic – e.g., TRIZ, stage-gate process, project management, product line planning, portfolio management and forward steps (Shah, Vargas-Hernandez, and Smith, 2003). The need to generate new ideas is very critical to the firms that want to satisfy their customers' demands effectively and efficiently by offering desired and required products to achieve considerable competitive advantage (Wheelwright, and Clark, 1992). Woodruff (1997) supports the notion by suggesting that in order to succeed, organizations must re-orient their strategies well in time towards superior customer value. According to Edgett and Parkinson (1994), real time market research plays a significant role in identifying customer needs and behavior patterns in relation to their choice in addition to offering insights into generating new product ideas with the a prospect of catching the attention and satisfying the demand of a diverse set of users. Lindman, (2002) proposes factors namely, the ability to explore, reach potential markets, fit between the market needs and firm's resources, product planning from the inception, targeting the global market, the span of market experience, a pioneering attitude and the understanding of customer needs and product user´s circumstances, as the most critical factors that highlight the actual condition of a firm's market positioning. In addition, Dougherty and Heller (1994) suggest that when product innovators do not

understand their customer needs, they usually end up developing seriously flawed products and services. According to Hurley and Hult (1998), professional learning orientation, from an organizational stand point, is a hint of understanding and accepting the significance of new idea adaptability. The process of new idea generation is related to the creation of new products, services and processes that requires a set of skills and knowledge base as diverse as in routine manufacturing. Therefore, the potential of an organization's new idea generation capability depends critically on the eminence of an organization's learning ability.

2.1.2.3   Organizational technology policy

According to Ettlie, Bridges, and O'Keefe (1984), the technology policy of an organization depicts its approach and commitment to offer novelty. Organizations involved in offering novel solutions to their clients mostly obtain clues from the market on what kind of products to manufacture. The decision of an organization on manufacturing styles is specifically related to its technological side. Soderquist et al., (1997) propose numerous empirical studies suggesting a strong connection between the firm's innovative performance and the existence of a strategically planned technology policy. The above cases support the claim that the presence of a focused policy to resolve the issues related to new idea generation process, products and processes is linked with the firm's technology orientation.

According to Schumpeter (1942), strong barriers to industrial entry encourage novelty or the process of generating new ideas. When a firm is forced by external forces to restrict competitive initiatives, it in return enhances its strengths to win over the competition and consequently achieves profitability. This further offers the required financial resources to support research and development in addition and a genuine drive for innovation. He further pointed out that the lack of external push caused by market competition kills the spirit and reason for innovation and the drive for new idea generation capabilities. According to Dasgupta and Stiglitz (1980) an organization´s desire to generate new ideas becomes unnecessary in the absence of competition. However, Kamien and Schwartz (1982) negated the above proposition by pointing out the complexities of the innovation process under tough market competition due to which the tendencies of a company to innovate become seriously hampered and sometimes come to complete halt.

2.1.2.4   Organizational collaboration and networking

The theory of a critical mass in social networks (Marwell, Oliver and Prahl, 1988) defines the mechanism of how density of social connections in a group improves its prospects for collective action. However, it is believed that culture can severely restrict any corporate strategy selected to begin with, due to the myopia of shared beliefs among decision makers regarding the organization's goals, competencies, and environment (Casey and Goldman, 2010; Lorsch, 1985).

Teece, (1986) proposes that the phenomenon of organizational cooperation refers to collaborative research and development activities, joint ventures and strategic alliances, and is highly relevant to organizations that are seeking new ideas relating to their corporate operations for their extension beyond the localized market. The reason why organizations indulge in networking and research cooperation is that they require information in the areas of complementary assets, specialized equipment and know-how, which they lack or consider to be insufficient. According to Brush and Chaganti (1996), organizations which specialize in technical operations are more likely to have a focused and planned strategy of cooperation. A substantial number of empirical studies provide evidence that customer orientation is significantly related to firm performance (Kirca, Jayachandran, and Bearden, 2005). From the firm's perspective, customer orientation is achieved if the voice of the customer is systematically integrated into various stages of the NPD process (Bowen, Siehl, and Schneider, 1989; Lengnick-Hall, 1996).

2.1.2.5   Organizational market positioning

Empirical studies for approximately three decades have been analysing success factors (Cooper's and Kleinschmidt, 1995; Heskett, 2001; Sparke, 1983; Jevnaker, 1998; Leenders et al., 2007; Murray and O'Driscoll, 1996) of new product development. These studies have been focused on the internal organizational elements or factors that influence NPD activity to gain competitive edge through reaching market needs early. These parameters are actually ones that can be influenced instantly by the management level of the company. NPD success variables are classified according to the NPD process, organization, culture, role and commitment of senior management and strategy. Angle (1989) proposes that the new idea generation process is grounded in the organization´s creativeness in addition to its ability to foresee opportunities for innovation.

  Cooper's and Kleinschmidt's (1995) work has identified positive influence on the overall NPD process due to an effective linkage between two aspects, namely the

use of market information along with the NPD process, at the company level and the proficiency of activities in each phase of the NPD process. This includes effective product idea generation, product development, test marketing and Market introduction. The significance of the initial aspect is further supported by numerous studies that highlight the significance of critical commercial evaluation of the NPD projects before the actual development phase. Therefore, in-depth initial market assessments covering the technical aspects are decisive in NPD project. Taking into consideration the recommendations of Cooper and Kleinschmidt (1995), following four aspects are suggested for an effective NPD process:

i. Explicit definition of the product concept and target market before product development,

ii. Conducting extensive investigation on the technical and market-oriented feasibility and commercial evaluation.

iii. Conduct research on the targeted market and the competition in order to align the NPD process along with the market demands.

iv. Designing an effective NPD process.

Involving the customers and assessing and utilizing their feedback within NPD activities are of paramount significance. The early stages of new product development, also termed fuzzy front end (FFE) (Koen et al., 2002; Smith and Reinertsen, 1991), involve planning and evaluation activities that determine the `go` or `no-go` decision to either abandon or to accept the product idea to further start the product development process. The notion of democratizing product innovation by empowering customers to take a greater role by taking more of an active stake in corporate NPD (Von Hippel, 2005) has gained attention over the years. Such thinking in NPD practices encouraged many companies globally (e.g. Adidas, BMW, Ducati, Procter and Gamble, 3M) to involve their customers and other stake holders to incorporate their customers' innovative new product ideas into NPD processes more actively, more directly, and more systematically (Fuchs, Martin, 2010; Pitt et al., 1996). This is further suggested not only in the earlier phases when the new product process needs to be aligned with the market needs but also in the prototyping and market introduction phases as well. However, final authority and control have been strictly centralized, since ultimately this is the company that designs and develops the products and have the final say over the decision to produce any product or not (Fuchs, Martin, 2010; Pitt et al., 1996).

2.1.2.6   NPD success potential and internal organizational forms

The nature of an organizational setup is critical to NPD process especially to bring the above mentioned success factors into effect. Mainly, two forms of organizations are proposed by the theorists (Larson, Gobeli, 1988): the matrix and task force models. The form of organization may depend on the priority that the NPD team is addressing. For example, in telecommunications where time to market is very critical, a task force organization is the most suitable organization form for the NPD team (Hauschildt, 1997).

2.1.2.6.1   Organizational culture and team climate

The culture in a NPD organization supports how new ideas or propositions are handled within the company. This principle was expressed by Cooper and Kleinschmidt (1995) as NPD team climate. However, organizations, while working on new product development (NPD) projects to cultivate new product ideas by involving team members representing separate departments, often experience serious failures either due to unsuccessful new products or poor relations between the functional specialists (Souder, 1981, 88). Organizational behavior is one subject that has focused extensively on explaining the concepts of organizational culture and team climate (Patterson et al, 2005; Schein, 1990; Sparrow, 2001) as the two are referred to interchangeably by researchers in the literature. The logic to explain the overlap of the two referred concepts is that both (i.e. organizational culture and team climate) are closely related to the employee's experiences within their organization and the resultant behavioral pattern formulation (Deshpande and Webster, 1993: Patterson et al, 2005; Sparrow, 1996).

The main difference between organizational culture and team climate is that organizational culture installs the appropriate states of mind that shape the employees' behavioral patterns in accordance with their shared values and beliefs (Mohr and Nevin, 1990; Moorman, 1995) and can be measured by employing qualitative techniques (e.g. interviews, case studies and observation) since their outcomes are descriptive in nature (Deshpande and Webster, 1993; Sparrow, 2001). Team climate, on the other hand, is behaviorally oriented, and can be understood by qualitatively measuring (Ouchi and Wilkins, 1985) the impact of the feelings and perceptions of the employee about their organization on their behavior (Mohr and Nevin, 1990; Moorman, 1995; Barclay, 1989).

The above clarifies that though the concepts of organizational culture and team climate share strong similarities, extensive research has defined them as parallel

and non-overlapping discipline concepts (Schneider, 2000). In brief, team climate may be referred to as a surface manifestation of culture, reflecting the obvious, explicit and observable facets of behavior. One example of this is when an organization tries to create conducive climates for creativity or safety within the context of its overall organizational culture (Patterson et al, 2005; Schein, 1990; Sparrow, 2001).

2.1.2.6.2   NPD team climate and NPD team support

According to Cooper and Kleinschmidt (1995), when taking into consideration the entrepreneurial or NPD team climate, the following aspects ought to be considered:

   i.   Opportunity for employees to spend part of their work time in developing their personal ideas,

   ii.   Company support for work on unofficial projects, even if those projects are stopped by the management,

   iii. Venture capital, structures to assist the realization of creative ideas.

Cooper's and Kleinschmidt (1995) recommended a global picture of the requirements for success of NPD activity from the organizational point of view, as follows:

   i.   Strong and responsible project leader. This factor was approved by further studies. Actually, the project leader must show enough authority to manage different people from different areas and also enough commitment to the project in order to motivate the rest of the team.

   ii.   Cross functional NPD teams. This factor has been seen by Brockhoff (1994) as an efficient instrument to overcome the organizational interfaces. Moreover, cross functional teams encourage inter-functional communication and cooperation which promote success (Balbontin et al. 1999; Maidique, and Zirger, 1984; Yap, and Souder, 1994).

   iii. A dedicated NPD team for the project. Other studies have shown that autonomy of the NPD team has a positive impact on the success of the project (Gerwin, Moffat, 1997; Thamhain, 1990).

iv.   Commitment of the NPD team to the NPD project. Actually, the commitment of the project leader and his team may have a big influence on the success of the NPD project (Balachandra, 1984; Thanain, 1990).

v.   Effective communication between the NPD team members during the process of NPD. This can be achieved by sharing information among the NPD team and organizing project meetings (Balachandra et al. 1996; Ebadi, Utterback, 1984; Rothwell et al. 1974; Souder, Chakrabarti, 1987; Thamain, 1990)

The 'product champion' structures are identified as success factor for new product development. The 'product champion' principle implies that a dedicated team with its members show great personal commitment to the NPD project (Song and Parry, 1997). After all, fostering such internal organizations would be inherent to the innovation-culture within the company and to what extent they are encouraged. Sometimes, in order to overcome some internal obstacles that are blocking the new products development processes, associating the champion's team with a powerful 'promoter' is necessary (Fang, and Ou, 2007). The promoter belongs to the senior management layer and can easily guarantee the necessary resources for the project development.

New Product Development process – Basic success factors

Innovative culture development for NP Idea generation	*Organizational support for NPD Team*	*NPD team climate*
- *Active search for new product idea search,* - *Encouragement for ideal generation process,* - *Open cross communication process,* - *Continuous brain storming sessions, motivation etc.*	- *Product: Strong Champion,* - *Free time and support for technical and non-technical design teams,* - *Supportive Organizational culture,* - *Availability of genuine leadership and devoted work team members.*	- *Possibility of cross exposures and collaboration, joint ventures, related projects and programs,* - *Acceptability of Skunk to work or fail,* - *Risk taking climate generation,* - *Boot strapping etc.*

Figure 8.   Conceptual framework of NPD project success factors

Figure 8 summarizes some of the key success factors for NPD projects (Holger, 2002). As identified earlier, the commitment of the NPD team is one of the key success factors for the NPD project. Cooper and Kleinschmidt (1995) identified

that commitment at the senior management level is highly significant in NPD programs. This metric is of paramount importance because it is considered as a secure asset for the NPD team to obtain the required resources. Allowing resources would mean not only guaranteeing a long-life time for the project (Balachandra, 1984), but also successful introduction of the product by investing in market research studies in order to have a better market orientation of the NPD process (Cooper and Kleinschmidt, 1995).

2.1.2.7   Organizational strategy in line with product innovation

By focusing on a long-term stratagem for NPD program, Cooper and Kleinschmidt (1995) defined strategy as a construct of four variables:

i.   The objectives of the NPD program.

ii.   How the NPD goals can be better aligned to achieve the company's goals.

iii.   Strategic focus of the NPD program in order to draw a path for each individual NPD project.

iv.   Long-term thrust for the projects in terms of process length.

Many companies strive to create and introduce `new product´ to secure market lead and profit gains, and to do that, they have to adapt or sometimes even transform their core operations in accordance with the changing environment. The usual aims of the "patterns" in new product development process`, is to achieve and gain knowledge to manage the skills for the development of the new product while maximizing efforts to achieve `sustained innovation`.

The companies striving for `sustained innovation` usually face tensions of the following nature while proceeding towards ultimate success:

i.   Tensions of current work against the targets of future innovation (exploitation vs. exploration)

ii.   Tensions between the company's current resources and strengths versus demands from its external environment (cost vs. flexibility).

The main rationale behind focusing on "patterns (configurations)" in NPD` is that while pursuing `sustained competitive edge` the company can find the best fit within the NPD system or with its overall context in comparison to the NDP system (De Weerd-Nederhof, 1998). The fit or congruence refers to the

compatibility among different elements of the (NDP) system. The NPD process is a specialized and highly complex corporate activity.

Hence, to analyse the conceptual framework of NPD project success factors and its operationalization, presented in figure 8, the company has to have deep and extensive knowledge and command over its elements/factor (goals, management, support processes, people and resources) that interact with several intra and extra-organizational factors while making the whole process more complex and sensitive to handle.

To understand the conceptual framework, in-depth study of the related corporate strategy, culture and structure are the building blocks to assess the related patterns (Sherwin, Ewans, 2000) for decision making and managing the sustainable innovation process. *"When it comes to the integration of environmental considerations, it is important to understand the product development process and to be able to relate it to traditional theories of innovation and product development"* (Berchicci and Bodewes, 2005; Magnusson, 2003; Ritze´n, 2000). As the research dimensions of "eco-design" are in the process of continuous improvement and evolution, hence it is hard to find out the best and final definition. But the one which is widely acknowledged is coined by Sherwin and Ewans (2000): research on the integration of environmental concerns in product development is often very general, concentrating on how to achieve successful eco design (Ritze´n, 2000; Cramer and Stevels, 1997; Simon et al., 2000).

However, the technical operational procedures then have to be realigned and adjusted to achieve the best and appropriate fit for the targeted new product development project(s) as well as sustained new product development projects in order to successfully create the best fit between "product" or "system innovation" and "environmental challenges" It is widely acknowledged by the research scientists that eco-innovation product development projects should be managed differently from projects aimed at repair and refinement (Magnusson, 2000). Hence, the extensive research efforts in this field are displayed in the following table:

Table-1.   Basic features of radical innovation

Category	Description
Project champion	Strong project champions with a vision for the product and the drive to advance the development are important (McDermott, 1999;Verzyer, 1998)
Formalized stage-gate process unsuitable	Formalized stage-gate processes are not suitable for projects Characterized by intensive technology development (Verzyer, 1998)
Uncertainty	The projects have a high degree of uncertainty regarding both the market and the technology (Verzyer, 1998).
Exploratory	The development processes are exploratory and less customer-driven (Verzyer, 1998)
Fortuitousness	The projects are messy and coincidence and fortuitousness play an important role (Verzyer, 1998; McDermott, 1999)
Iterative	An iterative process exists for adapting product applications (Verzyer, 1998)
Networks	Informal networks inside and outside the company are important (McDermott, 1999)
Early phases	Early design and prototyping are essential (Verzyer,1998)

Source: Kazmi, 2012; Kazmi, Naaranoja 2013

Hence, the best eco-design procedures can be enhanced by co-relating them with radical and innovative product development processes. A four step model of approaches to environment improvements in product development is as follows:
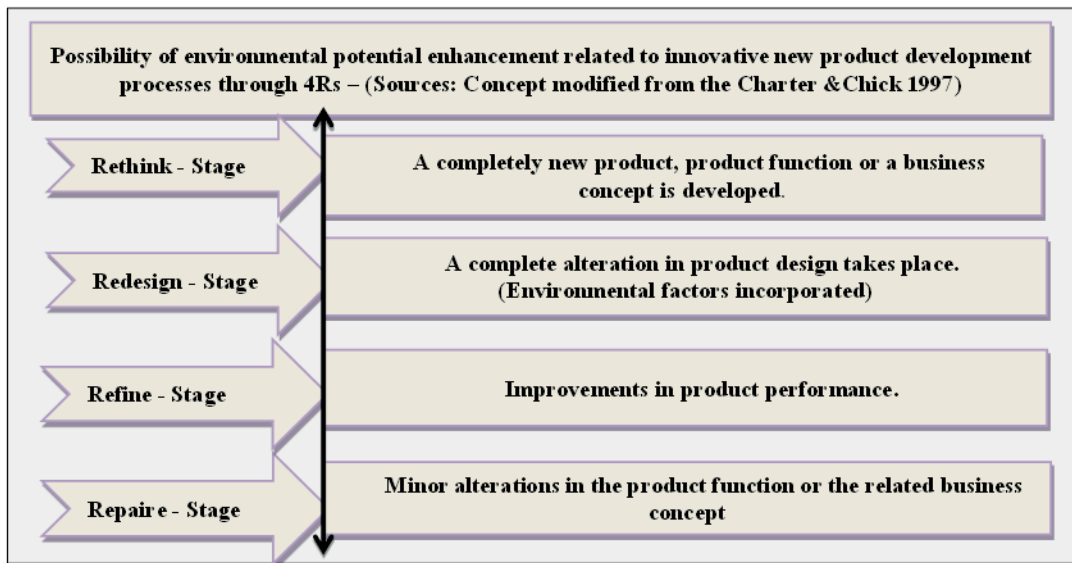
Source Kazmi, 2012; Kazmi, and Naaranoja 2013.

Figure 9.   Approaches to environmental improvements in new product development

Figure 9 above, displays the process through which companies can offer new products by incorporating environmental opportunities as well as the requirements by following a systematic four step flow of rethinking, redesigning, refinement and repair (Charter and Chick 1997, Magnusson, 2000; McDermott, 1999; Verzyer, 1998; Kazmi, 2012; Kazmi, Naaranoja, 2013).

2.2   Innovation process and organizational leadership

The current highly volatile global corporate environment is constantly pushing companies to innovate new products, services (Cooper, Kleinschmidt, 1995; Brockhoff, 1994) or systems to gain competitive advantage and win larger market share. Nonetheless, numerous companies struggle while opting for `innovation` as it is itself a complex process requiring constant control and balancing amongst various contrasting factors, namely term versus long term plans and related issues, and accommodating the internal customers (i.e. employees) while satisfying the company´s external customers and other stakeholders. In some instances, the inter-departmental command and control set-up becomes tense merely because the innovative process demands contradictory actions and roles. This tension can clearly be visible during the implementation stages of the organizational R&D strategies, while working on the new product´s conceptual quality and novelty, and the issue of speed of the product out-put time may hamper the product innovation process. Thus, pursuing both ends

simultaneously poses conflicting demands upon the organizational structure and (inter) actions for innovation in which R&D projects are being embedded (Van looy, Debackere and Bouwen. 2002).

Innovation theorists have noted (Van looy, Debackere and Bouwen, 2002; Cooper and Kleinschmidt, 1995; Brockhoff, 1994) the paradoxes in innovative environment as `forming a pulse like phenomena` due to having explicit objectives, temporary in nature and unique in form, in addition to having reciprocal interdependencies proving the process of innovation as a complex whole. Following are some of the solutions proposed to counter these paradoxes by using the time and space, best practices or management of dualities,

i.   Sequencing, (e.g. road maps, fish bone technique, cognitive and logic trees, etc.)

ii. Portfolio arrangements,

iii. Helix type approaches (e.g. inter-organizational arrangements etc.)

iv. Reframing and third parties (conflict management, matrix structures etc.)

The above, in addition to decades' of work by innovation theorists, suggests that (Van looy, Debackere and Bouwen, 2002; Cooper and Kleinschmidt, 1995; Brockhoff, 1994) there is no final recipe or ideal way to manage and organize the innovation process, especially while coping with the paradoxes resulting from adopting an innovative process.

In addition, environmental uncertainty (i.e. referring to the external environment) and complexity (i.e. referring to the internal environment) are the main dimensions that determine the type of innovation management with the help of organizational leadership capable of crafting suitable strategies. Uncertainty depends on the rate of change of technologies and markets, and complexity is related to the technological and organizational interdependencies.

The process of innovation requires a suitable corporate strategy aligned with the subject organizational structure. Table 2 below throws light on the general view of interdependence linked with the referred process.

Table-2.   Effects of uncertainty and complexity on innovation
                     management

Type of innovation management : Innovative (high uncertainty, low complexity) - Technical competences required - Functional structure	**Type of Innovation management :** Complex (high uncertainty, high complexity) - Several competencies: management, technical .etc. - Flexibility, adaptation and learning are required.
Type of innovation management : Differentiated (low uncertainty, low complexity) - Marketing competences are critical - Multidivisional structure typical	**Type of innovation management :** Networked (low uncertainty, high complexity) - Project management competencies are critical - Professional structures

Source: Kazmi, 2012; Kazmi, Naaranoja, 2013

The table above presents the effect of uncertainty and complexity associated with each management style of innovation. Henceforth, companies must seek options to find the best fit in accordance with their situations, taking into consideration that the most suitable NPD configuration can be established on a case-to-case basis. Inquiry into earlier studies relating to NPD through implementing innovation frameworks suggests that no single ideal pattern or configuration can be recommended or applied to the NPD activity. Understanding the organization context, the industry dynamics and developing the product development teams´ skill sets and capabilities are of paramount significance in order to drive the product innovation process toward success. This is additionally supported by contingency theory which implies that there is always one optimal organizational structure that is suitable to certain contingencies. The contingencies (Tidd, 2001)

may rather put restrictions on management of innovation and organizational structure. Therefore, finding one optimal way is the hallmark of the right organizational leadership through its strategic capability.

The leadership style (Howell and Avolio, 1992; O'Connor et al., 1995; Judge and Piccolo, 2004; Gardner, and Avolio, 1998; Conger and Kanungo, 1998; Conger et, al., 2000) can identify, develop, engage and effectively utilize cross functional teams; create manage and then sustain a balance among the various conflicting factors being created while the innovation process passes through strategic controls to ensure process success. In addition, as long as there remains a balance between the key factors, the performances of the organization remain high.
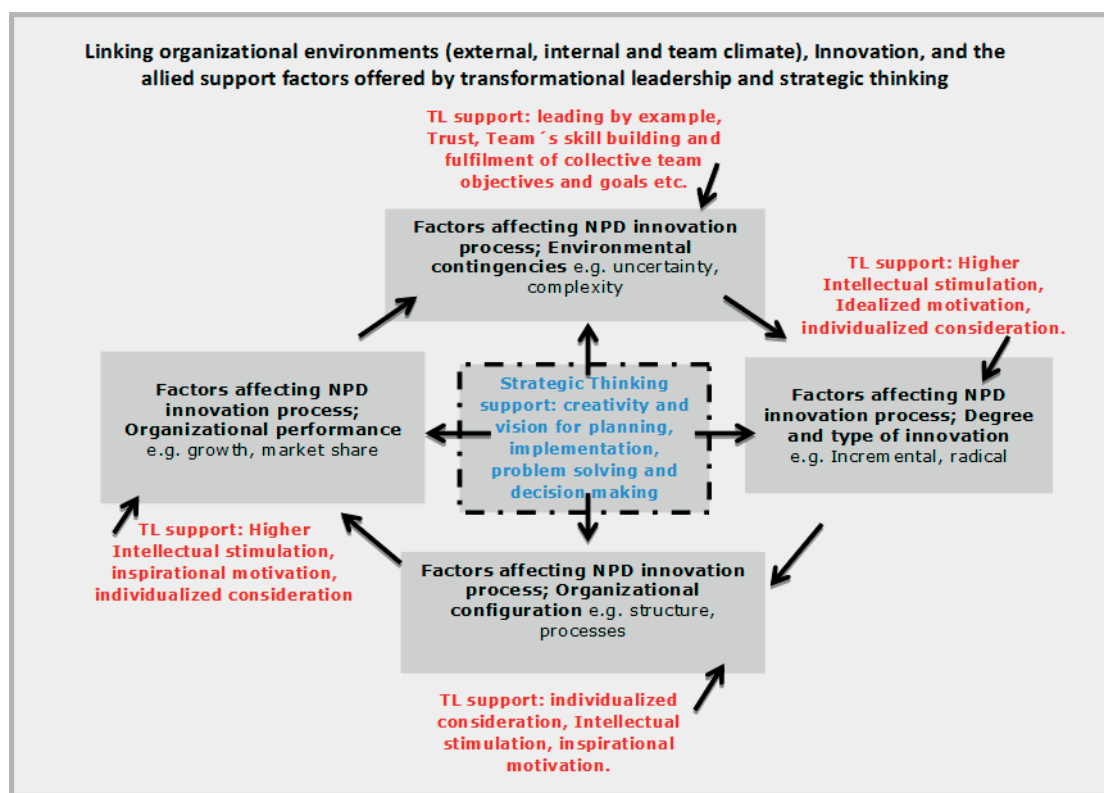
Figure10. Linkage transformational leadership and strategic thinking to organizational support factors

Figure 10 represents the cyclic flow of interconnected realities impacting the process of an organization´s new product development process (i.e. environmental contingencies, degree and type of innovation, organizational configuration and organizational performance (Van looy, Debackere and Bouwen., 2002; Cooper and Kleinschmidt, 1995; Brockhoff, 1994; Tidd, 2001) and the support elements offered by transformational leadership (Bass and

Avolio, 1994; Howell and Avolio, 1992; O'Connor et al., 1995; Judge and Piccolo, 2004; Gardner, and Avolio, 1998; Conger and Kanungo, 1998; Conger et, al., 2000) as well as strategic thinking potential (Bonn, 2005; Goldman, 2007; Goldman and Casey 2010; Essery, 2002).

After reviewing the concept of NPD and its linkage with the organizational factors, namely leadership and strategic thinking, in the coming part the author will define the concept of transformational leadership and why transformational leadership has gained paramount attention in the field of organizational leadership practices.

2.2.1 Organizational innovation and transformational leadership

To explain why transformational leadership style is preferred for the current study, it is important to start by exploring the concept in the light of theoretical support. Burns (1978) was the first to introduce the concept of transformational leadership and highlighted the difference between transactional and transformational leadership. Transformational leadership (Bass, 1985; Kazmi and Naaranoja, 2013; Taylor, 2014) is considered the most suitable by organizational management theorists and researchers, who truly encourage (Judge and Piccolo, 2004) and develop their employees to perform beyond expectations. This leadership style stimulates (Bass 1985; Bass, Avolio, 1993) the process of thought (i.e. beliefs and values) and cognitive behavior (i.e. attitudes and attributes) of the followers. The transformational leadership model is superior to the transactional leadership model on the basis of several factors, namely intellectual stimulation, inspiration motivation and charisma (Judge, Piccolo, 2004; Gardner, Avolio, 1998; Conger and Kanungo, 1998; Conger et, al. 2000) in contrast to mere dependence on contingent reinforcement and management-by-exception and exploitation (Howell, Avolio, 1992; O'Connor et al., 1995). Kouzes and Posner (2003) described five fundamental practices of leadership that encourage extraordinary performance through: a- Challenging the process, by exploring new opportunities for their followers to innovate and grow; b- Inspiring a shared vision, through their inspirational skills leaders install collective behavior among the team members; c - Modelling the way, whereby the leaders set examples for their teams to follow; d - Enabling others to act, whereby the leaders help their followers to learn skills and groom them; and e- encourage the hearts, by which the leaders win their followers' trust and respect. Raelin (2003) defined the concept of `team` as the creation or development of `leaderful` communities where leadership actually embraces the basis for followers to flourish. Explicitly, research studies (Bass, Avolio, 1994)

have shown that transformational leadership is positively linked to: subordinate work attitudes (e.g. loyalty and commitment, job satisfaction); subordinate work performance (e.g. sales); employee creativity; employee well-being (mental and physical health, occupational safety); and financial performance. The results of a study conducted by Patiar, and Mia, (2009) confirmed positive linkage between transformational leadership style and non-financial performance further creating positive connection with the financial performance of various work departments.

There are numerous leadership models (Bryman, 1992). According to the research study findings by Pearce and Sims (2002) "shared or collective leadership is considered the most significant basis of team effectiveness". The case findings revealed obvious relevance to the components of strategic transformational leadership among team members and this relationship is likely to substantially enrich team effectiveness. A study by Pearce and Sims (2002) confirmed positive linkage between transformational leadership and the provision of vision, inspiration, expressive idealism and team empowerment (Judge and Piccolo, 2004). Strong motivational appeal can be developed among team members through leadership for the fulfilment of collective team objectives and goals. Motivation is the combination of a person's desire and energy directed towards achieving one´s goals. According to Kouzes and Posner (2003), one of the main characteristics of exemplary leaders is to empower others (Thompson, 2012) to act (Childre and Cryer, 2000) and management leaders or organizations can adopt team empowerment practices to distribute power and authority downstream and develop centers or mid-points of innovation and excellence at all levels of the organization. Influencing people's motivation enables followers to do what they want to do know must be done (Military Leadership, 1993).

2.2.1.1   Four I's of transformational leadership

According to (Bass and Avolio, 1990), transformational leadership is considered a potential source of team performance enhancement through several factors, namely intellectual stimulation, individualized consideration, inspirational motivation and idealized influence. This style of leadership requires spending one's own capabilities (De Cremer, and Van Knippenberg, 2004; Van Knippenberg and Van Knippenberg, 2005) to foster leadership potential in others (Judge and Piccolo, 2004). This leadership style has emerged as a central model for understanding how leaders achieve effective and desired behavioral responses from their followers, namely due to the followers being highly satisfied with and respectful of their leaders (Bycio et al., 1995; Conger et al., 2000;

Thompson, 2012). It combines four sub-categories commonly known as the four-I's, to constitute a whole. The four I's are detailed below;

The first `I` is for idealized influence. It refers to the leader's capacity to lead his or her followers by setting an example (Bono and Judge, 2003) based on high moral and ethical grounds (Podsakoff, Mackenzie and Bommer, 1996; Whitener, 1997; Bass and Steidlmeier, 1999; Dirks and Ferrin 2002). The second `I` is for individualized consideration. It elucidates that a leader must achieve his or her followers' maximum potential through coaching or mentoring, during a process of helping and refining their skill potential. The third `I` is for inspirational motivation. It refers to the leader´s ability to install a desire in their followers for a cause. The fourth ´I` is for intellectual stimulation. It refers to the leader's capacity to encourage his or her team members or followers to think out of the box and generate new ideas (Bono and Judge, 2003; Jung and Avolio, 1999; Kirkpatrick and Locke, 1996). Followers of transformational leadership consider the development of mutual trust to be the most desirable and authentic leadership quality (Podsakoff, Mackenzie, and Bommer, 1996; Whitener, 1997; Bass and Steidlmeier, 1999; Dirks and Ferrin 2002).
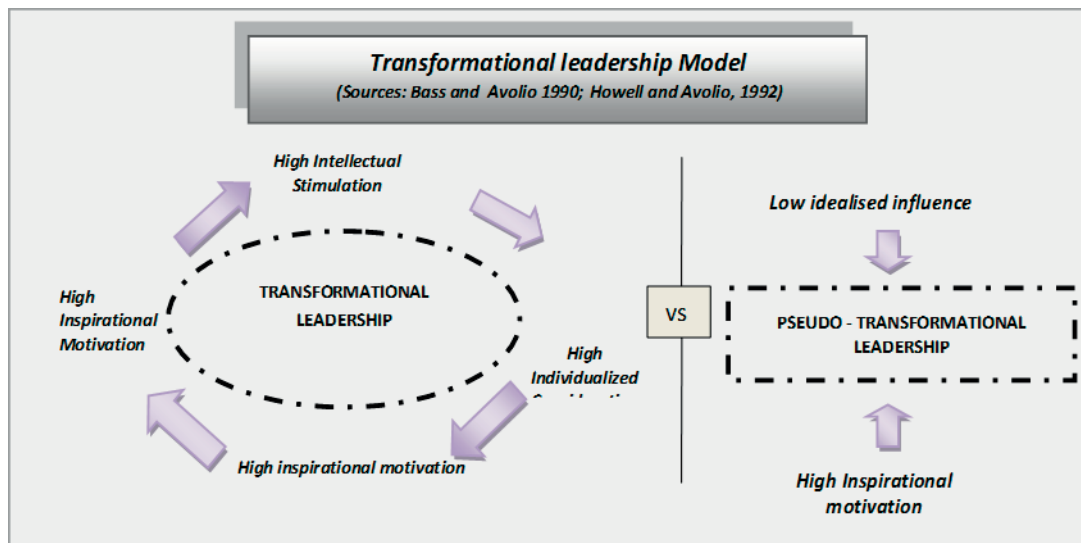
Figure 11.   Transformational leadership Model

The elements of transformational leadership are displayed on the right side of the Figure above while on the left side the elements of pseudo-transformational leadership are displayed to highlight the difference between the two.

2.2.1.2 Pseudo- transformational leadership

Extensive research on the concept of transformational leadership (Howell and Avolio, 1992; O'Connor et al., 1995) proposes focused attention to ensure ethical organizational leadership practices. In simple words, pseudo-transformational leadership is termed dark leadership (Howell and Avolio, 1992; O'Connor et al., 1995; Taylor 2014) and is defined (Barling, Christie, and Turner, 2008) as highly self-serving, inspirational leadership behavior, that is unwilling to encourage independent thought in subordinates, and offers little caring for one's followers more generally. Such form of leadership (Howell and Avolio, 1992; O'Connor et al., 1995) manipulates others for its own purposes, and thus followers may fear the consequences of their disobedience from the leader's ideas and be in a tenuous situation, thus hindering independent thinking and actively discouraging creative thought and collective good (Conger and Kanungo, 1998) during difficult times, more especially when organizations are faced with challenging choices. In addition, empirical evidence has confirmed that the followers of leaders who do not offer self-sacrifice on behalf of their group have lower performance as compared to ones led by a self-sacrificing leader (Van Knippenberg and Van Knippenberg, 2005). In addition, Tourish (2013) when commenting on the recent economic recession, mentioned (Taylor 2014) that what America was suffering from was not the housing, banking, or economic crisis, but a morality crisis. Numerous research studies conducted on the subject (Crown and Spiller, 1998 ; Klein et al., 2006) confirmed that business students scored lower on an ethical issues related scale than non-business students (Alimo-Metcalfe, 2013; Taylor, 2014).

2.2.1.3 Transformational leadership and work teams

Transformational leadership is characterized as a leader's ability to articulate a shared vision of the future, intellectually stimulate employees, and attend to individual differences in the work force (Lowe, Kroeck, and Sivasubramaniam, 1996). According to Kouzes and Posner (2003), leadership practices are to enable others to act. The research work conducted by Padykula and his colleagues (2013) mainly focused on the factors linked to the creation of work environment where trust, collaboration and accountability are valued. When followers gain a sense of appreciation, they establish full dedication to common goals of the organization. Transformational leaders (Hurley and Linsley, 2007) filled with self-awareness in addition to intense personal humanistic attributes such as creativity and flexibility display a strong ability to inspire others. The leaders,

when aligned with leadership attribute (Kouzes and Posner, 2003) inspire and empower their followers to engage in collaborative work.

Intellectual or mental simulation is applied by designers as an evaluation strategy, while investigating 'what if' cause-effect reasoning to define the effectiveness of possible solutions (Ball and Christensen, 2009; Ball et al., 2010). According to Coad and Berry (1998), transformational leadership supports organizational learning by facilitating intellectual stimulation, inspirational motivation, and self-confidence among organization members. Yukl (2002) describes leadership as the process of influencing followers and making them agree on the things that must be done and through the most required and effective ways. The process of leadership additionally includes the process of facilitating the followers as well as their collective efforts to achieve the shared objectives. Kouzes and Posner (2009), acknowledge leaders' excellence in leadership practices to transfer their futuristic visions to their followers effectively.

Hence, the reason to select transformational leadership for the current study is that new product idea generation potential can be supported through developing work teams´ cognitive, moral, communicative, collaborative, physical and business skills potential through the four `Is` (Bono and Judge, 2003; Podsakoff, Mackenzie and Bommer, 1996; Whitener, 1997; Bass and Steidlmeier, 1999; Dirks and Ferrin 2002) namely idealized influence, individualized consideration, inspirational motivation and intellectual stimulation), while dealing with highly complex and dynamic process of product innovation (Song and Parry 1997; 1995; Balbontin et al. 1999; Maidique and Zirger 1984; Yap and Souder 1994; Gerwin and Moffat 1997; Thamhain 1990; Fuchs and Martin, 2010; Pitt et al., 1996; Sawhney et al., 2005) which requires highly committed and effective work teams to assure project success.

After discussing the leadership potential and its link with idea generation potential, the author will now describe the concepts of creativity and new idea generation potential and their interconnection, in the following sections.

2.3   New idea generation and creativity

The current study, is based on the fact that individuals depend on creative thinking, while searching for creative solutions through generating innovative ideas, either to resolve their personal or professional life issues Actually, no single concept of creativity can fully cover all aspects of endeavor. Creativity demands   cognitive   and   non-cognitive   skills,   curiosity,   intuition,   and

perseverance. The process of creative solutions making may either take place through discovery, in a flash or it may spread over a period of decades. An in-depth research on creativity has identified almost 172 methods for idea generation (Smith, 1998). A phenomenon of idea generation termed `heuristic` (West, 1996) is extensively explored by psychologists and management experts to explain the underlying logic and impact of experience-based techniques for problem solving, learning, and discovery to offer solutions, which might not be optimal ones, due to being embedded in non-scientific methods namely; rule of thumb, an educated guess, an intuitive judgment, stereotyping, or common sense). The concept of heuristic is criticized by few theorist for being unscientific. According to the critics, it is a situational solution and limited in scope since being depended upon while fuzzy front end phases of the NPD process. However, despite being criticized, the concept still holds significance in the field of NPD process (West, l996; Gigerenzer, 1991).

An individual´s decision making is facilitated through creative thinking for exploring effective problem solutions while being flexible in opting from a variety of choices to gain maximum benefits, opportunities, technologies, and changes to support his routine life (Flach, 1990; Mumford and Gustafson, 1988; Runco, 2004). Team empowerment through decentralization of official authority results in creating mid-points of innovation and excellence at various levels to ensure enhanced level of organizational operational effectiveness (Childre, and Cryer, 2000).

However, there are contradictory approaches to the idea generation process. The traditional approach for generating innovative ideas for problem resolution through creative thinking is built upon the adoption of an `out of the box and unstructured thinking approach`. Such a cognitive approach does not follow systematic patterns to be truly original and innovative by initiating the thought process by placing the 'problem first' to encourage 'brainstorming' ideas till the desired solution is reached. Contrary to `out of the box` thinking, a modern approach to new idea generation through creativity propagates the logic of thinking `inside the box` (Boyd and Goldenberg, 2013), an enhanced or rapid process for innovation, referred to as a counter intuitive approach. Theorists in favor of the notion defend the concept with the logic that humans think in patterns, or operate within their bounded rationality (Gigerenzer, 1991; Simon, 1957) and usually depend upon cognitive factors, namely knowledge, familiarity and experience, during the problem solving process. 'inside the box' thinking is a process of exploring problem solutions while remaining within one's familiar surroundings and using the help of set patterns embedded in creativity. This is additionally termed inventive solutions and prepares the ground for systematic

inventive thinking (SIT). This technique is currently followed by number of well-known companies (Boyd and Goldenberg, 2013) across the globe (e.g., SAP, Johnson and Johnson, GE, Procter and Gamble, and Philips). According to Boyd and Goldenberg (2013), the most inventive ideas are not very far from one's reach and occasionally at the advent of a new invention; one feels that he or she could have thought that too.

The SIT technique elucidates that new ideas can be generated by using any of five simple techniques namely:

i.   Subtraction, (e.g. the invention of the Sony Walkman by subtracting the recording feature and the size of the cassette player, invention of contact lenses by subtracting the frame from the pair of glasses),

ii.   Task addition, (e.g. innovations of scanners with the added function of emailing facility or the latest introduction of back packs by the Samsonite company that has the of addition to the back holding straps having massagers placed at the `Shiatsu` points in accordance with Japanese body massage techniques,

iii. Division, (e.g. the introduction of split air conditioners with offering separate components (i.e. air blower part, exhaust box and remote control),

iv.   Multiplication and the attribute dependency (e.g. transition sunglasses, as their one attribute of changing colour depends on changes in the outside light). Basically, the SIT method is embedded in the cognitive sequence of moving inside out. The difference in the process flowing between the two approaches of innovation can be understood by looking at the Figure 12.
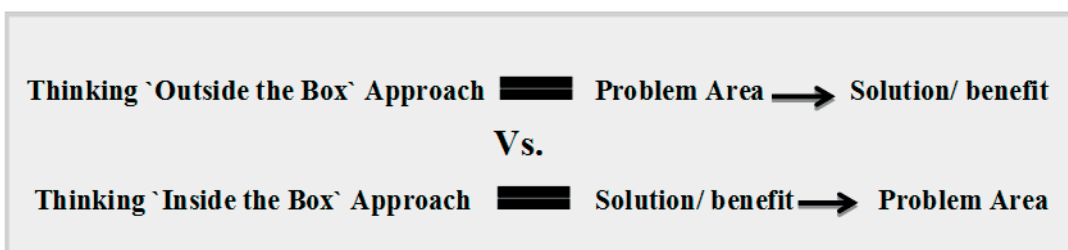
Figure 12.   Opposing process flows – outside vs. inside the box thinking

Figure 12 above presents a brief overview between the two approaches which take completely the opposite route from each other while supporting innovative idea generation logic. One starts from defining the problem area first and the finding

effective solutions in an unstructured way (i.e. out of the box thinking), while an inside the box thinking process approaches the effective solution or the benefit logic prior to exploring the problem area (Boyd and Goldenberg, 2013). All the above, suggests that there is no single approach to support innovation process and new idea generation. Therefore, the aimed approach of the study is to install strategic thinking so that the thinking process is aligned with corporate planning (Goldman and Casey, 2010) and targeting the required operational areas. In the next section the author will describe the concepts of strategic thinking and product innovation along with their interconnection.

2.3.1   Strategic thinking and product innovation

Corporate planning is only a small portion of a comprehensive process of strategic thinking (Goldman and Casey 2010). It does not come naturally since most of us are static thinkers who tend to make decisions only for a known or particular period, while strategic thinking (Kazmi, Naraanoja, 2015) skills have to be learnt, cultivated, practiced, and then applied (Bonn, 2005).
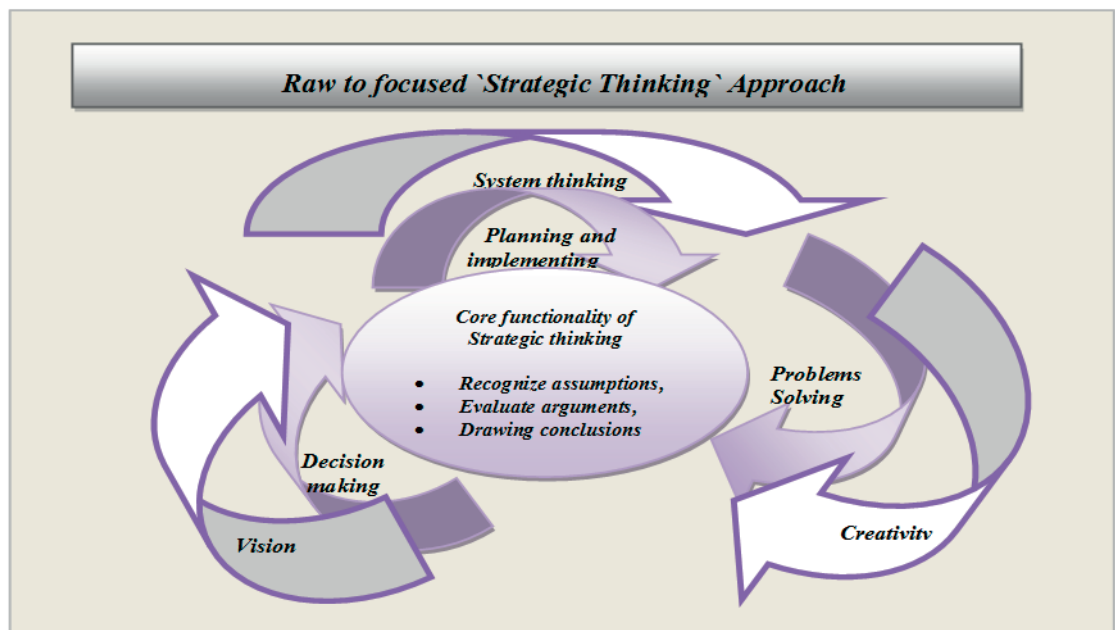
Figure 13. Strategic thinking process progression

Figure 13 displays a simplified cycle involving systematic thinking, creativity and vision which progresses to a relatively focused strategic thinking approach based on planning and implementation, problem solving and decision making approach

(Goldman, 2007). Whether one takes the simplified approach or the focused one, the aim in selecting either of them is usually to utilize the core functionality of strategic thinking i.e. recognizing assumptions, to evaluate argument and finally to draw conclusions. Batty and Quinn (2010) define strategic thinking as a process that involves collection, combination and filtration of information to generate new, relevant, focused and feasible ideas and strategies. Corporate planning is defined as simply the tip of the iceberg or the part of the greater process of strategic thinking (Essery, 2002). According to Wheatley (2006), the requirement for information and thinking skills which were once considered the key skills for top leaders is now moving deeper into organizations, since currently it is the requirement of every employee to be able to interpret complex information and explore their own realities. In fact, the cognitive mechanisms connected to the (i.e. product idea related) design process are usually considered a precedent-based type of reasoning (Oxman and Oxman, 1992), where knowledge is continuously transformed to generate new knowledge.

Flood (1990; 1995) has stressed that a philosophical review of systems research is essential to propagate the new knowledge offered by unconventional post-positivist outlooks. In addition, the annexation of social concerns in management theories is reasonably well justified (Singer, 1995). During the idea generation process, designers refer to their background experiences and skills, in addition to connecting such exposures with different types of internal and external stimuli they might have access to. For instance, in the process of inspiration, designers tend to combine physical and/or mental visual samples to support inspirational purposes (Keller et. al., 2009).

2.3.1.1   Cognitive processes in strategic thinking

Modern theorists emphasize the significance of (Pisapia et al. 2005) three main cognitive processes, namely systems thinking (Senge, 1990), reframing (Morgan, 1986; Bolman and Deal, 1994), and reflection (Dewey 1933; Argyris and Schön, 1978; Schön, 1983) as the success factors for organizational leaders in dealing with situational complexity. Information gathered through the process of system thinking and reframing is used as a significant tool by management leaders during the process of reflection to make sense of the situation (Pisapia et al., 2005).

These three processes support leaders in (a) understanding the situation through the process of reframing; (b) formulating theories of practice to guide actions through the process of reflecting and; (c) using systems thinking in a holistic

manner (Parsons,1960; Senge, 1990; Capra, 2002; Pisapia et al., 2005). These three processes support leaders in visualizing events and understanding problems in terms of concepts to combat them effectively (Pisapia et al., 2005).

Systems thinking propagates the logic that the unified whole is superior to its individual parts. Modern theorists emphasize that in systems thinking the whole is primary while the parts are secondary (Capra, 2002; Pisapia et al., 2005). However, the traditional approach to systems thinking (analytic/linear/reductionist thinking) proposes that the parts are crucial and primary while the whole is secondary (Senge, 1990; Capra, 2002; Pisapia et al., 2005). This reverse of the mindset from parts to whole is of great significance for modern theorists and management experts to understand living organisms (Parsons, 1960; Senge, 1990; Capra, 2002; Pisapia et al., 2005). Capra (2002) further defines that in order to understand an object or a phenomena one initiates the cognitive process by visualizing it from a larger context rather than dividing it into parts. In addition, modern systems thinkers agree that it is not viable to isolate the organization from its environment (Pisapia et al., 2005) to understand its processes.

'Reframing' is defined as a cognitive tool or skill to collect and arrange the information or knowledge set to define the situational realities (Morgan, 1986; Bolman and Deal, 1994; Pisapia et al. 2005).

 'Reflecting' is explained as a skill to process information or the knowledge set to apply it according to the situational requirements (Schön, 1983; Pisapia et al. 2005) through practice. As a whole, the cognitive processes require understanding by taking leads from the surroundings and day to day events for enhancement of the skill level to effectively apply strategic thinking. Hence, to proceed further in the quest of understanding the strategic thinking phenomenon the researcher recommends that readers ponder upon an unusual philosophical point made by Blanchard, and Blanchard, (2013) and follow a rose gardener's approach as an example. A strategic thinking perspective supports building connections between the human cognitive process with most simplified day to day examples, in order to comprehend the complex organizational decision making process and to support systems thinking (Kazmi, and Naaranoja 2013) . According to Blanchards (2013), an everyday example of the rose garden is probably visible in almost all of our neighbourhoods. They suggest that the readers to have a keen eye at their rose gardens in the vicinity the next time they walk down their streets. By doing so, they can easily observe that the gardeners with the most attractive and healthy roses are the ones who most carefully prune and shape their rose-bushes. "When one prunes a rose bush (i.e. cutting out the

unnecessary parts of the bushes), it provides the plant with a way to concentrate its resources to create the best-looking roses on the strongest branches". Though regular pruning is tough but by doing it consistently one can obtain stunning results. It is an example to relate clear vision to strive for ultimate results. Being confident about where one is heading strengthens person´s willpower to cut back on things that are not helping to attain one's goals. Cutting back on what is not necessary will free up additional resources and potential so to make the goals attainable (Blanchard and Blanchard 2013). External stimuli are defined as entities in a person's surroundings and can include, for instance, objects that are pictorial, verbal, audible or tangible (Eastman, 2001). After understanding the concepts of strategic thinking and product innovation the author will discuss the need and reality behind having T- shaped vs. I – shaped team members" in modern strategic organizations.

2.3.2 Product innovation, T vs. I–shaped team members

Modern organizations require working teams capable of strategic thinking supported through a multidisciplinary knowledge base, referred to as persons having T-shaped skills (Iansiti, 1993), unlike the classical approach of having task specialists i.e. team members having a focused knowledge base of a certain skill set. Engineers and scientists are known to express their work knowledge differently. The reasons behind such differences are their close connection with entirely different subcultures (i.e. specific and specialized fields) to which they belong and socialize in addition to the differences in their educational knowledge base (Wu and Haar. 2013). Gilsing et al. (2011) studied such differences in the field of technology. An example to take advantage of T-shaped thinking professionals in an industrial operational scenario is cross-functional teams (Kazmi, Naraanoja, 2015, Kazmi, Takala, Naraanoja, 2015; Kazmi, Takala, 2012; Kazmi, Naaranoja, 2013) when they successfully complete a prescribed set of related cross-functional activities at each stage prior to obtaining management approval to proceed to the next stage of product development.
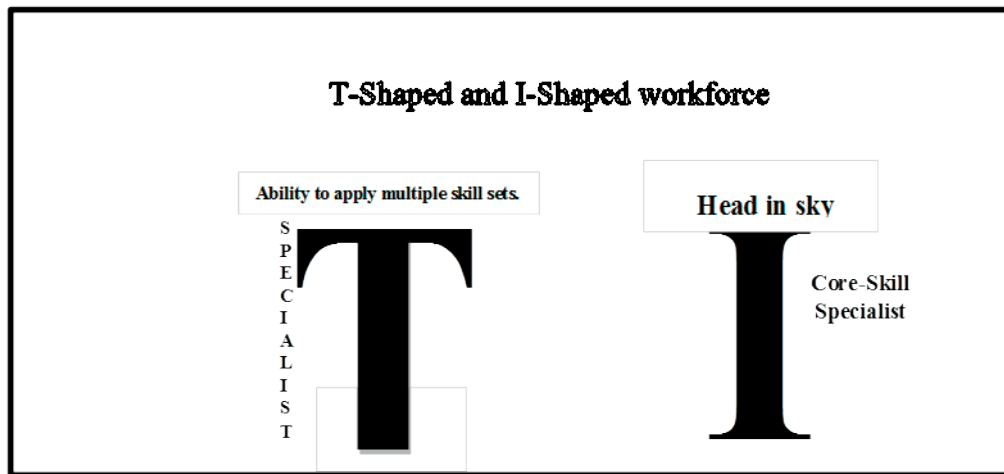
Figure 14. Differences between T-Shaped and I-Shaped workforce, at a glance

Figure 14 above reflects what David (1991) has analysed and shared about T-shaped people. According to him, T-shaped people or team members have a variety of cross disciplinary skills while having in-depth command over their core specialty area. He identified the T-shaped professional as a new breed of 'hybrid' managers who would combine their diversified business skills capability with IT skills. The hybrid manager (David, 1991) must obtain the capability to stand out from the rest of the ordinary set of specialty area specialists due to his or her ability to relate to 'the broader picture' due to having advanced level of multidisciplinary knowledge base compared to others. He or she additionally displays character dimensions such as being enthusiastic, intuitive, a great listener, and having 'an unusual set of interests'. Such a well-rounded personality is identified as a T-shaped professional or a Renaissance man; for example a single person equally comfortable with information systems, modern management techniques and 12-tone scale, etc. (David, 1991). However, I-shaped people have a detailed knowledge base in their specialty discipline, are capable of communicating clear expectations without intruding upon other fields by extensively exploring what is unknown to others in their domain (Bannerman, 2003). Iansiti (1993) defines a T-shaped team as having members capable of a multi-disciplinary knowledge base. He stresses the T-shaped people as experts in a definite skill field (T´s vertical stroke) but additionally having command over the disciplines (Horizontal stroke). According to the T-shaped approach, vertical skills in an individual are the most essential capabilities for new knowledge creation among the team members while the horizontal skills are the ability to combine more than one skill sets in the team members to offer and support creativity and innovation (Madhavan and Grover 1998).

A similar point of view is shared by Bannerman (2003) when he suggests that training scientists having diversified know how are required for the growth of the field. According to the vice chancellor for research and graduate studies at Louisiana State University, a T-shaped person has disciplinary depth, in biology for example, but with arms, to reach out to other disciplines. `We ought to encourage this new breed of scientist` (Amber, 2000). The concept of T-shaped skills or T-shaped persons is a metaphor used in job recruitment to describe the abilities of persons in the workforce. The vertical bar on the T represents the depth of related skills and expertise in a single field, whereas the horizontal bar is the ability to collaborate across disciplines with experts in other areas and to apply knowledge in areas of expertise other than one's own. The initial introduction of the term T- shaped person was by David Guest in 1991. Later on Tim Brown, CEO of the IDEO design consultancy stressed this approach for employee selection criteria to establish interdisciplinary work teams for innovative and creative work processes. The T-shaped teams are termed 'agile' teams and are considered cross-functionally diverse and sufficient.

In general, the idea generation approaches can range from informal activities, for example active or passive searching, collaborating (Leiviska, 2001), and socializing (Herring, Jones, and Bailey, 2009) or can involve certain formal procedures as well (Shah et. al., 2000). The process of communication among people, belonging to various disciplines, is considered to be the hardest challenge encountered by specialist teams in the field of industrial design business management (IDBM) industry projects, usually resulting in poor coordination in language, tools, practices and thinking models among the collaborating experts (Leiviska, 2001). Tom Kelley explained in depth about the strengths of T-shaped people in his book titled 'The Ten Faces of Innovation'. According to him, T-shaped people have deep expertise in one area, but in addition have much wider superficial knowledge about a variety of related subject areas or disciplines. The idea can be summarized by saying that T-shaped people have limited knowledge about a lot of subject areas, while having a lot of knowledge in a specific subject area. According to Kelley and Littman (2005), such T-shaped people can be regarded as excellent cross-pollinators in a team, and are great sources of unusual ideas to support innovation.

After having a clear understanding of the concepts of T- shaped vs. I- shaped team members the author will proceed further to discuss the concept of organizational new product idea generation potential.

2.4 Organizational new product idea generation potential

Professional inadequacies, namely poor planning and financial judgement greatly hamper the process of new product idea generation capability of an organization (Barber et al., 1989). Nooteboom (1994) suggests that the factors of insufficient delegation and high turnover of managerial staff are considered as managerial deficiencies. Excessive dependence on word-of-mouth sales without any real and well-coordinated marketing efforts are the causes of professional inadequacies that ultimately hinder the process of new idea generation which can either be for a new product, a new service or a unique idea related to organization´s working process (Oakey, 1991). In a general sense, the methods for ideation (i.e. new idea generation) have been broadly categorized into two groups: 1) Intuitive – e.g., brainstorming, role playing, metaphors, synectics; and 2) Logical – e.g., TRIZ and forward steps (Shah, Vargas-Hernandez, and Smith, 2003). The need to generate new ideas is very critical to firms that desire to satisfy their customers' demands effectively and efficiently by offering desired and needed products to gain competitive advantage (Wheelwright and Clark 1992). Woodruff (1997) supports the notion by suggesting that in order to succeed, organizations must re-orient their strategies well on time to move towards superior customer value. According to Edgett and Parkinson (1994), real time market research plays a significant role in identifying customer needs and behavior patterns in relation to their choice making in addition to offering insights into generating new product ideas with the prospect of catching the attention and satisfying the demands of a diverse set of users. Lindman, (2002) proposes such factors as the ability to explore, reach the potential market, the fit between the market needs and firm's resources, product planning from the inception, targeting the global market, span of market experience, pioneering attitude and understanding of customer needs and product user´s circumstances as the most critical factors that highlight the actual condition of a firm's market positioning. In addition, Dougherty and Heller (1994) suggests that when product innovators do not understand their customer needs, they usually end up developing seriously flawed products and services. According to Hurley and Hult (1998), professional learning orientation, from an organizational stand point, is a hint of understanding and accepting the significance of new idea adaptability. The process of new idea generation is related to the creation of new products, services and processes and requires a more diverse set of skills and knowledge base compared to those one sufficient for routine manufacturing. Therefore, the potential of an organization's new idea generation potential depends critically on an organization's learning ability. Angle (1989) proposed that the new idea generation process is grounded in the organization´s creativeness in addition to its ability to foresee opportunities for

innovation. When a firm is imposed by external forces to restrict competitive initiative, it in return enhances its strengths to win over the competition and consequently achieves profitability. This further offers the required financial resources to support research and development in addition, and a genuine drive towards innovation. He further pointed out that the lack of external push caused by market competition kills the spirit and reason for innovation and the drive for new idea generation capabilities. According to Dasgupta and Stiglitz (1980) an organization´s desire to generate new ideas becomes unnecessary in the absence of competition. However, Kamien and Schwartz (1982) negate the above proposition by pointing out the difficulties of innovation under tough market competition due to which the tendencies of a company to innovate become seriously hampered and sometimes come to complete halt.

The ability to think strategically is critical for leaders and managers at multiple organizational levels. Specific work experience can contribute to the development of an individual's strategic thinking ability. Culture, among other organizational factors, can either encourage or limit those contributions. Leaders, as culture constructors and transformers, can act to maximize the relationship between organizational culture and the process of learning to think strategically (Goldman and Casey, 2010). When taken seriously, strategic management can promote participatory decision making and adaptability. Yet, success in organization strategy depends more on the right mental outlook than on specific techniques that can themselves sometimes turn into an impediment to open, creative thinking. Strategic management works best when understood as a way to learn, not as a prescribed remedy to follow (Goldsmith, 1996).

The management of organizations must keep on aligning their strategies in order to manage organizational crises (Eren, Zehir and Özşahin, 2004) to support their teams to innovate especially in the area of new product development. And to formally end the literature review on the study's highlighted concepts, the author will share relevant literature on the concept of strategic leadership that can be considered somewhat the combination of leadership and strategy approach.

2.5 Strategic leadership vs. strategic transformational leadership

The right blending of transformational leadership with strategy creates `strategic leadership´. According to Barron (1995), strategic leadership is an expression of utilizing existing abilities and skills to influence others to be trained in new formats for new leadership models. This concept highlights the organizational

leader´s ability to think strategically by pin pointing the areas that require transformation on the basis of rational approach. According to Rowe (2001), there are clear dividing lines between strategic, visionary and managerial leadership. Strategic leadership represents a shared vision of what an organization ought to be in addition to support day-to-day decision making, while managerial leadership only influences the actions and decisions of those with whom they work.

A strategic thinking approach emphasizes the leaders´ capability of problem-solving, decision-making and creative/critical thinking to form total quality leadership. In addition, strategic orientation is considered a capacity to be innovative by aligning concepts and long-range visions with routine assignments. Thus, Barron's (1995) characterization of strategic leadership is a form of leadership demonstrated by individuals having the skills to craft and convey vision and effect change through interactive leadership.

Leadership empowers innovators and change agents to have a broader vision supported through strategic thinking for corporate goal attainment (Kouzes and Posner, 2009). Quong and Walker (2010) presented a framework by outlining seven principles of strategic leadership. Referred key principles are detailed below:

   i.   Principle - Is future oriented and involves strategies to achieve futuristic goals;

   ii. Principle - It follows intensive research outcomes;

   iii. Principle - It helps in getting things done;

   iv. Principle -It helps in opening new horizons;

   v.   Principle -It is the best option to lead;

   vi. Principle -It helps to build good partnership;

   vii. Principle - It helps in doing the 'next' best thing.

Beatty and Quinn, (2010) defined strategic leadership as a force to ensure decision potential especially highlighting the key points about whether and when to act. They deal with situations and contexts which are closely associated with daily life activities that are more related to the core concepts of responsibilities. Visionary leadership is considered future oriented and supported by a risk taking attitude. Such leaders display an independent approach in their organizations

due to being who they are. In addition, such leaders work from high risk positions to explore risky ventures as they carry high rewards (Rowe, 2001).

All the above defines the concept of strategic leadership as merely the fusion of strategy and leadership. Strategic leadership is actually linked to organizational transformation through its corporate vision, internal culture and values, organizational climate, operational structure as well as its internal systems and overall corporate strategy. In this process, senior executives and managers continuously work to form extensive clarity, institute stronger systems, expand their leadership repertoire—and contribute to their organization's well-being.

In strategic leadership character, the leader envisions the organization as interlinked so that the activities undergone at one part of the organization are acknowledged as having impact on the other parts.

A strategic leader operates with a comprehensive plan of actions while integrating short-term results to the long-term focus. Furthermore, such a leader is generally considered driving force for organizational change. The influence of such leader's effort cascades across the whole organization. Hence, the who, the what, and the how of strategic leadership mostly revolves around the position's like CEOs, top executives or the middle management. The above elucidates that in strategic leadership role, the process of strategic decision making or its implementation revolves around the initiatives of either the top management, the middle management or just a few critical lower positions. Additionally, such process does not propose a hint whether there is any role of the elements like 'idealized influence' or 'individualized consideration' from the very top to the extreme bottom of the line and the followers'(ordinary staff members) empowerment to suggest strategic ways and tactics to be incorporated in the overall corporate strategy. Moreover, there is no obvious support of elements like intellectual stimulation, inspirational motivation or charisma in building leadership capabilities and individual decision making capacity in the lower staff or followers (Bass, Avolio, 1990; 1992). This leaves a hole in the concept of strategic leadership and makes the concept more of a technical process rather than a humanly act of power sharing till the very end of the loop (top management till the ordinary staff members) since anybody can come with a brilliant idea.

In the light of above, the fusion of transformational leadership with strategic thinking is proposed in the current research instead of any ordinary leadership style (i.e. that can be of any form or type of leadership- e.g. authoritative, transactional leadership or laissez-faire leadership) with strategy to build strategic leadership.   Hence the crux of current research idea was to attempt for

combining process of deeper level of 'strategic thinking', having the elements of reframing, system thinking, reflection (Pisapia, 2006; 2011) with the specialized form of 'transformation leadership' having the elements of idealized influence, intellectual stimulation, individual consideration and inspirational motivation (Bass, Avolio, 1985; 1993, Barling, Christie, and Turner, 2008; Sun et al. 2012). Figure 15 presents the visual description.
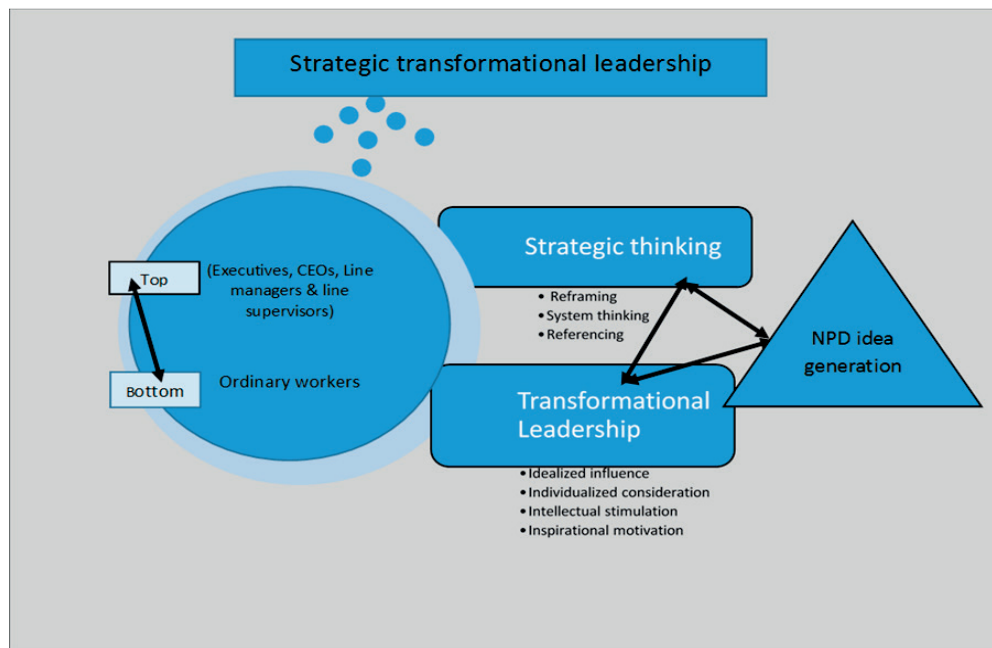
Figure 15. Concept of strategic transformational leadership

By doing so, the author has actually tried to replace the earlier process of combining 'strategy', involving the elements of thinking, acting and influencing (having weaker theoretical grounding) and 'leadership', with no specific reference of the leadership style or reflecting the ingredients resembling more to the authoritative, transactional or laissez-faire leadership. Figure 16 presents the visual description.
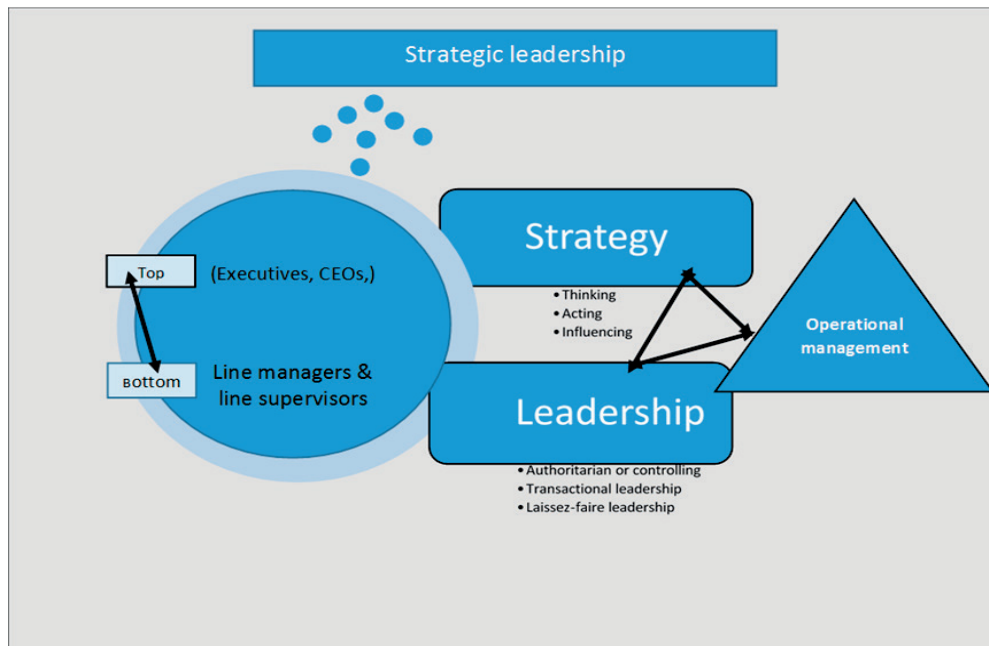
Figure 16. Elements of strategic transformational leadership

Moreover, the author would like to stress upon the basic logic of doing the research, here. Whenever the text related to strategic leadership is explored, one mostly finds the material revolving around the ideas that how the concept is supporting strategic management operations, with very little focus on NPD idea generation aspect.

And therefore, the author has seen the gap or vacuum, that can be filled through an in-depth research. Since the 'new product development is considered a vital industrial process to produces new products to offer to the customers and gain revenues, profitability and source of survival, therefore, through the current research, the author has tried to link specialized concepts, built upon extensively tried and tested theoretical models (i.e. strategic thinking and transformational leadership) to fill the operational gaps (i.e. focusing on NPD idea generation logic).

2.6   Theoretical framework

Literature research is the discussion of existing data and developments within a particular incidence or phenomenon. It is aimed at revealing shortcomings, developments, future research avenues and it usually reflects the advancement of findings over time. In order to attain the goals of the subject study, research

literature has been consulted and established techniques are carried out towards an empirical study.

The subject study attempted to investigate new product (NP) idea generation potential or practices in an organization from the perspectives of transformational leadership and strategic thinking keeping in view the competitive nature of multinational businesses of today, combating against social, economic and cultural factors. Thus, to evaluate the success of an organization´s new product development efforts through innovation will present limitations in a scenario where various work teams as well as work systems are operating together while either being controlled from different hierarchal levels or being operated upon by individuals having entirely different skill sets. To support such limitations and to equip the theoretical framework of new product development with strategic maneuvering capability, the researcher proposed the integration of the findings of various research studies done in the field of transformational leadership (Bass and Avolio, 1990; 1992; Barling et. al., 2008; Sun et.al., 2012) and strategic thinking (Pisapia, et. al., 2005; 2006; 2009; 2011). The framework of the subject case study is a combination of two established models (i.e. transformational leadership and strategic thinking and two fieldwork studies i.e. NPD team climate and pseudo transformational leadership) developed in relation to the new product idea generation capability of an organization by harnessing NPD teams on the basis of transformational leadership and strategic thinking.

The chosen techniques use prior studies to base this study upon, as below:

i.   To study the concept of `strategic thinking`, the researcher tried to focus on the concept by following extensive research work done by experts (Pisapia, et. al., 2005; 2006; 2009; 2011) in the field with their well-recognized efforts in establishing an STQ (strategic thinking questionnaire) tool involving the three cognitive factors, i.e. *system thinking (Pisapia, et al., 2009; Senge, 1990), reflecting (Pisapia, et. al., 2009; Argyris and Schön, 1996) and reframing (Pisapia, et al., 2009; Bolman and Deal, 1994).* The research scale has gone through three iterations, since 2005, to be strengthen and take the form of a credible and functional tool to measure strategic thinking capability (i.e. the STQ has been used on more than 3000 cases). Later on, the STQv1 44 items scale was established, to study 136 for-profit and non-profit leaders effectiveness (Pisapia, et al., 2006). The STQv2 (48 items) was created, with focused measures to overcome the potential bias of self-reported data to enforce convergent validity. In 2008, the STQv2 was validated

through conducting a multi-country study on graduate students preparing for management positions. The experts finally came up with the establishment of the STQv3 (53 items) through an extensive review of research results and critiques from earlier versions of the tool. The above is self-explanatory to explain the credibility and the worth of the theoretical framework established by theorists in the field (Pisapia, Reyes-Guerra and Coukos, 2005; Yasin 2006) by combining and further refining the earlier work in the field (Dewey, 1933, 1999; Simon, 1957; Argyris andSchön, 1978; Senge, 1990; Mintzberg 1994).

Based upon the above conceptual themes, the current study´s theoretical approach is embedded partially in three factors (i.e. system thinking, reflecting, and reframing) and therefore included (Pisapia et.al. 2006), modified (Pisapia et.al. 2006; 2009; 2011) or formulated 12 question items, keeping in view the current research study needs.

ii.   Transformational leadership, the model introduced by Bass and Avolio (1992) was followed wherein the concept of leadership type is measured through seven factors i.e. idealized influence, inspirational motivation, intellectual stimulation, individualized consideration, contingent reward, management -by-exception and laissez-faire leadership. However, we have adopted only four factors in our study which are idealized influence, inspirational motivation and intellectual stimulation in order to judge the level of transformational leadership. We have excluded contingent rewards and management -by-exception as the factors associated with transactional leadership while laissez-faire leadership is the term referring no or the absence of leadership. In addition, the concepts of new product development teams and transformational leadership linkage were selected on the basis of theory presented by Sun, Xu, and Shang (2012). The above study evaluated the influence of team transformational leadership on an NPD team´s performance in addition to the mediating role of team climate during the new product development process. The results, based upon the data collected from184 Chinese high-tech firms´ NPD projects confirmed positive linkage between NPD team´s transformational leadership to the team performance. The study further confirmed that NPD team climate positively facilitates most of the transformational leadership dimensions namely; charisma, inspirational motivation, intellectual stimulation, individualized consideration) and team performance.

iii.   To judge 'pseudo- transformational leadership (i.e. the unethical facet of transformational leadership) a model has been developed by Barling, et al., (2008). According to the model, low idealized Influence and high inspirational motivation is seen as the central point to define 'pseudo-transformational leadership in contrast to the conceptual model of transformational leadership where highly idealized influence and high inspirational motivation are considered the highlights to ensure ethical leadership. The said theoretical model is validated by Barling, Christie and Turner (2008) on the basis of an extensive research survey conducted on 611 senior managers. The result of their extensive study on pseudo-transformational leadership revealed different effects of transformational, pseudo-transformational, and laissez-faire leadership. The findings of the theorists opened future avenues to explore, investigated or extend the model.

2.6.1   Study variables

This research work, through empirical investigation on this subject (i.e., existing theoretical frame works), brings out features that affect the operation of organizations´ initiatives in coming up with innovative products and services through multitasked NPD teams, in the forms of hindrances, possible support actions (i.e. to neutralize the referred hindrances) and the final outcomes or goals of the whole process of the case study.

Keeping in view the referred study features, the author has selected study variables from the selected existing theoretical models (i.e., Transformational leadership, strategic thinking and associated studies) to formulate hypotheses. The investigation proposed a framework for the current study, through descriptive statistical analysis of variables and testing of study hypotheses. The subject framework has main constructs; from the selected theories and studies discussed in detail at section 2.6 above. Below is table 3, with a detailed list of variables along with respective theoretical frameworks;

Table 3.   The study variables along with their theoretical bases

Theoretical origin	Variables
NPD idea support	Early client involvement
NPD idea support,	Management initiatives
Transform-leadership(IM)	Supportive leadership
NPD idea support	Market intelligence,
Transform-leadership(IS)	Leaders' competence,
Strategic thinking,	Work situation
Strategic thinking	Investigative approach
Pseudo transformational leadership(PTL)	Dark leadership
NPD idea support	Customer value
TL (IINF.)	Association with leader
NPD idea support	Team initiative
NPD team climate	Responsiveness
Strategic thinking	Situational referencing
Strategic thinking, NPD Idea support,	Situation handling
team climate	Communication
Transform-Leadership (IC)	Employee empowerment
NPD idea support	Target reach
Transform-leadership (II)	Trust,
NPD Team climate	Collaboration
NPD Team climate	Idea generation
NPD idea support	Product innovation
Strategic thinking	Problem solving

2.6.2 What is the relevance?

The relevance between the research techniques and the subject study goals were to evaluate the new product development practices and if possible, suggest steps for alignment and refinement of the company´s current new product development practices on the concepts of strategic thinking and transformational leadership, free from the pseudo effect. We required recognized frameworks or theoretical models as foundations for our research work which were already discussed in 1.6 above. These proposed variables will play a helpful role as groundwork to develop a logical evaluation instrument for our study. For acquiring an understanding of the selected theoretical models and their application, more than 76 research articles from well reputed journals were

collected. The research material was collected, keeping in view its relevance to support the evaluation of strategic thinking and transformational leadership to evaluate and suggest refinement in the new product development practices of the target company. From these 76 articles, 11 were found in a similar research context to our subject project. The similarities between the selected empirical studies and our project's goals were as below;

    i.   All the selected literature evaluated the success of the relationship between/among the indicated/ selected variables.

    ii.   Empirical research is used to collect quantitative results.

    iii.   Survey methodology is implemented with questionnaires and interviews (i.e. established on the basis of the earlier mentioned variables as survey instruments.

    iv.   Closed ended questionnaires have been used as the data gathering tool.

    v.   The qualitative information (organizational and situational) is collected and displayed through a case study format.

Due to the above mentioned similarities the proposed theoretical framework was found to be quite appropriate.

2.6.3 Study´s base framework and its limitations

The main limitation of the proposed theoretical framework is that in the current case study the author has combined segments of four separate models which is a challenge (i.e. Bass and Avolio ´s (1993) model of transformational leadership, NPD team related theory is followed from the publication of Sun et al. (2012), furthermore, the framework of strategic thinking is taken from the research model of Pisapia, et. al., (2005; 2006; and 2011) and its extended modifications; pseudo transformation leadership is from Barling, Christie and Turner´s (2008) research work, while the seminal work on product development process is adapted from Cooper´s (1990) stage–gate® model). Hence, combining the variety of theoretical frameworks and then combining only the related portions in accordance with the current study´s requirements is a critical task and the author has to cover this limitation present in our own model with caution.

2.6.4 Success evaluation

Evaluation is a central concept in the field of new product development projects; whereby new technologies and concepts are identified by organizations and assessed, and are shaped into processes and systems to serve their needs. These practices are then put in place with an expectation to perform (Klecun and Cornford, 2005).
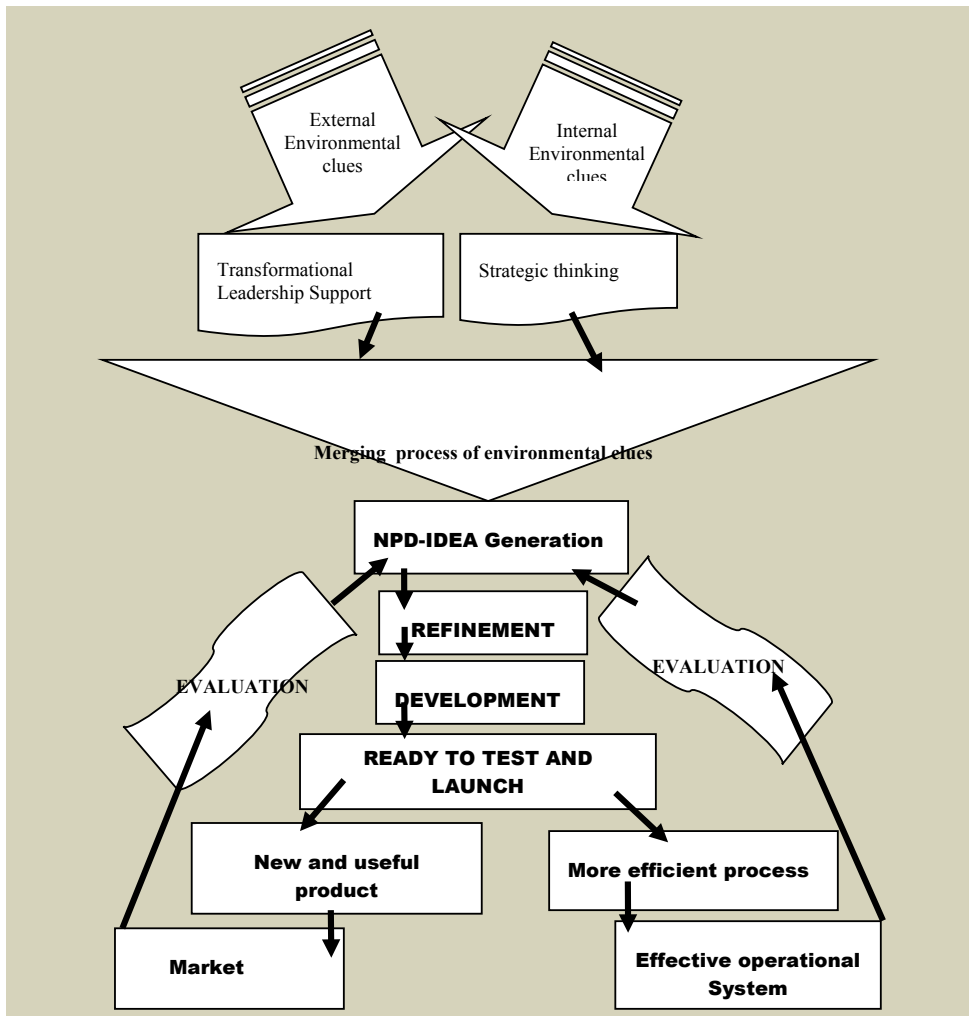
Figure 17. Proposed evaluation process

Figure 17 above reflects in detail the ideal process model to support the proposed theoretical framework extension, presented in the current research study, through especially highlighting the evolution of the new product development (NPD) related idea as well as evaluation cycle. According to the above, the reader can clearly view the relation among various NPD process stages. The process starts by taking the new product development related feeds through internal and

external environment clues. The next stage comes when the clues are merged together to give birth to a new product or process related idea with the support of transformational leadership and strategic thinking factors. Further, this product related idea crosses various stages including formal new product or process related idea formation, the refinement process stage, then the formal development process starts, which later takes the form of either a product which is ready to be tested and launched or a formation of a product development related process. Finally, the new product goes to the market as a new and useful creation, gets evaluated through real time market testing and in return becomes the source of customers' feedback. Such market feedbacks further generate new product related ideas and this cycle goes on and on. On the other hand, if the idea is related to the formation of any new product process, then it goes to the organizational process formulation stage (i.e. through discussions and brainstorming etc.), and if accepted, then it is implemented after the necessary testing as a useful process; consequently it becomes part of the effective operational system. After evaluation, the newly approved process may further work as the source of generating new process related ideas to keep such a thought process cycle alive and running.

2.6.5 Instrument design

As described earlier in this chapter, we base our research on the models of transformational leadership and strategic thinking. The subject research combines the philosophies of strategic thinking and transformational leadership. The framework has five interdependent constructs collected from the selected theoretical framework and associated studies (i.e. transformational leadership, strategic thinking, pseudo transformational leadership and new product development stage gate model) in addition to the field work studies. The method of our examination is a mix of quantitative and qualitative research. In this regard, the instrument to collect quantitative data from the subject company´s selected personnel, as stated previously, has been chosen as an online questionnaire. This online questionnaire development is based on the ten constructs of our research framework. Each construct is sub divided to cover the associated variables and phrased as meaningful questions to gather employee feedback. The author attempted to devise a validated quantitative questionnaire from established research literature therefore the questions reflecting the sub-indicators or the variables, have been taken from the published models and case studies but were modified to meet the subject company's research objectives.

2.6.6 Questionnaire expectations

The questionnaire aims at seeking quantitative results in the form of feedback data. The data gathering strategy kept in mind was to involve the subject company´s selected employees, the operators and beneficiaries of the new product development process, as critics to evaluate the operations of the organization – new product development´s stage gate system through a global teamwork scenario and as consultants to suggest updates that may better assist them with their work tasks, especially focusing on new product development idea generation capacity. The questionnaire comprises four sections. Starting with 'getting to know' the respondent, proceeding with the evaluation of the current new product development work environment and ending with critical areas and suggestions for future refinement of NPD processes for the target company.

The details of the sections are as follows;

Section 1 (Survey questionnaire question numbers 01 to 16 and question numbers 25 to 35) has been designed to collect the respondent´s feedback on organizational new product development (NPD) idea support related practices and trends.

Section 2 (Survey questionnaire question numbers 17 to 24) has been designed to collect the respondent´s feedback on transformational leadership based organizational work leadership practices and trends.

Section 3 (Survey questionnaire question numbers 35 to 46) has been designed to collect the respondent´s feedback on organizational strategic thinking related practices and trends.

Section 4 (Survey questionnaire question numbers 47 to 50) has been designed to collect the respondent´s feedback on organizational pseudo transformational leadership related trends.

2.6.6.1   New product development (NPD) idea support and NPD team climate

In research literature new product development (NPD) idea support refers to the desirable characteristics of team leaders and members who are involved in new product development operations. We have distributed the conceptual inventory items into two separate categories i.e. NPD idea support and NPD team climate

(Sun, Xu, Shang, 2012). In our survey, this concept refers to an organization´s capacity to offer supportive practices to its work teams, involved in new product development operations. The selected indicators seek feedback to reveal organizational practices in relation to new product development idea generation team potential. In total, twenty six questions were designed/ modified while following the strategic thinking characteristic introduced by Sun, Xu, Shang (2012) in their research inventory. Table 1 below shows the details.

Table 4. Survey instrumentation - Section 1

Questions: 01-16 and 25 to 34	*Indicator*	*Reference*
Q1: New products developed at our unit are very different to our existing products.	Product innovativeness capability	
Q2: Our flexible production capability allows us to modify our products faster.	Product innovativeness capability	
Q3: We remain in contact with our key clients during the product development process.	Early client involvement	
Q4: We take advantage of all forms of media to connect with potential stake holders during NPD process.	Early client involvement	
Q5: Management encourages us to develop something novel instead of just a new shape of the product.	Management´s NPD idea initiatives	
Q6: Management constantly looks for options to connect with external stake holders for NPD ideas.	Management´s NPD idea initiatives	
Q7: I feel very comfortable if external stake holders give new ideas for NPD project.	NPD Team initiative aspect	
Q8: We select NDP ideas based on their technical feasibility to design, develop and manufacture.	NPD Team initiative aspect	Bass and Avolio (1990; 1992), Sun , Xu, Shang (2012).
Q9: Our business strategy focuses on aligning NPD process with market needs.	Customer value aspect	
Q10: We focus on all types of customers (i.e. purchasers, influencers and end users) during NPD projects.	Customer value aspect	
Q11: Our success in NPD idea generation is due to our ability to reach potential stake holders.	Target reach aspect	
Q12: There is a good fit between what the market needs and what we provide.	Target reach aspect	
Q13: Our market intelligence strategy combines-customer needs assessment, price sensitivity, supplier capabilities, competitors NPD strategies and geo-political know-how aligned with new product specifications.	Market intelligence aspect	
Q14: NPD teams regularly travel to remain in contact with potential influencers in search of NPD ideas.	Market intelligence aspect	
Q15: Our NPD projects are supported through extensive internal and external communication.	Communication aspect	
Q16: Our teams quickly share, NPD ideas with each other that they have received from outside.	Communication aspect	

Q25: Team members display agreement with the team´s objectives	NPD team climate
Q26: Team members feel understood and accepted	NPD team climate
Q27: Team members keep each other informed	NPD team- internal communication
Q28: Team is capable of making real attempts to share information	NPD team- internal communication
Q29: Team is strong in searching for new ways of looking at product development problems	NPD team- idea generation capacity
Q30: Team is cooperative in developing and applying new ideas in collaboration with key individuals from other departments	NPD team – idea generation capacity
Q31: We, as a work team, are capable of cooperating with other work groups	NPD team collaboration
Q32: In our organization, work performance is considered as an overall and combined phenomenon.	NPD team collaboration
Q33: We, as a work team are able to complete work targets on time.	NPD team responsiveness
Q34: The team´s ability is considered "quick" while responding to problems.	NPD team responsiveness

2.6.6.2   Arrangement of NPD idea support and team climate constructs variables in quantitative survey tool

The **NPD idea support construct** variable consists of sixteen items/questions to obtain respondents' feedback on the quality of work environmental support and the clues for future refinement. The questions are divided into two sets to offer focused and reliable data analysis relating to the construct. Question items 1, 2, 5, 6, 13, 14, 15 and 16 investigate the level of organizational effectiveness in terms of the external environment specific innovation boosters while question numbers 3, 4, 7, 8, 9, 10, 11 and 12 explore the effectiveness of organizational internal environment specific innovation boosters.

Question numbers 25 to 34 are linked to **NPD team climate** construct variable. The detailed plan of both the construct variables i.e. new product development (NPD) idea support and NPD team climate in the quantitative survey tool may be referred to below for better understanding. Below is the sequence of the referred construct items placement in the survey tool.
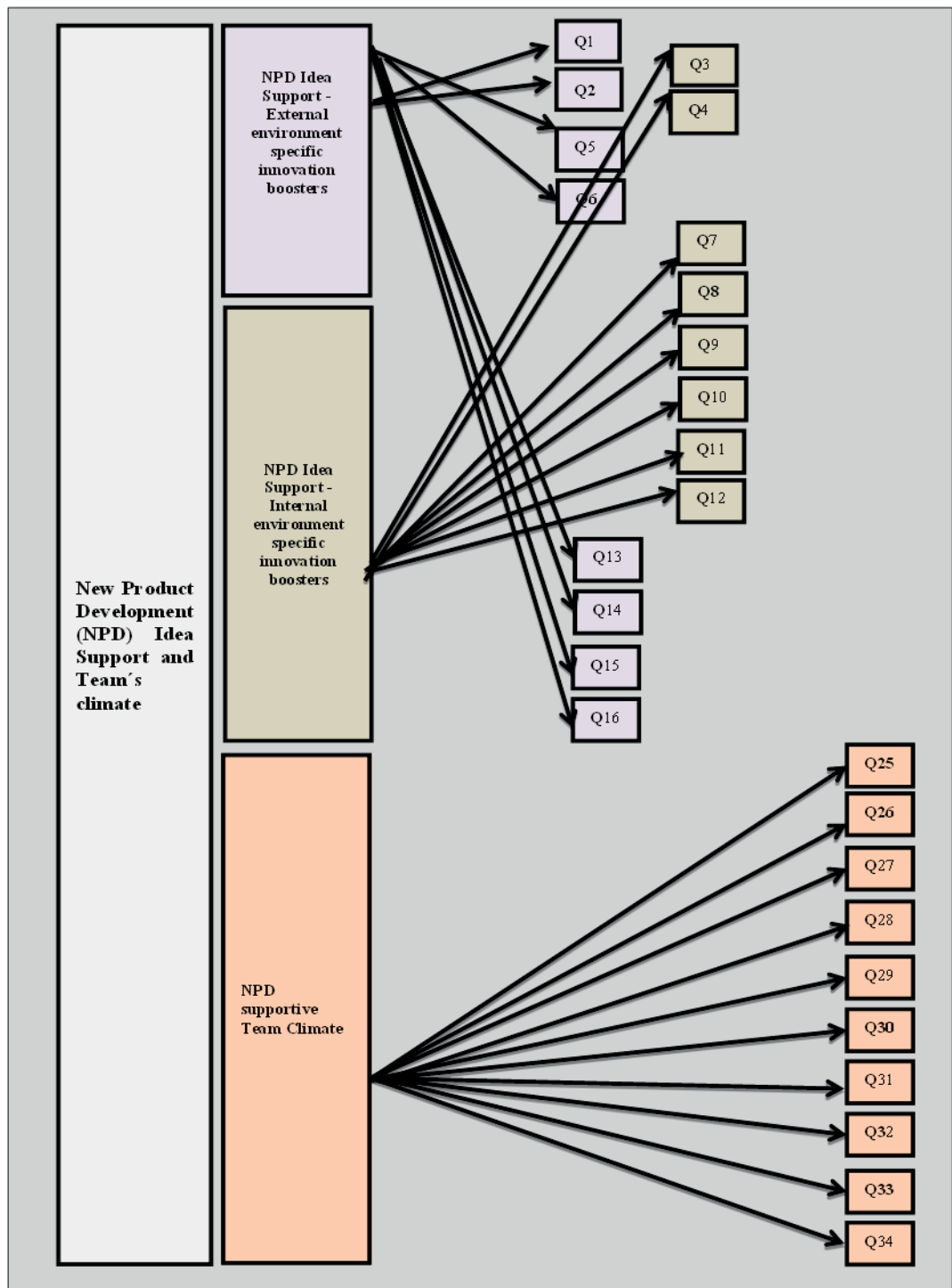
Figure 18. Plan of the survey tool for NPD idea support construct variables

2.6.6.3   Arrangement of transformational leadership construct variables in quantitative survey tool

In the research literature, transformational leadership refers to the desirable characteristics of an organization's leadership support practices. In our survey, this concept refers to an organization's capacity to offer its work teams a supportive leadership (Bass and Avolio, 1992: Zaccaro, 1996) environment to harness new product development idea generation. The selected indicators seek feedback to reveal organizational practices with reference to transformational leadership connected to new product development idea generation team potential. In total, eight questions were designed/ modified while following the transformational leadership characteristic introduced by Bass and Avolio (1992) in their research inventory. The table 5 below shows the details.

Table 5.   Survey instrumentation- Section 2

Questions: 17-24	*Indicator*	*Reference*
Q17: Our experts are trusted to pass on genuine and quality knowledge to their teams.	*TL-Idealized influence*	*Based on the theoretical framework of transformational leadership. (Bass and Avolio 1990; 1992)*
Q18: Team members associate themselves with their seniors for their work skills and expertise.	*TL-Idealized influence*	
Q19: Team leaders are capable of explaining the project work targets and procedures.	*TL-Inspirational motivation*	
Q20: Leaders can help members to find out the important ways to carry out NPD activities.	*TL-Inspirational motivation*	
Q21: Experts challenge their teams to resolve their usual NPD related concerns from new perspectives.	*TL-Intellectual stimulation*	
Q22: Experts are capable of forcing their teams to rethink things that they have never thought of before.	*TL-Intellectual stimulation*	
Q23: Experts are capable of helping their team members to improve their work efficiency.	*TL-Individualized consideration*	
Q24: Experts are capable of providing support to their team members in special situations.	*TL-Individualized. Consideration*	

The construct items listed in table 5 are placed in the survey tool in a sequence displayed in figure 19 that is as follows:
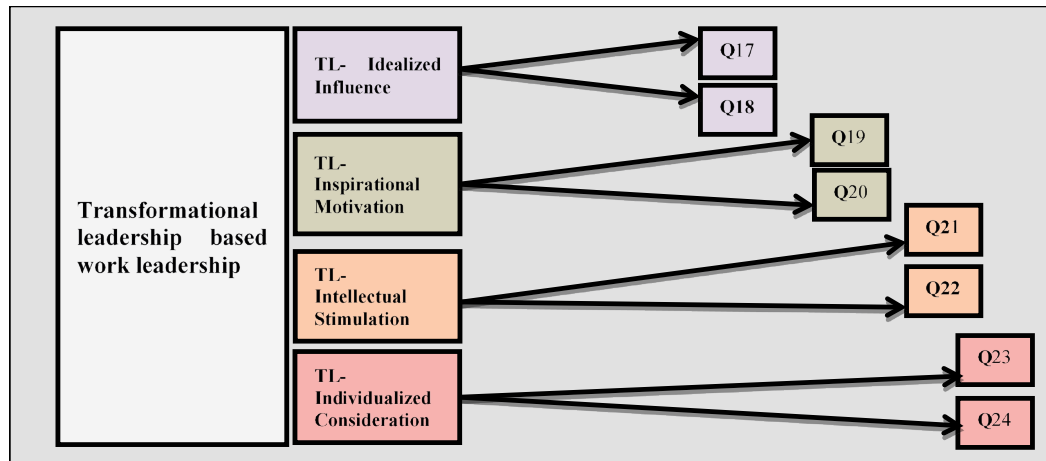
Figure 19. Plan of the survey tool for transformational leadership based work management construct variables

2.6.6.4 Arrangement of strategic thinking construct variable in quantitative survey tool

Corporate leaders or senior executives must master the skills and cognitive capabilities needed to steer successfully within an intricate environment (Zaccaro, 1996). In our survey, this concept refers to an organization´s capacity to offer its work teams a supportive environment for new product development idea generation. The selected indicators seek feedback to reveal organizational practices with relation to strategic thinking connected to new product development idea generation team potential. In total, twelve questions were designed/ modified while following the strategic thinking characteristic introduced by Pisapia, Reyes -Guerra, and Yasin (2006) in their research inventory. The table 6 shows the details:

Table 6.   Survey instrumentation - Section 3

Questions: 35-46	*Indicator*	*Reference*
Q35: I ask myself how the parts of an incomplete Figure connect in a certain situation.	*Reflection -work situation*	
Q36: I think intuitively about what is unique or unusual about a certain problem situation.	*Reflection -work situation*	
Q37: I think about questions I am neglecting to ask.	*Reflection- situation handling*	
Q38: I think about what is important about this challenge.	*Reflection- situation handling*	
Q39: I try to understand how the facts in the situation are related to each other.	*System thinking-investigative approach*	*Pisapia, Reyes - Guerra, and Yasin, (2006; 2011)*
Q40: I look at the "big picture" in the information available before examining the details.	*System thinking-investigative approach*	
Q41: I investigate the cause before taking any action.	*System thinking-problem solving*	
Q42: I seek different perspectives while thinking about NPD ideas.*	*System thinking-problem solving*	
Q43: I try to find a common goal when two or more parties are in conflict.	*System thinking- conflict handling*	
Q44: I engage in discussions with those who hold a different point of view.	*System thinking- conflict handling*	
Q45: I ignore my past experiences when trying to understand situations presented to me.*	*Reframing- situational referencing*	
Q46: I create a plan to solve a problem before considering other viewpoints.	*Reframing- situational referencing*	

The sequence of the referred construct item placement in the survey tool is as follows:
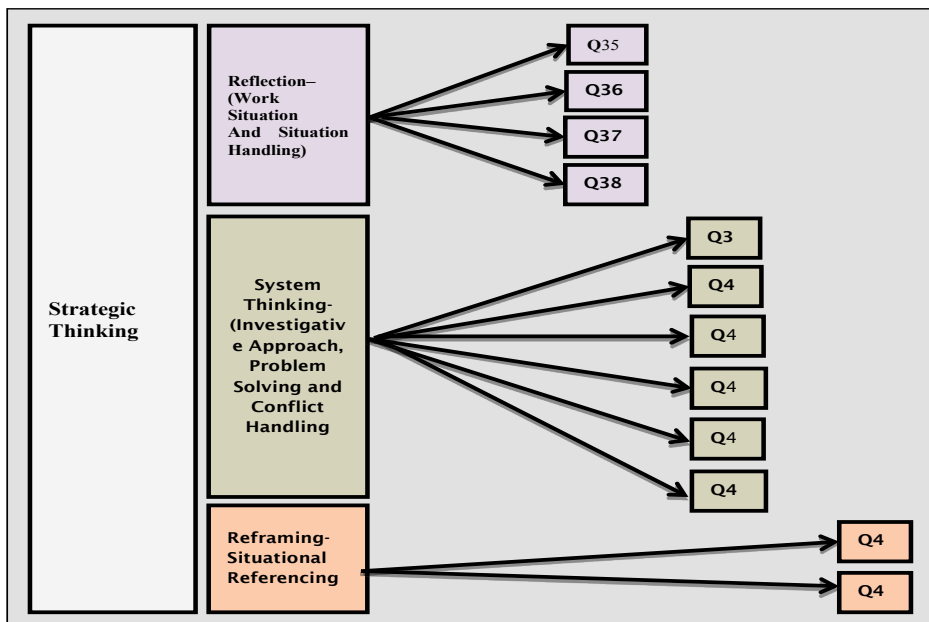
Figure 20. Plan of the survey tool for strategic thinking construct variables

2.6.6.5 Arrangement of pseudo- transformational leadership construct variables in quantitative survey tool

In the research literature, pseudo transformational leadership focuses on identifying the conditions under which users are (or are not) satisfied with the quality and genuineness of the leadership. Transformational leadership is positively linked with subordinates' enhanced trust levels (Conger and Kanungo 1994), while pseudo-transformational leaders use fear as a way to control their employees. Such leaders are highly focused on self-interest supported by their very personal sense of self-confidence, authority, and status by exploiting others (Howell and Avolio, 1993). In our survey, this concept refers to the level of faulty leadership patterns if existent within the work scenarios that can hamper the team´s new and innovative generation capabilities. The selected indicators seek feedback to reveal the grey areas in leadership practices if present within the target organization that can hinder the new product development idea generation team potential. In total, four questions were designed/ modified while following the pseudo-transformational leadership characteristic introduced by Barling, Christie and Turner (2008) in their research inventory. The table below shows the details:

Table 7. Survey instrumentation - Section 4

Questions: 47-50	*Indicator*	*Reference*
Q47: When assigning tasks, I consider people's skills and interests through my judgment.	*Pseudo TL- high inspirational motivation*	
Q48: I expect my kind of work from my team members.	*Pseudo TL- high inspirational motivation*	
Q49: I encourage everyone to work toward the same goal through my way.	*Pseudo TL- low idealized influence*	*Barling, Christie, Turner, (2008)*
Q50: Teams` performance is best when members keep repeating the same tasks for perfection instead of learning new skills.	*Pseudo TL- low idealized influence*	

Below is the sequence of the referred construct items placement in the survey tool:
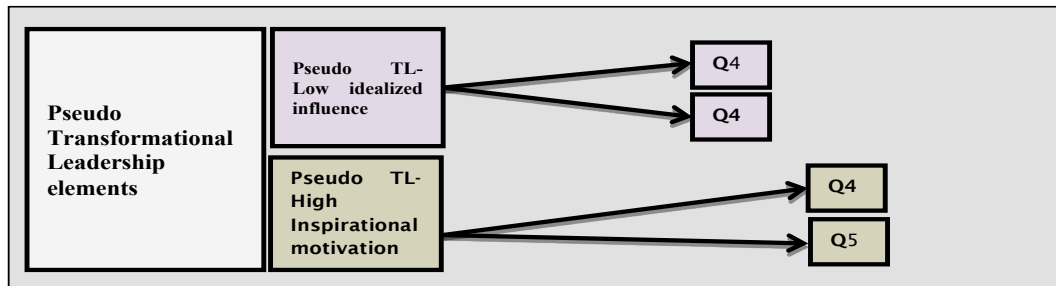
Figure 21. Plan of survey tool for pseudo-transformational leadership construct variables

Summary of Chapter 2 - Literature Review

This chapter provides background support through literature references to develop the readers' understanding of the main research domains (i.e. new product development idea generation through transformation leadership and strategic thinking) in this study. In addition, the chapter is divided into two parts: the first part highlights the theoretical background as discussed above, while the second half presents the empirical logic behind the formulation of the theoretical framework and the study's instrumentation.

3 RESEARCH METHODOLOGY AND DESIGN

To achieve the project objectives, pragmatic examination was selected as the data collection method. In the current research, case study approach helped in understanding the functions of the organization, its new product development (NPD) idea generation related team culture, communication patterns within its internal and external environments and above all the global teamwork represented by its three selected locations, i.e. the UK, Norway and Finland. The subject company has a strong geographical spread across borders in 160 global locations in more than 70 countries. However, the scope of this study takes into account 10 selected professionals each from its three selected international locations, based upon their professional expertise and operational relevance.

A synthesized survey approach (Yin, 2003; Pettigrew, 1990), combining quantitative and qualitative methods, was implemented as an instrument to collect employee assessment, response and feedback, owing to the method´s empirical relevance in enquiring about contemporary phenomenon within a real life context, and specifically in the circumstances when the boundaries between phenomenon and context are not clearly known facts. Furthermore, a focused methodology is a critically significant source of referring to the previously conducted work of other researchers in a similar meta-theoretical perspective to elucidate theoretical and terminological misperception, (Finger and Dixon, 1989; Hollins, 1994; Ullman, 1992). The current section, in detail, defines the framework which was designed to conduct this data collection event. It contains a step-wise line of action, information about the designated methodology, instrumentation, participants and references to support the literature and strengthen understanding about the selected research methodology.

3.1 Initial stage setting

The initial research plan was made keeping in view the following focused objectives.

   i.   Information collection about the subject company in terms of its new product development related current work teams practices, rationale behind the focused business operations, infrastructure and technology to have an overview of provided support and global teamwork situation.

ii.   On the basis of collected information, an effort is made to select critical areas to be empirically investigated to accomplish the project objectives through the current research study.

iii.   The current case study aims to create linkage between critical study areas (i.e. work leadership and strategic thinking) and new product development idea generation team culture.

iv.   The preparation of an online survey inventory from validated literature representing prior case examinations.

3.2   Methodology and design

The practice of coalescing research methods generally and more precisely combining qualitative and quantitative methods is considered resilient. Research designs that have hitherto extensively integrated both fieldwork (i.e. case studies) and survey research are uncommon.

One out of the four extensive issues that Kraemer (1991) recognized from the research publications and case studies presented at a survey colloquium (ISRC 1989) was that survey research, though highly significant, is significantly improved when implemented in conjunction with other qualitative research methods (Gable, 1994; Pettigrew, 1990). Evaluation of the subject company´s new product development culture is carried out by combining quantitative and qualitative research methodologies. The selected quantitative approach is the survey methodology which is performed through an email based questionnaire having 50 items. The qualitative approach, on the other hand, is involved with putting together an organizational case study through in person and email based interview questionnaire. Hence, in this case study the researcher has especially devised 10 open ended or interview questions to collect qualitative data from the study respondents to support the data gathered through the quantitative survey tool.

In behavioral or social sciences, researchers use the term inventory to refer to the questionnaires or the sets of questionnaires they use as their scientific tool(s) for obtaining useful information about either the individuals or populations. The term is even used in the case of gathering information about products as well as the events. However, the use of term 'inventory' is relatively new and in practice since the end of nineteenth century. The beginning of twentieth century introduced modern statistical methods and recent advancement in the field of digital technology (Thomas, 2003; Aiken and Aiken, 1997). This made such

inventories to be considered as indispensable tools in a wide range of fields, including behavioral and social sciences, education, health, and business to support researchers and practitioners (Thomas, 2003; Aiken and Aiken, 1997). In the referred case study, the researcher has often used the term inventory instead of the term 'research questionnaire(s)' as the study involved a set of questionnaires (qualitative and quantitative) and each one is measuring more than one discipline of social scientific fields. The quantitative questionnaire focused on the following study areas, on the basis of 50 closed ended, multiple choice items:

1.   New product development idea support
2.   Work leadership
3.   New product development team climate
4.   Strategic thinking
5.   Pseudo transformational leadership

In addition, the qualitative questionnaire focused on the following study areas, with the help of 10 open ended, interview questions:

1.   New product value
2.   Customer services
3.   New product opportunities
4.   Company's knowledge creation potential
5.   Company's innovative potential
6.   Company´s potential to celebrate new ideas creation process.

3.2.1 Survey (quantitative approach)

The survey approach refers to a combination of individual research techniques which emphasize quantitative analysis, where information for a large number of organizations are collected through methods such as mail questionnaires, telephone interviews, or from published statistics, and this bulk of data is analyzed using statistical techniques. By studying a representative sample of organizations, the survey approach attempts to discover relationships that are conjoint across organizations and hence to offer generalized statements about the object of study (Gable, 1994). A central objective among various critical objectives of this research project is to evaluate the current new product development idea generation specific work practice teamwork among its three selected locations. Therefore, for both of these evaluations, a quantitative

analysis is considered necessary. An in-depth analysis signified by numbers and percentages will present a logical representation of how the new product development practices are viewed by the company´s work teams.

3.2.1.1   Mixed mode surveys

The instrumentation selected for the current project survey is mixed mode in nature. Survey designers choose a mixed-mode approach since such mixing up gives an opportunity to compensate for the weaknesses of each individual mode at affordable cost (de Leeuw, 2005). Mail and face-to face surveys are the traditional recorded data collection methods. Thus, it is not unusual to understand the reason why the earliest forms of mixed-mode designs combine face-to-face interviews with mail surveys. Hence, the current research is in line with the school of thought of Glaser and Strauss (1967) and Pettigrew (1990) who suggest the notion that business and management researchers ought to adopt a pluralistic approach using multiple concepts and methodologies. For example, a case study method may be implemented to establish a grounded theory (Pettigrew, 1990) duly supported through extensive survey to confirm a theoretical conjecture. It is no wonder that mixed-mode surveys are still attracting much interest and have been continuously treated as the central topic in data collection conferences of the Council of American Survey Research Organizations (CASRO) in 2003 and 2004 (de Leeuw, 2005).

The selected mix for this project is an electronic mail based survey. The electronic survey was used for feedback on the organizations new product development practices, whereas interviews involved new product development operations support representatives in sharing knowledge about their support services and practices linked to the new product development idea generation process.

3.2.1.2   Electronic survey

In electronic surveys the computer plays a prominent role in both the delivery of a survey tool (questionnaires) to potential respondents and the collection of survey data from the targeted respondents. (Jansen, Corley and Jansen, 2007) With the internet has come the ability to run surveys to involving a huge number of people at comparatively lower cost in comparison with the expenses involved in fielding paper versions of the same survey to the same population.

Electronic surveys can be sent to large number of population for minor marginal cost with the additional advantage of automated data entry at high speed and at

low cost and with no or marginal errors. The methods of using the Internet as a survey mechanism are electronic mail (e-mail) and the World Wide Web (the Web). With an e-mail, researchers can distribute their survey inventories to the targeted e-mail address as a text message, which the recipient can then read, save, respond to, or throw away, in a rather similar way to paper surveys. Surveys can also be posted on allocated Web spaces and may additionally include text, pictures and forms to be filled in by the respondent (Brawner, et al. 2001).

The electronic survey conducted at the subject company, recorded data through two types of questionnaires. The first being a web based closed ended questionnaire and the second an email interview questionnaire.

3.2.2 Survey Questionnaires

During a survey process, the researcher utilized a questionnaire to collect responses from the respondents to formulate their overall responses to investigate the main research questions. Hence, a questionnaire is a simplified way to collect and combine information from a large number of selected populations within a specified period of time (Foddy, 1993). Hence, the design of a questionnaire is of utmost significance to ensure accurate data is collected so that the results are interpretable and generalized. A bad or weak questionnaire makes the results uninterruptable or worse and lead to erroneous conclusions (Jenn, 2006).

3.2.2.1 Online or web based questionnaire

An online questionnaire uses web based interactive technology to display questions and their answer options. The interactive nature of such electronic forms, gives the respondent the convenience to report feedback with the help of single clicks and text entry (Brawner, et al., 2001). The questionnaire was distributed among the subject company employees and it collected most of the analytical data.

3.2.2.2 Mail vs. email questionnaire

The first formally documented mail survey dates from 1788 when Sir John Sinclair distributed the questionnaire to the ministers of all parishes of the Church of Scotland. Though it took 23 reminders, he successfully achieved a

100% response and documented his findings in 'The Statistical Account of Scotland' (De Leeuw, 2005).

The second phase of the study's research data collection in the field of information system went through an email questionnaire distribution among a group of selected study participants. The research objective mainly involved supported data balancing and filled in for misreporting caused due to technical malfunction.

3.2.3 Questionnaire validation

A quality questionnaire should be valid, reliable, comprehensive, stimulating and succinct. An effective questionnaire should ask what it aims to inquire about, i.e. the question items should be formulated in such a manner that the respondent understands the objective of each of the questions. The reliability of a questionnaire is proved when the same answers are drawn if the same question is posed to the respondent repeatedly during a short span of time. The quality of an interesting questionnaire is that it is more likely to be completed by the respondent and hereafter yields a better response rate. In addition, a succinct questionnaire inquiries about questions that aim to answer only the research objectives. Questions beyond the scope of the research should be excluded (Jenn, 2006).

The online questionnaire used in the current survey project falls in line with the above mentioned definition of a validated questionnaire instrument. Here, its validity, reliability and clarity are based on published literature and it provides questions with comprehensive and relevant phrasing to better understand the project objectives.

3.2.4 Open ended vs. closed questions

Open-ended and close-ended questions vary on several characteristics, especially as regards the role of respondents in answering such questions. Close-ended questions restrict the respondent to a set of given alternatives, while open-ended questions encourage the respondent to express an opinion without being influenced by the external factors (Reja, et al., 2003).

The survey questionnaire was kept as a mix of open ended and closed ended questions to increase the scope of expected feedback from all possible perspectives. The success variables, with the help of their specific indicators,

were evaluated with the closed-ended questions from a quantitative Likert scale. The respondent's suggestions, on the other hand, regarding new product development, customer value, company's knowledge creation and its celebration potentials were gathered through open ended questions.

3.2.5 Likert scale

The question items which involve assessing attitudes or giving opinions, includes a scale with a range of responses, usually preferred as having a yes/no answer options. Likert scale (usually 5-point or 7-point) is a normally used method. Likert-type or frequency scales include fixed choice response formats to measure attitudes or opinions (Burns and Grove, 1997). Such ordinal scales are employed to measure levels of agreement/disagreement.

It provides a measure of strength for a particular attitude or belief. It is possible to calculate mean scores for any given responses to statements i.e. question item scores (Jenn, 2006).

However, while selecting the point scales (i.e. a 5 - point scale over a 7 - point scale) the following are important considerations (Fowler, 2008):

i.   ***The way of administering the survey questionnaire:*** If the questionnaire is administered through some communicational medium (i.e. telephone, internet etc.) then it is advisable to opt for a 5-point scale that has fewer options in one response trend, either negative or positive (e.g. Strongly disagree, disagree and agree or strongly agree) than a 7 point scale (e.g. strongly disagree, disagree, somewhat disagree and agree, strongly agree or somewhat agree) to keep the entire response categories easy to comprehend by the survey respondents. It is noted that survey respondents while dealing with 7-point Likert scale are more susceptible to extreme responding (i.e. picking one or other of the endpoints). It is observed in a few studies (e.g. Weijters et al, 2010) that the respondents on occasion are confused in deciding about the response categories "somewhat disagree or somewhat agree" among the categories "disagree or agree" and "strongly disagree and strongly agree" in case of 7-point Likert scale.

ii. ***The length of the response categories should be meaningful to the respondents:*** To explain the category one may take a hypothetical example of receiving a product, where most likely it does not really matter how many response options are offered to the survey respondents.

Nonetheless, if one is inquisitive about the options the survey respondents feel about offering the referred product in some shopping mall, one may want to know that what the people decide on and what they actually feel about the issue.

Keeping in view the above, in the current survey project, a 5-point Likert scale, with opinion choices of 'strongly disagree', 'disagree', 'neither agree', 'nor disagree', 'agree' and 'strongly agree', has been used in the online questionnaire. Scales 1 and 2 correspond to the respondent's level of disagreement, 3 equals a neutral answer and in the same way 4 and 5 show the respondent's degree of agreement to the posed statement or question.

3.3   Case study (quantitative and qualitative approaches)

Data was collected from a limited number of organizational locations through methods such as participant-observation, in-depth interviews, and longitudinal studies. The case study approach is to understand the research areas being investigated. Case study is defined as a research strategy that supports the researchers to understand the dynamics present within a single setting (Eisenhardt, 1989). However, irrespective of the purposes of the case study research, the researchers must follow caution to accomplish maximum measurement reliability and theory validity (McCutcheon; Meredith, 1993). It offers the opportunity to ask penetrating questions and to capture the richness of organizational behavior, but the conclusions drawn may be specific to the particular organizations studied and may not be generalized (Gable, 1994).

As stated earlier, this project implies both quantitative and qualitative approaches to meet its objectives critically thus, although case studies differ fundamentally from surveys (and from laboratory experiments, field experiments and field studies) wherein the researcher generally has less presumptive knowledge or control of what the variables of interest will be and how they will be measured (Gable, 1994). A case study has also been recorded to describe the subject company new product development team culture from its organizational practical work practices, human resource interactive capability and the technology perspective. The case study approach helped in understanding the functions of the organization, its new product development (NPD) idea generation related team culture, communication patterns within its internal and external environments and above all the global teamwork represented by its three selected locations, i.e. the UK, Norway and Finland.

An empirical inquiry about a contemporary phenomenon (e.g. a "case"), set within its real-world context especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2009).

A case study can either involve a single case or multiple cases (i.e. extended case study) and labeled as according to its nature (Bromley, 1986; Buraway, 1991). In addition, in both cases one can select the scope of the case study from two possibilities i.e. holistic or one with embedded sub-cases.
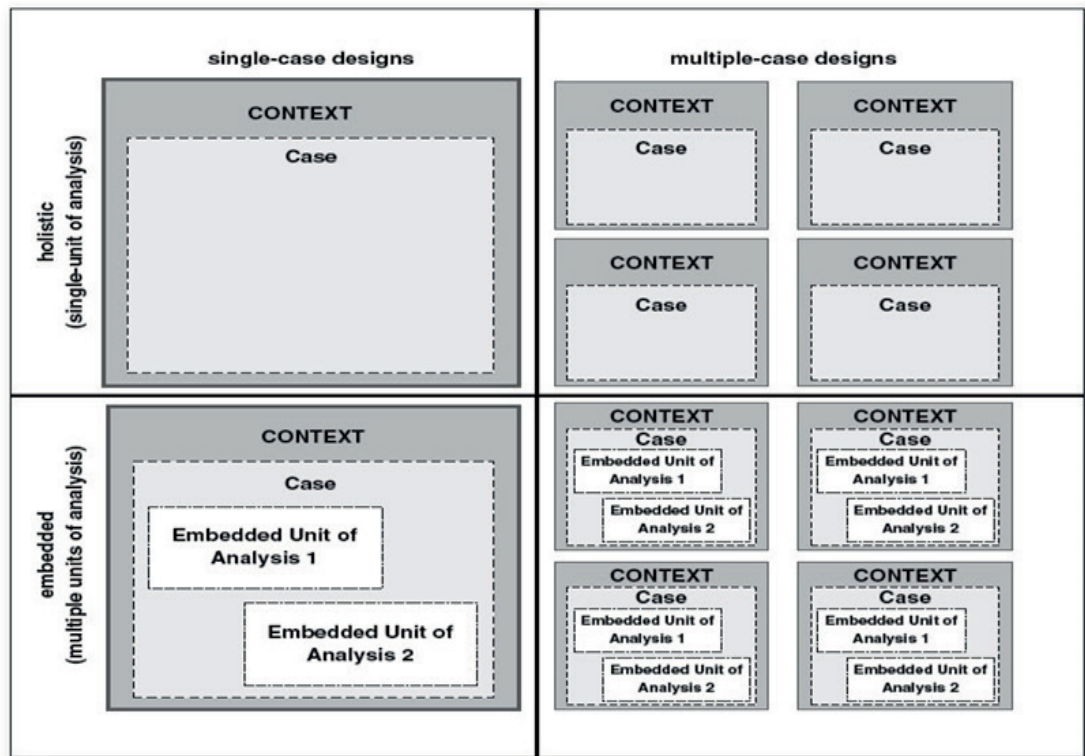
Figure 22. Types of case study designs. Source: Yin, 2014. Cosmos Corporation.

There ought to be at least one out of three preconditions to justify taking the option of case study as the research method, i.e. 1- *Nature of research question to be addressed in the research* (Shavelson and Towne, 2002); 2- *While emphasizing the study of a phenomenon within its real-world context* (Bromley, 1986); 3- *While conducting evaluation* (Yin, 1992).

3.3.1   Interview

In the history of modern research, the first formal scientific face-to-face survey took place in 1912, when a renowned researcher, Sir Arthur Bowley initiated a comparative study of working-class conditions in five British cities. In the

research, the samples of citizens were interviewed using a structured interview schedule. The interviewer modes produced more socially desirable answers and less consistent answers, though more detailed responses to open ended questions (de Leeuw, 2005).

The case study of this project has been recorded, observed and understood through open-ended questionnaire based interviews with selected managers from the subject company and with operations-related representatives of new product development. All the interview questionnaire based data was extremely helpful in understanding the team's strategic capacity regarding new product development idea generation, its distribution of workforce and especially the interactive patterns between internal and external environments. The study achieved 100% response rate and suggestions offered by the respondents.

3.3.2 Selection of site and participants

The subject company has a strong geographical spread across borders in 160 global locations in more than 70 countries. However, the scope of this study takes into account 10 selected professionals each from its three international locations: Finland, the UK, and Norway on the basis of their professional expertise and operational relevance. The questionnaire was sent to the three selected locations in order to evaluate the new product development work culture with reference to the concepts of transformational leadership and strategic thinking from all possible perspectives. The selected study respondents represented the new product development operational support areas. It was a deliberate action as about 100% of the evaluation criteria depended upon the core operational systems under investigation in the current study at the selected subject company offices. To keep the balance, the study respondents, as mentioned above, were interviewed about understanding their work role, their service orientation toward employees and gaining knowledge about the new product development practices being followed at the target locations for work assistance.

3.3.3 Questionnaire format

The final 'touch-up' of the questionnaire is important because the 'look' of the questionnaire may decide whether the respondent is going to complete it. This is especially relevant for postal surveys. The title should be highlighted and it should reflect the main objective of the research. If possible, the questionnaire should be divided into sections according to the content (e.g. boxes with bold headings) and it should flow smoothly from one section to another with

appropriate filtering. If the respondents are older persons, bigger font size should be used. Finally, a covering letter should be sent stating the objective of the study, the researcher's affiliations, and, if appropriate, assuring confidentiality and how the information collected will be used (Jenn, 2006).

3.3.4 Instrument development

After the selection of relevant questions based on the amended evaluation framework, an online questionnaire was created. Internet support was utilized mainly to email, distribute and collect online questionnaires. Along with survey creation and response collection, it offers time management, greater geographical outreach and efficient communication speed.

The survey questionnaire, according to the formatting suggestions made in the research literature above, was divided into five sections according to the project objectives. The titles were highlighted, descriptive text was included where needed and text formatting and colors were given special attention for reading assistance. Finally, a covering message was included at the start of the questionnaire, which included a brief description of the project for the respondent's information.

Summary of Chapter 3 - Research methodology and design

This chapter presented in detail the research methodology, design and its approach in addition to the survey instrumentation in the light of theoretical support.

4   DATA COLLECTION

In this study the required data was collected through quantitative and qualitative methods in three rounds in total. At first, informal interviews (qualitative method) were held with the subject company's management representative to grasp an idea about the operations of the organization, its workforce and technology support infrastructure. After receiving firsthand knowledge about the company´s new product development practices especially focusing on strategic as well as the work leadership approach in the global teamwork scenario, two rounds of data collection were made through an online survey questionnaire (quantitative method). The purpose behind this effort was to record employee feedback and suggestions targeting the research areas, evaluation and upgrade. The wrapping up of the project, analysis and report, is done in a case study style (qualitative method), joining all the collected facts together to produce this project report.

This chapter, in detail, describes the data collection carried out to meet our project objectives. It includes a stepwise instrument implementation strategy, its follow up, deactivation and initial examination of the collected data.

4.1   Interview events (qualitative data collection)

One informal (by telephone) and one formal interview took place with a senior executive and project initiator and representative from the subject company side. In those two sessions he introduced in detail the company's practices, its project perspective and the identification of the desired outcomes of the research.

Further, all the 30 selected study recipients participated in the interview process by providing their feedback on our 10 item questionnaire to facilitate qualitative data collection.

4.2 Survey   implementation   (commencement   and closure)

The research team was in contact with the subject company management from June 2013 to decide the objectives, scope and organization of the survey project. After the collection of necessary information about the organization and its new product development idea generation team culture, the project commencement

was announced to all the selected study participants on 27th of October, 2013 by one of the senior executives and the initiators of the research project. The targeted duration of all the rounds of response gathering was a period of one month. However, the total expected duration of the project until the final report submission was of one year, i.e. August 2013 – August 2014.

4.2.1   Pilot testing of the survey inventory

The pilot test is a crucial step in the design of questionnaire before data collection begins. It helps to detect flaws in the questionnaire in terms of content, grammar and format. First, you have your colleagues, family or friends comment on the questionnaire. This picks up any mistakes in terms of content, grammar and format. This should be followed by asking the potential respondents to answer the questionnaire and provide their feedback (Jenn, 2006). It is important to reduce the chance of incomplete questionnaires when we design and test our instruments. A very strong justification for pilot surveys is that misleading questions and/or poor instructions may be detected before the main survey takes place (Kitchenham and Pfleeger, 2003).

An online questionnaire was developed, in September 2013, with the help of the interview(s) with the subject company´s senior executive and the academic project supervisor at the University of Vaasa. Three rounds of questionnaire content analysis were run during a period of two weeks in August-September 2013: two at the University of Vaasa and once analyzed by the representative (i.e. senior executive) of the subject company. The initial and later survey tool check reported minor content modifications and logical rearrangements of questions.

4.2.2   Questionnaire modification and finalization

The suggestions for change were taken up and the questionnaire was modified accordingly. During the mid-October 2013, both the project supervisor from the Industrial Management, Production department, at Vaasa University, Finland and the subject company´s chief representative confirmed their satisfaction with the survey questionnaires in terms of question phrasing, logic, look, feel and relevance with the project goals. With some final touch ups, the online questionnaire was ready to be sent to the respondents. Finally, during the first week of November, 2013, the modified survey tools were sent to the targeted survey respondents after getting final endorsements from the test faculty and client's senior representative.

4.2.3   Survey invitation

The survey invitation was distributed among the targeted study respondents on 24 October 2013, by one of the subject company´s senior executive and the initiator of the research project. With this, the final version of the survey questionnaires (i.e. a closed ended questionnaire, with 50 items for quantitative data analysis and an open ended interview questionnaire, with 10 items for qualitative data analysis) validated, checked, modified and approved by the university´s representative as well as the subject company project supervisors, was distributed to the selected recipients for response collection on 7 November, 2013. The distribution of the survey tools was made with the help of an invitation email to the 30 selected study participants representing company´s three selected geographical locations (Finland, the UK and Norway).

4.2.4   Credibility establishment

A total of 30 selected employees represented the subject company´s new product development operations at three of its subsidiaries spread across the globe. The invitation email was sent to all 30 recipients by the company´s senior executive and initiator of the project. This was a deliberate action since our evaluation project focuses mainly on the targeted new product development processes which are expected to give insight into the current target operational environment, highlight possible gaps and offer insights into the need for further refinement of the related processes. Therefore, in order to avoid any feedback bias, subject company personnel who were connected to the traditional NPD policy formulation in any manner, (i.e. from decision making to implementation) were not included in this survey.

4.2.5   Survey duration

The duration of the survey was targeted at two weeks, but was later extended for two weeks for the participants' convenience. In total, the event remained active for 24 days.

4.2.6   Reminders and follow up

The survey invitation was followed by the formal distribution by the project researcher of a set of survey questionnaires on 7 November 2013: 1) a closed ended questionnaire with 50 items for quantitative data analysis and 2) an

interview questionnaire with 10 open ended questions. The first round of survey feedback submission was valid for two weeks for the survey recipients. During this round, a `reminder` was issued to the survey participants on 19 November 2013, to encourage maximum participation. By the deadline of the first survey feedback submission round on 22 November 2013, only 50% of the participation was achieved.

Hence, on the basis of consultations between the project representatives from the University of Vaasa, Finland and the subject company, it was decided to run a second round of survey feedback submission with a time extension until the 30 of November, 2013. Accordingly, the second round was forwarded to all the selected survey recipients who had yet not participated in the survey. The second round of feedback collection included first a 'Gentle' reminder on 26 November 2013, followed by a second reminder on 27 November, 2013 and a third reminder on 29 November 2013 to all those who had yet not responded in the survey. On sending reminder emails, it was kept under special consideration that reminders should not be sent to participants who had already submitted feedback. In addition, a ***thank you email*** was sent to everyone to acknowledge receipt of their feedback. *The above arrangement made it possible to achieve a collection rate of 100% survey feedback.*

4.2.7 Survey deactivation

The survey was deactivated after twenty four days at 17:00 on 30 November, 2013.

4.2.8 Email survey - first round of data collection

The first round of survey feedback collection started on 7 November 2013. It formally ended on 22 November 2013, at midnight (i.e. at all selected global locations: Finland, the UK and Norway). During the two weeks session only one reminder was issued to non- respondents on 18 November 2013. At the end of the survey feedback session only 50% of the targeted participants had managed to submit their feedback.

4.2.9 Email Survey - second round of data collection

To achieve higher rate of feedback collection, it was mutually decided by the University of Vaasa (UoV), Finland and the subject company to extend the survey feedback collection period till 30 November 2013. Therefore, a second round of email questionnaires was sent on 25 November 2013 to the remaining 15 survey respondents. This email included the set of questionnaires once again. The email was followed by a polite reminder on 26 November 2013 and two follow-up reminders on 27 November 2013 and 29 November 2013. This session was declared closed on 30 November 2013, at 1700 hours (i.e. at all the targeted locations). As the result of the second round and with maximum support from the company´s representative, the author managed 100% survey participation. The report writing and data analysis began on 02 December 2013.

4.3 Limitations

One of the respondents included in the initial list was replaced at his own request. According to his statement, he felt that his work experience is not related to the field of research so he was unable to offer feedback.

4.4 Ethical considerations

The research team was obligated, through a confidentiality agreement dated 24 October, 2013, to maintain the secrecy of the subject evaluation survey. According to this assurance, the research personnel possess no right to disclose any details obtained during this research task to any third parties. The collected information is restricted to remain only for academic research purposes and under the authority and supervision of the University of Vaasa (UoV) and the subject company only. It has been made clear and understood by the parties, UoV and the subject company, that no individual answer can be recognized and connected to any single person so as to protect the respondent's ethical and moral privacy rights.

The initial email message by the representative of the target company in the research initiative included information about the above mentioned confidentiality agreement to ensure survey credibility on ethical grounds.

Summary of Chapter 4 - Data collection

This chapter presented the stage by stage process of the case study. It shared first-hand knowledge on the survey instrument implementation of the selected study sample. In addition, this section shared the study's limitations and ethical considerations to highlight a balanced approach.

5   DATA ANALYSIS

The evaluation survey collected data through quantitative and qualitative approaches in two formats to answer the five central study questions. As mentioned in the introductory chapters, the five central research questions of the study are follows:

> **Research Question 1:** *How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?*
>
> **Research Question 2:** *How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?*
>
> **Research Question 3:** *How adaptive is this organization in designing supportive new product development processes?*
>
> **Research Question 4:** *How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?*
>
> **Research Question 5:** *What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?*

The closed ended questionnaire with 50 items covered the following four subject areas:

i.   New product development practices - in two sections; NPD idea support - question items from 1 to 16, and, NPD team climate – from question items 25 to 34;

ii.   Work leadership based on transformational leadership - question items 17 to 24,

iii.   Strategic thinking – question items 35 to 46 and

iv.   Pseudo–transformational leadership –question items 47 to 50.

The question items for the above four categories were especially devised for quantitative feedback analysis.

The sequence and linkage between the research questions and the qualitative survey tool items (i.e. closed ended question items) are as follows;

Table 8. Linkage between study's research questions and the quantitative/ closed ended question items

Research Questions:	Closed ended/ quantitative question items
1: How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?	Question items 17 to 24 and 47 to 50.
2: How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?	Question items 35 and 46
3: How adaptive is this organization in designing supportive new product development processes?	Question items; 1 to 16 and 25 to 34.
4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?	Question items 1 to 50
5: What is the empirical significance of the fusion of the selected constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?	Question items 1 to 50

In addition, the interview questionnaire comprising 10 questions was administered to selected subject company personnel to collect information regarding the NPD operations of the organization and assess the feedback qualitatively. The analysis of interview based assessment of the study will be discussed in the next section.

5.1 Analysis stages

The collected employee feedback was analyzed in following four ways to maximize possible recommendations for an effective system upgrade.

Analysis 1 – Construct/item orientation

Analysis 2 – Work operation orientation

Analysis 3 – Location orientation

Analysis 4 – Additional findings, if any observed

5.2   Analysis 1 – Construct/item orientation

In this section, an analysis of employee feedback is presented. The analysis for each construct variable and its associated items will be discussed separately satisfying the following evaluation steps.

Step 1: Reliability check

Cronbach's alpha internal consistency indicator was applied to assess the reliability of the construct variables included in the survey tool (Parry and Thomson, 2002; Cronbach, 1951; George, and Mallery, 2003). `Acceptable` reliability is indicated if the Cronbach Alpha is greater than .6 to .07 while the reliability is considered `good` if the Alpha values of the items are greater than .07 or .08 (Cronbach, 1951; George and Mallery, 2003; Kline, 2000; Brown, and Jayakody, 2008). In addition, special caution was observed to keep the construct item length in the survey tool within a moderate range to avoid artificial inflation or deflation of the Alpha value (Cortina, 1993).

Step 2: General overview

The overview table for each construct variable includes the number of responses for each item along with the resulting mean, median, confidence interval and standard deviation.

Step 3: Mean view

The mean view graph and table demonstrate mean results, on a scale of 1 to 5, for each item to base further analysis upon.

Step 4: Cross examination

Items indicating mean scores below the level of 3.5 on a scale of 1 to 5 were cross examined to identify the exact working groups, work locations, or work roles facing the process weaknesses.

5.2.1 Analysis scale

As discussed in previous chapters, our research questionnaire requested employee feedback on a 5-point Likert scale. The opinion categories to choose from were *strongly disagree, disagree, no opinion, agree* and *strongly agree* representing quantitative scales from 1 to 5 accordingly.

To suggest a valuable upgrade for the subject company's new product development idea generation work practices, we have set a slightly higher scale of success evaluation. Usually the neutral level of 3 on a scale of 1 to 5 is considered satisfactory in marking the level of success between a disagreement and an agreement. However in this analysis, a mean score of 3.5 and above, on a scale of 1 to 5, are considered satisfactory in terms of the independent construct variable or its sub-indicators.

The stage of no opinion, being in the exact middle of the performance scale, can reflect a feedback inclination both toward a disagreement, or an agreement therefore; a slightly higher standard in the positive direction is anticipated to rule out any such feedback ambiguities. The suggested scale upon which the upcoming analysis will be based is shown in the Figure below.
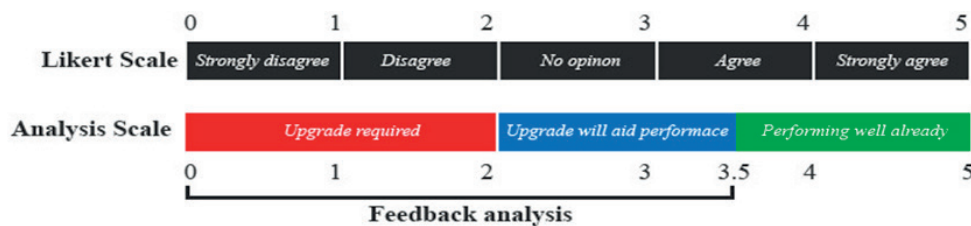
Figure 23. Response scale for quantitative item scoring

Cross comparisons are used for comparing the results of different respondent groups (i.e. work groups, location orientation or work role orientation). In order to produce valuable suggestions relating to the new product innovative idea generation potential by incorporating the elements of transformational leadership and strategic thinking are incorporated into an in-depth comparative analysis performed on all construct items scoring averages less than 3.5 (i.e. covering the response categories of strongly disagree, disagree and no opinion). However, this is the reverse in the case of the last four question items of the closed ended questionnaire for quantitative data analysis (i.e. question numbers 47 to 50) to measure the 'pseudo- transformational leadership) construct. The comparative result tables present different row colors to present the statistical significance of the analyzed data. The statistically significant variances among the respondent groups are displayed in either red ($p < 0.01$) or green ($p < 0.05$) cell

colors. Blue cell color is shown when the difference between the respondent groups is not statistically significant (p>=0.05).

5.2.2 Limitations

In situations where the items to be analyzed are odd in number, the remainder item is analyzed independently and not as a group. In addition, there is an operational category (i.e. general management) in our analysis section wherein the participants belong to diverse work areas which are not directly covered under any specified department affiliated to new product development operations. However, their inclusion and feedback is valuable on account of their being in new product development operations related policy making roles. Therefore, we have formulated a separate category of general management due to have their new product development and company leadership and strategic thinking related working practices.

5.2.3 Results

The study targeted in total 30 survey recipients from three international work locations, i.e. 10 participants from each selected location; Finland, the UK and Norway. The participants are further grouped in five categories in accordance with their affiliation with the work roles or categories.

Figure 24. Survey locations and survey recipients- work role orientation

The three selected study locations reflected 33.33% participation each on account of the 100 % survey participation rate. Keeping in view the research areas (i.e. work leadership and, strategic thinking linked with new product development operations refinement) the rate of work category/ role involvement in the study was planned accordingly. In the sample cluster, 23.33 % participation was from general management and technical engineering to collect the company´s expert level knowhow on leadership, strategy and new product development related

cultural dimensions as well as the pattern of related policy formation. In addition, 20% of sample was from the design and product development and sales related work categories which were the central study fields. Lastly, 13.33 % involvement was from the project management and research and development work roles, due to these being the core of the new product idea generation process.

The first section of the study´s closed ended survey questionnaire for quantitative data analysis is focused on aspects of new product development idea support and team climate in relation to the target company´s three surveyed locations. The evaluation is done on the basis of all 30 responses, since the study survey achieved a 100% response rate. The result analysis of this category is conducted through the respondent´s feedback obtained through the questions covering the organization´s new product development operations related work practices (i.e. NPD idea support and NPD team climate).

5.2.4 NPD idea support and research questions

Research question 1- How adaptive is this organization in designing supportive new product development processes?

And partially;

Research question 4- How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

The NPD idea support construct variable consisted of sixteen items/questions to gather respondents' feedback about the quality of work environmental support and clues for future refinement. Sixteen questions included in this section cover the analysis on the subject of NPD idea support from two dimensions. Question items 1, 2, 5, 6, 13, 14, 15 and 16 investigate the level of organizational effectiveness in terms of the external environment specific innovation boosters while question numbers 3, 4, 7, 8, 9, 10, 11 and 12 explore the effectiveness of organizational internal environment specific innovation boosters.

5.2.4.1   Reliability check for NPD idea support

In case of NPD idea support construct, Cronbach alpha was calculated as 0.78 and 0.80 for the partial constructs of 'external environmental specific innovation

boosters' and `internal environmental specific innovation boosters` respectively, representing `good` internal item consistency to anticipate (Cronbach, 1951) the overall construct reliability. The current estimated alpha values detailed below present the internal consistency for each item:

1-   Cronbach Alpha and related statistics for construct items: NPD idea support - external environment specific innovation boosters

Table 9.   Cronbach Alpha and related statistics - NPD idea support external environment innovation boosters

Items	Cronbach Alpha	Std. Alpha	G6(smc)	Average R
All items	0.78	0.782	0.8045	0.3096
Q1 excluded	0.7356	0.7511	0.762	0.3012
Q2 excluded	0.7622	0.7726	0.7903	0.3268
Q5 excluded	0.7898	0.7962	0.7989	0.3582
Q6 excluded	0.7413	0.748	0.7696	0.2978
Q13 excluded	0.735	0.748	0.7713	0.2977
Q14 excluded	0.7453	0.7579	0.7741	0.3091
Q15 excluded	0.7414	0.7522	0.7622	0.3025
Q16 excluded	0.7252	0.7345	0.7576	0.2832

The table 9 above confirms that all the construct items are reliable and acceptable due to their having `Alpha` values over 0.7. Therefore, all the construct items maintain good internal consistency and must be retained.

2-   Cronbach Alpha and related statistics of the items linked to internal environmental specific innovation boosters` linked to NPD idea support

Table 10.   Cronbach Alpha and related statistics - NPD idea support internal environment innovation boosters

Items	Cronbach Alpha	Std. Alpha	G6(smc)	Average R
All items	0.80	0.7957	0.8318	0.3274
Q3 excluded	0.8158	0.8139	0.8416	0.3846
Q4 excluded	0.7617	0.7577	0.7743	0.3088
Q7 excluded	0.7915	0.7894	0.8197	0.3487
Q8 excluded	0.7562	0.7508	0.7854	0.3009
Q9 excluded	0.7449	0.7427	0.7829	0.292
Q10 excluded	0.7724	0.7671	0.8006	0.32
Q11 excluded	0.7909	0.7879	0.8159	0.3467
Q12 excluded	0.7694	0.7649	0.8068	0.3173

Table 10 above confirms that all the construct items are reliable and acceptable with Cronbach Alpha values over 0.7. Therefore, all the construct items maintain good internal consistency and must be retained. An overview and cross examination of each construct variable evaluating NPD idea support category follows:

5.2.4.2   General overview on NPD idea support construct

A total of 30 responses contributed toward evaluating the quality of the current practices and clues for the gaps. The response mean average for all the seven items representing the construct variable ranged from 2.5 to 4.3 which indicate a mix of user's disagreement and agreement with the posed evaluation queries. Table 11 below shows a quantified statistical overview in detail.

Table 11.   Combined results on NPD idea support dimension

Sr. No.	Variables	Count	Average	Median	Unique	Standard deviation	Confidence Interval at 95%	Highlighted Response trend
1	New products developed at our unit are highly different than our existing products.	30	3.26	3	3	1.04	2.89 - 3.63	Neutral 46% response rate.
2	Our flexible production capability allows us to modify our products faster.	30	2.8	3	2	1.03	2.43 – 3.17	Disagreed with 40%
3	We remain in contact with our key clients during the product development process.	30	3.83	4	4	0.74	3.57 – 4.09	Agreed with 63%
4	We take advantage of all forms of media to connect with potential stake holders during NPD process.	30	2.9	3	3	0.69	2.65 – 3.15	Neutral with 53% response rate.
5	Management encourages us to develop something novel instead of just a new shape of product.	30	3.3	3	4 and 3	0.87	2.99 – 3.16	Neutral and agreed by 36% and 36 % respectively.
6	Management constantly looks for options to connect with external stake holders for NPD ideas.	30	3.2	3	3	0.76	2.93 - 3.47	Neutral with 50% response rate.
7	I feel very comfortable if external stake holders give new ideas for NPD project.	30	3.7	4	4	0.79	3.42 – 3.98	Agreed 50%
8	We select NDP ideas based on their technical feasibility to design develop and manufacture.	30	3.83	4	4	0.79	3.55 – 4.11	Agreed 56%
9	Our business strategy focuses on aligning NPD process with market needs.	30	4.36	4	5	0.66	4.06 – 4.12	Agreed and strongly agreed with 43% and 46% respectively.
10	We focus on all types of customers (i.e. purchasers, influencers and end users) while NPD projects.	30	3.55	3.5	4,3	0.97	3.2 – 3.9	Neutral and Agreed by 33% and 33% each.
11	Our success in NPD idea generation is due to our ability to reach potential stake holders.	30	3.36	3	3	0.76	3.9 – 3.69	Neutral with 50% response rate.
12	There is a good fit between what the market needs and what we provide.	30	4.2	4	4	0.76	3.9 – 3.63	Agreed and strongly agreed with 50% and 36% respectively.
13	Our market intelligence strategy combines- customer's needs assessment, price sensitivity, suppliers capabilities, competitors NPD strategies and geo-political know how aligned with new product specifications.	30	3.5	3.5	4,3	0.9	3.47 – 3.53	Agreed with 40%
14	NPD teams regularly travel to connect with potential influencers in search of NPD Ideas.	30	2.56	2	2	0.81	2.27 – 2.85	Disagreed with 53%
15	Our NPD projects are supported through extensive internal and external communication.	30	3.1	3	3	0.75	2.83 – 3.37	Neutral with 43% response rate.
16	Our teams quickly share with each other, NPD ideas that they receive from outside.	30	3.2	3	4	0.92	2.87 – 3.53	Agreed with 43%.
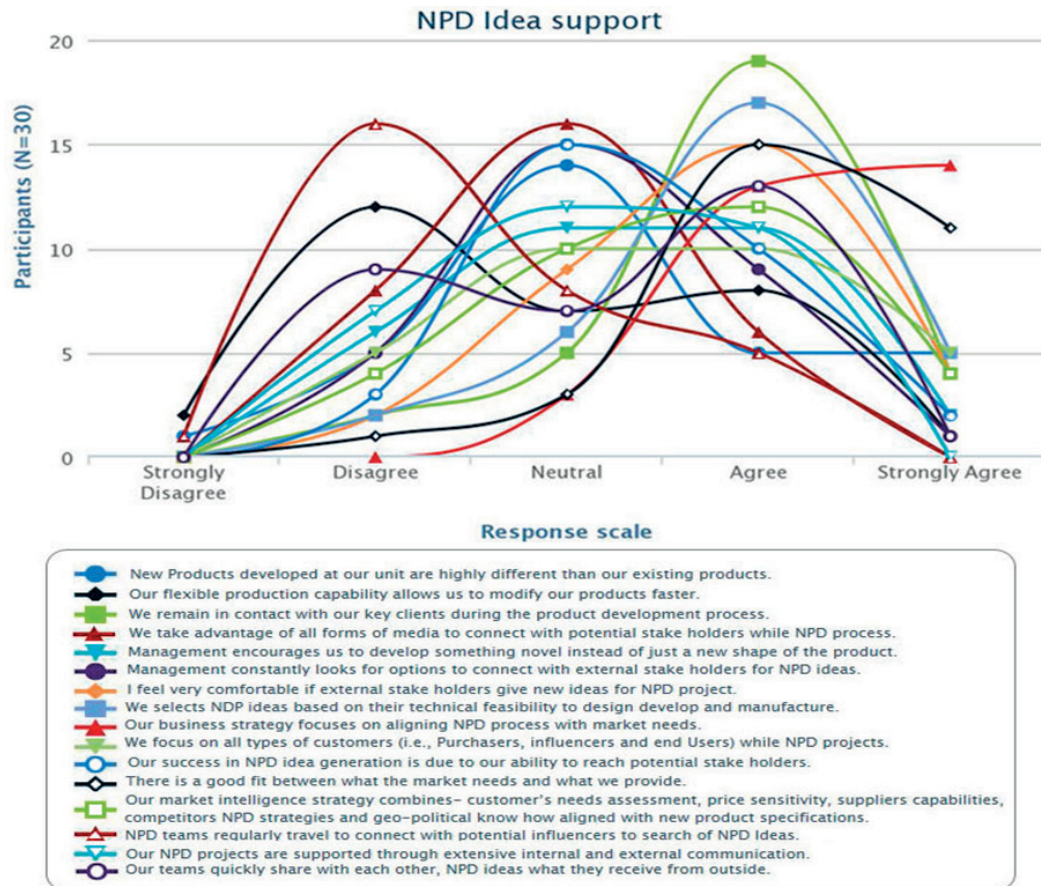
Figure 25. Overall quantitative results on `NPD idea support construct

5.2.4.3   Results analysis for NPD idea support construct

Table 11 and Figure 25 above depict the combined response trend on category-new product development support practices with respect to the new product related `idea support` aspect touched an overall `agreed` opinion level of 4, on a scale of 1 to 5. This trend indicates a highly positive inclination towards NPD idea support practices. In addition, in the case of five items (i.e. items 3,7, 8, 13, and 16) reliability exceeds the satisfactory level of agreement while in two items this is further exceeded as strongly agreed (i.e. 9 and 12). However, the rest of the items reflected a `neutral response trend` (i.e. 1, 4, 6, 11, 15) while item numbers 5 and 10, reflected clear disagreement. For comparative analysis, the sixteen items were divided into eight groups. Additionally, in the cases of question numbers 1 and 2, a relatively dissimilar trend is seen, where we have noticed standard deviation values exceeded point '1'. Such a trend may either be attributed to the sample size and its associated background (i.e. 10 persons each from three different international work locations and further representing

different work roles and hierarchical levels), the outliers, (i.e. sensitivity of mean to the values causing increase in the standard deviation),or indefinite interference in the data set. However, since the overall results of the other items, included in the category are enough to demonstrate clearly the overall trends, it is not necessary to consider running either kurtosis or skewedness analysis.

Comparative analysis among sixteen items in the referred category covers three dimensions that include a general overview, and geographical and work role orientation response trends. The Item orientation analysis is as follows:

Figure 26. Survey results - NPD idea support construct - Questions No. 1-2

NPD idea support construct´s variable – Product innovativeness

Item 1: *New products developed at our unit are highly different from our existing products.*

The number of respondents who disagreed with the item in this group are 6 (20%) and those having neutral opinion 14 (47 %) out of the total of 30 responses in this category. The respondents who have shown agreement with the item are 10 (33%).

The geographical location orientation data analysis reveals an overall higher neutral response trend (47%) with up to 20% disagreement, belonging to the study samples representing the three selected study locations i.e. Norway (10%), Finland (3%) and the UK (7%). The majority of the negative responses on this item came from team members associated with product and sales (10%), project management (3%), design (3%) and general management (3%) related work roles.

A low agreement rate (i.e. 33%) shown by the respondents on this question item reveals a generally lower activity of new product idea generation linked to product (or service) differentiation aspect, which is actually considered a

negative trend. According to numerous research studies, new product idea generation capability is positively associated with the process of product or service innovation (Cooper, and Kleinschmidt, 1995). In cases where the companies cannot offer completely new products or services on account of limitations in relation to the size, scale or the scope of their products and services, they can find solutions through the innovation phenomenon of incremental innovation or variety innovation (Jevnaker, 2005; Brockhoff, 1994; Cooper, and Kleinschmidt, 1995) to better reach existing as well and new markets through competitive advantage. On the basis of the results, one may identify this area as a gap in the current management practices of the study organization. In addition, special efforts were made while conducting the study to control confusion that might occur due to any misunderstanding in comprehending the logic behind any asked question

To support the innovation process for new product or services related idea generation a company requires strong corporate strategic structure (i.e. embedded in strategic thinking) to select the right mode of innovation option while doing SWOT analysis (Hill and Westbrook, 1997). This potential can be better achieved by empowering and refining the skill level of the working teams (i.e. supported through idealized motivation, individualized thinking and intellectual stimulation) and building a supportive work environment embedded in fair work practices (i.e. pseudo transformational leadership).

NPD idea support construct´s variable – Product innovativeness

Item 2: *Our flexible production capability allows us to modify our products faster.*

The number of respondents who disagreed with the item in this group are 14 (47%) and those having a neutral opinion 7 (23.33 %) out of the total of 30 responses in this category. The respondents who showed agreement with the item are 9 (33%). Comparative analysis revealed an overall higher unsatisfactory response trend displayed by the respondents (i.e. 47% disagreement) belonging to the study samples representing the three selected study locations, i.e. the UK (24%), Finland (20%) and Norway (3%). The majority of the negative response trend came from the team members associated with design (13%), product and sales (10%) and technical management (10%), project management (7%), general management (7%) related work roles.

Figure 27. Survey results - NPD idea support construct - Questions No. 3-4

NPD idea support construct´s variable – Early client involvement

Item 3: *We remain in contact with our key clients during the product development process.*

The number of respondents who agreed with the item in this group are 23 (77%) and those having a neutral opinion are 5 (16.6 %) out of the total of 30 respondents in this category. The respondents who showed disagreement with this item are 2 (7%). Comparative analysis with regard to location revealed that this 7% population showing disagreement belongs mainly to Norway (3%) and the UK (3%). The main bulk of negative responses came from team members belonging to general management (3%), product and sales (3%) related work roles.

NPD idea support construct´s variable – Early client involvement

Item 4: *We take advantage of all forms of media to connect with potential stake holders during the NPD process.*

The number of respondents having a neutral opinion on the item in this group are 16 (53%) and those who disagreed are 8 (26.6 %) out of the total of 30 responses in this category. The respondents who agreed with the item are 6 (20%). The geographical location orientation comparative data analysis reveals that 27% of the population showing disagreement belongs to the UK (13%) and Finland (10%) while the response in Norway (3%) was moderate. The negative responses came from the team members belonging to the general management (10%), design (3%), product and sales (7%), project management (3%) and technical engineering (3%) related work roles.
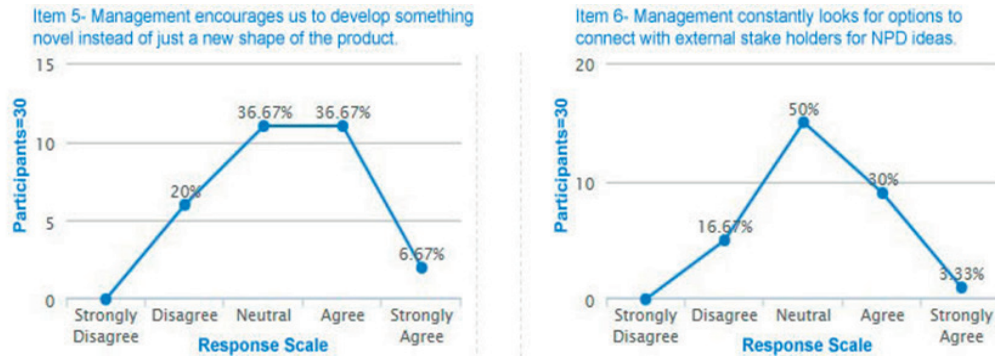
Figure 28. Survey results - NPD idea support construct - Questions No. 5-6

NPD idea support construct´s variable - Management´s initiatives

Item 5: *Management encourages us to develop something novel instead of just a new shape of product.*

The respondents who agreed or strongly agreed with the item are 13 (33.2%) in total. The respondents having a neutral opinion are 11 (36.6 %) out of 30 respondents in this category. The respondents who showed disagreement with the item are 6 (20%).

The comparative analysis with respect to geographical location revealed that the population segment disagreement responses (20%) belong mainly to the UK (10%) and Finland (7%), while the response from Norway (3%) was moderate. The negative responses came from the team members belonging to mainly product and sales (3%), project management (3%), design (3%), general management (7%) and technical engineering (3%) related work roles.

NPD idea support construct´s variable – Management´s initiatives for NPD

Item 6: *Management constantly looks for options to connect with external stake holders for NPD ideas.*

The number of respondents having a neutral opinion on the item are 15 (50%) and those who showed agreement or strong agreement are 10 (33.3%) in total out of the 30 responses in this category. The respondents who disagreed with the item are 5 (17%). The comparative analysis related to location revealed that the population reflecting disagreement (17%) belongs mainly to the UK (10%) with Finland (7%) showing a comparatively moderate response. The negative responses came from team members belonging to mainly the product and sales

(7%), general management (3%), technical engineering (3%), project management (3%) related work roles.

Figure 29. Survey results - NPD idea support construct - Questions No. 7-8

NPD idea support construct´s variable – NPD team initiative

Item 7: *I feel very comfortable if external stake holders give new ideas for the NPD project.*

The number of respondents who agreed or strongly agreed with the item are 19 (63%) in total. The respondents having a neutral opinion are 9 (36.6 %) out of 30 respondents in this category. The respondents who showed disagreement with the item are 2 (7%). The comparative analysis revealed that the population reflecting disagreement (7%) belongs to Norway (7%) only. The negative responses came mainly from the team members belonging to product and sales (3.3 %), project management and R&D (3.3 %) related work roles.

NPD idea support construct´s variable - NPD team initiative

Item 8: *We select NDP ideas based on their technical feasibility to design, develop and manufacture.*

The number of respondents having a neutral opinion on the item are 6(20%) and those who showed agreement or strong agreement are 22 (73%) in total out of the 30 responses in this category. The respondents who disagreed with the item are 2 (7 %). The comparative analysis revealed that the population segment showing disagreement (7 %) belong to the UK (7%) only. The negative responses came from the team members belonging to the product and sales (3.3%) and project management related work roles.
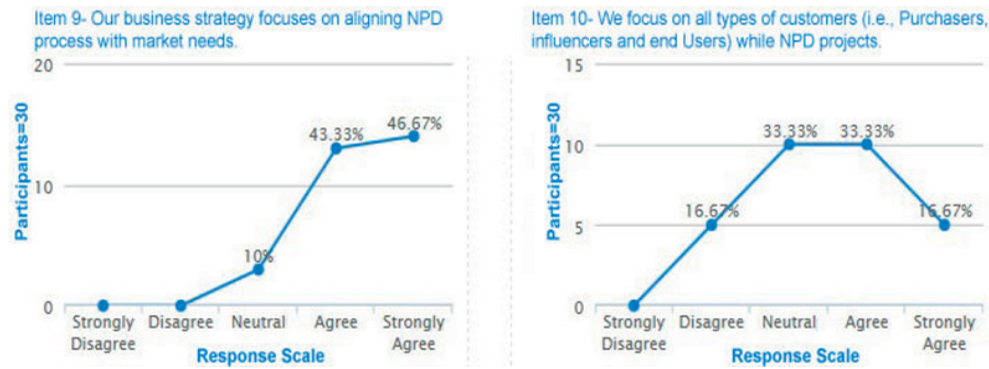
Figure 30. Survey results - NPD idea support construct - Questions No. 9-10

NPD idea support construct´s variable - Customer value

Item 9: *Our business strategy focuses on aligning NPD process with market needs.*

The number of respondents who agreed or strongly agreed with the item are 27 (89.6%) in total. The respondents having a neutral opinion are 3 (10 %) out of the 30 respondents in this category. No respondent showed disagreement with the item. However, comparative analysis revealed that a minor level of neutral response trend (i.e. 10%) belongs to the UK (7%) mainly and then Norway (3%).

The neutral response trend came from team members associated with project management and R&D (3%), and general management (3%) related work roles.

NPD idea support construct´s variable – Customer value

Item 10: *We focus on all types of customers (i.e. purchasers, influencers and end users) during NPD projects.*

The number of respondents who agreed or strongly agreed with the item are 15 (49%) in total. The respondents having a neutral opinion are 10 (33 %) out of the total of 30 in this category. The respondents who disagreed with this item are 5 (17%). The comparative analysis revealed that the population segment reflecting disagreement (i.e. in total 17%) belong mainly to the UK (7%) and Norway (10%). The negative responses came from team members belonging to the product and sales (10%), project management (3.3%) and general management (3.3%) related work roles.
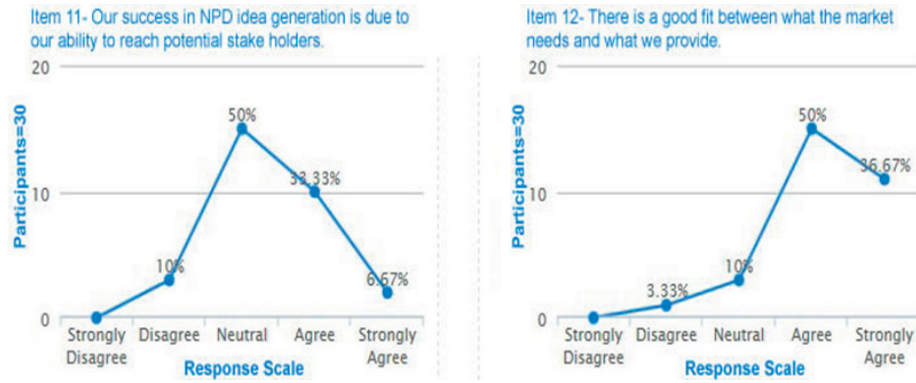
Figure 31. Survey results - NPD idea support construct - Questions No. 11-12

NPD idea support construct´s variable – Target reach

Item 11: *Our success in NPD idea generation is due to our ability to reach potential stake holders.*

The number of respondents who agreed or strongly agreed with the item are 12 (40%) in total. The respondents having a neutral opinion are 15 (50 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 3 (10%).

The comparative analysis revealed that the population showing disagreement (10%) belongs to the UK (3%) and Finland (7%). The negative responses came from team members belonging to general management (7%) and product and sales (3%) related work roles.

NPD idea support construct´s variable – Target reach

Item 12: *There is a good fit between what the market needs and what we provide.*

The number of respondents who agreed or strongly agreed with the item are 26 (86.6%) in total. The respondents having a neutral opinion are 3 (10 %) out of the 30 respondents in this category. Only 1 (3%) respondent showed disagreement with the item.

The comparative analysis revealed that the population segment showing disagreement (3%) belongs to Norway (3%). The negative responses came from the team member belonging to general management (3%).
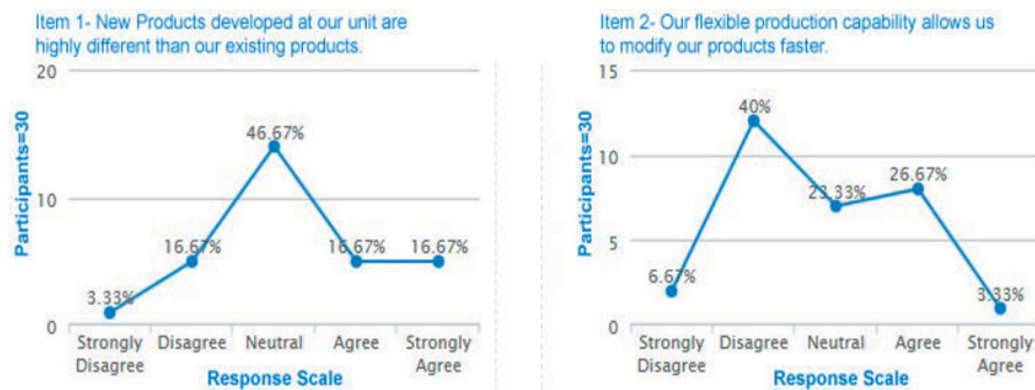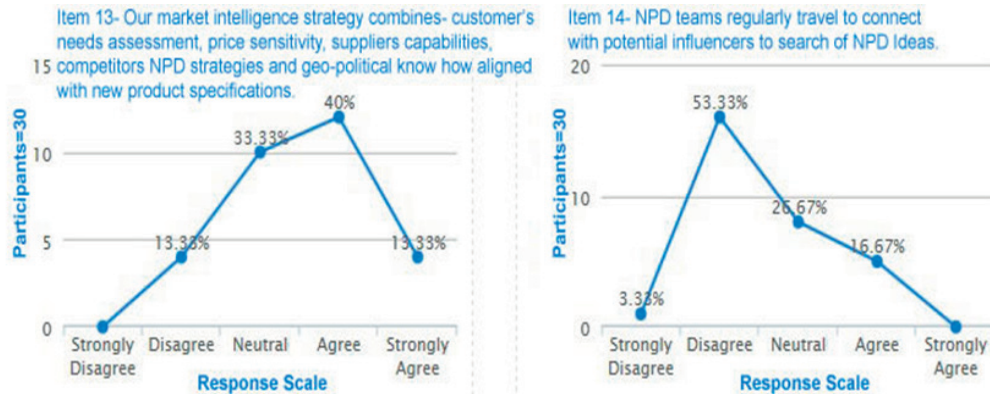
Figure 32. Survey results - NPD idea support construct - Questions No. 13-14

NPD idea support construct´s variable – Market intelligence

Item 13: *Our market intelligence strategy combines- customer's needs assessment, price sensitivity, suppliers capabilities, competitors NPD strategies and geo-political know how aligned with new product specifications.*

The number of respondents who agreed or strongly agreed with the item are 16 (53.3%) in total. The respondents having a neutral opinion are 10 (33.33 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 4 (13.3%).

The comparative analysis revealed that the population reflecting disagreement (13%) belong to the UK (10%) and Norway (3%). The negative responses came from the team members belonging to general management (3%), product and sales (3%) and project management and R&D (7%) related work roles.

NPD Idea support construct´s variable – Market intelligence

Item 14: *NPD teams regularly travel to connect with potential influencers to search for NPD Ideas.*

The number of respondents who disagreed or strongly disagreed with the item are 17 (56%) in total. The respondents having a neutral opinion are 8 (26 %) out of the 30 respondents in this category. The respondents who agreed with the item are 5 (17%).

The comparative analysis revealed that the population segment showing (56%) disagreement belongs to Finland (23%) and the UK (20%) mainly, while Norway (13%) disagreed moderately. The negative responses came from the team members belonging to product and sales (20%), design (13%), general

management (13%) and technical engineering (7%) and project management (3%) related work roles.

Figure 33. Survey results - NPD idea support construct - Questions No. 15-16

NPD idea support construct´s variable – Communication

Item 15: *Our NPD projects are supported through extensive internal and external communication.*

The number of respondents who agreed with the item are 11 (36.6%) in total. The respondents having a neutral opinion are 12 (40 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 7 (23%). The comparative analysis revealed that the population segment showing disagreement (23%) belongs to Norway (13%) and Finland (7%) mainly and the UK (3%) moderately. The negative responses came from team members belonging to general management (10%), product and sales (7%), project management (3%), and technical engineering (3%) related work roles.

NPD idea support construct´s variable – Communication

Item 16: *Our teams quickly share with each other, NPD ideas what they receive from outside.*

The number of respondents who agreed or strongly agreed with the item are 14 (46.6%) in total. The respondents having a neutral opinion are 7 (23.3 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 9 (30%). The comparative analysis revealed that the population showing disagreement (30%) belongs to the UK (13%) and Finland (10%) with Norway (7%) showing moderate response. The negative responses came from the team members belonging to the design (10%), general management (7%) and technical engineering (7%), product and sales (3%) and project management (3%) related work roles.

5.2.5 Transformational leadership based work leadership construct and research questions

Research question 2: How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?

And partially;

Research question 4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

The work leadership construct variable consisted of eight items/questions (i.e. items 17 to 24) to gather respondent feedback on the quality of work leadership support and related clues for future refinement. The overview and cross examination of each construct variable evaluating work leadership support category follows:

Table 12.   Combined results on transformational leadership dimension

Item No.	Variables	Count	Average	Median	Unique	Standard deviation	Confidence interval at 95%
17	Our experts are trusted for passing on genuine and quality knowledge to their teams.	30	3.8	4	4	0.69	3.55 − 4.05
18	Team members associate themselves with their seniors for their work skills and expertise.	30	3.8	4	4	0.55	3.6 - 4
19	Team leaders are capable of explaining the project work targets and procedures	30	3.7	4	4	0.59	3.49 − 3.91
20	Leaders can help members to find out the significant ways to carry out NPD activities.	30	3.6	4	4	0.55	3.4 − 3.8
21	Experts challenge their teams to think about old NPD related issues in new ways.	30	3.3	3	4,3	0.7	3.5 − 3.55
22	Experts are capable to force their teams to rethink things that they have never thought before.	30	3.43	3	3	0.67	3.19 − 3.67
23	Experts are capable of helping their team members to improve work efficiency.	30	3.3	3	3	0.65	3.07 − 3.55
24	Experts are capable of providing support to their team members in special difficulties.	30	3.9	4	4	0.36	3.77 − 4.03

5.2.5.1   Overview on transformational leadership based work leadership construct

A total of 30 responses contributed toward evaluating the quality of the current practices and clues for filling the gaps. The response mean average for all the eight items representing the construct variable ranged from 3.3 to 3.9, which indicated a mix of user's agreement and neutral response pattern to the posed evaluative queries. Table 12 above shows a quantified statistical overview in detail. Item orientation calculation of average, median, mode and standard deviation along with the response trends on work leadership related question items are highlighted in Table 12 above. A graphic representation of the data presented in Table 12 follows.
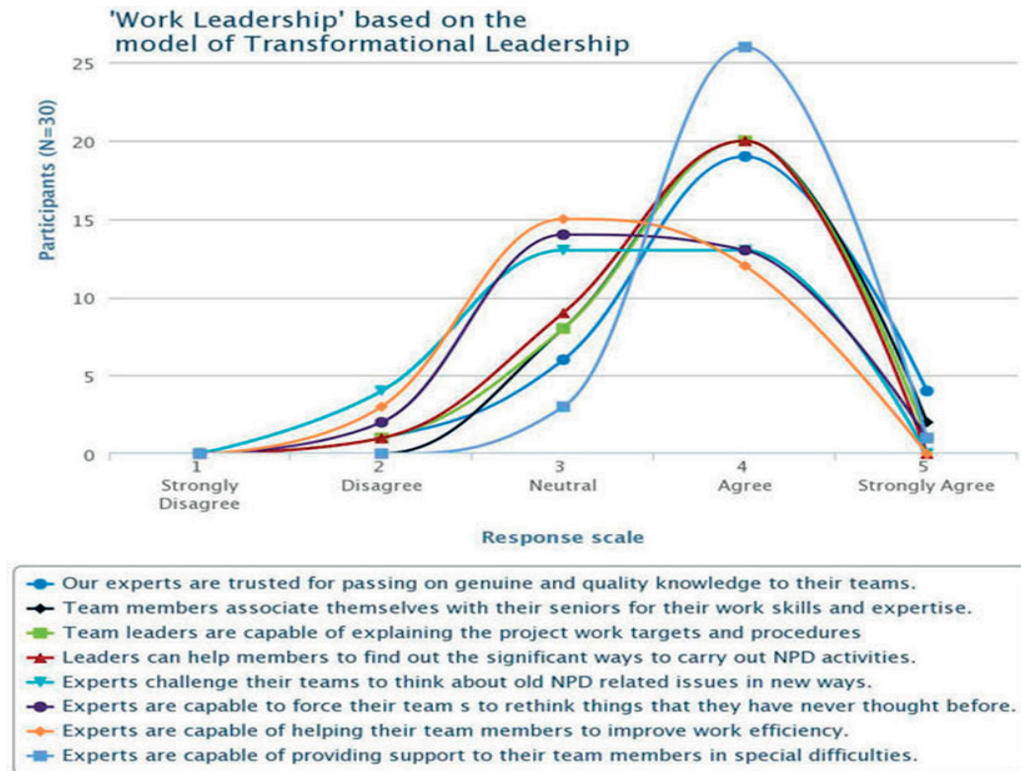
Figure 34. Overall quantitative results on transformational leadership based work leadership construct

5.2.5.2   Reliability check for transformational leadership based work leadership construct

In case of the work leadership construct, Cronbach alpha was calculated as 0.67, representing `acceptable` internal item consistency to anticipate (Cronbach , 1951) the overall construct reliability. The estimated alpha values detailed below present the internal consistency for each item:

Table 13.   Cronbach alpha and related statistics for construct items- work leadership

Cronbach alpha and related statistics for construct items- work leadership				
Items	Cronbach alpha	Std. alpha	G6(smc)	Average R
All items if deleted	0.67	0.703	0.8332	0.1647
Q17 excluded	0.6102	0.6608	0.8142	0.1505
Q18 excluded	0.60	0.6475	0.7671	0.1431
Q19 excluded	0.6726	0.7254	0.8471	0.1937
Q20 excluded	0.6651	0.7146	0.8139	0.1854
Q21 excluded	0.6159	0.6632	0.7988	0.1518
Q22 excluded	0.637	0.6841	0.8113	0.1645
Q23 excluded	0.6386	0.6933	0.7764	0.1705
Q24 excluded	0.605	0.6534	0.7606	0.1463

Table 13, above confirms that all the construct items are reliable and acceptable for having their 'Alpha' values over .67, therefore, all the construct items must be retained.

5.2.5.3   Analysis for transformational leadership based work leadership construct

Table 12 and Figure 34 above present a summarized response trend on the category of `work leadership´ supportive official practices to evolve a strong environment for new product development related idea generation processes. On the basis of the survey recipients' feedback, the work leadership category almost touched the 'agreed' opinion level of 4, on a scale of 1 to 5. In addition, in six items (i.e. items 17, 18, 19, 20, 23 and 24) reliability exceeds the satisfactory level of agreement. However, the remaining two items (i.e. items 21, 22) divided equally between the agreed and neutral response rate` (i.e. 43% and 46%).

For comparative analysis, the eight items in the category of transformational leadership based work leadership were divided into four groups. Item orientated scores are represented in the next pages.
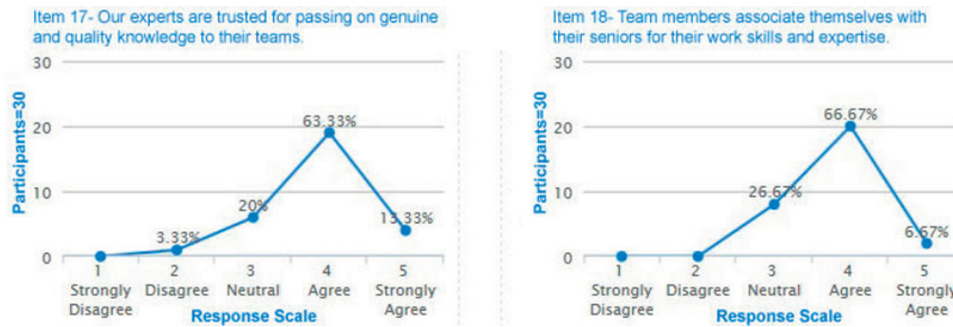
Figure 35. Survey results - Transformational leadership based work leadership - Questions No. 17-18

Transformational leadership construct's variable - Idealized influence (trust)

Item 17: *Our experts are trusted for passing on genuine and quality knowledge to their teams.*

The number of respondents who agreed or strongly agreed with the item are 23 (76.6%) in total. The respondents having a neutral opinion are 6 (20 %) out of the total 30 respondents in this category. Only 1 (3.3%) respondent showed disagreement with the item. The comparative analysis revealed that the population segment showing disagreement (3%) belong to the UK (3%). The negative response came from the project management (3%), related work roles.

Transformational leadership construct's variable - Idealized influence (affiliation with the leader)

Item 18: *Team members associate themselves with their seniors for their work skills and expertise.*

The number of respondents who agreed or strongly agreed with the item are 22 (73.4%) in total. The respondents having a neutral opinion are 8 (26.6 %) out of the 30 respondents in this category. No respondent disagreed with the item.

The comparative analysis revealed that the population segment showing neutral responses (26%) belong to the UK (20%) mainly and Norway (3%) and Finland (3%) moderately. The neutral responses came from team members belonging to product and sales (3%), project management (9%), technical engineering (7%), general management (7%) related work roles.
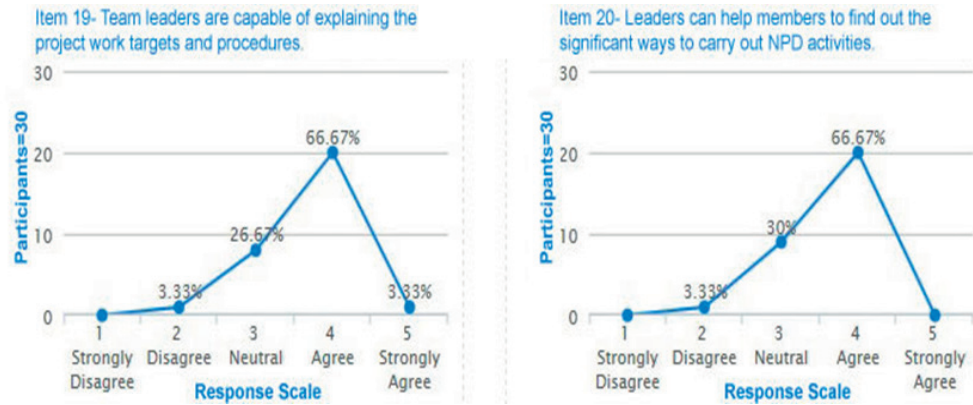
Figure 36. Survey results - Transformational leadership based work leadership
- Questions No. 19-20

Transformational leadership construct's variable - Inspirational motivation (supportive leadership)

Item 19: *Team leaders are capable of explaining the project work targets and procedures.*

The number of respondents who agreed or strongly agreed with the item are 21 (70%) in total. The respondents having a neutral opinion are 8 (26.6 %) out of the total 30 respondents in this category. Only 1 (3%) respondent disagreed with the item.

The comparative analysis revealed that the one respondent showing disagreement (3%) belonged to Finland (3%) and represented the general management (3%) related work role.

Transformational leadership construct's variable - Inspirational motivation (supportive leadership)

Item 20: *Leaders can help members to find out the significant ways to carry out NPD activities.*

The number of respondents who agreed or strongly agreed with the item are 20 (66.6%) in total. The respondents having a neutral opinion are 9 (30 %) out of the 30 respondents in this category. Only 1 (3%) respondent disagreed with the item.

The comparative analysis revealed that the population segment showing disagreement (3%) belongs to Finland and represents the general management (3%) related work role.
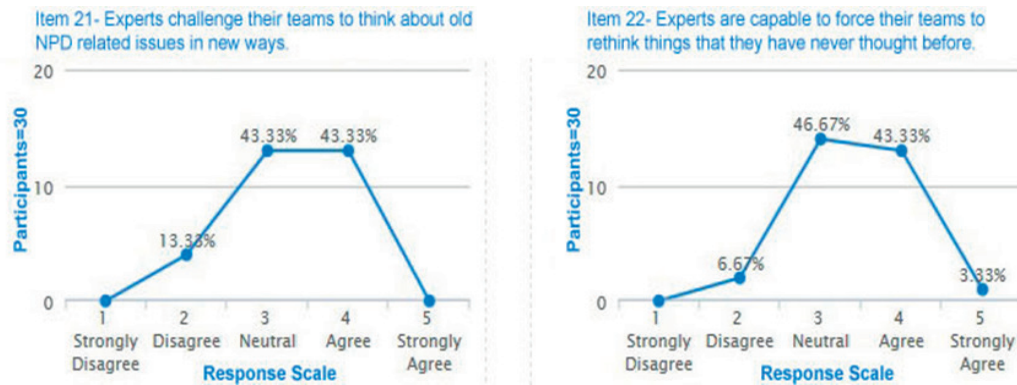
Figure 37. Survey results - Transformational leadership based work leadership - Questions No. 21-22

Transformational leadership construct's variable - Intellectual stimulation (leader's competence to empower followers)

Item 21: *Experts challenge their teams to think about old NPD related issues in new ways.*

The number of respondents agreeing with the item are 13 (43.3%) and the respondents having a neutral opinion are 13 (43.3 %) out of the total of 30 respondents in this category. The respondents who disagreed with the item are 4 in number (13.3%).

The comparative analysis revealed that the population segment showing disagreement (13%) belongs to the UK (7%) mainly while Finland (3) and Norway (3%) showed moderate disagreement. The negative responses came from the team members belonging to the product and sales (3%), project management (3%) and design (7%) related work roles.

Transformational leadership construct's variable - Intellectual stimulation (leader's competence to empower followers)

Item 22: *Experts are capable to force their teams to rethink things that they have never thought before.*

The number of respondents who agreed or strongly agreed with the item are 14 (46.6%) in total. The respondents having a neutral opinion are 14(46.6 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 2 (7%). The comparative analysis showed that the disagreement with to this item (7%) came from the UK (3%) and Finland (3%), moderately. These negative responses came from the team members belonging to project management (3%) and general management (3%) related work roles.
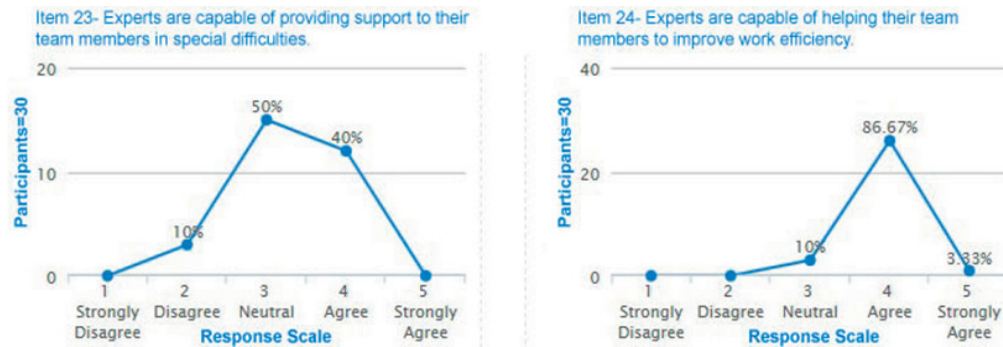
Figure 38. Survey results - Transformational leadership based work leadership
 - Questions No. 23-24

Transformational leadership construct's variable - Individualized consideration (team empowerment)

Item 23: *Experts are capable of providing support to their team members in special difficulties.*

The number of respondents who agreed with the item are 12 (40%) and the respondents having a neutral opinion are 15 (50 %) out of the total 30 respondents in this category. The respondents who disagreed with the item are 3 (10%). The comparative analysis revealed that the population mainly showing disagreement (10%) belongs to Norway (7%) and the UK (3%). The negative responses came from the team members belonging to product and sales (7%) and project management (3%) related work roles.

Transformational leadership construct's variable - Individualized consideration (team empowerment)

Item 24: *Experts are capable of helping their team members to improve work efficiency.*

The number of respondents who agreed or strongly agreed with the item are 27 (90%) in total. The respondents having a neutral opinion are 3 (10 %) out of the 30 respondents in this category. No respondent disagreed with the item.

The comparative analysis revealed that the population reflecting neutral responses (10%) mainly belonged to Norway (7%) with the UK (3%) disagreeing moderately. The neutral responses came from team members belonging to the project management (7%), general management (3%) related work roles.

5.2.6 NPD team climate and research questions

Research question 3: How adaptive an organization can be in designing supportive new product development processes?

And partially;

Research question 4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

The NPD team climate construct variable consisted of ten items/questions to gather respondents' feedback on the quality of new product development related team climate and hints for future value addition.

5.2.6.1 Reliability check for NPD team climate

In the case of the strategic thinking construct, Cronbach Alpha was calculated as 0.81 representing `good` internal item consistency to anticipate (Cronbach , 1951) the overall construct reliability. The estimated alpha values detailed below present the internal consistency for each item:

Table 14. Cronbach Alpha and related statistics for construct - NPD team climate

Cronbach Alpha and related Statistics for construct items- NPD team climate				
Items	Cronbach Alpha	Std. Alpha	G6(smc)	Average R
If All items deleted	0.81	0.8083	0.8546	0.2966
Q25 excluded	0.8012	0.8049	0.8296	0.3143
Q26 excluded	0.7919	0.7928	0.8338	0.2983
Q27 excluded	0.7779	0.7788	0.8082	0.2812
Q28 excluded	0.7957	0.8022	0.8401	0.3107
Q29 excluded	0.7862	0.7903	0.8385	0.2952
Q30 excluded	0.774	0.7787	0.8309	0.2811
Q31 excluded	0.7888	0.792	0.8349	0.2972
Q32 excluded	0.7826	0.7877	0.8337	0.2919
Q33 excluded	0.7953	0.7978	0.833	0.3048
Q34 excluded	0.7809	0.787	0.8328	0.2911

The table 14 confirms that all the construct items are reliable and acceptable due to having their `Alpha` values over 0.8, therefore, all the construct items must be retained.

The overview and cross examination of each construct variable evaluating NPD team climate category follows:

Table 15.   Combined results for NPD team climate

Item No.	Variables	Count	Average	Median	Unique	Standard deviation	Confidence Interval at 95%	Highlighted Response trend
25	Team members display agreement with the team´s objective.	30	3.8	4	4	0.48	3.77 – 4.03	Agreed with 73%
26	Team members feel understood and accepted.	30	3.9	4	4	0.54	3.71 – 4.09	Agreed with 70%
27	Team members keep each other informed.	30	3.7	4	4	0.74	3.44 – 3.69	Agreed with 56%
28	Team is capable of making real attempts to share information.	30	3.7	4	4	0.59	3.49 – 3.91	Agreed with 66%.
29	Team is strong in searching for new ways of looking at product development problems.	30	3.8	4	4	0.66	3.56 – 4.04	Agreed by 63%
30	Team is cooperative in developing NPD ideas with members from other departments, if required.	30	3.46	4	4	0.81	3.17 – 3.75	Agreed with 46%.
31	We, as a work team, are capable of cooperation with other work groups.	30	4.06	4	4	0.82	3.77 - 4. 35	Agreed with 53%
32	In our organization, work performance is considered as a combined phenomenon.	30	3.63	4	4	0.61	3.41 – 3.85	Agreed with 60%
33	We, as a work team, are able to complete work targets on time.	30	3.5	4	4	0.93	3.17 – 3.83	Agreed with 40%
34	The team´s ability is considered to be quick to respond to problems.	30	3.73	4	4	0.82	3.44 - 4.02	Agreed with 56%

5.2.6.2   General overview for NPD team climate

A total of 30 responses, contributed toward evaluating the quality of the current practices and clues for filling the gaps. The response mean average for all the ten items representing the construct variable ranged from 3.46 to 4.06, which indicates agreement with the posed evaluation queries.

Table 15 above shows a quantified statistical overview in detail. No unique response trend is noticed through the targeted feedback.

Graphic representation of item-wise scores on new product development – team climate category is as follows:
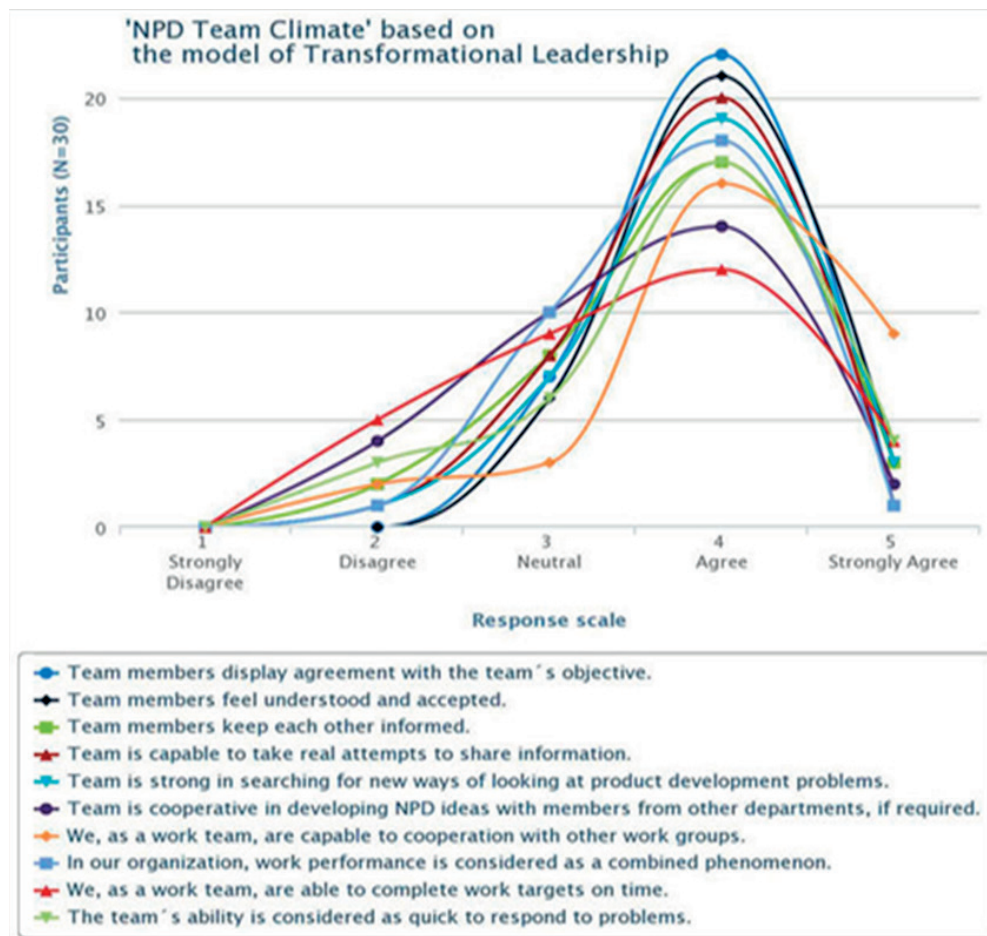
Figure 39. Overall quantitative results on NPD team climate construct

Figure 39 displays the trend that the majority of the sample´s responses are clearly focused on the 'agreed' (i.e. 4) point on the 5 level scale.

5.2.6.3 Results analysis for construct - NPD team climate

Table 15 and Figure 39 presents a summarized response trend on NPD - team climate category supportive official practices to strengthen the environment for new product development related idea generation processes. On the basis of the survey recipient's feedback, the NPD - team climate category reached beyond the 'agreed' opinion level between 4 and 5, on a scale of 1 to 5.

In all the ten items (i.e, from items 25 to 34) reliability exceeds the satisfactory level of agreement. For comparative analysis, the eight items in this category were divided into four groups. An item orientation scores representation follows;
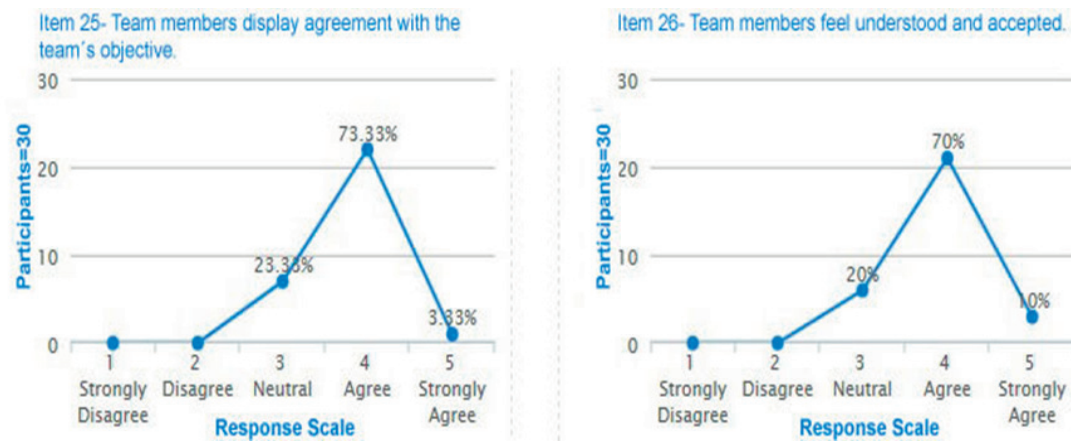
Figure 40. Survey results - NPD team climate - Questions No. 25-26

NPD team climate construct's variable - Collaboration

Item 25: *Team members display agreement with the team´s objective.*

The number of respondents who agreed or strongly agreed with the item are 23 (76.6%) in total. The respondents having a neutral opinion are 7 (23.3 %) out of the 30 respondents in this category. No respondent disagreed with the item. The comparative analysis revealed that the population segment reflecting neutral responses (23%) belong to Norway (13%) mainly, while Finland (10%) scored moderately. The neutral responses came from the team members belonging to the product and sales (10%), project management (3%) and general management (10%) related work roles.

NPD team climate construct's variable - Collaboration

Item 26: *Team members feel understood and accepted.*

The number of respondents who agreed or strongly agreed with the item are 24 (80%) in total. The respondents having a neutral opinion are 6 (20 %) out of the 30 respondents in this category. No respondent disagreed with the item. The comparative analysis revealed that the population segment reflecting neutral responses (20%) belong to Norway (13%) mainly, while the UK (7%) had a moderate score. The neutral responses came from the team members belonging to the product and sales (3%), project management (7%), design (3%) and general management (7%) related work roles.
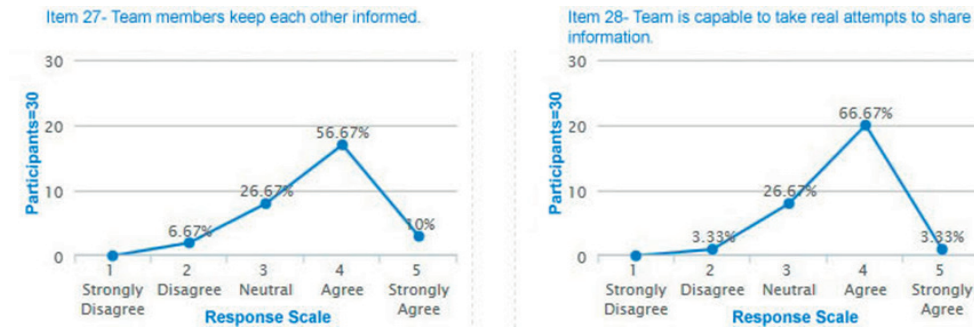
Figure 41. Survey results - NPD team climate - Questions No. 27-28

NPD team climate construct's variable - Communication

Item 27: *Team members keep each other informed.*

The number of respondents who agreed or strongly agreed with the item are 20 (66.6%) in total. The respondents having a neutral opinion are 8 (26.6 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 2 (6.6%). The comparative analysis revealed that the population segment showed disagreement belonged to Norway (3.33%) and the UK (3.33%) moderately. These negative responses came from the team members belonging to the product and sales (3.33%), project management (3.33%) related work roles.

NPD team climate construct's variable - Communication

Item 28: *Team is capable to make real attempts to share information.*

The number of respondents who agreed or strongly agreed with the item are 21 (70%) in total. The respondents having a neutral opinion are 8(26.6 %) out of the 30 respondents in this category. Only 1 (3%) respondent disagreed with the item.

The comparative analysis revealed that the population segment showing disagreement belongs to the UK (3%). This negative response came from the team member belonging to the project management (3%) related work role.
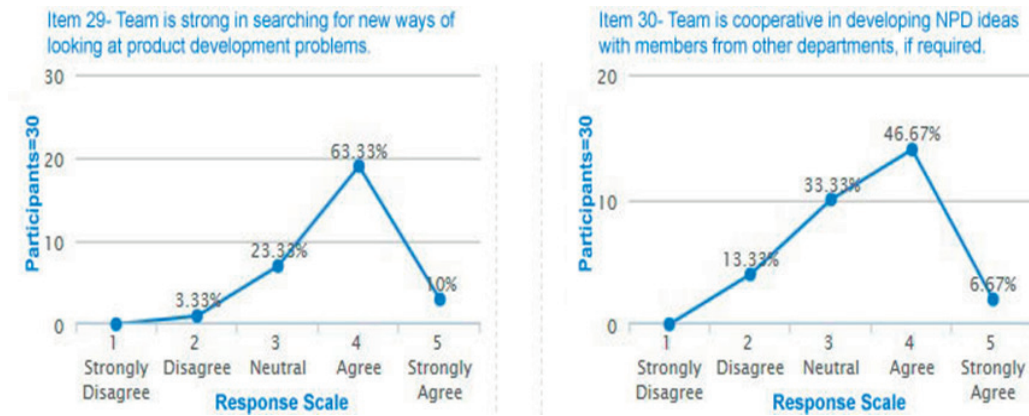
Figure 42. Survey results - NPD team climate - Questions No. 29-30

NPD team climate construct's variable - Idea generation

Item 29: *Team is strong in searching for new ways of looking at product development problems.*

The number of respondents who agreed or strongly agreed with the item are 22 (73.4%) in total. The respondents having a neutral opinion are 7 (23.3 %) out of the 30 respondents in this category. Only 1 (13.3%) respondent disagreed with the item. The comparative analysis revealed that the population segment showing disagreement (3%) belonged to Norway (3%) moderately. This negative response came from the team member belonging to the product and sales (3%) related work role.

NPD team climate construct's variable - Idea generation

Item 30: *Team is cooperative in developing NPD ideas with members from other departments, if required.*

The number of respondents who agreed or strongly agreed with the item are 16 (53%) in total. The respondents having a neutral opinion are 10 (33.3 %) out of the 30 respondents in this category. Only 4 (13%) respondents showed disagreement with the item. The comparative analysis revealed that the population segment showing disagreement (13%) belongs mainly to the UK (10%), with moderate disagreement from Norway (3%). The negative responses came from the team members belonging to the project management (3%), design (3%), and general management (3%) and technical engineering (3%) related work roles.
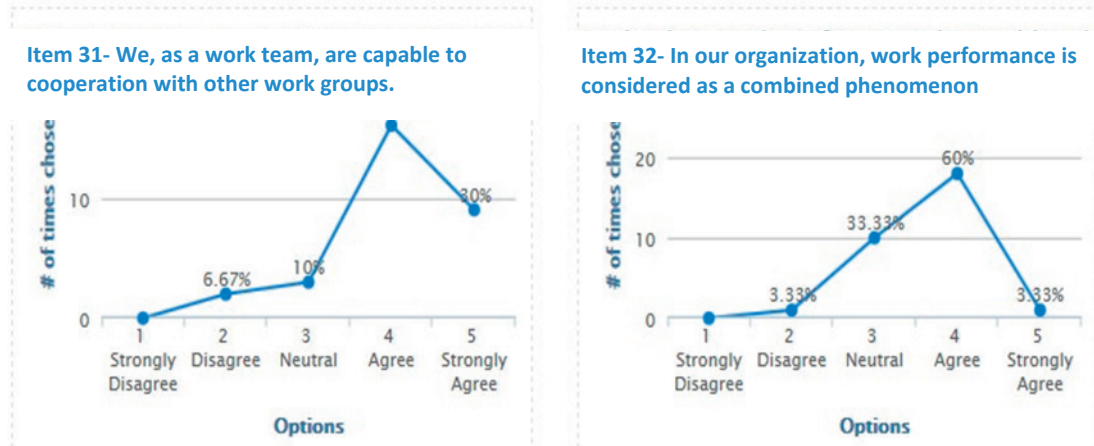
Figure 43. Survey results - NPD team climate - Questions No. 31-32

NPD team climate construct's variable - Collaboration

Item 31: *We, as a work team, are capable of cooperation with other work groups.*

The number of respondents who agreed or strongly agreed with the item are 25 (83%) in total. The respondents having a neutral opinion are 3 (10%) out of the 30 respondents in this category. The respondents who have disagreed with the item are 2 (7%). The comparative analysis revealed that the population segment showing disagreement (7%) belongs to Norway (3%) and the UK (3%). These negative responses came from team members belonging to the technical engineering (3%), product and sales (3%) related work roles.

NPD team climate construct's variable - Collaboration

Item 32: *In our organization, work performance is considered as a combined phenomenon.*

The number of respondents agreed or strongly agreed with the item are 19 (63.3%) in total. The respondents having a neutral opinion are 10 (33.3 %) out of the 30 respondents in this category. The respondents who have disagreed with the item are 1 (3.3%).

The comparative analysis revealed that the population segment showing disagreement belongs to the UK (3.3%) moderately. This negative response came from the team member belonging to the project management (3.3%) related work role.
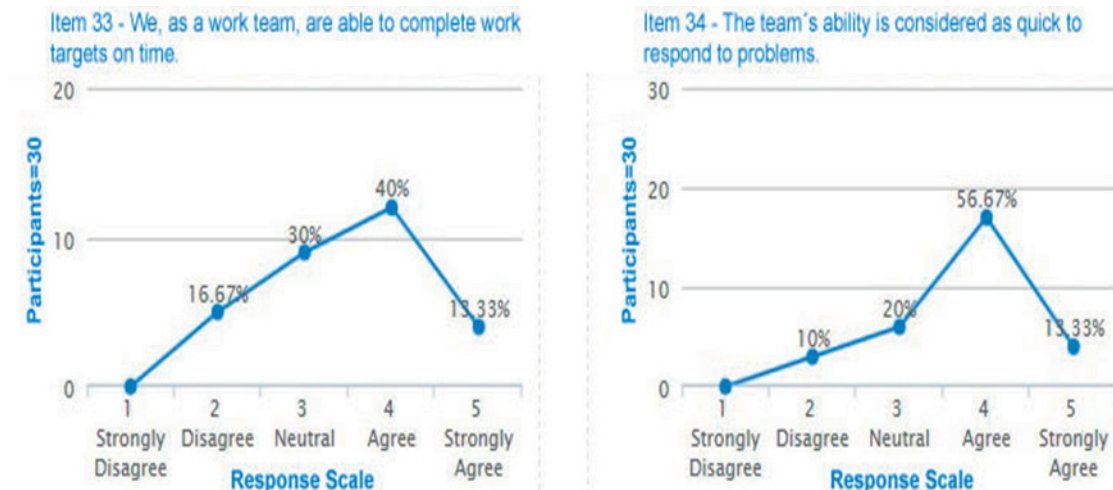
**Figure 44.** Survey results - NPD team climate - Questions No. 33 -34

NPD team climate construct's variable – Responsiveness

Item 33: *We, as a work team, are able to complete work targets on time.*

The number of respondents who agreed or strongly agreed with the item are 16 (53.3%) in total. The respondents having a neutral opinion are 9 (30 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 5 (16.6%).

The comparative analysis revealed that the population showing disagreement (16.6%) belongs to the UK (6.66%) and Finland (6.66%) mainly while Norway (3.33%) moderately. These negative responses came from team members belonging to project management (10%) and design (6.6%) related work roles.

NPD team climate construct's variable - Responsiveness

Item 34: *The team´s ability is considered to be quick to respond to problems.*

The number of respondents who agreed or strongly agreed with the item are 21 (70%) in total. The respondents having a neutral opinion are 6 (20 %) out of the 30 respondents in this category. The respondents who disagreed with the item are 3 (10%).

The comparative analysis revealed that the population segment showing disagreement (10%) belongs to the UK (7%) and Finland (3%). The negative responses came from team members belonging to the general management (7%) and technical engineering (3%) related work roles.

5.2.7 Strategic thinking and research questions

Research question 2: How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?

And partially;

Research question 4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

The strategic thinking construct variable consisted of twelve items/questions to gather respondent's feedback on the quality of strategic thinking approach with reference to the new product development operations.

5.2.7.1   Reliability check for construct - Strategic thinking

In case of Strategic thinking construct, Cronbach Alpha was calculated as 0.78 representing 'good' internal item consistency to anticipate (Cronbach, 1951) the overall construct reliability. The estimated Alpha values detailed below presents the internal consistency for each item:

Table 16.   Cronbach Alpha and related statistics for strategic thinking
construct items

Cronbach Alpha and related statistics for construct items- strategic thinking			
Items	**Cronbach Alpha**	**Std. Alpha**	**G6 (smc)**	**Average R**
If all items deleted	0.78	0.7796	0.8872	0.2276
Q35 excluded	0.7565	0.7629	0.8613	0.2263
Q36 excluded	0.7711	0.7757	0.8696	0.2392
Q37 excluded	0.7548	0.7619	0.8527	0.2254
Q38 excluded	0.7548	0.7619	0.8527	0.2254
Q39 excluded	0.7288	0.7369	0.8648	0.203
Q40 excluded	0.7387	0.7412	0.8674	0.2066
Q41 excluded	0.7525	0.757	0.8695	0.2207
Q42 excluded	0.7434	0.7471	0.8683	0.2117
Q43 excluded	0.7641	0.7655	0.8807	0.2288
Q44 excluded	0.7808	0.7842	0.883	0.2483
Q45 excluded	0.7764	0.7817	0.8923	0.2456
Q46 excluded	0.783	0.7861	0.8791	0.2504

Table 16 confirms that all the construct items are reliable and acceptable due to having their 'Alpha' values over 0.7, therefore, all the construct items must be retained. An overview and cross examination of each construct variable evaluating strategic thinking category follows:

Table 17. Combined results for construct - Strategic thinking

Item No.	Variables	Count	Average	Median	Unique	Standard deviation	Confidence interval at 95%	Highlighted Response trend
35	I ask myself how the parts of an incomplete Figure connect in a certain situation.	30	3.66	3	3	0.8	3.37 – 3. 95	Neutral with 53% response rate.
36	I think intuitively about what is unique or unusual about a certain problem situation.	30	3.8	4	4	0.76	3.53 4.07	Agreed and strongly agreed with 50% and 16% respectively.
37	I think about questions I am neglecting to ask.	30	3.1	3	3	0.84	2.8 – 3.4	Neutral 50% with response rate.
38	I think about what is so important about this challenge.	30	3.76	4	4	1	3.72 – 3.8	Agreed and strongly agreed with 56% and 20% respectively.
39	I try to understand how the facts in the situation are related to each other.	30	4.13	4	4	0.77	3.85 – 4.41	Agreed and strongly agreed with 50% and 33% respectively.
40	I look at the "Big Picture" in the information available before examining the details.	30	4.26	4	4	0.69	4.01 – 4.51	Agreed and strongly agreed with 46% and 40% respectively.
41	I investigate the cause before taking any action.	30	4	4	4	0.74	3.74 – 4.26	Agreed and strongly agreed with 46% and 26% respectively.
42	I seek different perspectives while thinking about NPD ideas.	30	4	4	4	0.69	3.75 – 4.25	Agreed and strongly agreed with 53% and 23% respectively.
43	I try to find a common goal when two or more parties are in conflict.	30	4	4	4	0.45	3.84 – 4.16	Agreed and strongly agreed with 80% and 10% respectively.
44	I engage in discussions with those who hold a different point of view.	30	3.9	4	4	0.66	3.66 – 4.14	Agreed and strongly agreed with 56% and 16% respectively.
45	I ignore my past experiences when trying to understand situations presented to me.	30	2	2	2	0.69	1.75 – 2.25	Disagreed with 73%.
46	I create a plan to solve a problem before considering other viewpoints.	30	2.63	3	3	0.85	2.33 – 2.93	Neutral with 47% response rate

5.2.7.3   General overview for construct - Strategic thinking

A total of 30 responses contributed toward evaluating the quality of the current practices and clues for filling the gaps. The response mean average for all the twelve items representing the construct variable ranged from 2.0 to 4.26, which indicates a clear mix of user disagreement until the strong agreement towards the posed evaluation queries. Table 17 shows a quantified statistical overview in detail. Graphic representation of item-wise scores on strategic thinking category is as follows:
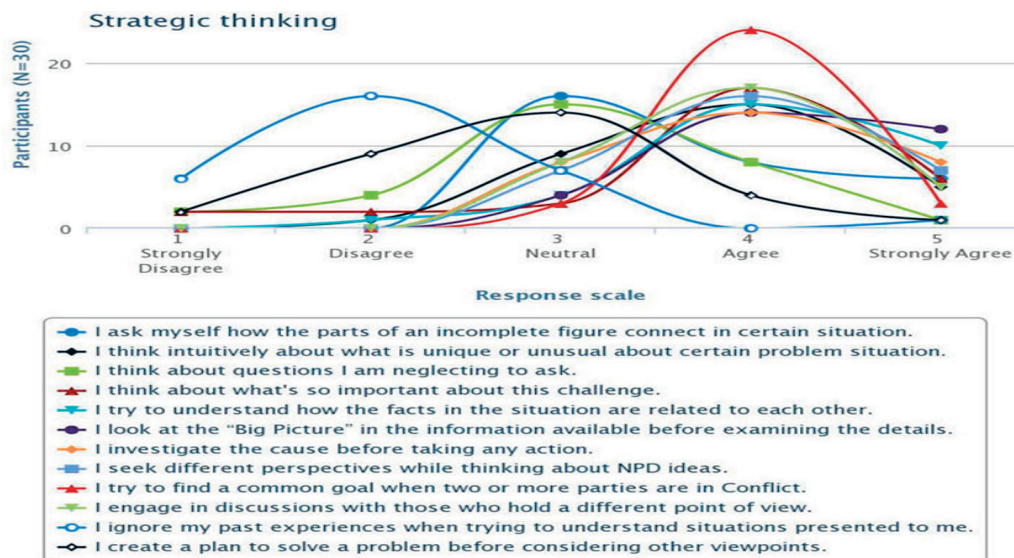
Figure 45. Overall quantitative results on strategic thinking construct

5.2.7.4   Analysis for construct - Strategic thinking

Table 17 and Figure 45 above a presents summarized response trend on the category of `strategic thinking´ supportive official practices to strengthen the environment for new product development related idea generation processes. On the basis of the survey recipient feedback, the strategic thinking category surpassed `agreed` opinion level of 4, on a scale of 1 to 5. In items 36, 38, 39, 40, 41, 42, 43 and 44, reliability exceeds the satisfactory level of agreement. In addition, in three incidents items 35, 37 and 46, a neutral response trend is noticed, while in one instance disagreement is noticed (i.e. item number 45). Additionally, in the case of question number 38, a relatively dissimilar trend is seen, where we have noticed a standard deviation value exceeded point `1`. Such a trend may be attributed to the sample size and its variant background (i.e. 10 persons each from three different international work locations who further represent different work roles and hierarchical levels): the outliers, (i.e.

Sensitivity of mean to the values causing increase in the standard deviation), and the data sets indefinite interference. However, since the over-all results of the other items, included in the group category are enough to display the overall trends, it is not therefore necessary to consider applying either kurtosis or skewedness analysis to determine the exact trend on the specific item. For comparative analysis, twelve items in this category were divided into six groups. The presentation of item-wise scores follows:

Figure 46. Survey results - strategic thinking - Questions No. 35 -36

Strategic thinking construct's variable – Work situation

Item 35: *I ask myself how the parts of an incomplete Figure connect in a certain situation.*

The number of respondents who agreed or strongly agreed with the item are 14 (46.7%) in total. The respondents having a neutral opinion are 16 (53.3 %) out of the 30 respondents in this category. No respondent disagreed with this item.

A comparative analysis revealed that the population segment showing neutral responses (53%) belong to the UK (20%) mainly similar with Norway (17%) and Finland (17%). These neutral responses came from the team members belonging to the technical engineering (13%), product and sales (13%), project management (7%), general management (10%) and design (10%) related work roles.

Strategic thinking construct's variable – Work situation

Item 36: *I think intuitively about what is unique or unusual about a certain problem situation.*

The number of respondents who agreed or strongly agreed with the item are 20 (67%) in total. The respondents having a neutral opinion are 9 (30%) out of the 30 respondents in this category. Only 1 (3%) respondent disagreed with the item.

The comparative analysis revealed that the population segment showing disagreement belongs to the UK (3%). This negative response came from a team member belonging to the technical engineering (3%) related work role.
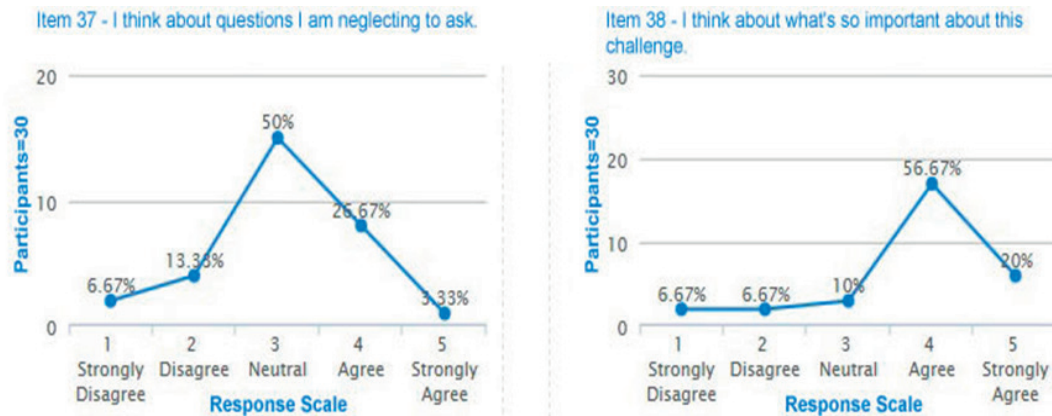

Figure 47. Survey results - strategic thinking - Questions No. 37- 38

Strategic thinking construct's variable - Situation handling

Item 37: *I think about questions I am neglecting to ask.*

The number of respondents who agreed or strongly agreed with the item are 9 (30%) in total. The respondents having a neutral opinion are 15 (50 %) out of the 30 respondents in this category. The respondents who disagreed or strongly disagreed with the item are 6 (20%) in total. The comparative analysis revealed that the population segment showing disagreement belongs to Norway (10%) and Finland (7%) mainly and the UK (3%) moderately. The negative responses came from the team members belonging to the technical engineering (10%), product and sales (7%), project management and R&D (3%) related work roles.

Strategic thinking construct's variable - Situation handling

Item 38: *I think about what is so important about this challenge.*

The number of respondents who agreed or strongly agreed with the item are 23 (76.6%) in total. The respondents having a neutral opinion are 3 (10 %) out of the 30 respondents in this category. The respondents who disagreed or strongly disagreed with the item are 4 (13.3%) in total.

The comparative analysis revealed that the population segment showing disagreement (13%) mainly belongs to Norway (10%) and Finland (3.3%) moderately. These negative responses came from team members belonging to the

product and sales (6.6%), project management (3.3%) and general management and R&D (3.3%) related work roles.

Figure 48. Survey results - strategic thinking - Questions No.39- 40

Strategic thinking construct's variable - Investigative approach

Item 39: *I try to understand how the facts in the situation are related to each other*.

The number of respondents who agreed or strongly agreed with the item are 25(83.3%) in total. The respondents having a neutral opinion are 4 (13.3 %) out of the 30 respondents in this category. Only 1 (3.3%) respondent disagreed with the item.

A comparative analysis revealed that the population segment showing disagreement (3.3%) belongs to Norway (3.3%) only. This negative response came from a team member belonging to the technical engineering (3.3%) related work role.

Strategic thinking construct's variable - Investigative approach

Item 40: *I look at the "Big Picture" in the information available before examining the details*.

The number of respondents who agreed or strongly agreed with the item are 26 (86.6%) in total. The respondents having a neutral opinion are 4 (13.3 %) out of the 30 respondents in this category. No respondent disagreed with this item.

A comparative analysis revealed that the population segment reflecting neutral responses (13%) belong to the UK (10%) mainly and Norway (3%) moderately. These neutral responses came from the team members belonging to the technical engineering (7%), product and sales (3%) and design (3%) related work roles.

Figure 49. Survey results - strategic thinking - Questions No. 41-42

Strategic thinking construct's variable - Problem solving

Item 41: *I investigate the cause before taking any action.*

The number of respondents who agreed or strongly agreed with the item are 22 (73.3%) in total. The respondents having a neutral opinion are 8 (26.6 %) out of the 30 respondents in this category. No respondent disagreed with this item.

A comparative analysis revealed that the population segment showing neutral responses (i.e. in total 26.6%) belongs mainly to Finland (17%) and the UK (7%), and Norway (3%) moderately. These neutral responses came from the team members belonging to the product and sales (13%), design (3%), technical engineering (3%), and general management and R&D (7%) related work roles.

Strategic thinking construct's variable - Problem solving

Item 42: *I seek different perspectives while thinking about NPD ideas.*

The number of respondents who agreed or strongly agreed with the item are 23 (76.6%) in total. The respondents having a neutral opinion are 7 (23.3 %) out of the 30 respondents in this category. No respondent disagreed with this item.

A comparative analysis revealed that the population segment showing neutral responses (23.3%) belongs to Finland (10%) mainly while Norway (7%) and the UK (7%) had moderately responsible. These neutral responses came from the team members belonging to the product and sales (10%), technical engineering (7%), design (3%) and general management (3%) related work roles.
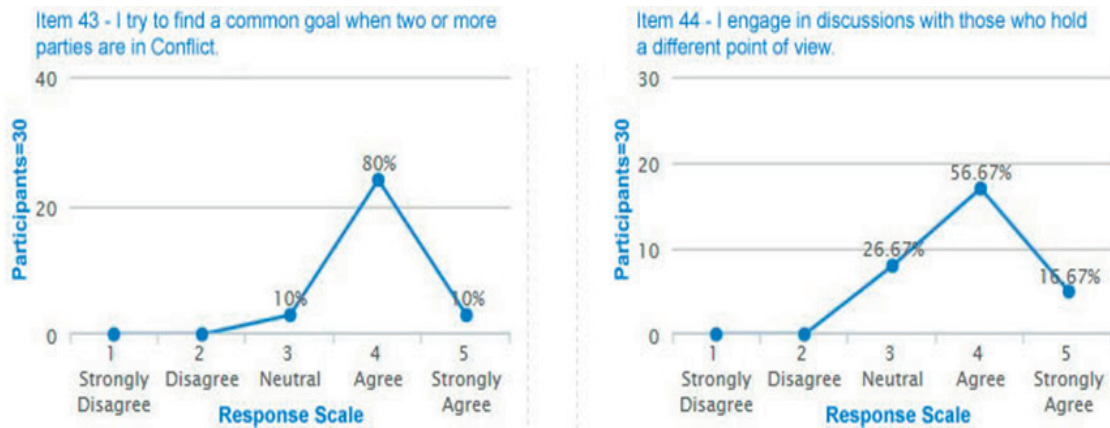
Figure 50. Survey results - strategic thinking - Questions No. 43-44

Strategic thinking construct's variable - Situation handling

Item 43: *I try to find a common goal when two or more parties are in conflict.*

The number of respondents who agreed or strongly agreed with the item are 27 (90%) in total. The respondents having a neutral opinion are 3 (10 %) out of the 30 respondents in this category. No respondent disagreed with this item.

A comparative analysis revealed that the population segment showing neutral responses (10%) mainly belongs to Norway (7%) and the UK (3%). These neutral responses came from the team members belonging to the product and sales (7%) and general management (3%) related work roles.

Strategic thinking construct's variable - Situation handling

Item 44: *I engage in discussions with those who hold a different point of view.*

The number of respondents who agreed or strongly agreed with the item are 22 (73.3%) in total. The respondents having a neutral opinion are 8 (26.67 %) out of the 30 respondents in this category. No respondent disagreed with this item.

A comparative analysis revealed that the population segment showing neutral responses (27%) belongs to the UK (10%) and Finland (10%) mainly and Norway (7%) moderately. These neutral responses came from team members belonging to the product and sales (10%), design (7%), project management (7%) and technical engineering (3%) related work roles.
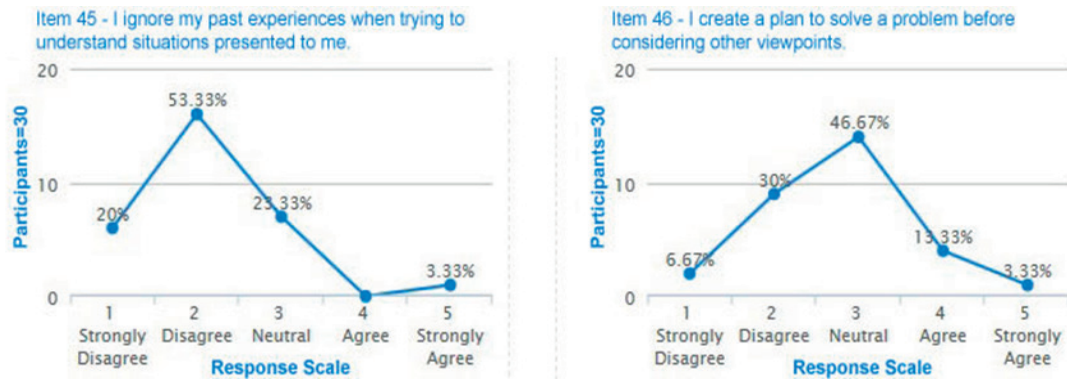
Figure 51. Survey results - strategic thinking - Questions No.45-46

Strategic thinking construct's variable - Situational referencing

Item 45: *I ignore my past experiences when trying to understand situations presented to me.*

The number of respondents who disagreed or strongly disagreed with the item are 22 (73.3%) in total. The respondents having a neutral opinion are 7 (23.3 %) out of the 30 respondents in this category. Only 1 (3.3%) respondent showed his agreed with the item.

A comparative analysis revealed that the population segment showing disagreement (73.3%) belongs to Norway (26.6%) and the UK (26.6%) mainly and Finland (20%) moderately. The disagreement came from team members belonging to the product and sales (23%), project management (17%), general management (23%) and design (10%) related work roles.

Strategic thinking construct's variable - Situational referencing

Item 46: *I create a plan to solve a problem before considering other viewpoints.*

The number of respondents who disagreed or strongly disagreed with the item are 11 (36.6%) in total. The respondents having a neutral opinion are 14 (46.6 %) out of the 30 respondents in this category. The respondents who have agreed with the item are 5 (16.6%).

A comparative analysis revealed that the population segment showing disagreement (36.6%) belongs to the UK (16.6%), Finland (10%) and Norway (10%). These negative responses came from the team members belonging to the

product and sales (10%), design (13%) and general management (13%) related work roles.

5.2.8 Pseudo Transformational Leadership construct;

Research Question 1: How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?

And partially;

Research Question 4: How significantly are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

The pseudo-transformational leadership, or dark leadership, construct variable consisted of four items/questions to gather respondent's feedback on the quality of the current management practices of the targeted company to evaluate its effects on the new product development idea generation practices. The purpose here was to identify gaps, if any to suggest supportive measures in accordance with the study´s objectives.

5.2.8.1   Reliability check for construct - Pseudo Transformational Leadership

The pseudo-transformational leadership construct, Cronbach Alpha was calculated as 0.66 representing `acceptable` internal item consistency to anticipate the overall construct reliability (Cronbach, 1951). The current estimated Alpha values detailed below presents the internal consistency for each item included to evaluate the Pseudo- transformational leadership construct;

Table18.   Cronbach Alpha and related statistics for construct items: pseudo- transformational leadership

Cronbach Alpha and related statistics for construct items - Pseudo-transformational leadership				
Items	Cronbach Alpha	Std. Alpha	G6(smc)	Average R
All items if deleted	0.66	0.703	0.8332	0.1647
Q47 excluded	0.6377	0.687	0.7858	0.1663
Q48 excluded	0.6267	0.6637	0.8027	0.1521
Q49 excluded	0.6346	0.6909	0.819	0.1689
Q50 excluded	0.6746	0.7125	0.8226	0.1838

Table 18 confirms that all the construct items are reliable and acceptable due to having Alpha values over 0.6. Therefore, all the construct items maintain acceptable internal consistency and therefore must be retained.

An overview and cross examination of each construct variable evaluating this category follows:

Table 19.   Pseudo- transformational leadership results

Item No.	Variables	Count	Average	Median	Unique	Standard deviation	Confidence interval at 95%	Highlighted Response trend
47	When assigning tasks, I consider people's skills and interests through my judgment.	30	3.86	4	4	0.62	3.64 – 4.08	Agreed and strongly Agreed with 60% and 13% respectively.
48	I expect my kind of work from my team members.	30	3.4	4	4	0.93	3.07 – 3.73	Agreed and strongly Agreed with 56% and 3.3% respectively.
49	I encourage everyone to work toward the same goal through my way.	30	2.9	3	3	0.98	3.58 – 4.22	Disagreed and Neutral with 30% and 33 response rate respectively.
50	Teams` performance is best when members keep repeating the same tasks for perfection instead of learning new skills.	30	1.9	2	1	0.88	1.59 – 2.21	Disagreed and strongly disagreed with 30% and 40% response rate respectively.

5.2.8.2   General overview of construct - Pseudo Transformational Leadership

A total of 30 responses contributed toward evaluating the quality of the current practices and clues for filling the gaps. The response mean average for all the four items representing the construct variable ranged from 1.9 to 3.86 which indicate clear mix from user disagreement to strong agreement towards the evaluation queries. Table 19 above shows a quantified statistical overview in detail. Graphic representation of item-wise scores in this category follows:
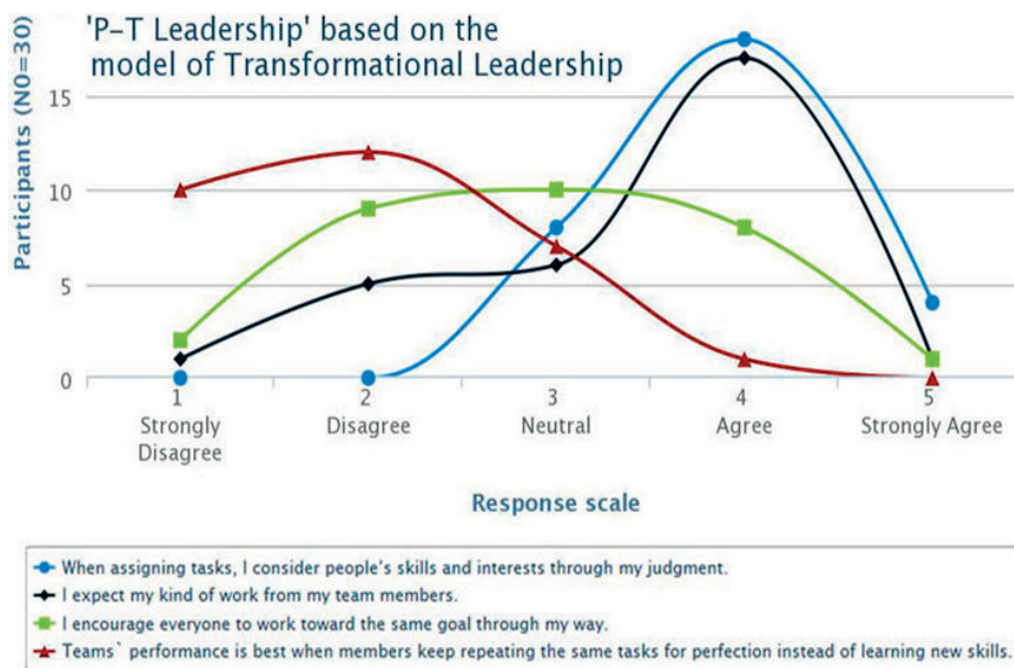
Figure 52. Overall quantitative results on pseudo transformational leadership construct

5.2.8.3   Analysis for construct - Pseudo Transformational Leadership

Table 19 and Figure 52 above, present a summarized response trend on pseudo-transformational leadership category. The feedback by the survey recipient showed a mixed opinion trend on a scale of 1 to 5.

In two items (i.e, 47 and 48) out of the total four, the reliability exceeds the satisfactory level of agreement. However, in the remaining two incidents (i.e. items 49 and 50) the response pattern reflected a mixed trend by splitting each one into disagreement, agreement and neutral categories. For comparative analysis, four items in this category were divided into two groups.

Item orientation scores representation is as follows:
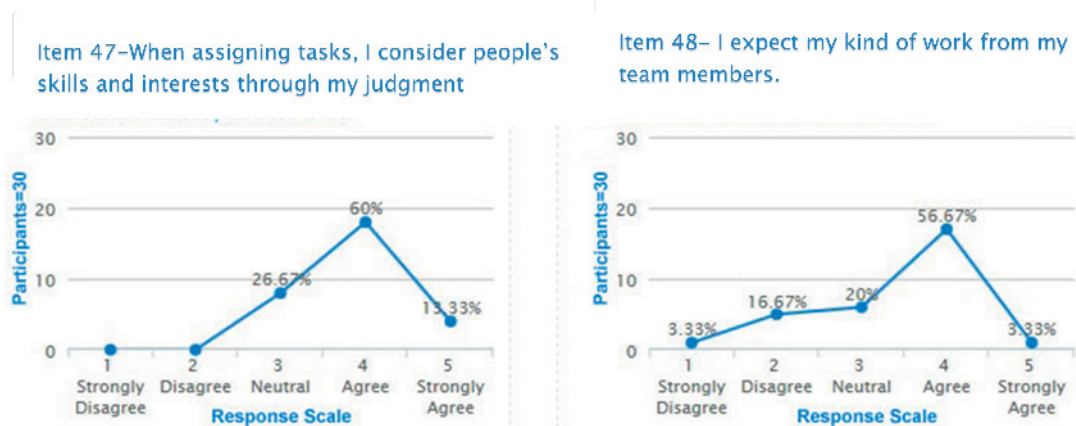
Figure 53. Survey results - pseudo transformational leadership - Questions No. 47-48

Pseudo -transformational leadership construct variable – High inspirational motivation

Item 47: *When assigning tasks, I consider people's skills and interests through my judgment.*

The number of respondents who agreed or strongly agreed with the item are 22 (73.3%) in total. The respondents having a neutral opinion are 8 (26.6 %) out of the 30 respondents in this category. No respondent disagreed with this item. A comparative analysis revealed that the population reflecting higher level of agreement (73%) belongs to all the three study locations; i.e. Finland (20%) and the UK (23%) and Norway (30%). The agreement came from team members belonging to the general management (20%), design (17%), product and sales (17%), project management (13%), technical engineering (7%), and related work roles.

Pseudo - Transformational leadership construct variable – High inspirational motivation

Item 48: *I expect my kind of work from my team members.*

The number of respondents who agreed or strongly agreed with the item are 18 (60%) in total. The respondents having a neutral opinion are 6 (20 %) out of the 30 respondents in this category. The respondents who disagreed or strongly disagreed with the item are 6 (20%). A comparative analysis revealed that the population showing a higher level of agreement (60%) belongs to all the three

study locations; i.e. Finland (20%) the UK (17%) and Norway (23%). The agreement came from team members belonging to the general management (13%), design (10%), product and sales (17%), project management (7%), technical engineering (13%), and related work roles.
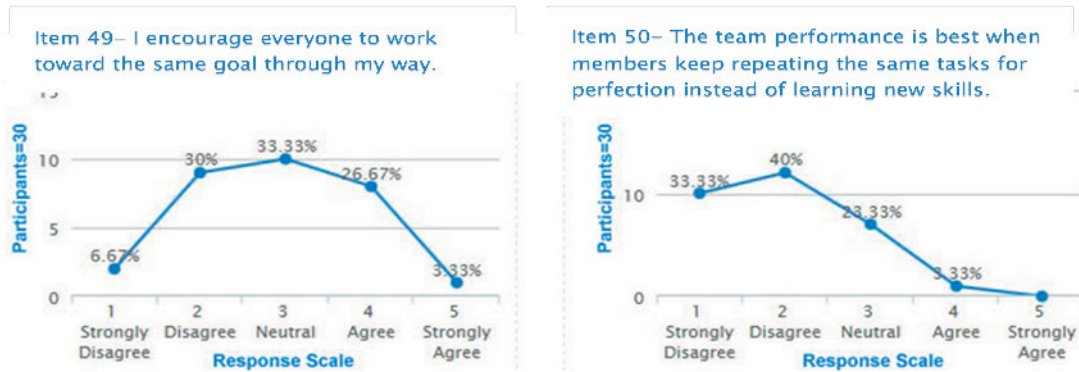
Figure 54. Survey results - pseudo transformational leadership - Questions No. 49-50

Pseudo - Transformational leadership construct variable - Low idealized influence

Item 49: *I encourage everyone to work toward the same goal through my way.*

The number of respondents who disagreed or strongly disagreed with the item are 11 (36.6%) in total. The respondents having a neutral opinion are 10 (33.3 %) out of the 30 respondents in this category. The number of respondents who agreed or strongly agreed with the item are 9 (30%) in total. A comparative analysis revealed that the population showing agreement (30%) belongs to all the three study locations, i.e. Finland (17%) the UK (7%) and Norway (7%). The agreement came from team members belonging to the general management (10%), product and sales (17%), and design (7%) and related work roles.

Pseudo - transformational leadership construct variable - Low idealized influence

Item 50: *The team performance is best when members keep repeating the same tasks for perfection instead of learning new skills.*

The number of respondents who disagreed or strongly disagreed with the item are 22 (73.3%) in total. The respondents having a neutral opinion are 7 (23.3 %)

out of the 30 respondents in this category. Only 1 (3.3%) respondent agreed with this item. The respondents who disagreed or strongly disagreed with the item are 6 (20%). A comparative analysis showed that the one respondent who reflected agreement (3%) belongs to Norway (3%) and is working in a product and sales (3%) related work role.

5.3 Analysis 2 – Operational category/ work role orientation

This section presents an operational category / work role specific analysis with respect to the new product development related organizational practices that affect teamwork linked to the new idea generation support process. In addition, as examined in the previous section, an additional evaluation will be conducted to observe if there are gaps among various operational or work roles in terms of new product development related areas that can be improved further.

5.3.1 NPD idea support vs. work roles
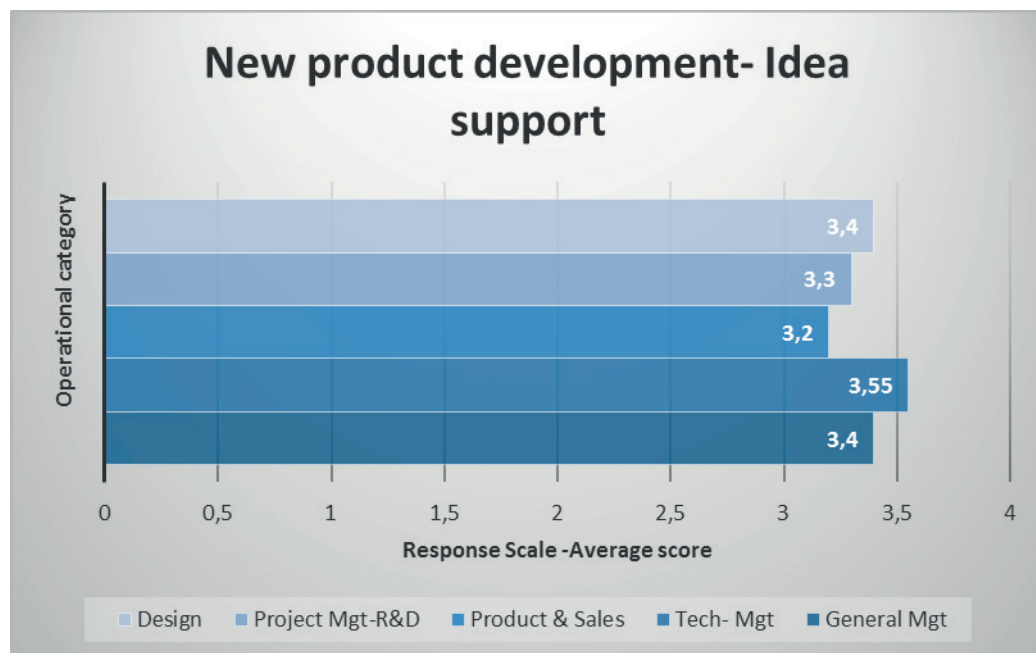
Figure 55. Comparative analysis - NPD idea support vs. work roles

As mentioned in the initial part of the report, the study participants were divided into five categories on the basis of the departments or the work roles they are officially reporting to. Figure 55 above presents a relational trend between the new product developments – idea support related indicators, mentioned in the

study questionnaire (i.e. question items 1 to 16) and the five work roles or operational categories.

5.3.1.1 Analysis of results on NPD idea support vs. work roles

According to the Figure 55 above, the study recipients working in technical management related operations reflected the highest level of agreement (i.e. exceeding the level of 3.5). The study sample related to the `design` and `general management` operational categories average scores touched the 3.4 level, which safely falls in the agreement level. Though the study participants linked to project management, research and development and product and sales related work operations were thought to reflect higher, the reality presented the opposite trend, i.e. slightly higher than the neutral score range (i.e. 3.3. and 3.2 respectively). This trend further suggests that if given more facilities, freedom and training based on the themes of transformational leadership and key strategic thinking factors, the company can sharpen the cognitive skill base of their workforce related to the new product development operations.

5.3.2 Work leadership vs. work roles
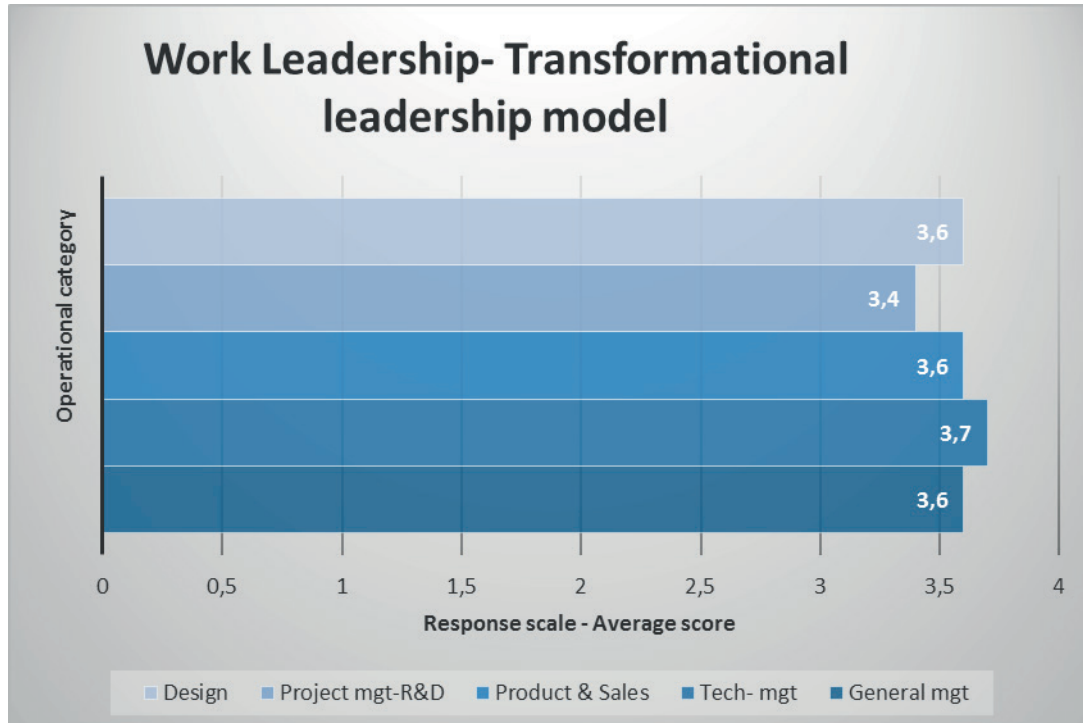
Figure56. Comparative analysis - work leadership vs. work roles

Figure 56, presents a relational trend between the current work practices related to leadership indicators, mentioned in the study questionnaire (i.e. question items 17 to 24) with the five operational categories.

5.3.2.1 Analysis of results on work leadership vs. work roles

According to Figure 56, once again the study recipients working in technical management related operations reflected the highest level of agreement (i.e. touching the level of 3.7). The study sample related to the 'design', 'product and sales' in addition to the 'general management' operational categories average scores touched 3.6 which safely falls in the agreement level. Here again the study participants linked to project management and research and development related work operations reflected marginally higher than the neutral score range (i.e. 3.4) as compared to other operations.

This suggests that more support from the organizational policy makers can enhance the skill base of their workforce related to the new product development operations especially related to the project management and research and development.

5.3.3 NPD team climate vs. work roles
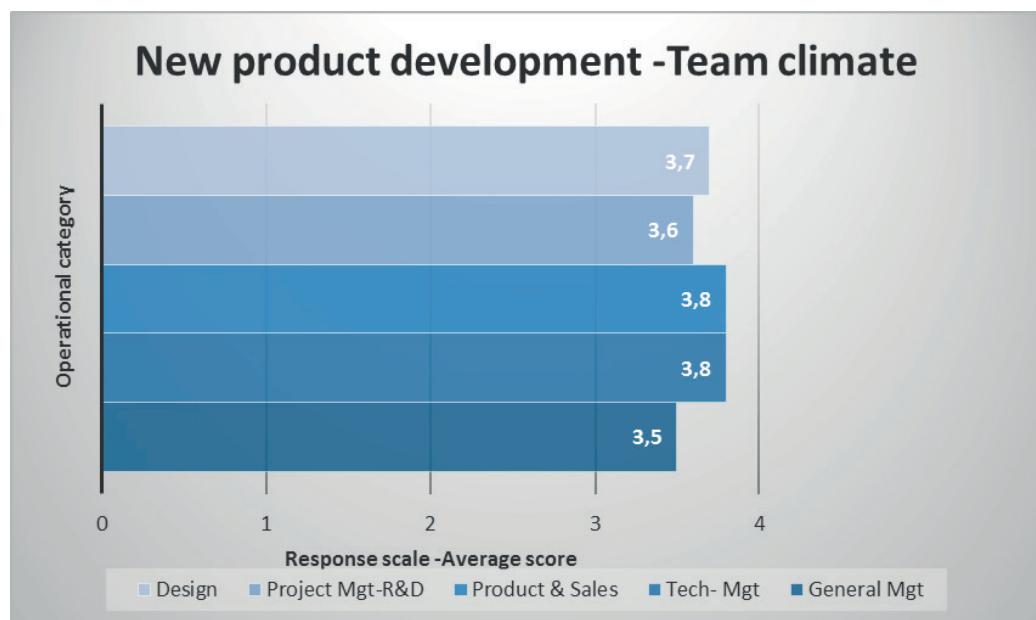
Figure 57. Comparative analysis - NPD team climate vs. work roles

Figure 57 above presents a relational trend between the current work practices related to new product development team climate indicators, as mentioned in the study questionnaire (i.e. question items 25 to 34) with the five operational categories.

5.3.3.1   Analysis of results on NPD team climate vs. work roles

According to the Figure 57 above, the study recipients working in Technical Management, and product and sales related operations reflected the highest level of agreement (i.e. touching the level of 3.8). Second place went to employees related to the 'design' related work operation. Third place went to those study participants linked to 'project management and research and development'. The study participants linked to the 'general management' related operational categories average scores touched 3.5 level, which safely falls within the range of agreement level but reflect the lowest agreement ratio as compared to the study participants related to the other work categories.

The comparative tabulation in this response category reflected an obvious gap wherein the general management related study participants displayed lower response scores, since they are considered to be the motivators as well as the team climate builders. Hence, by focusing more on the skill levels, intelligent resource utilization techniques and advanced capacity building approach through general management´s enhanced level of involvement; the target organization can easily achieve a high level of productivity in the field of new product development operations and output.

5.3.4 Strategic thinking vs. work roles
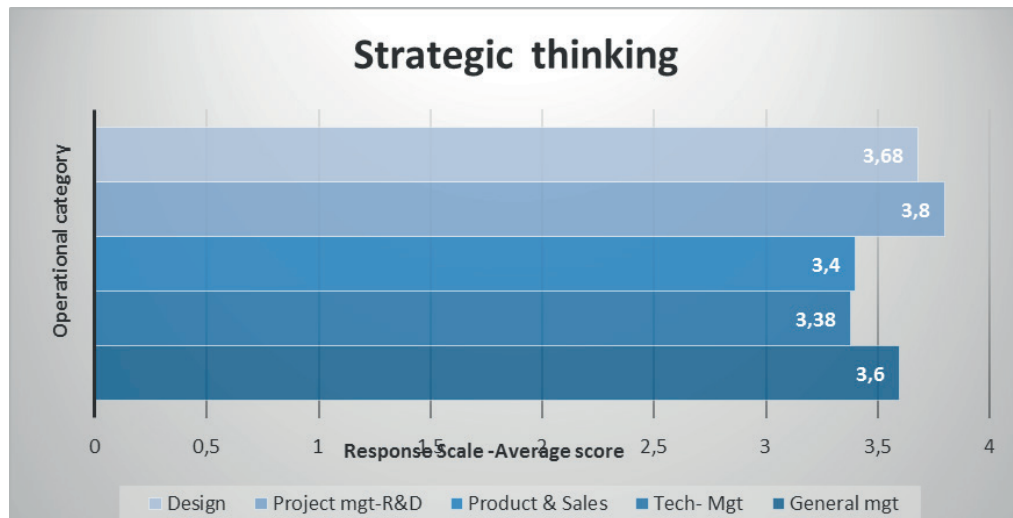
Figure 58. Comparative analysis - strategic thinking vs. work roles

Figure 58 above presents a relational trend between the current work practices related to leadership indicators, mentioned in the study questionnaire (i.e. question items 35 to 46) with the five operational categories.

5.3.4.1   Analysis of results on strategic thinking vs. work roles

According to the above Figure 58, the study recipients working in project management and research and development related operations reflected the highest level of agreement (i.e. touching the level of 3.8). The study sample related to the 'design' related operational category achieved an average score exceeding 3.6. The 'general management operations` related study participants achieved third place on strategic thinking related inventory items.

However, the study participants linked to the 'product and sales' and `technical management` related work operations showed the lowest score averages i.e. 3.3 and 3.4, respectively. This suggests an obvious gap since the work teams linked with the product and sales and technical management are quite related to new product development practices and they ought to be equipped with strategic thinking capability for organizational productivity.

5.3.5 Pseudo- transformational leadership vs. work roles
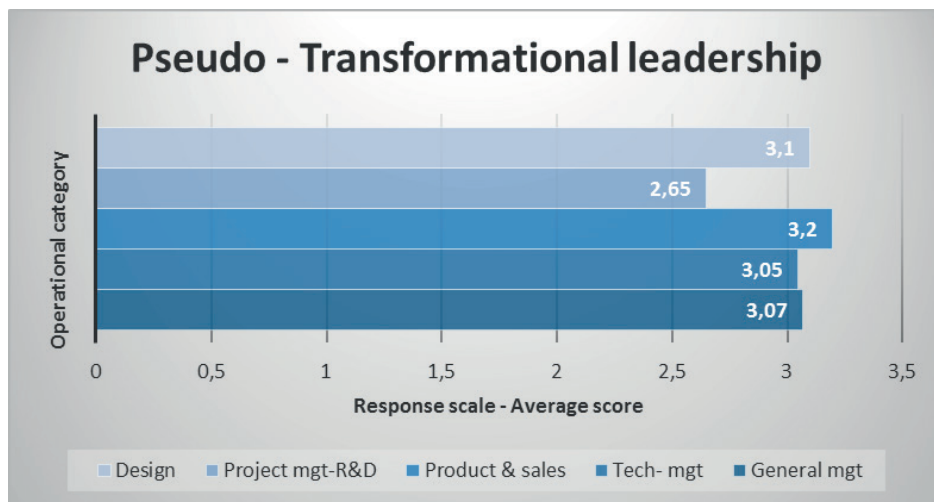
Figure 59. Comparative analysis - pseudo-transformational leadership vs. work roles

Figure 59 above presents a relational trend between the current work practices providing insights into pseudo transformational leadership as mentioned in the study questionnaire (i.e. question items 47 to 50) with the five operational categories.

5.3.5.1   Analysis of results on pseudo- transformational leadership vs. work roles

According to Figure 59 displayed above, the study recipients working in 'design', 'technical management', 'product and sales' and 'general management' related operations reflected a similar and comparatively higher level of agreement (i.e. slightly exceeding the level of 3), which is a faulty trend. The study participants associated with 'project management' and 'research and development' reflected the right approach in scoring within the range of ('2' that is disagreement) since this category measures a faulty leadership approach if present with in any work environment. Therefore, the analytical suggestion for the targeted company´s management to combat this trend by implementing the right leadership pattern is by focusing less on an 'I' or 'Me' approach to leadership and sharing power among the team members.

5.4 Analysis 3 – Location orientation

This section displays a location specific feedback analysis with respect to new product development work practices which significantly affect the work team distributed at three global locations. In the current study, 10 survey participants each from three targeted work locations of the subject company (i.e. Finland, the UK, and Norway) were selected to offer their feedback on a set of specialized survey questionnaires (i.e. a - Questionnaire having 50 closed ended items to finalize quantitative analysis and b – Questionnaire having 10 open ended items to perform qualitative feedback analysis).
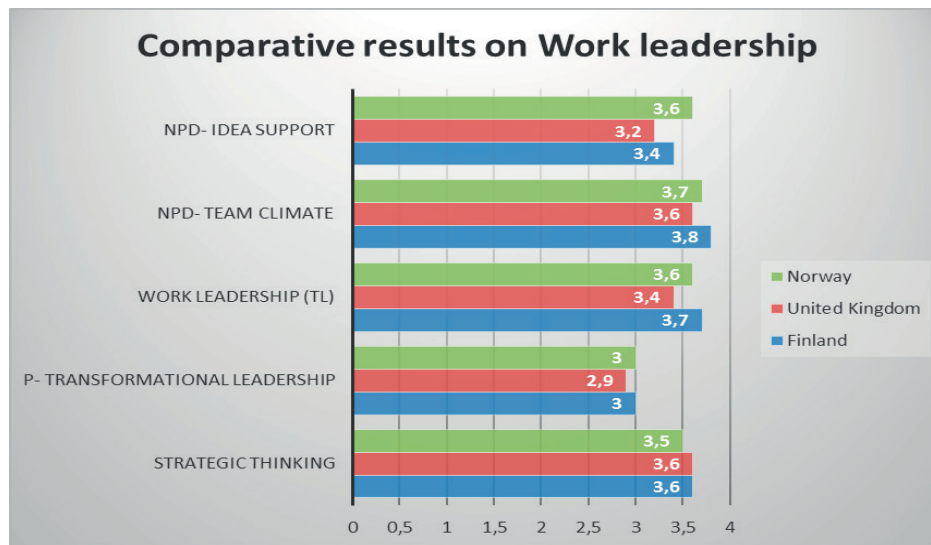
Figure 60. Comparative analysis on selected categories vs. work location

5.4.1 Target company's work location in Finland

The survey received 100% contribution through the feedback from the selected study participants in the targeted office in Finland.

5.4.1.1 Analysis of results on work location in Finland

According to Figure 60 above, comparative data analysis revealed that the study participants representing Finland´s office displayed higher levels of scores on items related to new product development (NPD) team climate trends, i.e. overall average score of 3.6, as compared to the other two work locations (i.e. the UK and Norway. In addition, the group scored significantly higher on new product development (NPD) idea support, Work Leadership categories and strategic

thinking (i.e. overall averages of 3.4, 3.7 and 3.6 respectively). In addition, the group´s higher average score on pseudo transformational leadership reveal that there are obvious gaps in the work leadership practices that require immediate attention through suitable management measures.

5.4.2 Target company's work location in the UK

The contribution from the UK office was 100% feedback received from the participants.

5.4.2.1   Analysis of results on work location in the UK

On the basis of comparative data analysis (i.e. Figure 48 above) the UK based work group displayed higher levels of scores on items related to strategic thinking trends, i.e. an overall average score of 3.6, higher than the group in Norway but similar to the group in Finland. In addition, the group scored lower on new product development (NPD) idea support and team climate in addition to work leadership categories (i.e. overall averages of 3.2, 3.6 and 3.4, respectively) as compared to the other two work locations (i.e. Finland and Norway). However, this work location reflected a positive trend by reflecting lower group average scores on pseudo-transformational leadership (i.e. 2.9) as compared to the two targeted work groups (i.e. Norway and Finland). Since modern leadership puts more focus on an unbiased leadership approach, therefore stronger and more effective work leadership patterns can be achieved when the work groups score lower on the highlighted trends included in our survey on the section – pseudo-transformational leadership.

5.4.3 Target company's work location in Norway

The contribution from the Norway office was also 100% feedback received.

5.4.3.1   Analysis of results on work location in Norway

Comparative data analysis (i.e. Figure 60 above) revealed that the study participants from the Norway office displayed higher levels of scores on items related to new product development (NPD) idea support, i.e. an overall average score 3.6 as compared to the lower scores of the other two work locations.

In addition, the group scored significantly higher on new product development (NPD) team climate and work leadership categories (i.e. group´s average scores of 3.7 and 3.6, respectively) as compared to the group working at the UK office. In addition, the group´s higher average score on pseudo transformational leadership reveals that there are obvious gaps in the work leadership practices. Further improvements can be suggested in the areas of strategic thinking related key dimensions, since the group scored lower as compared with other work locations i.e. overall average scores of 3.5. The response pattern of the group suggested that there is ample margin for refinement with reference to strategic thinking related skill base to lead and support new product idea generation areas for organizational new product development process up-grading. The next section will present the logic behind the validity of the proposed theoretical framework extension by incorporating transformational leadership and strategic thinking into new product team dynamics for organizational innovation.

Fusing the two constructs, transformational leadership and strategic thinking, with new product development (NPD) idea support and team climate through the selected study variables

After conducting a detailed analysis on the study constructs (i.e. transformational leadership, pseudo transformational leadership, strategic thinking and new product idea support and team climate) from the individual study variable perspective, the current section of data analysis includes linkages among the various constructs through cross comparative analysis by taking the pair of variables. The linkages among study variables were analyzed on the basis of Pearson correlation coefficient calculation to examine the strength and direction of the relationship between two variables belonging to either the same or different theoretical constructs, to confirm the validity of the proposed extended theoretical framework, along with the devised qualitative or quantitative study tools. And most significantly, the above process helps in responding to the final research question of the current study, which is as follows:

Research question 5: What is the empirical significance of the fusion of constructs (i.e., transformation leadership, pseudo-transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?

While answering the final research question the author intends to share that this dimension of the current research carries the main purpose of the current empirical effort. This research study started with the logic of proposing a fusion of various earlier established theoretical models to suggest a system thinking

approach: The process offered an opportunity to visualize the complete picture where transformational leadership, free from the pseudo effect, along with strategic thinking supports the process of new product team dynamics. This offers the ultimate aim of harnessing organizational innovation initiatives, rather than visualizing the effect of an individual concept (i.e. organizational leadership, corporate strategy, NPD work team issues and the organizational innovation initiatives) since all are interlinked. A realistic empirical approach demands the combination of aspects and their impacts as a whole rather than the analysis of parts; for example only analyzing the leadership role in work teams or the effect of leadership on organizational performance may neglect numerous related factors that may have stronger effects on the outcomes of future research if conducted on the same social setting by taking any different factor (e.g. team workers' performance effectiveness and organizational strategies on their communication and support infrastructure etc.). Hence, while going ahead with statistical method selection (McCram-Gardner, 2008) to explore the strength of linkages or degree of association' between two 'variables (independent variables)' in a situation where the initial data was converted into 'averages' in the case study with quite small 'sample or population size', the author followed the following facts for guidance. The statistical analysis of data can be conducted by selecting either one of the two options keeping in view the relevant features.

a- Parametric testing,

Parametric testing option is suitable if the data is normally or moderately non-normally distributed. Its assumed variance is homogenous, data type is either 'ratio' or 'interval' based. The usual central measure is 'mean'. The aims of testing are to draw more conclusions and to deal better with small population size, etc. It is suitable to use Pearson correlation to explore the degree of association between the independent variables. To deal with the independent measures between 2 or more groups, it is required to opt for T-test and ANOVA etc. but for repeat measurement of 2 or more conditions, it is suitable to opt for matched pair T-test (Pearson, 1920; Hryniewicz, Karpinski, 2014; Chok, N. S. 2010).

b- Non-parametric tests

Non- parametric testing option is relevant if the data is normally or non-normally distributed. Its assumed variance is either homogenous or non- homogenous, data type is either 'ordinal' or 'nominal' based.

The usual central measure is 'median'. The aims of testing are to opt for simplicity and the fact that it is less effected by outliers etc.

Spearman correlation, (for ranks) or Kendall's coefficient are suitable to explore the degree of association between the independent variables. To deal with independent measures between 2 or more groups, it is recommended to opt for Mann Whitney U test or Kruskal Wallis test etc. but for repeat measurement of 2 or more conditions, it is suitable to opt for Wilcoxon test or Friedman's test etc. depending upon the requirements and situational needs (Pearson, 1920; Hryniewicz, Karpinski, 2014; Chok, N. S. 2010).

Keeping in view the facts detailed in the above, the author considered the current case study's following features and the reasons for exploration and then selected sample correlation coefficient (termed as Pearson product movement correlation coefficient or simply Pearson Correlation coefficient for short) (Pearson, 1920; Hryniewicz, Karpinski, 2014; Chok, N. S. 2010; Hauke, Kossowski, 2011):

1. The basic data is 'combined averages'. In addition, the intension of statistical data exploration was to visualize the strength of relationship between two independent variables of the study,

2. The assumed distribution is normal (or slightly non-normal in few instances), In addition, the current case study dealt with considerably 'small sample size'.

3. The method gives no importance to the fact that which variable is independent and which is not so even reversing the sequence gives the same results,

4. It offers the researcher maximum freedom to interpret the results according to his/her study requirements.

The selection of the method was additionally based on the following general considerations:

a. The preferred method is considered a measure of strength of a linear association between two either normally or moderately non-normal distributed independent variables. (However, in the cases of non-normally distributed variables, when the data is in ranks and their inter-relationship is non-linear, Spearman rank correlation or Kendall's coefficient methods are considered more appropriate (Hauke, Kossowski, 2011).

b. The correlation coefficient is used to investigate the association between two interval or ordinal variables. If both variables are interval and approximately normally distributed then the Pearson's product-moment

correlation coefficient is used (Pearson, 1920; Hryniewicz, Karpinski, 2014; Chok, N. S. 2010).

c.   Pearson r is most widely used especially when the ranges of that data is moderate. Furthermore, its strongest feature is its capability to draw a line of best fit through the data of two variables (i.e., Such capability helps in indicating that how far away all the connecting data points are within the graphical line of best fit).

d.   Non parametric methods are typically less powerful as well as less flexible as compared to parametric tests. Hence, parametric methods are preferred if assumptions can be justified.

e.   Sometimes a transformation can be applied to the data to satisfy the assumptions such as log transformation or adding absolute '0' value to the score category in the middle of the Likert scale.

f.   One of the reasons of this method's popularity stems from the fact that in nearly all popular software tools, such as spreadsheets or basic versions of statistical packages, Pearson's coefficient of correlation r is the main measure used for the evaluation of regression models.

Hence, the current study is an effort to present the linkages through Pearson correlation coefficient among various concepts through the selected variables representing the referred constructs; i.e. transformational leadership, free from pseudo effect, strategic thinking and new product team dynamics to support organizational innovation process. The selected study variables (as displayed in Figure 5 of this dissertation) were divided into groups to analyze the linkages among the respective study constructs (i.e. transformational leadership, strategic thinking and NPD team climate and idea support) through hypothesis building:

Table 20. The study variables grouped in two to test the correlation

Sr. No.	Theoretical background	variable	Theoretical background	variable
H1	NPD idea support	Early client involvement	NPD idea support	Target reach
H2	NPD idea support	Customer value	NPD idea support	Target reach
H3	NPD idea support,	Early Client involvement	NPD idea support,	Customer value
H4	NPD idea support,	Management initiatives	Transformational leadership	Trust
H5	NPD idea support,	Management initiatives	Transformational leadership	Affiliation with leader
H6	Transformational leadership	Affiliation with leader	Transformational leadership	Trust
H7	Transformational leadership	Supportive leadership	NPD idea support,	Team initiative
H8	Transformational leadership	Supportive leadership	NPD idea support and NPD team climate	Collaboration
H9	NPD idea support,	Management initiatives	NPD idea support and NPD team climate	Collaboration
H10	Transformational leadership	Supportive leadership	Transformational leadership	Trust
H11	NPD idea support	Customer value	NPD idea support and NPD team climate	Communication
H12	NPD idea support and NPD team climate	Communication	NPD idea support	Target reach
H13	NPD idea support	Market intelligence	NPD idea support and NPD team climate	Communication
H14	NPD idea support,	Management initiatives	NPD idea support and NPD team climate	Communication
H15	Strategic thinking	Investigative approach	NPD idea support	Market intelligence
H16	NPD idea support	Market intelligence	NPD idea support	Responsiveness
H17	NPD idea support	Responsiveness	NPD idea support	Idea generation
H18	Transformational leadership	Leader's competence to empower	Strategic thinking	Situational referencing
H19	Strategic thinking	Work situation	Strategic thinking,	Situational handling
H20	NPD idea support and NPD team climate	Communication	NPD idea support	Product innovativeness
H21	Transformational leadership	Team empowerment	Strategic thinking,	Work situation
H22	Transformational leadership	Leader's competence to empower	Strategic thinking,	Work situation
H23	NPD team climate	Collaboration	Strategic thinking,	Problem solving
H24	Transformational leadership	Leader's competence to empower	NPD idea support	Product innovativeness
H25	Strategic thinking	Investigative approach	NPD idea support	Product innovativeness

On the basis of the above study variables, the following hypotheses were devised to test the linkages among their respective study constructs:

H-1: *"Early client involvement"* (NPD idea support) is significantly linked to *"Target reaches"* (NPD idea support).

H-2: *"Customer value"* (NPD idea support), is significantly linked to *"target reach"* (NPD idea support).

H-3: *"Early client involvement"* (NPD idea support) is significantly linked to *"customer value"* (NPD idea support).

H-4: *"Early client involvement"* (NPD idea support) is significantly linked to *"Trust"* (transformational leadership- idealized influence).

H-5: The variable *"Management initiatives"* (NPD idea support) is significantly linked to *"Affiliation with leader"* (transformational leadership - idealized influence).

H-6: *"Organizational trust"* (transformational leadership- idealized influence) is significantly linked to *"Affiliation with leader"* (transformational leadership- idealized influence).

H-7: *"Supportive leadership"* (transformational leadership- inspirational motivation) is significantly linked to *"Team initiatives"* (NPD idea support).

H-8: *"Supportive leadership"* (transformational leadership- inspirational motivation) is significantly linked to *"Collaboration"* (NPD idea support and team climate).

H-9: The *"Management initiatives"* (NPD idea support) is significantly linked to *"Collaboration"* (NPD idea support and team climate).

H-10: *"Supportive leadership"* (transformational leadership) has significant degree of association with the variable organizational *"Trust"* (transformational leadership- idealized influence).

H-11: *"Customer Value"* (NPD idea support) is significantly linked to *"Communication"* (NPD idea support and NPD team climate).

H-12: *"Target reach"* (NPD idea support) is significantly linked to *"Communication"* (NPD idea support and NPD team climate).

H-13: *"Market Intelligence"* (NPD idea support) is significantly linked to *"Communication"* (NPD idea support and NPD team climate).

H-14: *"Management initiatives"* (NPD idea support) is significantly linked to effective *"Communication"* (NPD idea support and NPD team climate).

H-15: *"Investigative approach"* (strategic thinking) is significantly linked to *"Market intelligence"* (NPD idea support).

H-16: *"Market intelligence"* (NPD idea support) is significantly linked to team's *"Responsiveness"* (NPD team climate).

H-17: *"Idea generation"* (NPD idea support) is significantly linked to team's *"Responsiveness"* (NPD team climate).

H-18: *"Leader's competence to empower followers"* (transformational leadership) is significantly linked to *"Situational referencing"* (strategic thinking).

H-19: *"Work situation"* (strategic thinking) is significantly linked to *"Situational handling"* (strategic thinking).

H-20: *"Product innovativeness"* (NPD idea support) is significantly linked to organizational *"Communication"* (NPD idea support).

H-21: *"Team empowerment"* (transformational leadership) is significantly linked to *"Work situation"* (NPD team climate).

H-22: *"Leader's competence to empower"* (transformational leadership) is significantly linked to *"Work situation"* (NPD team climate).

H-23: *"Collaboration"* (NPD team climate) is significantly linked to *"Problem solving"* (strategic thinking) initiatives.

H-24: *"Leader's competence"* to empower followers (transformational leadership) is significantly linked to *"Product innovativeness"* (NPD idea support).

H-25: *"Investigative approach"* (strategic thinking) is significantly linked to *"Product innovativeness"* (NPD idea support).

The following section presents the results on testing of the study hypotheses and data analysis to evaluate if there is a positive linkage among the study variables representing the study constructs (i.e. transformational leadership, strategic thinking, and new product development team support as well as the team climate.

The appearance of positive correlation among the study variables will prove the existence of linkages among the selected theoretical concepts to extend the theoretical framework which was proposed in Chapter 1 and formulated in Chapter 2 of this dissertation.

i - Relationship between 2 variables - Early client involvement (NPD idea support) and target reach (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above referred variables yielded the r value of 0.47, thus technically proving a positive but weak correlation between the two study variables i.e. early client involvement (NPD idea support) and target reach (NPD idea support), since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.22.

Figure 61. Scatter plot to display regression trend of study's H1

According to Figure 61, the regression details reveal the following data facts with reference to the study hypothesis (H1):
  i.   Sample size: 30

  ii.   Mean x (x̄): 3.4

  iii.   Mean y (ȳ): 3.6

  iv.   Intercept (a): 2.09

  v.   Slope (b): 0.46

  vi.   Regression line equation: ŷ=2.09+0.45x

The P-Value calculated on the basis of R value is 0.009 and is significant at 5%. Therefore, the study hypothesis;

H1- "Early client involvement" (NPD idea support) is significantly linked to "target reach" (NPD idea support) is accepted.

ii - *Relationship between 2 variables - customer value (NPD idea support) and target reach (NPD idea support)*

Result analysis

The correlation calculation to assess the relationship between the above referred variables yielded the r value of 0.49, therefore, technically proving a positive but weak correlation between the two study variables (i.e. customer value (NPD idea support) and target reach (NPD idea support), since the nearer the value is to zero, the weaker the relationship. Furthermore, the value of R2, the coefficient of determination, is 0.24.

Figure 62. Scatter plot to display regression trend of study's H2

According to Figure 62, the regression details reveal the following data facts with reference to the study hypothesis (H2):

    i.   Sample size: 30

   ii.   Mean x ($\bar{x}$): 3.9

  iii.   Mean y ($\bar{y}$): 3.6

  iv.   Intercept (a): 1.7

   v.   Slope (b): 0.49

  vi.   Regression line equation: $\hat{y}=1.7+0.48x$

The P-Value calculated on the basis of R value is 0.005 and is significant at 5%. Therefore, the study hypothesis;

H-2: "Customer value" (NPD idea support) is significantly linked to "target reach" (NPD idea support) is accepted.

iii - Relationship between 2 variables – early client involvement (NPD idea support) and customer value (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.64. Thus, technically proving a positive but weak correlation between the two study variables (i.e. early client involvement (NPD idea support) and customer value (NPD idea support), since the nearer the value is to zero, the weaker the relationship. Furthermore, the value of R2, the coefficient of determination, is 0.43.

Figure 63. Scatter plot to display regression trend of study's H3

According to Figure 63, the regression details reveal the following data facts with reference to the study hypothesis (H3);

   i.   Sample size: 30
   ii.   Mean x ($\bar{x}$): 3.35
   iii.   Mean y ($\bar{y}$): 3.93
   iv.   Intercept (a): 1.8
   v.   Slope (b): 0.63
   vi.   Regression line equation: $\hat{y}=1.79+0.63x$

The P-Value calculated on the basis of R value is 0.00013 and is significant at 5%. Therefore, the study hypothesis:

H-3: "Early client involvement" (NPD idea support) is significantly linked to "customer value" (NPD idea support) is accepted.

iv - Relationship between 2 variables – Management initiatives (NPD idea support) and trust (transformational leadership-idealized influence)

Result analysis

The correlation calculation to assess the relationship between the above referred variables yielded the r value of 0.16, thus, technically proving a positive but weak correlation between the two study variables i.e. management initiatives (NPD idea support) and trust (transformational leadership- Idealized influence), since the nearer the value is to zero, the weaker the relationship. Furthermore, the value of R2, the coefficient of determination, is 0.02.

Figure 64. Scatter plot to display regression trend of study's H4

According to Figure 64, the regression details reveal the following data facts with reference to the study hypothesis (H4);

   i.   Sample size: 30

   ii.   Mean x ($\bar{x}$): 3.28

   iii.   Mean y ($\bar{y}$): 3.8

   iv.   Intercept (a): 3.25

   v.   Slope (b): 0.16

   vi.   Regression line equation: $\hat{y}=3.25+0.164x$

The P-Value calculated on the basis of R value is 0.40 and is not significant at 5%. Therefore, the study hypothesis;

H-4: "Management initiatives" (NPD idea support) is significantly linked to "trust" (transformational leadership- idealized influence) is not accepted.

v- Relationship between 2 variables – management initiatives (NPD idea support) and affiliation with leader (transformational leadership - idealized influence)

Result analysis

The correlation calculation to assess the relationship between the above referred variables yielded the r value of 0.51. Therefore, technically proving a positive but weak correlation between the two study variables (i.e. management initiatives (NPD idea support) and affiliation with leader (transformational leadership-idealized influence), since the nearer the value is to zero, the weaker the relationship. Furthermore, the value of R^2, the coefficient of determination, is 0.25.

Figure 65. Scatter plot to display regression trend of study's H5

According to Figure 65, the regression details reveal the following data facts with reference to the study variables of hypothesis (H5):

  i.   Sample size: 30
 ii.   Mean x ($\bar{x}$): 3.28
iii.   Mean y ($\bar{y}$): 3.83
 iv.   Intercept (a): 2.38
  v.   Slope (b): 0.44
 vi.   Regression line equation: y=2.38+0.44x

The P-Value calculated on the basis of R value is 0.004 and significant at 5%. Therefore, the study hypothesis;

H-5: "Management initiatives" (NPD idea support) is significantly linked to team´s sense of "affiliation with leader" (transformational leadership- idealized influence) is accepted.

vi- Relationship between 2 variables – Trust (transformational leadership- Idealized influence) and affiliation with leaders (transformational leadership- idealized influence)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.16, therefore, technically proving a positive but weak correlation between the two study variables i.e. trust (transformational leadership- idealized influence) and affiliation with leaders (transformational leadership- idealized influence), since the nearer the value is to zero, the weaker the relationship. Furthermore, the value of R2, the coefficient of determination, is 0.03.

Figure 66. Scatter plot to display regression trend of study's H6

According to Figure 66, the regression details reveal the following data facts with reference to the study variables of hypothesis (H6):

i. Sample size: 30

ii. Mean x ($\hat{x}$): 3.8

iii. Mean y ($\hat{y}$): 3.83

iv. Intercept (a): 3.32

v. Slope (b): 0.13

vi. Regression line equation: $\hat{y}=3.31+0.13x$

The P-Value calculated on the basis of R value is 0.39 and is not significant at 5%. Therefore, the study hypothesis:

H-6: "Organizational trust"(transformational leadership- Idealized influence) is significantly linked to the team´s "affiliation with leader"(transformational leadership- idealized influence) is not accepted.

vii- Relationship between 2 variables – Supportive leadership (transformational leadership- inspirational motivation) and team initiative (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.13. Thus, technically proving a positive but weak correlation between the two study variables (i.e. *"supportive leadership" (transformational leadership- inspirational motivation) and "team initiative" (NPD idea support)* since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.02.

Figure 67. Scatter plot to display regression trend of study's H7

According to Figure 67, the regression details reveal the following data facts with reference to the study variables of hypothesis (H7):

    i.   Sample size: 30

   ii.   Mean x (x̄): 3.7

  iii.   Mean y (ȳ): 3.8

  iv.   Intercept (a): 3.

   v.   Slope (b): 0.15

  vi.   Regression line equation: ŷ=3.20+0.15x

The P-Value calculated on the basis of R value is 0.48 and is not significant at 5%. Therefore, the study hypothesis;

H-7: "Supportive leadership" (transformational leadership) is significantly linked to "team initiative" (NPD idea support) is not accepted.

viii- Relationship between 2 variables– supportive leadership (transformational leadership- inspirational motivation) and collaboration (NPD idea support and team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.19 thus, technically proving a positive but weak correlation between the two study variables (i.e. *"supportive leadership" (transformational leadership- inspirational motivation) and "collaboration" (NPD idea support and team climate)* since the nearer the value is to zero, the weaker the relationship. In addition, the value of $R2$, the coefficient of determination, is 0.04.

Figure 68. Scatter plot to display regression trend of study's H8

According to Figure 68, the regression details reveal the following data facts with reference to the study variables of hypothesis (H8):

  i.   Sample size: 30

 ii.   Mean x ($\bar{x}$): 3.67

iii.   Mean y ($\bar{y}$): 3.86

 iv.   Intercept (a): 3.22

  v.   Slope (b): 0.17

 vi.   Regression line equation: $\hat{y}=3.22+0.17x$

The P-Value calculated on the basis of R value is 0.29 which is not significant at 5%. Therefore, the study hypothesis;

H-8: "Supportive leadership" (transformational leadership) is significantly linked to "collaboration" (NPD idea support) is not accepted.

xi- Relationship between 2 variables – management initiatives (NPD idea support) and collaboration (NPD idea support and team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.42, thus, technically proving a positive but weak correlation between the two study variables i.e. *Management initiatives - NPD idea support and "collaboration - NPD idea support and team climate)* since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.18.
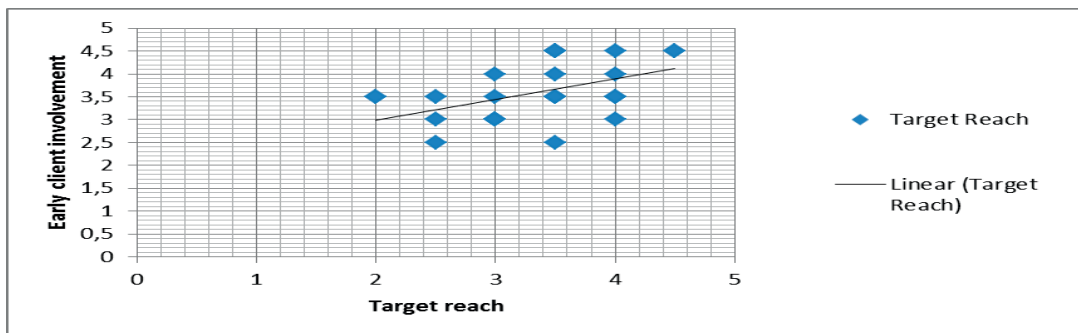

Figure 69. Scatter plot to display regression trend of study's H9

According to Figure 69, the regression details reveal the following data facts with reference to the study variables of hypothesis (H9):

  i.   Sample size: 30

 ii.   Mean x ($\bar{x}$): 3.28

iii.   Mean y ($\bar{y}$): 3.86

 iv.   Intercept (a): 2.92

  v.   Slope (b): 0.29

 vi.   Regression line equation: $\hat{y}=2.91+0.29x$

The P-Value calculated on the basis of R value is 0.02 and is significant at 5%. Therefore, the study hypothesis;

H-9: The variable "Management initiatives" (NPD idea support) is significantly linked to "collaboration" (NPD idea support and team climate)" (NPD idea support) is accepted.

x- Relationship between 2 variables – Supportive leadership (transformational leadership) and trust (transformational leadership- idealized influence)

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.28, thus, technically proving a positive but weak correlation between the two study variables (i.e. supportive leadership (transformational leadership) and trust (transformational leadership- Idealized influence) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.08.
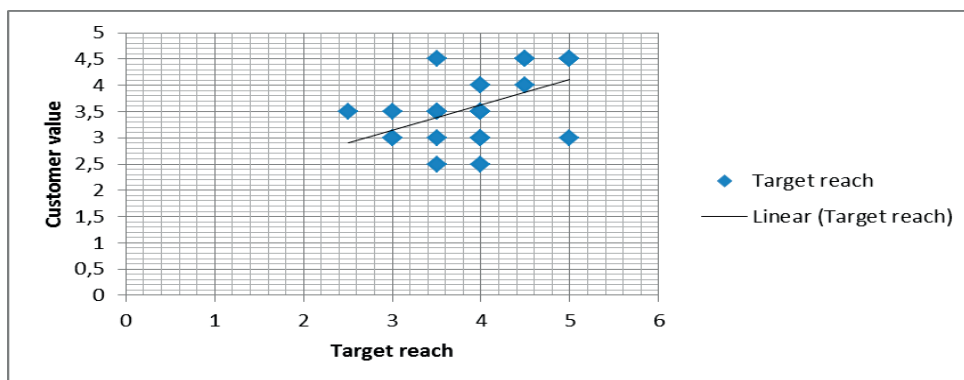

Figure 70. Scatter plot to display regression trend of study's H10

According to Figure 70, the regression details reveal the following data facts with reference to the study variables of hypothesis (H10):

   i.   Sample size: 30
  ii.   Mean x ($\bar{x}$): 3.7
 iii.   Mean y ($\bar{y}$): 3.8
  iv.   Intercept (a): 2.36
   v.   Slope (b): 0.39
  vi.   Regression line equation: y=2.36+0.39x

The P-Value calculated on the basis of R value is 0.13 and is not significant at 5%. Therefore, the study hypothesis;

H-10: "Supportive leadership" (transformational leadership) is significantly linked to organizational "trust" (transformational leadership- idealized influence) is not accepted.

xi- Relationship between 2 variables – customer value (NPD idea support) and communication (NPD idea support and NPD team climate)

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.39, therefore technically proving a positive but weak correlation between the two study variables (i.e. customer value (NPD idea support) and communication (NPD idea support and NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.15.
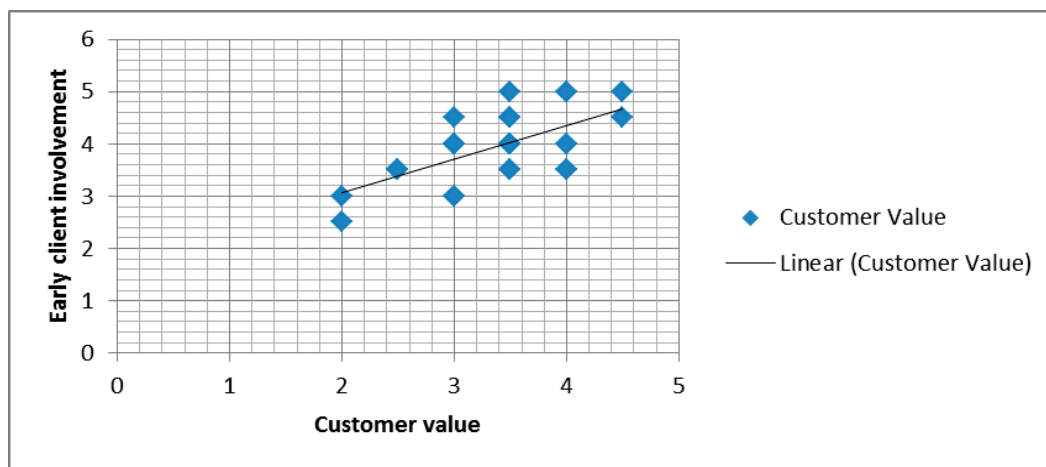

Figure 71.   Scatter plot to display regression trend of study's H11

According to Figure 71, the regression details reveal the following data facts with reference to the study variables of hypothesis (H11):

  i.   Sample size: 30
  ii.   Mean x (x̄): 3.93
  iii. Mean y (ȳ): 3.45
  iv.   Intercept (a): 2.2
  v.   Slope (b): 0.32
  vi.   Regression line equation: ŷ=2.19+0.32x

The P-Value calculated on the basis of R value is 0.03 proving the result as significant at 5%. Therefore, the study hypothesis;

H-11: "Customer value" (NPD idea support) is significantly linked to "communication" (NPD idea support and NPD team climate) is accepted.

xii - Relationship between 2 variables - target Reach (NPD idea support) and communication (NPD idea support and NPD team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.16, thus, technically proving a positive but weak correlation between the two study variables (i.e. target reach (NPD idea support) and communication (NPD idea support and NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.03.
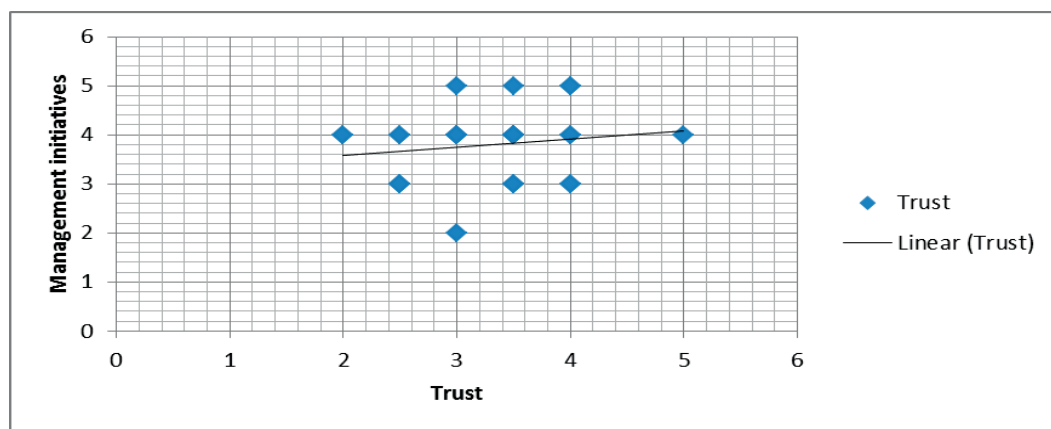

Figure 72. Scatter plot to display regression trend of study's H12

According to Figure 72, the regression details reveal the following data facts with reference to the study variables of hypothesis (H12):

    i.   Sample size: 30

    ii.   Mean x ($\bar{x}$): 3.6

    iii.   Mean y ($\bar{y}$): 3.45

    iv.   Intercept (a): 2.95

    v.   Slope (b): 0.14

    vi.   Regression line equation: $\hat{y}=2.95+0.14x$

The P-Value calculated on the basis of R value is 0.38 proving the result is not significant at 5%. Therefore, the study hypothesis;

H-12: "Target reach" (NPD idea support) is significantly linked to effective "communication" (NPD idea support and NPD team climate) is not accepted.

xiii- Relationship between 2 variables – Market intelligence (NPD idea support) and communication (NPD idea support and NPD team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.27, therefore technically proving a positive but weak correlation between the two study variables (i.e. market intelligence (NPD idea support) and communication (NPD idea support and NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.07.
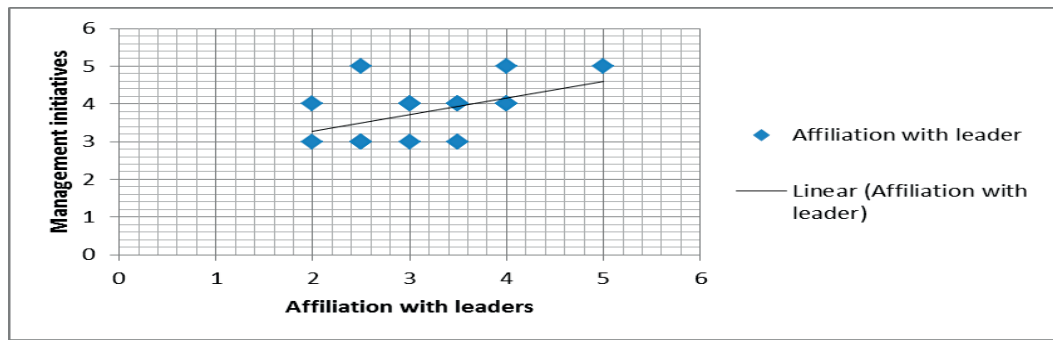

Figure 73. Scatter plot to display regression trend of study's H13

According to Figure 73, the regression details reveal the following data facts with reference to the study variables of hypothesis (H13):

i.   Sample size: 30

ii. Mean x (x̄): 3.08

iii. Mean y (ȳ): 3.45

iv. Intercept (a): 2.85

v.   Slope (b): 0.19

vi. Regression line equation: ŷ=2.85+0.19x

The P-Value calculated on the basis of R value is 0.16 and is not significant at 5%. Therefore, the study hypothesis;

H-13: "Market intelligence" (NPD idea support) is significantly linked to effective "communication" (NPD idea support and NPD team climate) is not accepted.

xvi- Relationship between 2 variables – Management initiatives (NPD idea support) and communication (NPD idea support and NPD team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.33, thus, technically proving a positive but weak correlation between the two study variables (i.e. management initiatives- NPD idea support) and communication - NPD idea support and NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.11.

Figure 74. Scatter plot to display regression trend of study's H14

According to Figure 74, the regression details reveal the following data facts with reference to the study variables of hypothesis (H14):
   i.   Sample size: 30

   ii.   Mean x ($\bar{x}$): 3.28

   iii. Mean y ($\bar{y}$): 3.45

   iv.   Intercept (a): 2.63

   v.   Slope (b): 0.25

   vi.   Regression line equation: $\hat{y}=2.64+0.25x$

The P-Value calculated on the basis of R value is 0.08 proving that the result is significant at 5%. Therefore, the study hypothesis;

H-14: The variable "Management initiatives" (NPD idea support) is significantly linked to organizational "communication" (NPD idea support and NPD team climate) is accepted.

xv - Relationship between 2 variables – Investigative approach (strategic thinking) and market intelligence (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.22, therefore, technically proving a positive but weak correlation between the two study variables (i.e. investigative approach (strategic thinking) and market intelligence (NPD idea support) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.05.
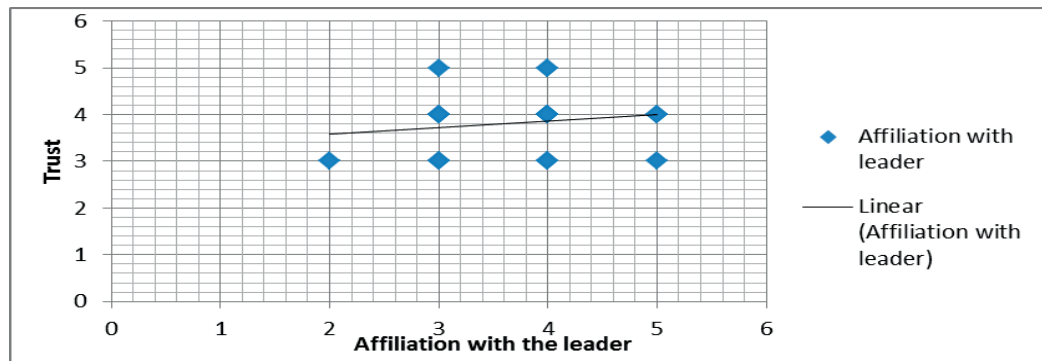

Figure 75. Scatter plot to display regression trend of study's H15

According to Figure 75, the regression details reveal the following data facts with reference to the study variables of hypothesis (H15):

    i.   Sample size: 30
   ii.   Mean x (x̄): 4.2
  iii.   Mean y (ȳ): 3.08
   iv.   Intercept (a): 2.01
    v.   Slope (b): 0.25
   vi.   Regression line equation: ŷ=2.01+0.25x

The P-Value calculated on the basis of R value is 0.24 and is not significant at 5%. Therefore, the study hypothesis;

H-15: "Investigative approach" (strategic thinking) is significantly linked to "market intelligence" (NPD idea support) is not accepted.

xvi- Relationship between 2 variables – Market intelligence (NPD idea support) and responsiveness (NPD team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.07, thus, technically proving a positive but weak correlation between the two study variables (i.e. market intelligence (NPD idea support) and responsiveness (NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.006.
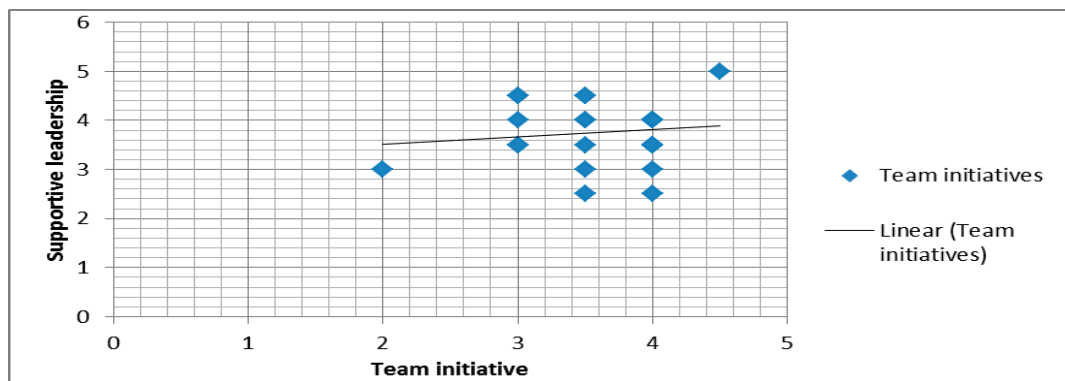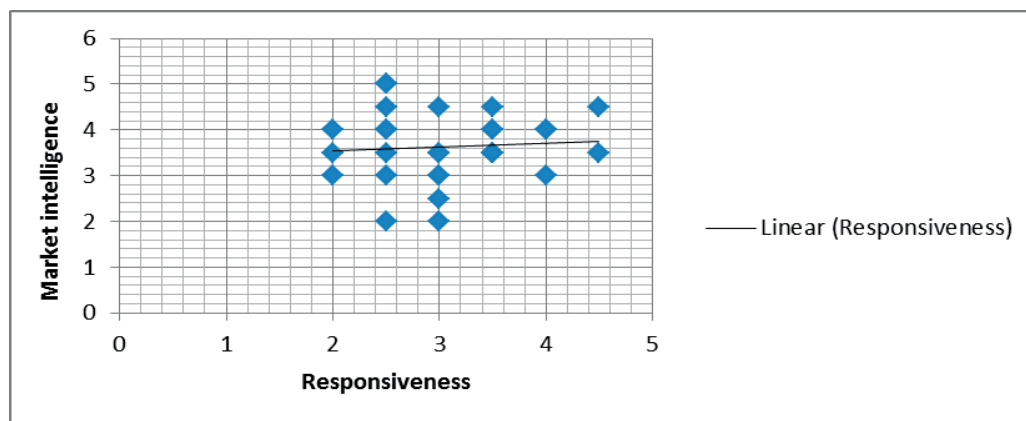

Figure 76. Scatter plot to display regression trend of study's H16

According to Figure 76, the regression details reveal the following data facts with reference to the study variables of hypothesis (H16):

    i.   Sample size: 30

   ii.   Mean x ($\bar{x}$): 3.08

  iii.   Mean y ($\bar{y}$): 3.63

  iv.   Intercept (a): 3.38

   v.   Slope (b): 0.08

  vi.   Regression line equation: $\hat{y}=3.38+0.08\,x$

The P-Value calculated on the basis of R value is 0.69 and is not significant at 5%. Therefore, the study hypothesis;

H-16: "Market intelligence" (NPD idea support) is significantly linked to the teams' "responsiveness" (NPD team climate) is not accepted.

xvii - *Relationship between 2 variables – Idea generation (NPD team climate) and responsiveness (NPD team climate)*

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.51, thus, technically proving a positive but weak correlation between the two study variables (i.e. Idea generation (NPD team climate) and responsiveness (NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.26.
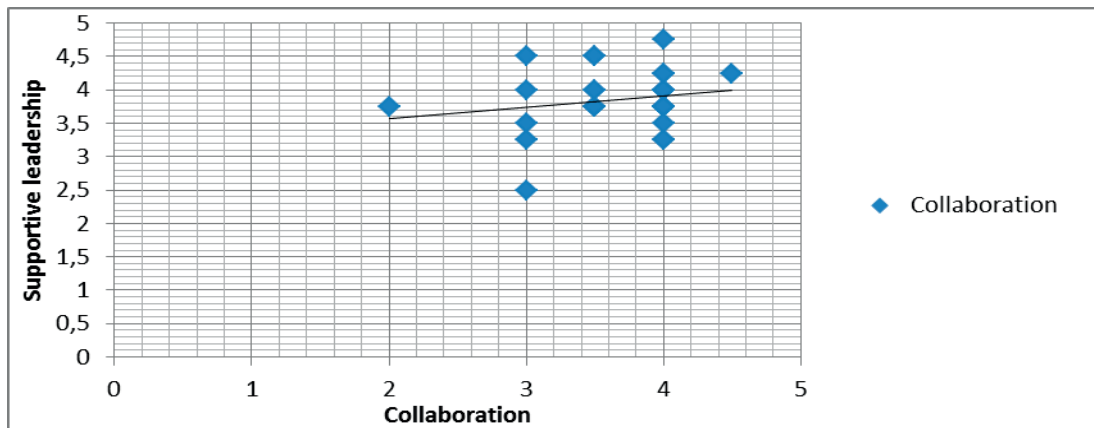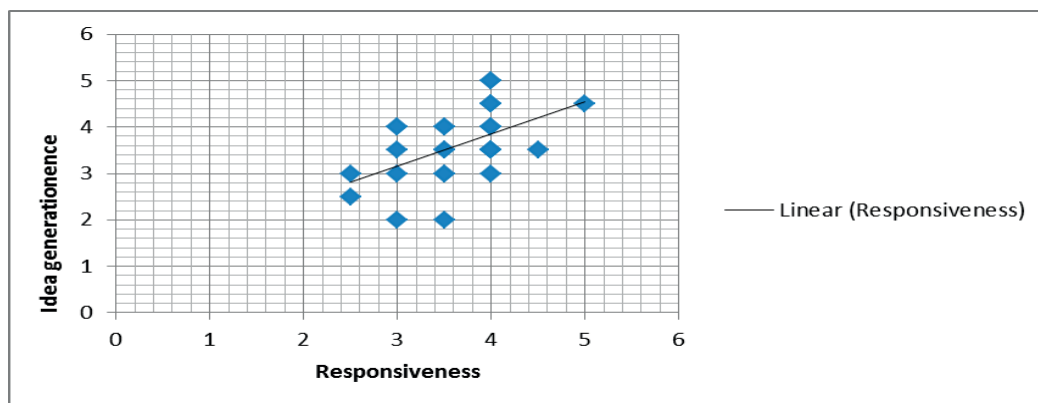

Figure 77. Scatter plot to display regression trend of study's H17

According to Figure 77, the regression details reveal the following data facts with reference to the study variables of hypothesis (H17):

    i.   Sample size: 30

    ii.   Mean x (x̄): 3.67

    iii.   Mean y (ȳ): 3.63

    iv.   Intercept (a): 1.1

    v.   Slope (b): 0.69

    vi.   Regression line equation: $\hat{y}=1.1+0.69x$

The P-Value calculated on the basis of R value is 0.003 and is significant at 5%. Therefore, the study hypothesis;

H-17: "Idea generation" (NPD team climate) is significantly linked to "responsiveness" (NPD team climate) is accepted.

xviii - Relationship between 2 variables – Leader's competence to empower (transformational leadership) and situational referencing (strategic thinking)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.11, thus, technically proving a positive but weak correlation between the two study variables (i.e. leader's competence to empower (transformational leadership) and situational referencing (strategic thinking) since the nearer the value is to zero, the weaker the relationship. In addition, the value of $R2$, the coefficient of determination, is 0.01.
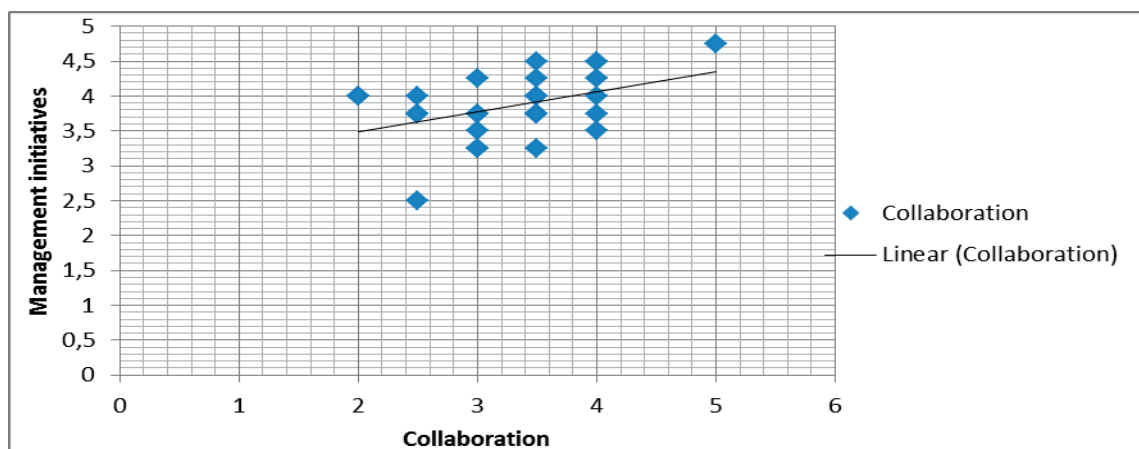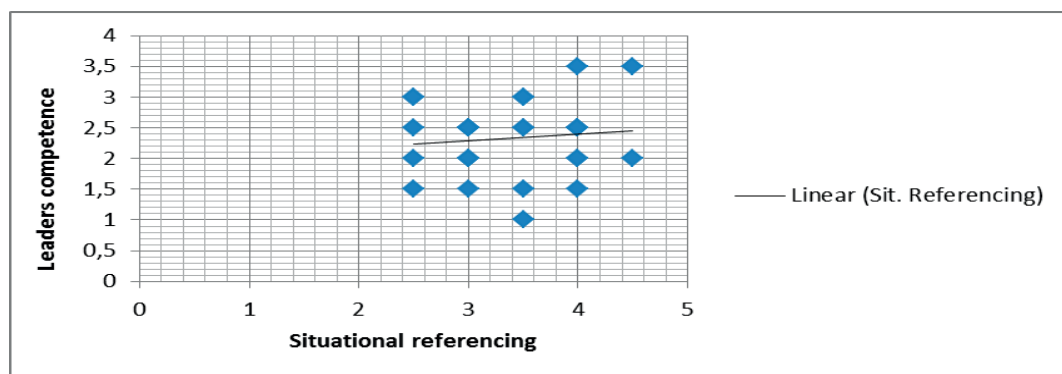

Figure 78. Scatter plot to display regression trend of study's H18

According to Figure 78, the regression details reveal the following data facts with reference to the study variables of hypothesis (H18):

i.   Sample size: 30

ii. Mean x ($\bar{x}$): 3.38

iii. Mean y ($\bar{y}$): 2.33

iv. Intercept (a): 1.97

v.   Slope (b): 0.10

vi. Regression line equation: $\hat{y}=1.97+0.10x$

The P-Value calculated on the basis of R value is 0.56 and is not significant at 5%. Therefore, the study hypothesis;

H-18: "Leader's competence to empower" (transformational leadership) is significantly linked to "situational referencing" (strategic thinking) is not accepted.

xix - Relationship between 2 variables – Work situation (strategic thinking) and situational handling (strategic thinking)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.24, thus, technically proving a positive but weak correlation between the two study variables i.e. work situation (strategic thinking) and situational handling (strategic thinking) since the nearer the value is to -zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.06.
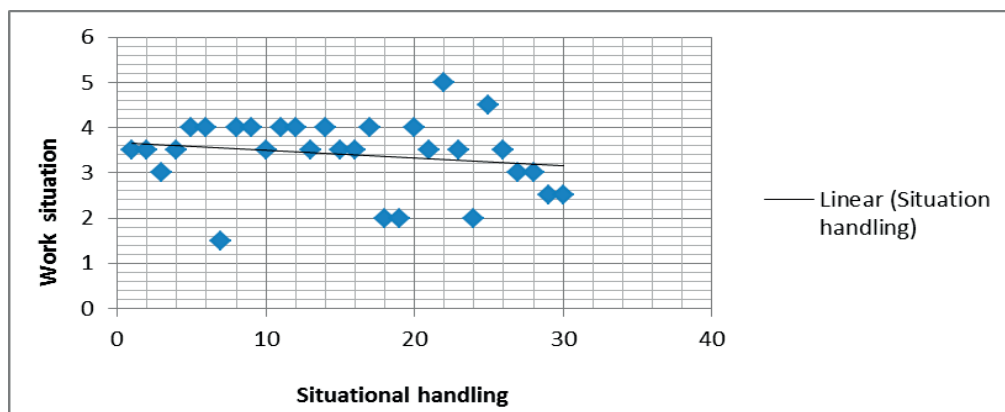
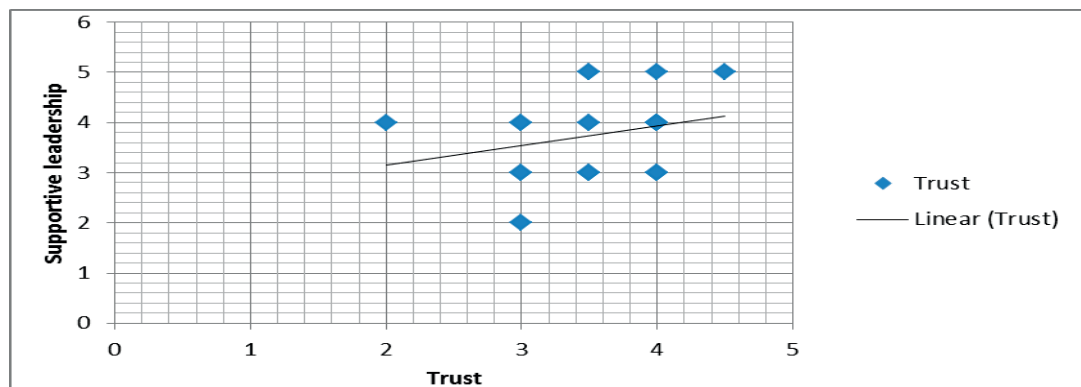**Figure 79.** Scatter plot to display regression trend of the variables of study's H19

According to Figure 79, the regression details reveal the following data facts with reference to the study variables of hypothesis (H19):

    i.   Sample size: 30

   ii.   Mean x ($\bar{x}$): 3.7

  iii.   Mean y ($\bar{y}$): 3.4

   iv.   Intercept (a): 2.32

    v.   Slope (b): 0.29

   vi.   Regression line equation: $\hat{y}=2.32+0.29x$

The P-Value calculated on the basis of R value is 0.21 and is not significant at 5%. Therefore, the study hypothesis;

H-19: "Work situation" (strategic thinking) is significantly linked to "situational handling" (strategic thinking) is not accepted.

xx - Relationship between 2 variables – Product innovativeness (NPD idea support) and communication (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.12, thus, technically proving a positive but weak correlation between the two study variables (i.e. product innovativeness (NPD idea support) and communication (NPD idea support) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R^2, the coefficient of determination, is 0.01.
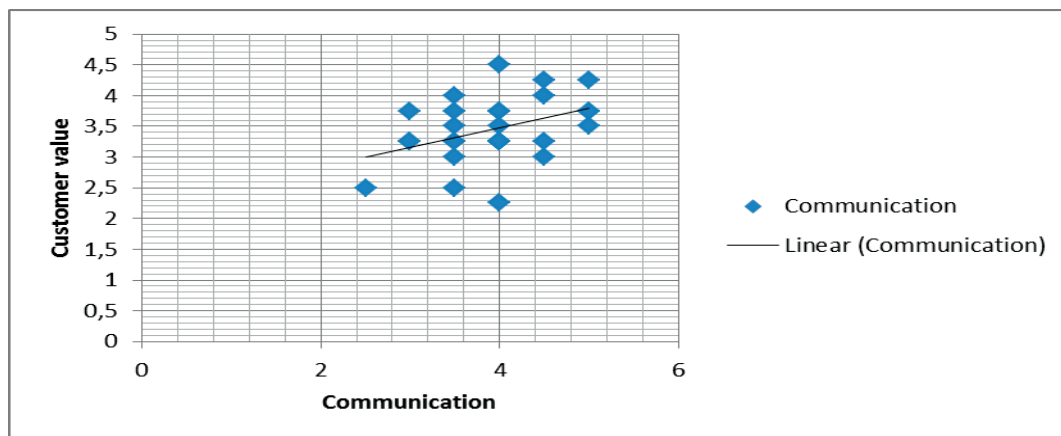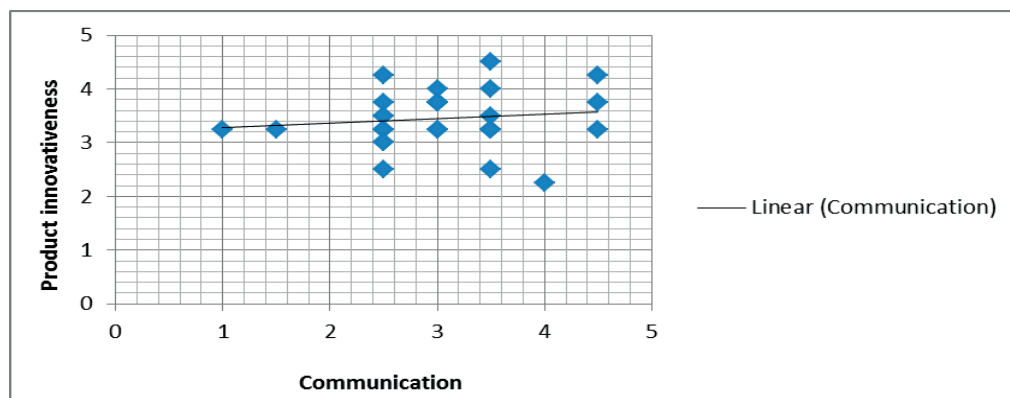

Figure 80. Scatter plot to display regression trend of study's H20

According to Figure 80, the regression details reveal the following data facts with reference to the study variables of hypothesis (H20):

    i.   Sample size: 30
    ii.   Mean x ($\hat{x}$): 3.03
    iii.   Mean y ($\hat{y}$): 3.45
    iv.   Intercept (a): 3.20
    v.   Slope (b): 0.08
    vi.   Regression line equation: $\hat{y}=3.20+0.08x$

The P-Value calculated on the basis of R value is 0.52 and is not significant at 5%. Therefore, the study hypothesis;

H-20: "Product innovativeness" (NPD idea support) is significantly linked to "communication" (NPD idea support) is not accepted.

xxi - Relationship between 2 variables – Team empowerment (transformational leadership) and work situation (NPD team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.02, thus, technically proving a positive but weak correlation between the two study variables (i.e. team empowerment (transformational leadership) and work situation (NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.0004.
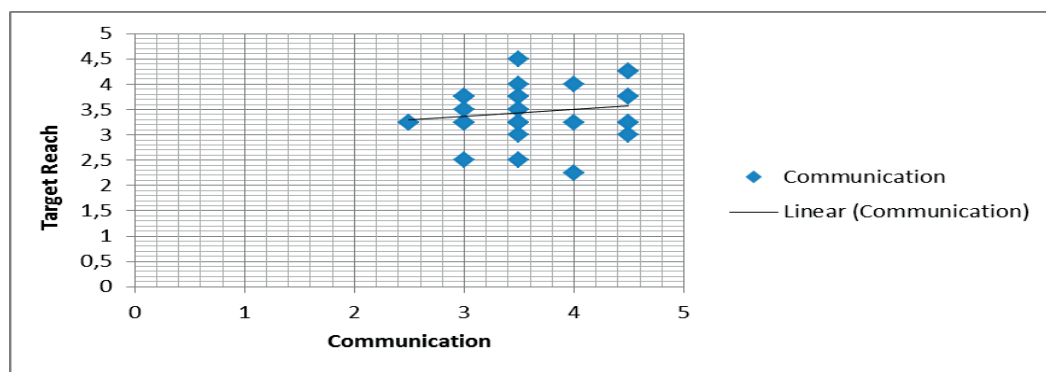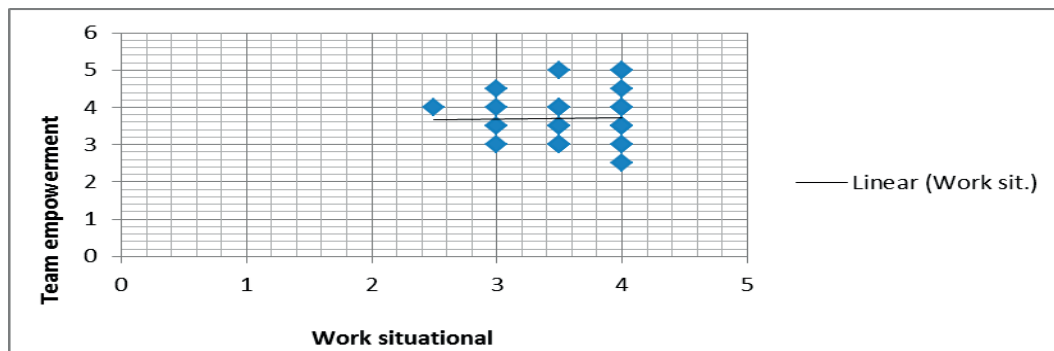

Figure 81. Scatter plot to display regression trend of study's H21

According to Figure 81, the regression details reveal the following data facts with reference to the study variables of hypothesis (H21):

i.   Sample size: 30
ii.   Mean x (x̄): 3.6
iii.   Mean y (ȳ): 3.7
iv.   Intercept (a): 3.59
v.   Slope (b): 0.03
vi.   Regression line equation: y=3.59+0.02x

The P-Value calculated on the basis of R value is 0.92 and is not significant at 5%. Therefore, the study hypothesis;

H-21: "Team empowerment" (transformational leadership) is significantly linked to "work situation" (NPD team climate) is not accepted.

xxii- Relationship between 2 variables – Leader's competence to empower (transformational leadership) and work situation (NPD team climate)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.38, thus, technically proving a negative but weak correlation between the two study variables i.e. leader's competence to empower (transformational leadership) and work situation (NPD team climate) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.04.
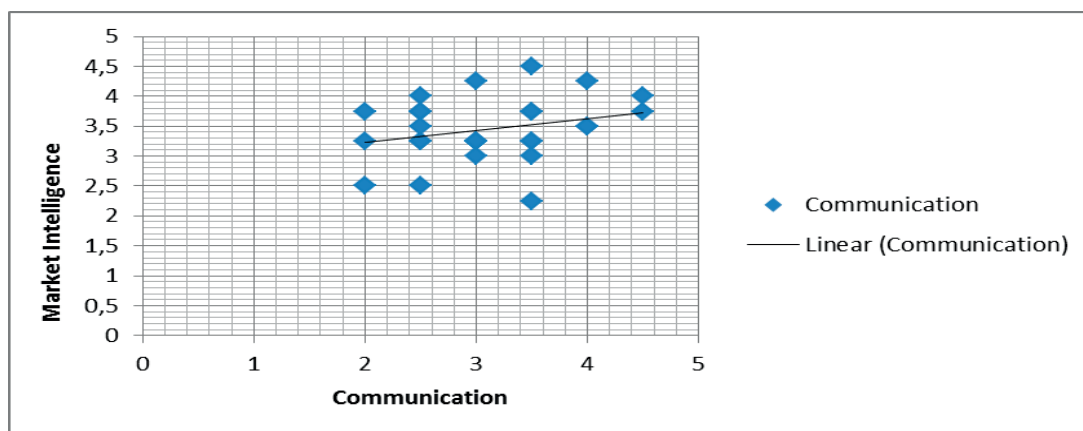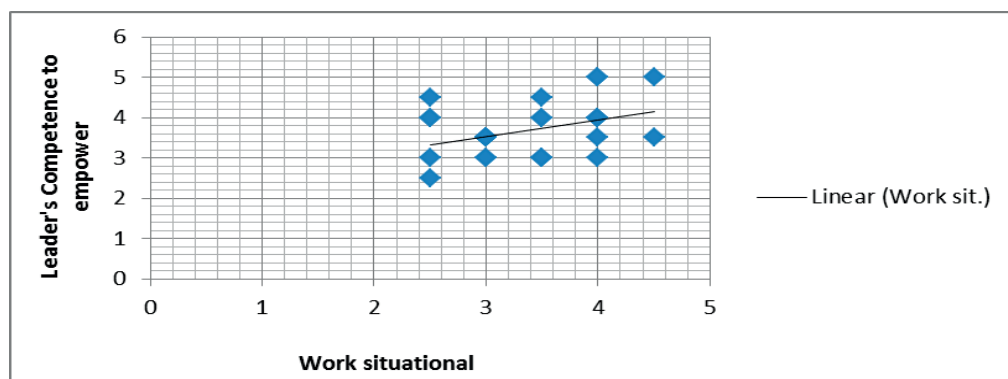

Figure 82. Scatter plot to display regression trend of study's H22

According to Figure 82, the regression details reveal the following data facts with reference to the study variables of hypothesis (H22):

   i.   Sample size: 30
  ii.   Mean x ($\bar{x}$): 3.4
 iii.   Mean y ($\bar{y}$): 3.7
 iv.   Intercept (a): 2.31
  v.   Slope (b): 0.41
 vi.   Regression line equation: $\hat{y}=2.31+0.41x$

The P-Value calculated on the basis of R value is 0.04 and is significant at 5%. Therefore, the study hypothesis;

H-22: "Leader's competence to empower" (transformational leadership) is significantly linked to "work situation" (NPD team climate) is accepted.

xxiii - Relationship between 2 variables – Collaboration (NPD team climate) and problem solving (strategic thinking)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.16 thus, technically proving a positive but weak correlation between the two study variables (i.e. collaboration (NPD team climate) and problem solving (strategic thinking) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.02.
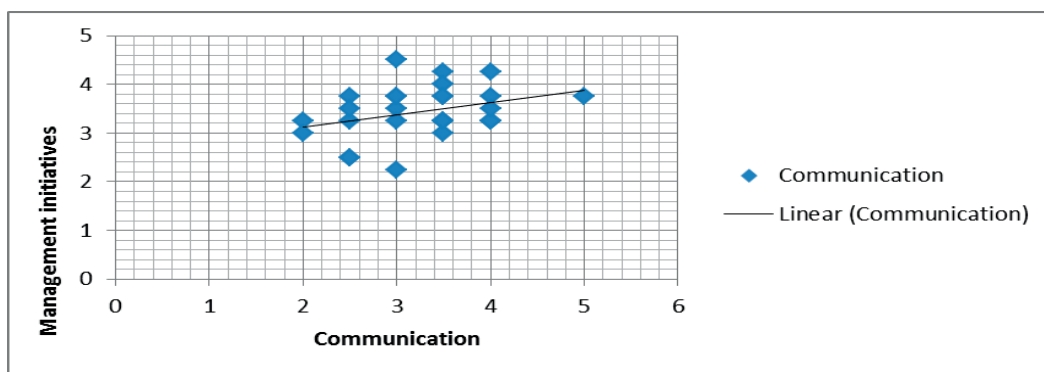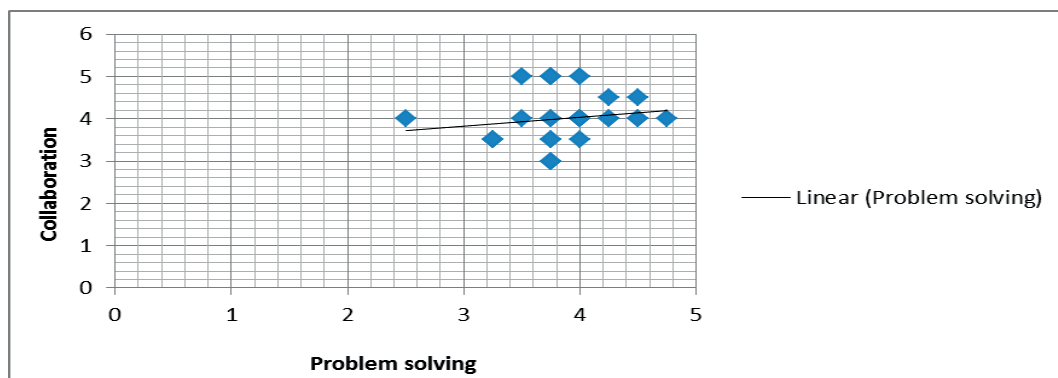

Figure 83. Scatter plot to display regression trend of study's H23

According to Figure 83, the regression details reveal the following data facts with reference to the study variables of hypothesis (H23):

- i. Sample size: 30
- ii. Mean x ($\bar{x}$): 3.8
- iii. Mean y ($\bar{y}$): 4
- iv. Intercept (a): 3.19
- v. Slope (b): 0.20
- vi. Regression line equation: $\hat{y}=3.19+0.21x$

The P-Value calculated on the basis of R value is 0.39 and is not significant at 5%. Therefore, the study hypothesis;

H-23: "Collaboration" (NPD team climate) is significantly linked to "problem solving" (strategic thinking)" is not accepted.

xxiv - Relationship between 2 variables – Leader's competence to empower (transformational leadership) and product innovativeness (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.17, thus, technically proving a positive but weak correlation between the two study variables (i.e. leader's competence to empower (transformational leadership) and product innovativeness (NPD idea support) since the nearer the value is to zero, the weaker the relationship. In addition, the value of R2, the coefficient of determination, is 0.03.
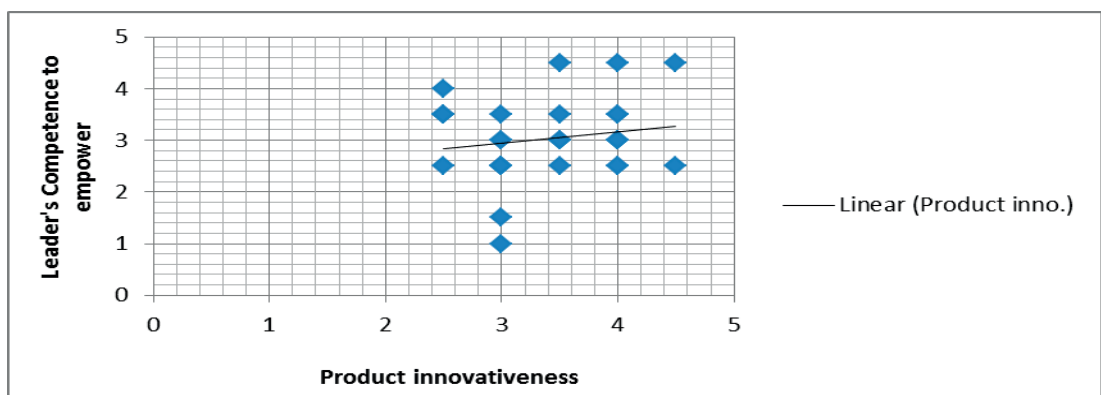
Figure 84. Scatter plot to display regression trend of study's H24

According to Figure 84, the regression details reveal the following data facts with reference to the study variables of hypothesis (H24):

i. Sample size: 30
ii. Mean x ($\bar{x}$): 3.38
iii. Mean y ($\bar{y}$): 3.03
iv. Intercept (a): 2.29
v. Slope (b): 0.22
vi. Regression line equation: $\hat{y}=2.3+0.21x$

The P-Value calculated on the basis of R value is 0.37 and is not significant at 5%. Therefore, the study hypothesis;

H-24: "Leader's competence to empower" (transformational leadership) is significantly linked to "product innovativeness" (NPD idea support) is not accepted.

xxv - Relationship between 2 variables – Investigative approach (strategic thinking) and product innovativeness (NPD idea support)

Result analysis

The correlation calculation to assess the relationship between the above variables yielded the r value of 0.29, thus, technically proving a positive but weak correlation between the two study variables (i.e. Investigative approach (Strategic thinking) and product innovativeness (NPD idea support) since the nearer the value is to zero, the weaker the relationship. In addition, the value of $R2$, the coefficient of determination, is 0.08.
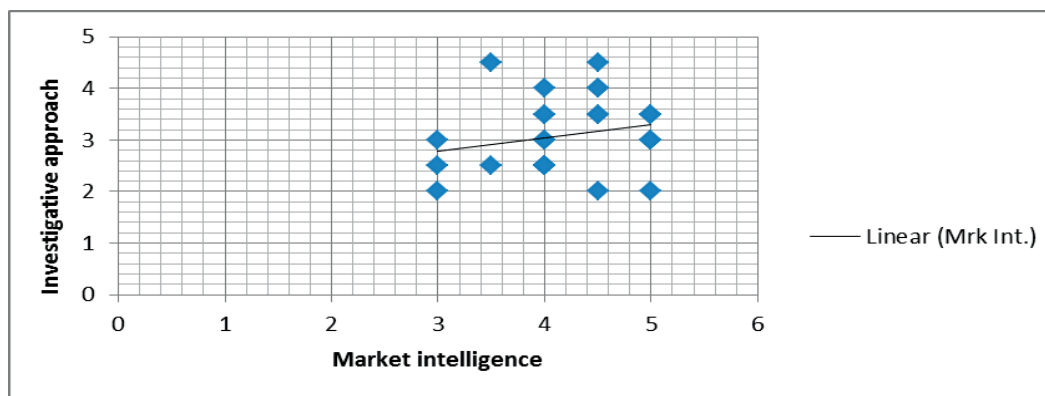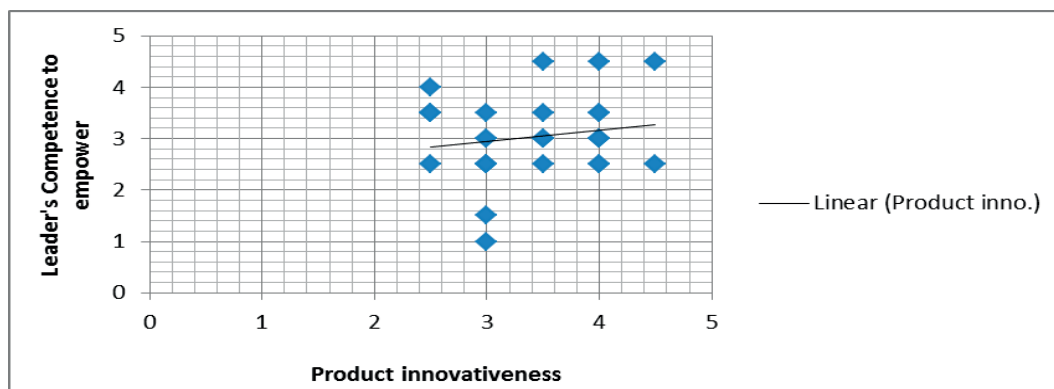

Figure 85. Scatter plot to display regression trend of study's H25

According to Figure 85, the regression details reveal the following data facts with reference to the study variables of hypothesis (H25):

    i.   Sample size: 30
   ii.   Mean x (x̄): 4.2
  iii.   Mean y (ȳ): 3.03
  iv.   Intercept (a): 1.46
   v.   Slope (b): 0.37
  vi.   Regression line equation: ŷ=1.46+0.37x

The P-Value calculated on the basis of R value is 0.12 and is not significant at 5%. Therefore, the study hypothesis;

H-25: "Investigative approach" (strategic thinking) isx significantly linked to "product innovativeness" (NPD idea support) is not accepted.

Hence, the correlation among the study variables (i.e. the study variables which stemmed from the selected study constructs, i.e. transformational leadership, strategic thinking and NPD idea support and NPD team climate to support innovation) were analyzed through testing twenty five hypotheses, to evaluate the linkage, level of strength and direction among the above theoretical constructs.

The correlation coefficient calculation revealed that out of the twenty five positively correlated linkages (i.e. shown through H1 to H25) only nine are considered highly significant on the basis of their p values with reference to the current company's perspective; i.e. hypotheses, H1, H2, H3, H5, H9, H14, H17 and H22 have significant values at $p < 0.05$, while H11 has the P value significant at $p < 0.01$ and therefore acceptable.

On the basis of above analysis, the significantly positive linkages are as follows;

H-1: *"Early client involvement"* (NPD idea support) is significantly linked to *"Target Reach"* (NPD idea support).

H-2: *"Customer value"* (NPD idea support), is significantly linked to *"Target reach"* (NPD idea support).

H-3: *"Early client involvement"* (NPD idea support) is significantly linked to *"Customer value"* (NPD idea support).

H-5: The variable *"Management initiatives"* (NPD idea support) is significantly linked to the team´s sense of *"Affiliation with leader"* (Transformational leadership- Idealized influence).

H-9: The variable *"Management initiatives"* (NPD idea support) is significantly linked to team *"Collaboration"* (NPD idea support and team climate).

H-11: *"Customer value"* (NPD idea support) is significantly linked to effective *"Communication"* (NPD idea support and NPD team climate)

H-14: The variable *"Management initiatives"* (NPD idea support) is significantly linked to organizational *"Communication"* (NPD idea support and NPD team climate)

H-17: *"Idea generation"* (NPD idea support) is significantly linked to team's *"Responsiveness"* (NPD team climate).

H-22: *"Leader's competence to empower"* (Transformational leadership) is significantly linked to *"Work situation"* (NPD team climate).

In the light of the result analysis and hypotheses testing, it is concluded that there are linkages among the theoretical constructs which were included in the proposed theoretical framework for model extension.

Summary of Chapter 5 - Quantitative data analysis

This chapter presented in detail, the quantitative data analysis and results cross comparisons against the selected study areas i.e. the collected employee feedback was analyzed in the following four ways to maximize possible recommendations for an effective NPD system upgrade in line with the study's research questions.

 i. Analysis 1 – Construct/Item orientation

 ii. Analysis 2 – Work operation wise

 iii. Analysis 3 – Location orientation

 iv. Analysis 4 – Additional findings,

In addition, linkages among various study constructs through selected variables were examined statistically.

6 QUALITATIVE DATA ANALYSIS – FEEDBACK THROUGH INTERVIEW

6.1 Overview

The study is additionally supported with qualitative research in the form of interviews to provide freedom of thought sharing to the targeted study participants. The highlighted aim is to probe for answers to the study's main research questions through open internal information capturing. The linkage and sequence between the research questions and the interview question items are as follows:

Table 21. Linking research questions to the interview question items

Research Questions;	Interview Question Items:
1: How effectively did this organization implement the transformational leadership principle in supporting new product t idea generation potential?	Question items: 9 and 10
2: How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?	Question items: 2, 7 and 8
3: How adaptive is this organization in designing supportive new product development processes?	Question Items: 1, 3, 4, 5 ,6,
4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?	Question Items: 1 to 10
5: What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?	Question Items: 1 to 10

The interview questions broadly covered key investigative areas of our research study (i.e. new product development idea generation approach, work leadership - based on transformational leadership model, strategic thinking in addition to the elements of pseudo transformational leadership). The question items for the above five categories were especially devised for quantitative feedback analysis through the study variables associated with the following sub categories:

    i.   New product development and customer value ,
    ii.   Company's knowledge creation potential,
    iii.   Company's innovative potential,
    iv.   Company´s potential to celebrate new idea creation process.

In addition, an interview questionnaire having 10 questions was administered to selected personnel of the subject company, who were also the participants of the quantitative study as well. The aim here was to collect information regarding the new product development operations and practices of the organization to qualitatively assess the feedback by additionally providing dual support to the quantitative data as part of the mixed-mode survey approach.

6.2   Analysis

The data received through the qualitative study tool is analyzed in terms of location orientation, keeping in view the difference in nature of the products and services offerings, work processes, scale of infrastructure and allied operations. A detailed analysis of the construct is presented in tables 22 to 39.

6.2.1 Data received from targeted team in Finland

6.2.1.1 Question 1:

Table 22. Data from Finland – Question 1

1-Construct	Question item	Department	Analysis- Key trends
NPD Value	*How does your company measure the worth of your products and services from the external stake holders' point of view (Customers, competitors, suppliers, etc.)*	General Manager	No opinion
		General Manager	Value for customers´ requirements.
		Design	Timely delivery of product design and identification of mistakes.
		Design	Unsure.
		Design	Value for customers´ requirements and timely product delivery.
		Design	Customer´s feedback analysis and competitors' intelligence.
		Project Management and R&D	Customer´s feedback analysis and cost effective product delivery.
		Tech Engineering	Team member´s task analysis.
		Tech Engineering	Product life cycle analysis (Cost vs. Competition).
		Product Development and Sales.	New product performance measurement.

In response to question item, i) *How does the company measure the worth of products and services from the external stakeholders' point of view (customers, competitors, suppliers etc.).*

The facts below present the weak areas identified through the survey responses:

A few of the senior position holders either did not answer or mentioned that they were not sure about the right response to that question. The response pattern of most of the study participants revealed their heavy dependence on mere job specific thinking approach instead of showing some knowledge diversification by covering the basic level of the company´s general information related to other operations as well. This refers to the situation when the respondents, even in response to the company´s basic processes related questions, answered in terms of their departments´ specific operations.

6.2.1.2   Question 2:

Table 23.   Data from Finland – Question 2

2-Construct	Question item	Department	Analysis-Key trends
Customer services	i. *How does your company identify and remove the causes of customer dissatisfaction?*	General Manager	Customers feedback is through service department by employing corporate relationship online surveys
		General Manager	Feedback through quality assessment agencies.
		Design	Through notifications issued from the factory and customer feedback.
		Design	Customers´ feedback.
		Design	Identification of the nature of the problem nature identification and customer satisfaction.
		Design	Direct flow of customer feedback to services and sales departments.
		Project Management and R&D	Strong customer service support after sales and guarantee period.
		Tech-Engineering	Customer feedback through service department by employing corporate relationship online surveys.
		Tech-Engineering	Feedback from technical service department.
		Product Development and Sales	Customer feedback through service department by employing corporate relationship online surveys.

In response to question item, 2) *How does your company identify and remove the causes of customer dissatisfactions?*

The facts below present the weak areas identified through survey responses with reference to the above question:

Respondent feedback on question 2 revealed the trend that among all the targeted work operations, sales and services departments are the company´s main sources of generating product and service ideas. Usually, the above departments serve as central points for client´s complaints and feedback handling when customers approach the company for their product related problem solutions. Such action initiates the loop of 'product or service related new idea generation' on the basis of information inflow from the external environment (i.e. customers being the actors) to the organization´s internal environment (i.e. the above departments of the company being the reactors). The above suggests that the sales and labs or services department undertake dual work roles i.e. 1- Selling the company´s products and then providing after sales services to the customers, 2- They play a significant role in either collecting or generating new ideas for research and designing new and improved products and services.   All the above facts presents a reactive NPD approach, heavily dependent on customers´ feedback and less proactive where the role of research and development work roles take the initiatives and leading role.

6.2.1.3   Question 3

Table 24.   Data from Finland – Question 3

3-Construct	Question item	Department	Analysis-Key trends
New Product opportunities	How does your company identify new product and service opportunities with existing customers?	General Manager	Sale orders
		General Manager	Customer feedback and market intelligence.
		Design	Demand for sustainable solutions and legal regulations.
		Design	Company´s product improvement initiatives.
		Design	Demand for sustainable solutions and legal regulations.
		Design	Customer feedback and market intelligence.
		Project management and R&D	Customer feedback through relevant departments.
		Tech- Engineering	Customer feedback through relevant departments.
		Tech- Engineering	Customer feedback through relevant departments´ individual and joint work efforts.
		Product Development and Sales	Collaborative efforts – Engineering, Production and Sales departments etc.

In response to question item, 3) *How does your company identify new product and service opportunities with existing customers?*

The paragraph below presents the weak areas identified through survey responses with reference to the above question:

The current approach of the company is more of a 'reactive action' than 'proactive' in terms of new products idea generation. The company´s reactive approach may be justified in some instances, keeping in view the nature of product and service solutions the company is engaged in offering.

In addition, the factors that play a significant role include, new product development (NPD) work processes and infrastructure, budgetary requirements, as well as legislative limitations. However, in a normal scenario, the companies work through strategic leadership based thinking to combat the above mentioned hurdles in a proactive manner to introduce innovative product solutions to take the market lead.

6.2.1.4   Questions 4, 5 and 6:

Table 25.   Data from Finland – Questions 4, 5 and 6

4-Construct	Question item		Analysis-Key trends
Company's knowledge creation potential	A) What sort of communication systems does your company have to connect with the external as well as internal environmental segments?	General Manager	A. Company´s online systems.
			B. Company internal online communication systems.
			C. Information is available upon request, (Not proactively in an organized manner).
		General Manager	A. Through face to face meetings, emails, seminars, symposiums, fairs, etc.
			B. Company internal online communication systems.
			C. Within function – `*Good*`, but across function - `**Weak**`.
	B) What kind of systems does your company possess to store and utilize the creative data bulk related to NPD?	Design	A. Mail correspondence, live meetings, internal web pages, design maintenance system.
			B. Company internal online communication systems.
			C. Knowledge sharing is always difficult.
		Design	A. Company internal online communication systems.
			B. Document management system.
	C) How can one rate the environmental openness of your company in terms of knowledge sharing?		C. Unsure.
		Design	A. E-mail…internet
			B. Internal database
			C. quite open inside company
		Design	A. Unsure.
			B. Not structured way of storing ideas for later utility.
			C. Quite open.
		Project management and R&D	A. Company internal online communication systems.
			B. Co-operations, university projects, using consultants.
			C. Not too open.
		Tech- Engineering	A. Unsure
			B. Company internal online communication systems.
			C. Unsure
		Tech- Engineering	A. Emails
			B. Databank and monthly competitive intelligence reports
			C. Limited freedom.
		Product Development and Sales	A. Mail,
			B. Local database.
			C. No opinion.

In response to question items, iv) Company´s internal communication system, v) the options to store new idea related data storage systems, and vi) company´s openness,

The paragraph below presents the weak areas identified through the survey responses in response to the above questions:

It was pointed out that the knowledge sharing within the subject company´s internal environment is difficult in usual circumstances. The work team members find it is difficult to know and select the appropriate communication channels to use. Additionally, a lot of information available in the company´s main information systems is obsolete. Furthermore, the said information systems are not very user friendly. It is also noted that the designated NPD processes are either not proactive in an organized manner or are not in usual practice. There is no structured way of storing 'left over ideas' that could be feasible and could be utilized later on.

Furthermore, the work systems of the subject company are highly formal, and detailed plans do not always allow additional communications during the process to offer room for new ideas; hence there is a limited freedom to modify processes. Furthermore, it was pointed out that within the internal environment of a modern day organization, where too much information remains floating all the time, it is a challenge to ensure the delivery of the right information to the right people. Finally, in few instances the respondents seemed unsure about the right response to the survey questions and they therefore offered no opinions.

4.2.1.5   Questions 7 and 8:

Table 26.   Data from Finland – Questions 7 and 8

5-Construct	Question item	Department	Analysis-Key trends
Company's innovative potential	A. How does the company innovate new products and service offerings? B. How does your company create a differentiated product option for the same target market?	General Manager	A. Workshops with key customer B. Focus on industrial design and value-based Pricing.
		General Manager	A. Brainstorming B. Benefit for the customer.
		Design	A. Company internal online communication systems. B. Tailor product via requests.
		Design	A. No opinion. B. No opinion.
		Design	A. Customer need assessment, B. Quest to offer sustainable solutions.
		Design	A. Brain storming sessions. B. Tailor product via requests.
		Project management and R&D	A. Product feature improvement and Innovation workshops. B. Quest to offer sustainable solutions.
		Tech-Engineering	A. New design process. B. Quest to be the market leader.
		Tech-Engineering	A. Periodical competitive intelligence reports, B. Quest to be market leader.
		Product Development and Sales	A. Brainstorming, idea refinement and prototype, test and feedback analysis. B. Quest to be market leader.

In response to the question items, vii) How does the company innovate new products and service offerings? viii) How does your company create a differentiated product option for the same target market?

The weak area identified through survey responses with reference to the above questions was that in one instance the respondent seemed unsure and offered no opinion.

6.2.1.6   Questions 9 and 10:

Table 27.   Data from Finland – Questions 9 and 10

6-Construct	Question item		Analysis-Key trends
Company´s potential to celebrate new ideas creation process.	A. Does your company offer any distinctive recognition to its staff members to encourage new initiatives?	General Manager	A. Patent applications are rewarded. B. High workload is hampering openness.
		General Manager	A. Patent applications are rewarded. B. Limited freedom.
		Design	A. Not sure. B. Quite stiff bureaucracy.
	B. Please describe how easy it is for team members to get new ideas/methods introduced into your company´s internal environment.	Design	A. No opinion B. No opinion
		Design	A. Patent gets some recognition. B. Not common.
		Design	A. Yes B. Bureaucratic control.
		Project management and R&D	A. Inventive initiatives get rewarded. B. Bureaucratic control.
		Tech-Engineering	A. Inventive initiatives get rewarded. B. No barriers.
		Tech-Engineering	A. Inventive initiatives get rewarded. B. Bureaucratic control.
		Product Development and Sales	A. Inventive initiatives get rewarded 'spot bonuses'. B. No barriers.

In response to the question items xi) *Does your company offer any distinctive recognition to its staff members to encourage new initiatives and x) how easy is it for team members to get ideas/methods introduced into your company´s internal environment,*

The paragraph below presents the weak areas identified through the survey responses in response to the above mentioned survey questions:

It was noticed that a heavy workload on the work teams is hampering their willingness to alter the ways of working. Furthermore, it is complicated if an individual generates an idea which is related to a different work area (functions/ departments) from the one he or she is directly associated with. The way of handling new ideas in the subject company is remarked as either being too bureaucratic or ineffective due to insufficient priorities and resources for evaluation. Few newly generated ideas get overridden easily. It is further pointed out that the lengthy process of introducing new ways of working hampers the spirit to do so.

Hence, individuals (team members) seem locked in the processes, descriptions and directives. Unfortunately, quite often not all the team members are taken on board when introducing new ways of working, quite often. A bureaucratic style of working has been increased lately. Usually it a difficult task to gain acceptance for all new ideas. In a few instances the respondents seemed unsure and offered no opinion.

6.2.2 Qualitative data received from Norway

6.2.2.1   Question 1:

Table 28.   Data from Norway – Question 1

1-Construct	Question item	Department	Analysis-Key trends
NPD Value	• How does your company measure the worth of your products and services´ from the external stake holders' point of view (customers, competitors, suppliers etc.	General Management	Customer's satisfaction survey (ISO 9001), market share analysis, regular meetings.
		General Management	Degree of compliance, robustness and price vs. performance analysis.
		Project Management and R&D	Performance and delivery analysis.
		Tech-Engineering	Unsure.
		Tech-Engineering	No opinion.
		Product Development and sales	Against value.
		Sales and Marketing Director	Cost vs. benefit for customers.
		Sales and Marketing Director	Customer feedback analysis and competitors' intelligence.
		General Management	Innovativeness and environmental sustainability.
		General Management	No opinion.

In response to question item, i) *How does the company measure the worth of products and services´ from the external stakeholders' point of view (customers, competitors, suppliers etc.)*

The weak area identified through survey responses with reference to the above questions was that in two instances the respondents seemed unsure and offered no opinion.

6.2.2.2   Question 2:

Table 29.   Data from Norway – Question 2

2-Construct	Question item	Department	Analysis-Key trends
Customer services	How does your company identify and remove the causes of customer dissatisfaction?	General Management	Sales input analysis and internal meetings.
		General Management	Close and quick cooperation during problem solving phase. Customer feedback analysis.
		Project Management and R&D	R&D and service minded attitude.
		Tech-Engineering	Speedy problem-solving.
		Tech-Engineering	Customer feedback analysis.
		Product Development and sales	Quest to be market leader.
		Sales and Marketing Director	Quest to satisfy customers.
		Sales and Marketing Director	Quest to satisfy customers.
		General Management	Customer feedback analysis.
		General Management	Quest to satisfy customers.

In response to question item, ii) *How does your company identify and removes the causes of customer dissatisfaction?*

The facts below present the weak areas identified through the survey responses:

The company´s heavy dependence on customer feedback collected at sales and service departments to generate new ideas encouraged a reactive approach. Such a way of working supports the new product development (NPD) innovation process, but only partially (i.e. inside the box thinking). However, current trends in market competition demand a radical and out of the box thinking approach to support proactive product thinking approach. This requires introduction of new lead roles and innovative ways of handling new product development (NPD) design and R&D functions, duly supported by sales and service departments. In addition, establishing close contacts with clients and key stakeholders through continuous follow-ups and designated workshops are recommended to obtain feedback or at least general market opinions or trends.

6.2.2.3   Question 3:

Table 30.   Data from Norway – Question 3

3-Construct	Question item	Department	Analysis- Key trends
New Product opportunities	How does your company identify new product and service opportunities with existing customers?	General Management	Long term relationships with key clients.
		General Management	Long term relationships with key clients.
		Project Management and R&D	Market intelligence and long term customer relationship.
		Tech-Engineering	No opinion.
		Tech-Engineering	Long term/ interactive customer relationship.
		Product Development and sales	Long term/ interactive customer relationship.
		Sales and Marketing Director	Demand for sustainable solutions and legal regulations.
		Sales and Marketing Director	Long term customer relationship and quest to lead the market by offering innovative solutions.
		General Management	Close customer relationship.
		General Management.	No opinion.

In response to question item iii) *How does your company identify new product and service opportunities with existing customers?*

The paragraph below presents the weak areas identified through survey responses, in response to the above question:

The analysis of respondents' feedback on the referred question once again displayed a reactive rather than proactive approach in terms of new product idea generation. It may be justified in some instances, keeping in view the variety in nature of products and service solutions offered, associated work processes and infrastructure support, budgetary requirements as well as legislative limitations. However, in usual circumstances, companies work with the support of strategic leadership based thinking. This approach helps in combating the above hurdles to introduce innovative product and solutions to take the market lead.

6.2.2.4   Questions 4, 5 and 6:

Table 31.   Data from Norway – Questions 4, 5 and 6

4-Construct	Question item	Department	Analysis-Key trends
Company's knowledge creation potential	A. What sort of communication systems does your company have to connect with the external as well as internal environmental segments?	General Management	A. Company´s online systems and internal meetings and events. B. On line data banks. C. Open with in functions but restricted to R & D.
		General Management	A. External lobbies, vendor association, R&D meetings etc. B. Data banks. C. On the technical side – `***Closed***`, but within the function - `**Weak**`.
	B. What kind of systems does your company possesses to store and utilize the creative data bulk related to NPD?	Project Management and R&D	A IT systems/ tools. B No opinion C No Opinion
		Tech-Engineering	A Team center. B Partly through team center. C No opinion
	C. How can one rate the environmental openness of your company in terms of knowledge sharing?	Tech-Engineering	A. No opinion. B. Online data banks (but currently not implemented.) C. No opinion.
		Product Development and sales	A. Face to face, email and telephone conversation. B. Server C. Open
		Sales and Marketing Director	**A.** E-mail, internet. B. Internal database. C. Open within function.
		Sales and Marketing Director	A. Customer´s feedback through Sales offices. Exhibitions and company´s events. B. Standard drawings, R&D Dept. and online database. C. Within functions.
		General Management	A. Internally; Intranet, Externally; New Bulletins, articles etc. B. R &D data bases. C. Team meetings
		General Management	A. No opinion. B. No opinion. C. Restricted.

In response to the question items, iv) What sort of communication systems does your company have to connect with the external as well as internal environmental segments? v) What kind of systems does your company possesses to store and utilize the creative data bulk related to NPD? And iv) How one can rate the environmental openness of your company in terms of knowledge sharing?

The paragraph below presents the weak areas identified through survey the responses with regard to the above questions:

The support data bases and communication systems are not completely operational. Consequently, critical information is currently stored in local servers with limited facilities that affect timely data retrieval, cause data duplication and restrict error free corporate reporting. It is also pointed out that currently there is no common internal communication system available in working condition. Furthermore, the employees experience limited freedom in introducing new ideas and work ways in their work environment. In addition, in few instances the respondents seemed unsure and offered no opinion.

6.2.2.5 Questions 7 and 8:

Table 32. Data from Norway – Questions 7 and 8

5-Construct	Question item	Department	Analysis-Key trends
Company's innovative potential	A. How does your company innovate new products and service offerings? B. How does your company create a differentiated product option for the same target market?	General Management	A. Workshops with key customer and R&D projects. B. Product capacity enhancement and combined solutions.
		General Management	A. Customer requirements / market intelligence through R&D database. B. Product leadership through tailor made solution provider.
		Project Management and R&D	A. No opinion. B. No opinion.
		Tech-Engineering	A. Collaboration between sales and R&D Departments. B. Product leadership through technically superior but economical solutions.
		Tech-Engineering	A. No opinion. B. No opinion.
		Product Development and sales	A. Through customer and team feedback. B. As above.
		Sales and Marketing Director	A. Customer need assessment, B. Quest to offer sustainable solutions.
		Sales and Marketing Director	A. Collaborative efforts between customers and R&D Dept. B. Quest for product leadership through superior but economical solutions.
		General Management	A. Customer (External) and cross functional (Internal) inputs. B. Market research.
		General Management	A. External request or legal regulations. B. Dedication to market / clients.

In response to question items vii) *Company´s new products and offering strategy and viii) Potential to create differentiated product option for the same target market?*

The weak areas identified through the survey responses with reference to the above questions were that the company´s new product development and offering strategy is noticed as based on a reactive approach (i.e. since the main sources of new idea generation are customer complaints or product maintenance units and the changes in environmental legislation, etc.) rather than being proactive (i.e. initiating interactive ventures periodically, e.g., workshops, exhibitions, etc. with key stakeholders) in search of either new product development or its improvements. Furthermore, in two cases the respondents seemed unsure and offered no opinion on the above questions.

6.2.2.5   Questions 9 and 10:

Table 33.   Data from Norway – Questions 9 and 10

6 -Construct	Question item	Department	Analysis-Key trends
Company´s potential to celebrate new ideas creation process.	A. Does your company offer any distinctive recognition to its staff members to encourage new initiatives? B. How easy is it for the team members to get new ideas/ methods introduced into your company´s internal environment?	General Management General Management Project Management and R&D Tech-Engineering Tech-Engineering Product Development and sales Sales and Marketing Director Sales and Marketing Director General Management General Management	A. Yes B. Quite easily through internal systems; test labs, intranet etc. A. Yes B. Quite easy for team members in R&D. A. Yes, through management acknowledgement. B. No opinion. A. Partly but depends on one´s own initiative. B. Internal and external communication exchanges. A. Company´s internal communication systems. B. Quite easily. A. Mutual initiatives for encouragement and tolerance. B. Through team leaders 'openness. A. Through creating patents. B. Inconvenient. A. Yes, but more recognition is required. B. Open environment. A. No B. Not much convenient. A. No opinion. B. Very hard.

In response to question items, ix) *Does the company offer any distinctive recognition to its staff members to encourage new initiatives and x) how easy is it for the team members to get new ideas introduced into your company´s internal environment?*

The paragraph below presents the weak areas identified through the survey responses:

'The team members need to focus more on orders and timely deliveries. Though the new ideas get due acknowledgement at the departmental level, they do not get recognition at the higher level'. The work approaches related to recognition of employees' initiatives are not very common in the work environment. Even if the employee's initiatives are recognized, the rewards are hardly visible. Finally, in some instances the respondents seemed not sure about the appropriate responses and therefore did not respond to the questions.

6.2.3 Qualitative data received from United Kingdom

6.2.3.1 Question 1:

Table 34. Data from the United Kingdom – Question 1

1-Construct	Question item	Department	Analysis-Key trends
NPD Value	• How does your company measure your products and services from the external stake holders' point of view (customers, competitors, suppliers, etc.	Tech-Engineering	Data through sales dept. regarding legislative requirements, market intelligence, share and current market price expectation.
		Project Management and R&D	Sales; customer relations; business profile.
		Product Development and sales	Weak at market intelligence.
		Design	Feedback through sales. Warrantee reporting, corporate relationship online survey questionnaires.
		Tech-Engineering	New market entry.
		Design	Market intelligence (i.e. focusing on International Maritime Organization (IMO) standard, technology review, BWT discharge standards, etc.)
		General Management	Customer need assessment and strong market intelligence.
		Tech- Engineering	Market intelligence; (i.e. IMO etc.)
		Project Management and R&D	No opinion.
		Tech- Engineering	Information through sales dept.

Inresponse to question item i) *How does the company measure the worth of the products and services from the external stakeholders' point of view? (Customers, competitors, suppliers etc.*

The paragraph below presents the weak areas identified through the survey responses with reference to the above question:

It was highlighted that the knowledge about competitors is subjective. Furthermore, less focus is given on developing procedures to measure the worth of the company´s products and services from the external stake-holders' point of view. This is especially with reference to customer engagement. There is a clear demand to have a competitive edge through which the customers recognize and enjoy value added client relationship. However, in a few instances the respondents seemed unsure and offered no opinion on the questions.

Furthermore, the product and services of the targeted site (the UK) are characterized as regulation and cost driven. This creates a strong requirement for market intelligence to be on a constant watch on the latest developments in financial, commercial and regulatory aspects (e.g. IMO regulations, BWT standards, etc.). However, the respondent feedback highlighted weak market and customer intelligence in addition to a few related discrepancies.

6.2.3.2 Question 2:

Table 35. Data from the United Kingdom – Question 2

2-Construct	Question item	Department	Analysis-Key trends
Customer services	• How does your company identify and remove the causes of customer dissatisfaction?	Tech-Engineering	Feedback through the service teams and quality investigation report.
		Project Management and R&D	Warranty claims and complaints removed through trouble shooting and continuous product improvement.
		Project Management and R&D	Market intelligence and long term customer relationship.
		Product Development and sales	Through feedback loop from service/after sales teams.
		Design	Feedback through the service teams and quality investigation report.
		Tech- Engineering	Warranty claims and direct client engagement in addition to sales and services involvement.
		General Management	Customer feedback and effective communication.
		Tech- Engineering	Feedback through the project teams, after sales/service, R&D /Engineering departments.
		Project Management and R&D	Insufficient knowledge.
		Tech- Engineering	Feedback through the service teams and Quality Investigation Report.

In response to the question ii) *How does the company identify and remove the causes of customer dissatisfaction:*

The paragraph below presents the weak areas identified through the survey responses with reference to the above referred questions:

Lack of proper communication networking between the company and its customers hinders identification of customer needs. Poor understanding of customer needs and product reliability are identified. Slow pace of information flow from sales points to the related departments (i.e. product maintenance, research and development/ design) disrupts timely problem identification and the solution process.

The respondents, instead of reporting the channels involved in their actual standard operating (work) procedures (SOPs) on the questioned areas, shared their own ideas by using the statement; `would be the way` and additionally mentioned ` No clue if such a route formally exists`.

6.2.3.3   Question 3:

Table 36.   Data from the United Kingdom – Question 3

3-Construct	Question item	Department	Analysis-Key trends
New Product opportunities	• How does your company identify new product and service opportunities with existing customers?	Tech-Engineering	Visits by sales and engineering to clients.
		Project Management and R&D	Environmental regulations, customer feedback, operational challenges.
		Project Management and R&D	General or Adhoc- approach.
		Product Development and sales	Regulations by classification society.
		Design	Strong interactive customer relationship via sales and services depts.
		Tech-Engineering	Interactive customer relationship, legal regulations and market intelligence.
		General Management	Interactive customer relationship, legal regulations and market intelligence.
		Tech-Engineering	Interactive customer relationship, legal regulations and market intelligence.
		Project Management and R&D	New product opportunity identification for client support.
		Tech-Management	Customer relation´s via sales and service department.

In response to question, iii) *How does the company identifies new product and service opportunities with existing customers?*

The paragraph below presents the weak areas identified through the survey responses:

A general ad-hoc approach is practiced. A more objective approach is required. There is a need to accept more from external practices. Efforts are required to identify and understand market needs.

In addition to the above, when answering the survey question, the respondents mostly offered suggestions related to the process improvements (i.e. what should be done rather than what the work teams actually do according to their standard operating procedures or officially approved practices).

6.2.3.4   Questions 4, 5 and 6:

Table 37.   Data from the United Kingdom – Questions 4, 5 and 6

4-Construct	Question item	Department	Analysis-Key trends
Company's knowledge creation potential	A. What sort of communication systems does your company have to connect with the external as well as internal environmental segments? B. What kind of systems does your company possesses to store and utilize the creative data bulk related to NPD? C. How can one rate the environmental openness of your company in terms of knowledge sharing?	Tech-Engineering	A. International conventions and committees (MEPC, CLIA, ADEC etc.). B. NPDO on central database. Other data on local drives C. Independent sampling and legislative framework.
		Project Management and R&D	A. **External:** customer base, regulators, classification societies, conferences/publications. **Internal:** inter-divisional meetings, competitor analysis, market research. B. Review meetings. C. Top.
		Project Management and R&D	A. Environmental lobbying by Head of R & D. B. NPI process. C. Excellent team communications.
		Product Development and sales	A. E-mail…internet B. None. C. No opinion.
		Design	A. Research Mangers. B. Central database. C. Open.
		Tech. Engineering	A. External: Internet, internal intranet (Compass). B. Central database. C. Open internally.
		General Management	A. Many: conferences, exhibitions etc. B. Special department to handle new idea data base. C. Open internally.
		Tech- Engineering	A. Trade journals, interviews, adverts, conferences, fairs and exhibitions. B. Special department to handle new idea data base. C. Open internally.
		Project Management and R&D	A. Room for improvement internally. B. No opinion. C. Open within functions.
		Tech - Engineering	A. Research managers. B. Central database. C. Open.

Inresponse to question items iv) *What sort of communication systems does your company have to connect with the external as well as internal environmental segments? v) What kind of systems does your company possess to store and utilize the creative data bulk related to NPD? and vi) How can one rate the environmental openness of your company in terms of knowledge sharing?*

The paragraph below presents the weak areas identified through the survey responses with reference to the above questions:

A lot of useful old data stored in the local and network drives is not easily accessible due to organizational operational transformation. The new product development process allows `new idea` storage and prioritization. However, this process needs further refinement. External stakeholders provide only rare input. No common communication system is currently available. It is consider better to connect/subscribe/gain access to relevant scientific journals and publication databases as the means of enabling access to contemporary and state of the art global knowledge. However, its interrogation and use is little difficult. In a few instances the respondents seemed unsure and offered no opinion to the questions.

In addition to the above, once again it is obvious that while answering the survey questions, the respondents mostly replied by offering system improvement related suggestions (i.e. what should be done rather than what the work teams actually do according to their standards operating procedures or officially approved practices).

6.2.3.5 Questions 7 and 8:

Table 38. Data from the United Kingdom – Questions 7 and 8

5-Construct	Question item	Department	Analysis-Key trends
Company's innovative potential	A) How does your company innovate new products and service offerings?	Tech-Engineering	A. Sales, market intelligence and R&D projects. B. Cost effective solutions.
		Project Management and R&D	A. Specialized team. B. Regulatory requirement, cost effectiveness, customer demands.
	B) How does your company create a differentiated product option for the same target market?	Project Management and R&D	A. New idea generation during complaints handing. B. Cost effectiveness.
		Product Development and sales	A. Customer needs. B. Difficult.
		Design	A. Customer needs. B. Already different due to the nature of bespoke design.
		Tech- Engineering	A. Customer contact, market intelligence, regulations. B. Quality, cost effectiveness, reliable, long lasting, value added features, global service support.
		General Management	A. Innovative in selling. B. Tried enhanced features.
		Tech-Engineering	A. Innovation book to record ideas. For development project; strategic partnership. B. Hosting global customer´s feedback, focus group sessions.
		Project Management and R&D	A. Legislation, B. No opinion.
		Tech- Engineering	A. Customer needs. B. Already different due to bespoke design.

In response to question items, vii) Company´s new products and offering strategy and viii) P*otential to create differentiated product option for the same target market?*

The paragraph below presents the weak areas identified through the survey responses with reference to the above questions:

Currently, the company has achieved limited success in formally establishing unified new products and offering strategy. Furthermore, focused creative thinking to harness organizational potential for developing differentiated products is rare. Finally, in one instance the respondent seemed unsure and offered no opinion to the questions.

6.2.3.6   Questions 9 and 10:

Table 39.   Data from the United Kingdom – Questions 9 and 10

6 -Construct	Question item	Department	Analysis-Key trends
Company´s potential to celebrate new ideas creation process.	A. Does your company offer any distinctive recognition to its staff members to encourage new initiatives? B. How convenient is it for team members to get new ideas/ methods introduced in your company´s internal environment?	Tech - Engineering	A. Named as "On Board" B. It is down to the senior management team to drive change.
		Project Management and R&D	A. Earlier there were. B. Workers are encouraged through verbal or email communication to share new ideas with management.
		Project Management and R&D	A. Not really, it is on own initiative. B. NPI Gate process.
		Product Development and sales	A. No, B. Not very common.
		Design	A. No, B. Ideas are welcomed but not easily utilized.
		Tech- Engineering	A. Yes, inventions, patents etc. B. Bureaucratic approach.
		General Management	A. Unclear about a formal process of new idea generation, though acknowledges team´s innovative potential. B. Not much option due to being a small unit.
		Tech-Engineering	A. No recognition of individual innovativeness. B. Fair opportunity but dies down due to weak support.
		Project Management and R&D	A. No opinion. B. Very hard.
		Tech- Engineering	A. No, B. Ideas are welcomed but not easily utilized.

In response to question items, ix) *Does the company offer any distinctive recognition to its staff members to encourage new initiatives and x) How easy is it for team members to get new ideas/methods introduced in your company´s internal environment,*

The paragraph below presents the weak areas identified through the survey responses with reference to the above questions:

New product ideas can be put into the new product introduction related process and be reviewed by the management team. However, the ability to use this process needs to be communicated better. Furthermore, there is a need for clear communication and a user friendly information system. The team members are extensively engaged in routine work assignments, therefore unable to allocate time for any additional collective activities involving two or more work functions. The employees feel that there is not much recognition of their individual innovative initiatives. Though fair opportunities are available, the initiatives die down due to weak support. A few respondents seemed unsure and offered no opinions on the referred questions. Furthermore, it was pointed out that there is an issue with the amount of resources, both labor and testing facilities that can be allocated to prove innovative ideas. The above points or the identified gaps suggest that the company´s internal environment has obvious room for improvements to make maximum use of its quality human resources, infrastructure, its global positioning and brand name etc. through the support of transformation leadership and strategic thinking for a smooth process of new idea generation, support and protection. In addition, a more proactive approach is required through cross exposure in the form of workshops and exhibitions to maintain an accurate pace of new idea generation process, its support and future protection.

Summary of Chapter 6 - Quantitative data analysis

This chapter presented in detail, a qualitative data analysis through interview questions broadly covering key investigative areas of our research study (i.e. new product development idea generation approach, work leadership - based on transformational leadership model, strategic thinking and the elements of pseudo transformational leadership). The question items covered the following study variables:

   i.   New product development and customer value,

   ii.   Company's knowledge creation potential,

   iii.   Company's innovative potential,

   iv. Company´s potential to celebrate new idea creation process.

7 RECOMMENDATIONS TO FILL THE OBSERVED GAPS

The current study explored the answers to the following five main research questions through analysis of the survey respondents' feedback.

Study's research questions:

1: How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?

2: How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?

3: How adaptive is this organization in designing supportive new product development processes?

4: How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

5: What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?

This research survey has been conducted in order to fulfill two main objectives. The foremost remains the evaluation of the company´s current practices associated with new product development (NPD) idea generation duly supported through the mix of work leadership (i.e. based on the concept of transformational leadership free from the pseudo effect) and strategic thinking approaches in line with the subject company´s global teamwork scenario to highlight success and discrepancies. This aim was additionally supportive in confirming the capability of the proposed framework to pinpoint weak areas as well as its effective linking and extension of constructs.

The subsequent aim anticipates gathering employee feedback, to propose upgrades in work practices to support new product development specific innovative idea generation capability. The proposed refinements are based upon the key concepts of transformational leadership and strategic thinking. In addition, the transformational leadership must be free and cleared from the pseudo effect.

The study objectives were met with the help of interviews and electronic questionnaire (i.e. email) surveys. The data was collected in two forms. The first was an electronic closed ended questionnaire with 50 items distributed among the targeted survey recipients to meet the requirements of our evaluative analysis to understand the current related work practices in place at the targeted work locations. The second part of the data collection was through a separate, open-ended questionnaire with the posed evaluation queries. Two rounds of feedback collection gathered data to meet the twofold research objectives of this project. The suggestions for practical refinement in the light of the analyzed feedback are as follows:

7.1 Research questions No. 3, 4 and associated recommendations

Research Question 3- How adaptive an organization can be towards designing supportive new product development processes?

Research Question 4- How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

7.1.1 Recommendations - Product development idea support initiatives

It has been observed that there are numerous areas that require attention and refinement to support the subject company's NPD idea generation initiatives and capabilities. Initially, more practical initiatives by the management are required to honor and acknowledge the efforts of new idea generators. In addition, the role and involvement of innovative media options must be enhanced to create effective connections between the company (i.e. through its various work units) and its external stake-holders. Greater level of efforts are required by the company's management to enhance their work teams' knowledge base and understanding of the market as well as the customer needs in order to establish strong customer dependence on the company´s products and services through reliability. Additional focus and effort level is required from the company's management to enable flexibility in the company´s production and service solutions capabilities. Furthermore, the information sharing among various work roles and functional levels in addition to the process phases should be made convenient. It is additionally recommended that the subject company's ability to reach all types of stake holders should be enhanced further. The company's management should introduce a periodical job rotation policy (i.e. across

functions as well as across borders) to make their work team members more capable of multitasking, alert, knowledgeable and responsible for the work areas across various functions and work roles. Extensive new product idea generation related processes should be formulated and implemented to enhance and ensure speedy response inflow from the sales networks to the services or repair and maintenances units. Finally, there is a major need to install effective sales and after sales communication networks additionally involving research and development, design and product manufacturing lines to support the subject company's innovation initiatives.

7.1.2 Recommendations - Products and services value measurement approach

It has been observed that there exists an obvious requirement to devise supportive policies for periodical assessment of the subject company's newly introduced products and services' value measurement. To make such a practice possible it is recommended that the subject company must install a stronger market intelligence system through proactive periodic follow-ups instead of solely depending upon the sales and services departments´ to generate customer feedback or the regulatory requirements. In addition, an enhanced level of effort is required to ensure proactive focus on other stake holders or factors as well (i.e. competitors' and suppliers´ intelligence, actors involved in counterfeit, global technological advancement, analysis of global financial or political factors, natural calamities in the global scene, new market search, etc.) to strengthen the subject company's in-house innovative environment. Finally, more involvement of Research and Development and Marketing departments is required for periodic proactive value assessment of their products and services.

7.2 Research questions No. 1, 4 and associated recommendations

Research question 1- How effectively did this organization the implement transformational leadership principle in supporting new product idea generation potential?

Research Question 4- How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?

7.2.1 Recommendations - Work leadership practices

In response to the gaps observed in the work leadership practices it is recommended that the work teams should be given regular training and practice on strategic thinking and leadership based modules to enhance their ability to rethink traditional new product development related issues and practices in new ways. Additionally, more focus is required to enhance team members' work efficiency, independence and effectiveness.

7.3 Research questions No. 2, 4 and associated recommendations

Research Question 2- How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?

Research Question 4- How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) can be applied in an organization?

7.3.1 Recommendations - Strategic thinking skills enhancement

Work teams affiliated to new product or service development operations and issues should be regularly trained to handle tricky work situations. Such training must include exercise sessions covering cognitive factors (i.e. system thinking, reflecting, and reframing) based work and exercise material.

7.3.2 Recommendations – Organizational communication potential

The study's quantitative as well as qualitative data analysis highlighted obvious weak areas in the subject company's environmental openness and internal communication systems. To cover these gaps it is recommended that an enhanced level of cross functional communicational flow and frequent knowledge sharing opportunities be ensured, especially involving research and development, design and engineering departments. Furthermore, an increased level of organized and scheduled cross functional team coordination is required in addition to relying on electronic communication methodologies (i.e. emails, webinars, etc.). Furthermore, more frequent Skype meetings and webinars

should be arranged, involving the subject company's globally scattered teams to support international projects and enhanced team coordination.

7.3.3 Recommendation - Online communication systems

The survey results confirmed that the target company is, at the moment, not successful in implementing and utilizing the maximum potential of its internal communication systems due to, either having obsolete data or currently having insufficient operational capacity. Hence, it is highly recommended that the subject company update its communicational systems and data bases. In addition, quick upgrading or trouble shooting upon user request is required. Furthermore, communication system alterations, improvements, and the inclusion of additional features (e.g., system based corporate report, generation upon user requests should be implemented promptly) in the current communication system is highly recommended.

It is further recommended that the subject company adopt a unified procedure for application usage so as to ensure standardized, one-feel, documentation. The use of ICT based applications and databases should be made compulsory for all data management and for all concerned so as to ensure a single platform for information search and sharing. There should be strict but user friendly guidelines for information and document archiving. In addition, data accessibility should be made efficient, and user friendly. Finally, the work teams must be encouraged to use the system applications and databases more frequently and efficiently through the support of system related trainings to handle the databases and systems significantly. Furthermore, better control over communication issues due to language barriers, moderately responsiveness and unclear job description/responsibilities should be ensured.

7.4 Additional recommendations for the target company

In the end, it is noticed that since all the three targeted locations specialize in separate categories of products and services (i.e. energy solutions, marine solutions and environmental sustainability solutions) they are linked to separate NPD process factors. In the light of the above, it is recommended that the subject company should broadly classify its products and services according to their nature, scale, scope as well as the associated stake holders. This will, on the one hand, ensure a standardized and focused work approach with fewer haphazard planning related incident occurrences (i.e. different project teams taking different routes in the processes), and on the other hand, it will enable the

company to formulate or design basic but separate stage gate models for the products and offerings, keeping in view the product category nature and allied factors (i.e. a - energy solutions related products and services, b - marine solutions related product and services and c - environmental sustainability related product and services) to ensure control over unnecessary waste of resources; especially project time spanning and financial accountability. This process will further ensure that all the global teams of the subject company must follow the unified new product development models (although leaving appropriate margin for minor alterations in the practices and systems in accordance with the local circumstance and factors but supported through authorized approvals and recording keeping). The purpose here is to ensure strategic resource planning, utilization and accountability.

8   DISCUSSION OF THE RESULTS

Corporate competition in today´s world is supported through globalization and constantly growing technology advancements. This, coupled with task diversity, demand advancements in almost all work processes, practices and systems. This study was, therefore, conducted to evaluate the subject organization´s new product development (NPD) team dynamics through the fusion and extension of existing theoretical frameworks related to transformational leadership (Bass and Avolio, 1990; 1992), pseudo-transformational leadership (Barling, Christie, Turner, 2008), strategic thinking (Pisapia, Reyes- Guerra, and Yasin, 2006; 2011) and new product development (NPD) team support and team climate (Sun, Xu, and Shang, 2012). The study was initiated with dual aims: firstly, to test the viability and strength of the proposed extended theoretical framework to investigate and pinpoint the subject company's operational health with reference to the referred study fields through the formulated study tools (i.e. qualitative and quantitative survey tools) to support organizational product innovation initiatives; and secondly, to explore the validity of the linkages or interconnections amongst the various constructs (i.e. transformational leadership, pseudo transformational leadership, strategic thinking alignment with the NPD team climate and idea support) to confirm the novelty of the current research endeavor by proposing and establishing an extension to the previously well researched theoretical frameworks.

 The evaluation process of the current study comprised qualitative (interview questionnaire) and quantitative (questionnaire) methods to collect employee feedback. In addition, the employees were involved mainly for two reasons: firstly, that users are the best judges to evaluate any process or its approach, and secondly, their personal experience based opinion or suggestions can add value in bringing about process refinement which is well suited to their work requirements.

The initial highlights of the study were;

    i.   The establishment of a study tool (i.e. closed ended research questionnaire for quantitative data analysis) through combining multiple management concepts and technical industrial processes (i.e. NPD, innovation, new idea generation capability transformational leadership, pseudo transformational leadership and strategic thinking) in a way that most of the construct item´s reliability reflected Cronbach Alpha (Parry and Thomson, 2002) values falling in the range of 'acceptable' (.60 to .70)

(Brown and Jayakody, 2008) and a few items fell into the 'good` (.80) category range (Cronbach, 1951; George, and Mallery, 2003; Kline, 2000). However, special attention was given to ensure that the construct items length in the survey tool remains within the moderate range (i.e. maximum item limit of 12 questions) to avoid artificial inflation or deflation of the Alpha value (Cortina, 1993).

ii.   Achieving a 100% survey response rate is considered a rare experience, especially when the respondents participate from different geographical locations and represent different knowledge backgrounds. To support the above statement, detailed below is a list presenting theoretical support (Table: 40) to what should be considered a good or adequate survey response rate (Babbie, 1990; 1998; Bailey, 1987 cited in Hager et al., 2003; Dillman, et al. 1974; Kiess, and Bloomquist, 1985; Kathleen Biersdorff, 2009; Vanderleest, 1996)

Table 40.   List reflecting good or adequate survey response rate

Sr. No.	Survey response percentage	Precedence
1	25%	Dr. Norman Hertz supported a 25% survey response rate as sufficient while responding to the Supreme Court of Arizona.
2	30%	R. Allen Reese, manager of the Graduate Research Institute of Hull University, UK, considered 30% survey response rate as sufficient.
3	36%	According to H. W. Vanderleest (1996), a survey response rate of 36% was considered sufficient. However, the referred response rate was achieved after a reminder.
4	38%	38% is considered sufficient in Slovenia where surveys are uncommon or rarely conducted.
5	50%	50% survey response rate is considered sufficient (Babbie, 1990, 1998).
6	60%	60% (Kiess and Bloomquist, 1985) to be considered as valid to avoid bias by the most happy/unhappy respondents only. In addition, 60% survey response rate is considered valid in an AAPOR study investigating the minimum standards for publishing in key research journals.
7	70% to 75% –	70% – (Don A. Dillman, 1974; 2000) and 75% (Bailey, 1987) are considered adequate survey response rates.

In addition, as suggested by Pettigrew (1990), when accomplishing theoretically sound and practically useful research on any procedural phenomena, it is important and essential to explore at least three basic concepts and their interconnections through time: the content of the phenomena, the process itself, and the context in which it occurs. The current research study was an attempt to evaluate interconnection among the three concepts; i.e. to assess corporate new product development (NPD) (Sun, Xu, and Shang, 2012) team potential development through transformational leadership by harnessing strategic thinking (Pisapia, Reyes -Guerra, and Yasin, 2006; 2011) and the capability of the workforce to support organizational initiatives. In addition, emphasis was given to evaluate presence and the associated effects of pseudo-transformational leadership or dark leadership (Barling, Christie, Turner, 2008) organizational practices. It was a challenge to connect management concepts with technical operations (i.e. new product development process) to evaluate the linkages, keeping in view the differences in their nature. However, in the current study a focused effort was made to connect transformational leadership and strategic thinking (i.e. management concepts) with organizational new product development innovative initiatives (i.e. technical process) to identify and evaluate existing gaps in the targeted organizational operations, to suggest suitable measures for effectively streamlining and weak areas to aim for higher operational effectiveness.

The collected data was analyzed in terms of item, work role and location aspects. A comparative analysis was performed to find gaps in the respondent's feedback. The study variables were then paired across the selected study constructs (i.e. transformational leadership, strategic thinking, pseudo transformational leadership, NPD idea support and NPD team climate) to formulate hypotheses to explore strengths and directions of the linkages. The following were the main research questions of the subject study.

The goals of the study were investigated through five research questions:

Research Question 1: *How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?*

Research Question 2: *How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?*

Research Question 3: *How adaptive is this organization in designing supportive new product development processes?*

Research Question 4: *How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?*

Research Question 5: *What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study?*

All the above are additionally supported through the respondents' feedback gathered in the interview process. The interview process investigated the areas of NPD customer value, the company's knowledge creation potential, the company's initiatives for innovation and the company's potential to celebrate and empower its work teams. The following variables were used to evaluate the current organization's target work practices with reference to the above mentioned five main research questions.

Table 41. (Copy of Table 3) List of study variables along with their theoretical origin

Theoretical origin	Variables
NPD idea support	Early client involvement
NPD idea support,	Management initiatives
Transform-leadership(IM)	Supportive leadership
NPD idea support	Market intelligence,
Transform-leadership(IS)	Leaders' competence,
Strategic thinking,	Work situation
Strategic thinking	Investigative approach
Pseudo transformational leadership(PTL)	Dark leadership
NPD idea support	Customer value
TL (IINF.)	Association with leader
NPD idea support	Team initiative
NPD team climate	Responsiveness
Strategic thinking	Situational referencing
Strategic thinking	Situation handling
NPD Idea support, team climate	Communication
Transform-Leadership (IC)	Employee empowerment
NPD idea support	Target reach
Transform-leadership (II)	Trust,
NPD Team climate	Collaboration
NPD Team climate	Idea generation
NPD idea support	Product innovation
Strategic thinking	Problem solving

The variables listed in Table 41 above were converted into survey question items so that the trends reflected through the survey feedback could be evaluated accordingly. As mentioned above, this research project was mainly aimed to fulfill clear objectives. The foremost was to evaluate the subject company´s current practices related to their new product idea generation potential. While exploring the above mentioned gaps, the role of transformational leadership and strategic thinking approaches in line with their teamwork scenario was heavily focused on. To fulfil the above objective the employee feedback was analyzed from multiple dimensions (i.e. construct/Item orientation analysis, work operation wise, location orientation analysis, additional findings and the correlation among them) to propose improvements in the subject organization's new product development approach especially focusing on the new idea generation approach.

The first objective was accomplished with the help of telephone and in-person interviews (i.e. with the company's senior representative) and electronic questionnaire (web and email) surveys (i.e. the rest of the study respondents). Separate, open-ended, text based interview was included along with the posed evaluation queries. Two rounds of feedback collection gathered data to the meeting objectives of this study. The employees' practical knowledge based feedback additionally offered suggestions for new product idea generation supportive process upgrade in accordance with their general views and suggestions.

The study targeted three work locations of the subject company i.e. Finland, the UK and Norway which are not only operating in different geographical locations and consequently exposed to some completely different external challenges (e.g. elements of national culture, financial settings, local legislations etc.), but also differ considerably from each other in terms of their new product development practices due to being involved in offering different sets of products and services at different international work locations (e.g. the subject company´s study locations include - Finland: offering power and energy solutions; the UK: offering environmental solutions/pumps and valves; Norway: offering marine and related energy solutions, i.e. fuel gas systems, etc.). Since the main objectives of the study were to propose 'process refinement logic' associated with the target company´s new product development idea generation potential through the concepts of transformational leadership and strategic thinking, the author of this dissertation therefore gathered clues relating to the company´s current targeted practices revealed through its survey of respondent feedback.

Discussion of the study results took place on the basis of the above facts. The itemized analysis revealed clear discrepancies which were presented in Chapters 5 and 6 earlier. However, a few critical areas are discussed below:

While initiating the discussion, it is significant to highlight that the study gaps were identified through the survey response points where the respondents showed various levels of disagreement. However, at the score points where the study researcher noticed a considerably high level of neutral responses, those areas were also considered gaps or weak areas, keeping in view the fact that the neutral response may either be closer to an agreement or disagreement.

8.1   Research Questions and theoretical outcomes

The first research question involves the theoretical testing of the concept of transformational leadership (Bass and Avolio, 1990; 1992). The detailed explanation of the related tool item's formation was presented in Chapter 2, section 2.6.6.3 and the results and analyses were explained in Chapters 5 and 6 of this dissertation. The construct testing was carried out based on employee data obtained through qualitative and quantitative empirical procedures from all the three targeted global work locations (i.e. the UK, Norway and Finland). The study recipients represented various work groups and hierarchal levels.

Research Question 1: *How effectively did this organization implement the transformational leadership principle in supporting new product idea generation potential?*

The study results presented in Chapters 5, 6 and 8 of this dissertation confirmed relevance with the traditional transformational leadership (Bass and Avolio, 1990, 1992) theoretical model. This fact can be verified on the basis of data displayed in Table 12 and Figure 34.

The results demonstrated that the interaction between management leaders and the team members is weak with reference to the aspect of intellectual stimulation. This trend reveals that employees at the targeted locations are not being significantly empowered to take independent decisions. In addition, the results revealed notable level of responses showing high inspirational motivation tendency and low idealized influence.

The study´s results on selective question items included in Table 43 below display a high level of neutral response patterns (i.e. items 1, 2, and 3). These

question items are associated with the team management´s ability to cultivate, groom and refine their subordinate´s skills for new idea generation capability.

Table 42. Neutral responses

Sr. No.(Question items from fixed ended survey inventory)	Key items	Averages	Response trends
Question No. 21.	Experts challenge their teams to think about old NPD related issues in new ways.	3.3	Neutral / Agreed by 43% and 43 % respectively.
Question No. 22.	Experts are capable to force their teams to rethink things that they have never thought before.	3.43	Neutral with 46% response rate.
Question No. 23.	Experts are capable of helping their team members to improve work efficiency.	3.3	Neutral with 50% response rate.

The response pattern reflected through the response scores on the items included in Table 42 above displays obvious room for improvement to strengthen new idea generation potential of the target work team members through transformational leadership. Here the aspects of *intellectual stimulation* (cf. high rate of neutral responses in responding to Q21 and 22) and *individualized consideration* (cf. high rate of neutral responses in responding to Q23) appear as weak areas with reference to the *team empowerment* perspective of the targeted organization's leadership pattern. *Through intellectual stimulation, leaders produce supportive behaviors to enforce problem awareness in their followers (Bass 1985; Bass and Avolio, 1990.*

A few examples that further confirm weaknesses in the current management's initiatives to empower their teams through acknowledging their efforts, gathered through qualitative data analysis, are as follows;

One response to a question related to employee recognition for the efforts of new knowledge creation was that *"New ideas are highly appreciated at departmental level but not recognized much at the higher level"*. Another response by a study respondent was that *"New initiatives are recognized but the rewards are not visible"*. A point raised by one interviewee was that *"There are people who listen but it doesn't happen so much, or it is a long process to introduce new ways of working. We also struggle with a stiff bureaucracy"*.

An opinion by one interviewee suggested that the *(Management initiatives)* *"should be more encouraging. If you create a patent you get some recognition. This is not easy as we are locked into the process descriptions and directives".*

A critical opinion by one interviewee suggested that *"Company seems to have its own ways of doing things and these ways are strongly defended by many people. It seems that many do the job/execute the task by strictly following an internal procedure while knowing it to be not the best practice. Based on this lack of flexibility I would say that it is not likely to be easy to introduce new things, it will be a battle for change".*

In addition, one opinion of the respondents suggested that *"In the group I work in, I believe there is a fair opportunity to get new ways introduced, but is stifled through poor facilities and poor investment in R&D".*

Table 43.   Pseudo transformational leadership evidences

Sr. No.(Question items from closed ended survey inventory)	Key items	Averages	Response trends
Question No. 47.	When assigning tasks, I consider people's skills and interests through my judgment.	3.86	Agreed and strongly agreed by 60% and 13% respectively.
Question No. 48.	I expect my kind of work from my team members.	3.4	Agreed and strongly agreed by 56% and 3.3% respectively.
Question No. 49	I encourage everyone to work toward the same goal through my way.	2.9	Disagreed and neutral with 30% and 33% response rate respectively.
Question No. 50.	Team performance is best when members keep repeating the same tasks for perfection instead of learning new skills.	1.9	Disagreed and strongly disagreed with 30% and 40% response rate respectively.

Table 43 above reflects the response trends of the survey questionnaire items to detect if there is evidence suggesting the presence of pseudo-transformational leadership or unethical or faulty leadership behavior patterns.

The results displayed in Table 43 reveal weaknesses in the areas of *work leadership linked* to the construct of transformational leadership management processes (cf. respondents' rate of disagreement while responding to Q49 and Q50). An improvement to fill the referred gaps in the area of work leadership is highly recommended to support organizational new product development and innovation process. Protecting the work environment and its processes from dark leadership ensures a healthy *NPD team climate and team support* through *team empowerment,* building *trust*, enforcing effective *communication* and *collaboration* to support organizational innovative initiatives. Drucker's (1992)

point of view on "efficient leadership's ultimate task to create human energies and human vision supports the above study results. In addition, one of the Taylor's (2014) study findings states that "the transformational leadership is positively linked to employee empowerment by being supportive to equip their followers to reach their full potential to achieve the corporate vision".

As the name suggests, pseudo-transformational leadership refers to self-serving, yet highly inspirational leadership sets of behaviors, highly reluctant to support independent thinking in their followers or juniors, and displaying very little care for them in general. In fact, such individuals try to act as genuine leaders in an attempt to cover up the contrasting reality from the people around. However, it is a significant trend to include fewer items measuring such category in the modern leadership ability assessment tools to assess the presence of dark leadership behavior to suggest improvements. The study results in this category reflect a positive trend, i.e. high average on inspirational motivation (i.e. 3.86 and 3.4) but negative scores on idealized influence (i.e. 2.9 and 1.9). This further suggests the pattern of a manageable level of pseudo-transformational leadership, which requires corrective measures to ensure an ethically supportive and genuinely cooperative work environment.

The facts referred to above confirmed positive linkage between the theoretical inferences and the practical working trends when the study's quantitative data was compared with the response trends obtained through the process of qualitative results analysis. This pattern confirms the presence of pseudo-transformational leadership in the study environment. Thus, the above results propose the practical and theoretical relevance of the construct with the study respondents and their organizational environment as well as dominant trends. This confirms the positivity of the theory testing, the study's proposed model and the proposed study tool with reference to the work leadership construct.

Figure 86 content:

- Work leadership
- Intellectual stimulation 3.3
- Individualized consideration 3.6
- Inspirational motivation 3.64
- Idealized influence 2.8
- Leader's Competence to empower 3.3
- Association with leader 3.8
- Collabora 3.9
- Team empowerment 3.5
- Trust 3.8
- Dark Leadership

Key to read the trends displayed in Figure 86: Construct - Work leadership

Arrows and combined average under or equal to "3" in "Red" in the scale of 1 to 5 - Seriously weak areas
Arrows and combined average under or equal to "3.5" in "Grey" in the scale of 1 to 5 - Moderately weak areas
Arrows and combined average over "3.5" in" Black" in the scale of 1 to 5 - Strong areas

Figure 86. Study results in response to research question 1, based on the selected variables

Figure 86 above shows that the theoretical testing significantly identified "intellectual stimulation" as a weak area (i.e. with low combined average scores 3.34) reflected through "leader's competence to empower followers" (i.e. with low combined average scores 3.3) and consequently affecting overall "team empowerment" (i.e. with low combined average scores 3.5) in the subject organization work leadership scenario.

Intellectual stimulation is identified as extremely significant leadership capability not only for organizational teams but for the overall productivity and growth of the organization. This leadership potential is considered as highly significant to encourage work team members or followers to think out of the box and generate new ideas (Bono and Judge, 2003; Jung and Avolio, 1999; Kirkpatrick and Locke, 1996) through empowerment. Furthermore, employee empowerment is defined (Stewart, 1994) as merely the effective use of managerial authority and is considered a productive approach to maximize all-around work efficiency. It helps in building trust in the organization.

Trust is extremely significant for organizational interactions to support progress through work quality, effectiveness and overall organizational growth. It is defined as (Mayer, Davis and Schoorman, 1995) one party's willingness to take risks by being vulnerable to the actions of the other party, based on the expectation that the other party will perform a particular action significant for the trusting party, irrespective of the ability to either monitor or control that act.

Another weakness of the work trends in the subject work environment was the high scores on inspirational motivation (i.e. high combined average scores 3.5) area with significantly low scores on idealized influence (i.e. with low combined average scores 2.8). This trend is identified as "dark leadership". To analyze the "dark leadership trends" on the basis of quantitative analysis, the author referred to the combined study results for the referred construct displayed in Table 19 and Figure 52.

Pseudo-Transformational leadership, additionally termed dark leadership, is defined by theorists (Howell and Avolio, (1992); O'Connor et al., (1995); Taylor (2014); Barling, Christie, and Turner, 2008) as highly self-serving, inspirational leadership behaviors that are unwilling to encourage independent thought in subordinates, and offer little care for one's followers more generally. In addition, low scores on idealized influence itself is an alarming situation since this tendency is referred to the leader's capacity to lead his or her followers by setting examples, based on high moral and ethical grounds (Bono and Judge, 2003; Podsakoff, Mackenzie and Bommer, 1996).

However, individualized consideration and inspirational motivation were the strong areas that helped in balancing the negative overall work leadership trends in the subject work environment. Individualized consideration elucidates that a leader must achieve his or her follower´s maximum potential through coaching or mentoring, during a process of helping and refining their skill potential (Whitener, 1997; Bass and Steidlmeier, 1999; Dirks and Ferrin, 2002) while through inspirational motivation, the leader installs strong desires in his/her followers for a cause (Bass and Avolio, 1990; 1993).

The above analysis reveals that the subject company is not following a strategically fluent plan to ensure effective work leadership practices to support the overall innovation process, but merely following a reactive approach through trouble shooting. In addition, through the analysis of the study results linked to the work leadership construct based on transformational leadership perspective, it is concluded that the theory testing of the proposed extended framework supported through the devised study tools is successful in highlighting the linkages among the construct variables and the weak and strong areas.

Research Question 2: *How effectively did this organization implement strategic thinking principles in supporting new product idea generation potential?*

To respond to research question 2 on the basis of quantitative analysis, the author referred to the combined study results for the referred construct displayed in Table 17 and Figure 45.

Innovation driven companies continuously look for futuristic strategic solutions by introducing a new product, service or related operational process approach. In a scenario in which a company is involved in offering heavy duty lifelong solutions, with minimum, or in some instances, no options to offer products having new features and capacities, the company can, even then, either offer an entirely new set of services, it can search for new markets or can introduce new ways of selling their goods and services by being proactive (i.e. searching for new markets).

All of this is possible if a company possesses or can cultivate potential minds to generate great ideas. In addition, it is significant to establish open work environments where valuable information can be freely accessible across various work locations (i.e. departments as well as different hierarchical levels simultaneously) effectively.

Table 44.   Cognitive ability of strategic thinking

Sr. No. (Question items from closed ended questionnaire)	Key items	Averages	Response trends
Question No. 35.	I ask myself how the parts of an incomplete Figure connect in a certain situation.	3.66	Neutral 53% response rate.
Question No. 45.	I ignore my past experiences when trying to understand situations presented to me.	2	Disagreed with 73% response.
Question No. 46.	I create a plan to solve a problem before considering other viewpoints.	2.63	Neutral with 47% response rate

The survey respondents' scores displayed in Table 44 above depict their cognitive ability associated with strategic thinking capacity while dealing with different work scenarios. Strategic thinking is defined as a process that involves collection, combination and filtration of information to generate new, relevant, focused and feasible ideas and strategies (Batty and Quinn, 2010).

Significantly high scores on two selected key items (i.e. 35 and 46) and a much higher disagreement for question item 45 proves that there is an ample margin

for strategic thinking skills refinement to strengthen the potential of the targeted work teams for new idea generation process.

The results displayed in Table 43 reveal weaknesses in the areas of *"work situation and situation referencing"* linked to the strategic thinking construct (cf. respondents' rate of disagreement while responding to Q45 and considerably higher neutral responses while responding to Q35 and Q46 of the closed questionnaire). The improvements to fill the gaps in the area of *"work situation"* and *"situation referencing"* are identified as significant factors to support NPD innovation and organizational operational management.

However, all of the above is possible if the company´s work leadership is supportive enough to create and strengthen the work environment to support the new product development process through quality idea generation, and its protection and utilization.

Key to read the trends displayed in Figure 87: Construct- Strategic thinking

Arrows and combined average under or equal to "3"in "Red" in the scale of 1 to 5 - Seriously weak areas
Arrows and combined average under or equal to "3.5" in "Grey" in the scale of 1 to 5 - Moderately weak areas
Arrows and combined average over "3.5" in" Black" in the scale of 1 to 5 - Strong areas
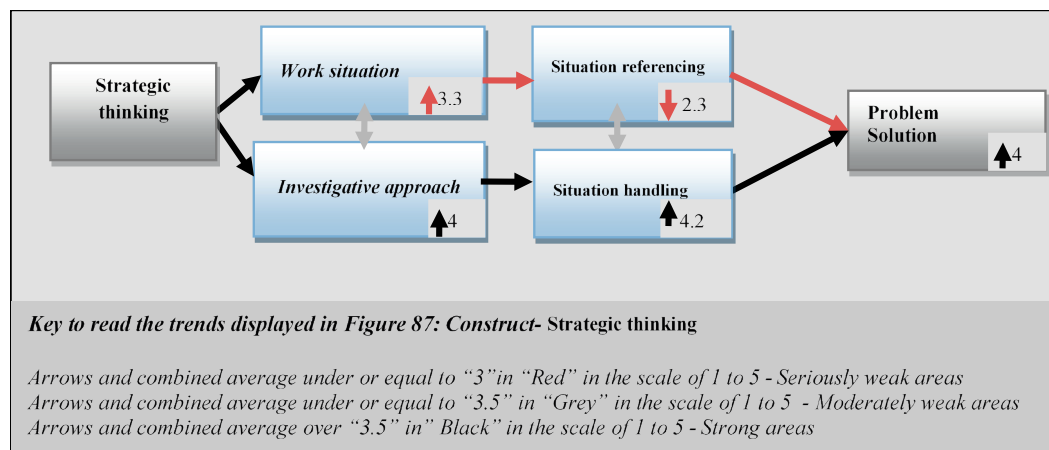
Figure 87. Study results reflecting the role of strategic thinking based selected variables

Figure 87, above exhibits that in the case of the strategic thinking construct, the theoretical testing of the extended framework identified "work situation" (i.e. representing reflection process of strategic thinking) with low combined average scores of 3.3 and "situation referencing" (i.e. representing reframing process of strategic thinking) with low combined average scores of 2.3) as weak areas, which consequently affect the "problem solution" (system thinking) process. Reflecting is explained as a skill to process information or the knowledge set to apply it according to the situational requirements through practice (Schön, 1983; Pisapia et al., 2005), while "reframing" is defined as a cognitive tool or skill to collect and arrange the information or knowledge set to define the situational realities (Morgan, 1986; Bolman and Deal, 1994; Pisapia et al. 2005).

However, the problem situation (i.e. high combined average scores of 4) in the subject company's case is effectively supported through the strength of the "investigative approach" (i.e. high combined average scores of 4) and "situational handling" (i.e. high combined average scores 4.2). The handling of "problem situation" is linked to the process of system thinking. Furthermore, systems thinking (Capra, 2002; Pisapia et al. 2005) propagates the logic that the unified whole is superior to its individual parts.

Modern theorists emphasize that in systems thinking the whole is primary and the parts are secondary. The analysis of Figure 87 above reveals that the theoretical framework testing supported through the devised study tools remained successful in highlighting the linkages among the construct variables and the weak and strong areas.

Research Question 3: *How adaptive is this organization towards designing NPD idea support and team climate supportive new product development processes?*

To respond to research question 3 on the basis of quantitative analysis, the author referred to the combined study results for the referred constructs displayed in tables 11 and 15 and Figures 25 and 39. The items in the categories of `new product development (NPD) idea support` and team climate in Table 45 below presents the question statements receiving predominantly neutral or clear disagreement. It reflects the trend that the said items which were based on leadership approach mixed with strategic thinking are either not understood in their true spirit or such trends are not much encouraged in the targeted environment.

To explain further, the author takes the results of one question item as an example (e.g. Question No. 1, of the closed ended survey tool), "new products developed at our unit are highly different from our existing products". To examine the linkage among the concepts of transformational leadership, strategic thinking and new product development embedded in the above question statement, the author proposes that the targeted new product development teams can actually utilize the associated logic, even in cases when the targeted locations are involved in manufacturing heavy duty equipment with less or in a few instances, no room to be altered extensively.

One strategic solution is to replace the feature of "highly different products" with "innovative after sales service offerings" referred to as "strategic service leadership" or the introduction of "novel ways of selling their heavy duty products or services" may be referred to as "strategic marketing leadership".

Table 45.   Connection between the concepts of leadership and strategic thinking

Sr. No. (Question items from closed ended questionnaire)	Key items	Averages	Response trends
Question No. 01.	New Products developed at our unit are highly different from our existing products.	3.26	Neutral 46% response rate.
Question No. 02.	Our flexible production capability allows us to modify our products faster.	2.8	Disagreed with 40% response rate
Question No. 04.	We take advantage of all forms of media to connect with potential stake holders during NPD process.	2.9	Neutral with 53% response rate.
Question No. 14.	NPD teams regularly travel to connect with potential influencers in search of NPD Ideas.	2.56	Disagreed with 53% response rate.
Question No. 15.	Our NPD projects are supported through extensive internal and external communication.	3.1	Neutral with 43% response rate.
Question No. 11.	Our success in NPD idea generation is due to our ability to reach potential stake holders.	3.36	Neutral with 50% response rate.
Question No. 06.	Management constantly looks for options to connect with external stake holders for NPD ideas.	3.2	Neutral with 50% response rate.
Question No. 30.	Team is cooperative in developing NPD ideas with members from other departments, if required.	3.46	Agreed with 46%.
Question No. 31.	We, as a work team, are capable of cooperation with other work groups.	4.06	Agreed with 53%
Question No. 33.	We, as a work team, are able to complete work targets on time.	3.5	Agreed with 40%

All the above items included in Table 45 reflect an obvious connection between the concepts of leadership and strategic thinking and their underlined logic in supporting the cognitive process of novel idea generation and its strategic utilization. In addition, Table 46 below, displays contradictory trends (i.e. highly agreed response ranges) as compared to the related trends reflected in Table 45

since all the items in both tables were responded to by the same set of respondents. To explain the above statement clearly, we refer to the response patterns in the instances of question items 04, 14, 15, 11, and 06 included in Table 45 for cross comparison with the response patterns in the case of items 09 and 12 mentioned in table 46 below. The results reveal weaknesses in the areas of *"flexible manufacturing"* processes (cf. respondents' rate of disagreement while responding to Q1 and 2 of the closed ended questionnaire), "team initiatives" to gain *"market intelligence"* (cf. Respondents' high rate of disagreement while responding to Q14 of closed ended survey tool) and considerable margin for process improvements in the areas of *"early client involvement, target reach, management initiatives and effective communication"* (cf. high rate of neutral responses while responding to Q4, Q6, Q11 and Q15 of the closed ended questionnaire).

The above referred gaps are related to NPD team climate and transformational leadership (i.e. *management initiatives and* effective *communication*) strategic thinking (i.e. team initiatives to gain *market intelligence*) and NPD idea support (i.e. *early client involvement, target reach*). A leader's capability is to engage his/ her followers and team members in inspirational talks (Bass, 1985; Yukl, 1981) and positive communication to help them achieve inspirational goals. The presence of gaps in the areas of *customer value, early client involvement and target reach* are additionally highlighted through the feedback gathered in interview sessions. A few responses are detailed below as the evidence;

Another respondent responded to the related question by saying that, *"(The company's targeted location is) not very strong at engaging with either customer or suppliers. Competitor knowledge is also subjective"*.

The weaknesses in the target organization's *communication* scenario are revealed through the feedback gathered in the interview sessions as well. Some of the examples are mentioned below.

When responding to the questions relating to the company's information systems and communication handling to support new idea generation process:

The response was *"I don't know"*. At one instance the response was: *"The way of handling new ideas is too bureaucratic"*. One team member pointed out that *"The information available at the internal information systems is outdated."*

And one response was that *"Currently there is no common internal communication system available in working condition"*. A respondent additionally reported that *"As far as I know, we do not have any structured way*

of storing ideas for later utilization. The best ideas and technologies are implemented into the new products according to what is considered suitable without too high risk taking (technology readiness level), but there is no structured way of storing the "left over ideas" that it could be feasible to utilize later on (after technology validation)".

The above statement is relevant to the work of Davenport and Prusak (1998) on the concept of working knowledge with reference to how organizations manage their knowledge bases.

The view of an interviewee on the company's internal communication system was that, *"(The) Company has a homepage ...... i.e. design guidelines and standards can be found there but a lot of information is outdated".* Another response received on the area was that, *"(The) Company has a document management system in which information should be stored. It may not always be so easy to find what you are looking for there".*

Furthermore, a respondent suggested that *"today information is stored on a server with limited possibilities for searching and indexing files and reports".* One respondent notified that *"The knowledge sharing is always difficult. It is difficult to know what channels to use".*

However, the results reflect a *collaborative* environment within the target locations (cf. Rate of agreement shown while responding to Q30, Q31 and Q33 of the closed ended survey tool).

The above trend supports the current management practices of the target company in the field of *team climate*. Organizational climate is referred to the recurring patterns of behavior, attitudes and feelings that portray life in the organization. It is also described as the shared perception of "the way things are around here" (Isaksen, and Ekvall, 2007; Reichers, and Schneider, 1990). The point to be noted here is the contradictory patterns of the responses by the same set of respondents for similar or associated item themes. For example, the survey respondents rated the company´s business strategy as `well designed` or their new product development process as well aligned with the market needs, suggesting they are a `good fit` (i.e. the response trends displayed in Table 46 below.

However, the associated trends supported through item numbers 04, 14, 15, 11, and 06 in Table 45 were not picked as `agreed` or `strongly agreed` with a similar ratio.

Table 46.   Contradictory response trends

Sr. No. (Question items from closed ended survey tool)	Key items	Averages	Response trends
Question No. 09.	Our business strategy focuses on aligning NPD process with market needs.	4.36	Agreed and strongly agreed by 43% and 46% respectively.
Question No. 12.	There is a good fit between what the market needs and what we provide.	4.2	Agreed and strongly agreed by 50% and 36% respectively.

An in-depth feedback analysis, conducted through quantitative analysis and duly supported by qualitative data analysis revealed that the targeted survey environments are heavily dependent on either their customer´s feedback, routed through sales and service departments, or the periodical legislative amendments, as being the core motivators and sources of new product or service development idea generation process.

These trends cannot fully support the efforts of any highly innovative company to create a perfect market fit and market leadership in terms of the customer's requirements, no matter what the nature of products or services there may be. In fact, it displays a reactive approach, which is in itself contrary to the very concept of innovation. Innovative solution providers usually depend on `out of the box thinking` to trigger surprise elements in the form of new products and service solutions, while most customers or their representatives, who approach the sales and maintenances desks bring in either their problem specific information routine service matters.

However, customers may provide some clues for future innovations, especially in the case of `inside the box thinking`, but since they are not the technical solution specialists therefore they may not be considered the sole innovation drivers.
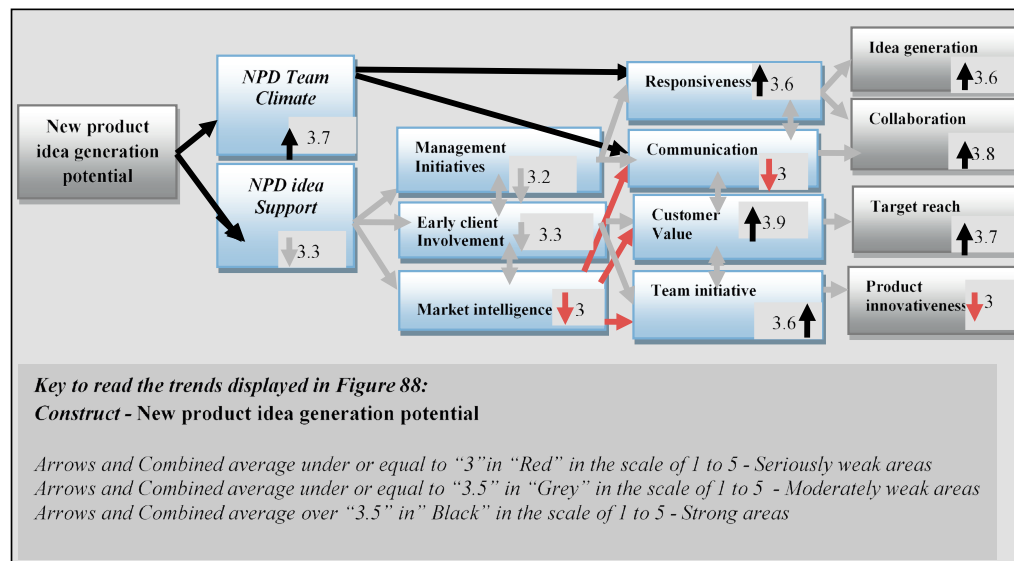
Figure 88. Study results on NPD team climate and team support based on the selected variables

Figure 88 above displayed that the theoretical testing identified "NPD idea support" as a weak area (i.e. with low combined average scores of 3.3), further effecting adversely the associated construct variables "management initiatives" (i.e. with low combined average scores of 3.2), early client involvement (i.e. with low combined average scores of 3.3), market intelligence (i.e. with low combined average scores of 3), communication (i.e. with low combined average scores of 3) and finally product innovativeness (i.e. with low combined average scores 3). While analyzing the construct results, it is worthwhile to understand that "product innovation activity can take any form out of the following three or the combination; incremental innovation - it can be reflected through industrial product improvement; variety innovation - it can be viewed as product styling or restyling; and finally, in the case of a radical innovation new capability it can be seen as introduction of a new version of the product or service (Jevnaker, 2005). Furthermore, "market intelligence" supported through effective communication is the core ingredient for the success of NPD innovation activity. Communication in an organization is defined as a process of one-to-one or interpersonal communication, between individuals. Such communication may take several forms. Messages may be verbal (that is, expressed in words), or they may not involve words at all but consist of gestures, facial expressions, and certain postures (i.e. also termed "body language"). Nonverbal messages may even stem from silence (Johnson, 1976). Market intelligence is the information relevant to a company's markets, gathered and analyzed specifically for the purpose of accurate and confident decision-making in determining strategy in areas such as

market opportunity, market penetration strategy, and market development (Cornish, 1997). Hence, the overall innovative activity associated with the process of new product idea generation is always associated with an individual´s knowledge base. Hence, it is also possible that a designer (or, perhaps, an observer during the overall product development process) will identify a new area of research while focusing on his own (Weisberg, 1999; Dorst and Cross, 2001). An individual's creativity is considered a process of producing novel and worthwhile products (Mumford, 2003).

In addition, to further support the NPD innovation process, modern theorists believe that "bringing the product design team(s) into direct contact with potential users at the initial stages of product development process instead of merely hearing or reading about them through human intermediaries, is highly significant (Gould and Lewis, 1985). However, customer value (i.e. with low combined average scores of 3.9) and team initiative (i.e. with low combined average scores of 3.6) were the two potential variables that provided support to normalize rather improve the overall negative trend. In addition, the NPD team climate (i.e. with high combined average scores of 3.7) and associated variable, responsiveness (i.e. with high combined average scores of 3.6) provided additional support to help the subject organization to cope with the weak areas mentioned above and gain positive standing in areas like idea generation (i.e. with high combined average scores of 3.6), collaboration (i.e. with high combined average scores of 3.8) and target reach (i.e. with high combined average scores of 3.7).

The above analysis once again revealed that the subject company has not devised a strategic new product development plan to ensure effective work leadership practices to support new product idea support initiatives. A reactive approach is obvious to trouble shoot the issues when and where they arrive. In the present case, the process of new product development team climate initiatives were seen as the balancing factors to counter the weaknesses in new product idea support activities. Furthermore, with the analysis of the study results linked to the new product idea generation construct based on transformational leadership and strategic thinking perspectives, it is concluded that the theory testing of the proposed extended framework supported through the devised study tools is successful in identifying the linkages among the construct variables and the weak and strong areas.

Research Question 4: *How effectively are these four components (transformation leadership, strategic thinking, new product idea generation potential and NPD adaptive culture) applied in this organization?*

The answer to this question is partially provided through the answers to the initial three questions. However, the consolidated response to this question requires discussion based on the study's overall findings. The comparative data analysis revealed that the study participants from Finland´s office displayed higher levels of scores on items related to new product development (NPD) team climate trends, i.e. overall average score of 3.6 as compared to the other two work locations (i.e. the UK and Norway).

The subject located in the UK displayed higher levels of scores on items related to strategic thinking trends (i.e. overall average score of 3.6, being higher than the group in Norway but similar to the Finnish group score). The site office in Norway displayed higher levels of scores on items related to new product development (NPD) idea support (i.e. overall average score of 3.6 as compared to the other two work locations). Put simply, we can state that the team members in the Finland site office are strong in cultivating a conducive new product development team climate, whereas team members representing the UK office are strong at new product idea generation capability on account of their strategic thinking, while the team members representing Norway are strong in new product idea generation capability through idea supportive potential. In addition, all three sites displayed almost similar leadership capabilities with marginal variations. All the three groups at the selected study locations displayed marginally higher average scores on pseudo- transformational leadership item scale, which is a negative leadership capability, revealing that there are obvious gaps in the work leadership patterns. The response patterns of the groups suggested that there is ample margin for refinement with reference to work leadership to combat the slight potential of pseudo-transformational leadership (i.e. the respondents' hints while responding to the open ended interview questions which are bureaucratic management style, low independence for work teams to adopt new ways of working through individual initiatives, fewer options for celebrating new ideas from team members at the higher levels, etc.) to lead and support the new product development idea generation concept for organizational process upgrade. The concepts of transformational leadership and strategic thinking and the earlier mentioned facts, inspired the author to explore extensively and offer recommendations with reference to the target company's new product development (NPD) process to support innovation.

As stressed by Beyer (1999), a "transformational leader is gifted with the abilities to resolve a crisis and offer radical innovative solutions to problems.

Accordingly, the qualitative and quantitative data analysis revealed possible room for improvement related suggestions in the area of new product

development stage gate process upgrade. According to the respondent's feedback, the current situation is reported as "case to case basis" with no formal new product stage and gate process being adopted. Hence, the following three sets of new product development activities with reference to each one of the studied location is formulized:

Site office: Finland			
Product or service - **Power engine**	**`New idea` sources for products and services –** i. CORL-Customer feedback through Sales and Services Departments, ii. V2- From factory, Labs and rigs, iii. Discussions with patent engineers iv. Competitor´s analysis, v. Product performance and life cycle analysis, vi. Market intelligence, vii. Gap analysis.	**NPD processes stage and gate –** Idea generation-Brain storming I - GATE Idea Refinement (Preliminary investigation I - Gate Second screening) I-GATE **Instructions for manufacturing** (Detailed investigation I - Gate Decision on business case) **I**-GATE **Product manufacturing** I - GATE **Testing** I -GATE **Feedback**	**Desired aims** i. Reliable product ii. Cheaper fuel options ii. Resolve engine break downs v. To match social regulations (emission regulations etc.) v. Worth to customers, /i. Easy to manufacture, ii. Tailor made facility- Nonstandard engine requests, ii. Value based pricing x. To gain competitive edge

Figure 89. Summary of NPD process at the targeted site office in Finland

Figure 89 above reflects the product associated with the Finland site office along with its allied processes and operational motives. The details displayed in columns 1 to 4 are in accordance with the respondents' feedback. The product category linked to the mentioned work site is energy or power related. The facts included in Table 46 reflect the site´s reactive approach towards the new product development since the major sources of the product ideas are customer´s feedback and the V2 notifications from the factory. The site office is dependent on certain regulations and standards (i.e. emission standards) that reconfirm the reactive product development approach.

The reflection of the stage and gate process, as reported by a study representative, includes the stages which are highlighted in bold format while those which are not highlighted are parts of the recommended set as well but usually get overlapped in the overall new product development process keeping in view the nature or category of the product.

Site office: Norway			
	`New idea` sources for products and services –	NPD Processes stage and gate –	Desired aims
Product or service - **Marine-shipyard support and solutions**	i. Customers claims and general feedback analysis, ii. Sales and service departments input, iii. ISO 9000 standard compliance iv. Future regulatory requirements v. Regular quality assurance (QA)meetings, vi. Degree of compliance analysis vii. Cost factors (Cost vs. customer benefit analysis). viii. Close client follow ups ix. Performance vs. deliveries analysis	Idea generation- I - GATE **Idea refinement** (Preliminary investigation- I-GATE Second screening) I-GATE **Instructions for manufacturing** (Detailed investigation on Business case– I-GATE **Decision on business case (client's NPD agreements)** **I**-GATE **Product manufacturing** I - GATE **Testing** I –GATE **Feedback**	i. **Efficient trouble shooting** ii. **Shipyard solutions** iii. **Product or sub-supplier´s equipment modifications** iv. **Long term relationships** v. **Worth to customer,** vi. **Non conformity system to log efficiently any mis-happening.** vii. **New agreements for product development** viii. **To gain competitive edge**

Figure 90. Summary of NPD process at the targeted site office in Norway

Figure 90 displays the information related to the product associated with the Norway site office. The information further highlights the product's current

baseline processes as well as its operational objectives. Here again, the details displayed in columns 1 to 4 are linked to the product category (i.e. marine - shipyard solutions) of the mentioned work site. The reflection of the actual stages and gates process includes the ones highlighted in bold format while the ones which are not highlighted are those which are part of the recommended NPD process set but usually get overlapped in the entire new product development process, keeping in view the nature or the product category.

Figure 91. Summary of NPD process at the targeted site office in the UK

Figure 91 displays the product associated with the site office in the UK along with its linked processes and operational objectives. Here, the details displayed in columns 1 to 4 are linked to the product category (i.e. environment sustainability solution) related to the mentioned work site. Figure 91 above is formulated on the basis of actual data reflecting in 'bold' the stages and gates in placed at the referred site. However, the stages that are not highlighted are those that are the part of the recommended NPD set of processes but are usually overlapped in the overall new product development process due to the nature or category of the product.

New product development process remains central and very critical to any industry. It reflects a company´s approach towards the new product opportunity. Through leadership and strategic thinking capabilities, a company's management and its work teams can sharpen their potential to react to the market opportunities by carving out smart, suitable and product category specific NPD processes.

Having a close look at Figures 89, 90 and 91 reflecting the three targeted work locations (Finland, Norway and the UK), it is recommended to implement separate stage gate processes implementations, keeping in view the differences in the product categories (i.e. energy, marine and environmental sustainability), its nature and production process requirements, to support innovation initiatives while taking care of the issues associated with NPD team dynamics (i.e. effective communication, team empowerment, effective control over resources, etc.). For instance, the products (i.e. environmental sustainability solutions- scrubbers, pumps and valves, etc.) of the site office in the UK are innovative solutions newly introduced globally.

It is a global directive and highly cost driven as well. Such products and services require more global market attention or dissemination at the initial production stages than the regular products and solutions related to power and energy or marine and shipyard issues. The difference can also be understood in terms of the nature of the stakeholders associated with each of the product categories. Environmental sustainability solutions and products are directly associated with global policies, standards and regulations, while energy solutions or marine solutions are mainly linked to social regulations and local standards and requirements. Similarly, power or energy solutions and products have more margins of manufacturing freedom and production based on innovative features (i.e. power engines, light machines or heavy and smart power plants, etc.). In all the three product categories associated with the three targeted sites, there are obvious differences in terms of product scope, manufacturing requirements,

customer base and other stakeholders. This supports a clear requirement, based on the concepts of leadership and strategic thinking, to suggest designing three different sets of new product development stage gate process to support each product category. It is anticipated that once the discrepancies highlighted through the study´s quantitative and qualitative data analysis are rectified and the targeted locations are supported through the product category specific stage gate processes, there will be an obvious positive change in the productivity and efficiency levels of the said target locations.

The above recommendation is in line with Rockart's (1979) suggestion that organizations are required to recognize elements that are significant to their success to formulate targeted goals, as failure to achieve goals associated with those specific factors would result in organizational failure. In the context of the above, extended investigation is recommended to analyze the feasibility of distributing the products and services on the basis of three broad categories (i.e. energy solutions, marine solutions and environmental sustainability solutions) supported through three separate stage gate options to establish generalized systems within the subject company's environment.

While exploring suitable measures to propose or formulate product nature specific separate stage gate models, the company's research teams can follow the examples of other manufacturing concerns as guidance: (e.g. Xerox; for Xerography, and Black and Decker for power tools) following Corning's Five-Stage, Stage- Gate process; i.e. Stage 0: Discovery; Stage 1: Scoping; Stage 2: Building a Business Case; Stage 3: Development; Stage 4: Testing and Validation; and Stage 5: Launch (Thakur, 2011; Crawford, and Di Benedetto, 2010) and an innovative approach (Henderson, and Reavis, 2008) to gain market lead through corporate product innovation strategies supported by the concept of strategic leadership (Koen, 2004). In addition, the companies could modify the basic new product development stage and gate processes according to their requirements and resources, the customers' needs and the nature of the products they are offering; e.g. United Technologies Corporation used variants of the stage gate processes to design helicopters and jet engines while ITT Industries, used to follow a staged process with progressive freezes to design military radios and satellites (Unger and Eppinger, 2011).

The sage gate process is an effective tool for accelerating incremental product development. Furthermore, it cannot be directly used for fuzzy front end (FFE) in case of platform or breakthrough products. Platform products (i.e. following a multi-market, multi-product strategy) need to begin with a strategic vision which will lead to a family of products based on an in-depth understanding of the

market and how the company's core competencies and capabilities may be used to build competitive advantage (Koen, 2004).

Research Question 5: *What is the empirical significance of the proposed fusion of constructs (transformation leadership, pseudo transformational leadership, strategic thinking and organizational NPD idea support and team climate related practices) based on the findings of the current study*

The significance of fusing the referred constructs in a single theoretical framework is an attempt to propose a system thinking approach to handle and resolve organizational issues relating to new product development initiatives and associated NPD team dynamics rather than suggesting a trouble-shooting approach by focusing on separate aspects of a single broader phenomena individually that can eventually waste vital organizational resources. In the current study, the proposed theoretical framework offers a set of tools to explore gaps in the areas of leadership and corporate strategy with special reference to organizational new product development initiatives.

The results analysis (displayed in Chapters 5, 6 and Section 8.1 of this dissertation) confirmed the capability of the current theoretical extension and its tools to highlight weak areas with reference to NPD team dynamics.

The subject study attempted to offer transformational leadership as the core management style in work utilizing the directional approach of strategic thinking to harness new product team dynamics in support of organizational innovative initiatives. The reason to fuse transformational leadership with the above constructs are the numerous research studies that have confirmed the positive role of this leadership style across samples and cultures (e.g., Birasnav, Rangnekar and Dalpati; 2010, Menguc, Auh and Shih, 2007; Bycio, Hackett, and Allen, 1995; Howell and Avolio, 1993; Howell and Higgins, 1990; Koh, Terborg, and Steers, 1991; Wofford, Goodwin, and Whittington, 1998) and confirmed this leadership style's universal theoretical support. In addition, a study conducted on 13 innovative companies by Zein and Buckler (1997), found that these companies valued their employees and had an environment that was conducive to high personal motivation.

However, much criticism on transformational leadership is in the domain of the situational context (e.g., Bass, 1985; Podsakoff, MacKenzie, and Bommer, 1996; Whittington, 1997). Numerous earlier research studies have revealed that the degree of complexity and goal difficulty have an adverse effect on team performance levels (Taylor, 1987; Taylor, Cosier, and Ganster, 1992). In addition, according to research findings (Kerr and Jermier, 1978) certain task

characteristics (e.g., that are intrinsically satisfying) and organizational characteristics (e.g., formalization in terms of explicit plans and goals) may have the potential to neutralize the impact of a leader's behavior. The above facts are in line with the early work of Bass (1985), who proposed that external environmental characteristics, organizational environment, and the role of a leader may restrain the relationship between transformational leadership and follower performance. Furthermore, some view this leadership style as being biased towards higher authority or top management (Stevens et. al, 1995) as being the source of followers' emotional exploitation and eventual burn out (Yukl, 1999). Such tendencies are completely opposite to positive organizational practices which cultivate a positive new product development team climate for innovation and creativity.

Furthermore, the empirical work conducted at DuPont by Prather (2000) confirmed that organizational openness allows people to communicate openly and offer contrasting opinions and therefore it is important for maintaining an environment conducive for innovation. Keeping in view all of the above, in the current study the researcher supplemented the construct of "strategic thinking" in the proposed framework to support transformational leadership and new product development innovation connection by having adequate control over "situational context" (e.g., Bass, 1985; Podsakoff, MacKenzie, and Bommer, 1996; Whittington, 1997) while the "pseudo-transformational leadership" construct is added in the study survey tool as a potential moderator against incidents of management or leadership bias (Stevens et. al, 1995), or followers' emotional exploitation and eventual burn out (Yukl, 1999).

The highlight of the current study is an attempt to fuse separate theoretical models (i.e. transformational leadership and strategic thinking with NPD team dynamics) and proposing an extension that has been successfully achieved in Chapter 5 through statistically validating and implementing the survey tools and consequently analyzing the data through hypotheses testing. The correlation results displayed in the Figure below confirm the linkages among the various constructs of transformational leadership, strategic thinking, NPD idea support and NPD team dynamics.
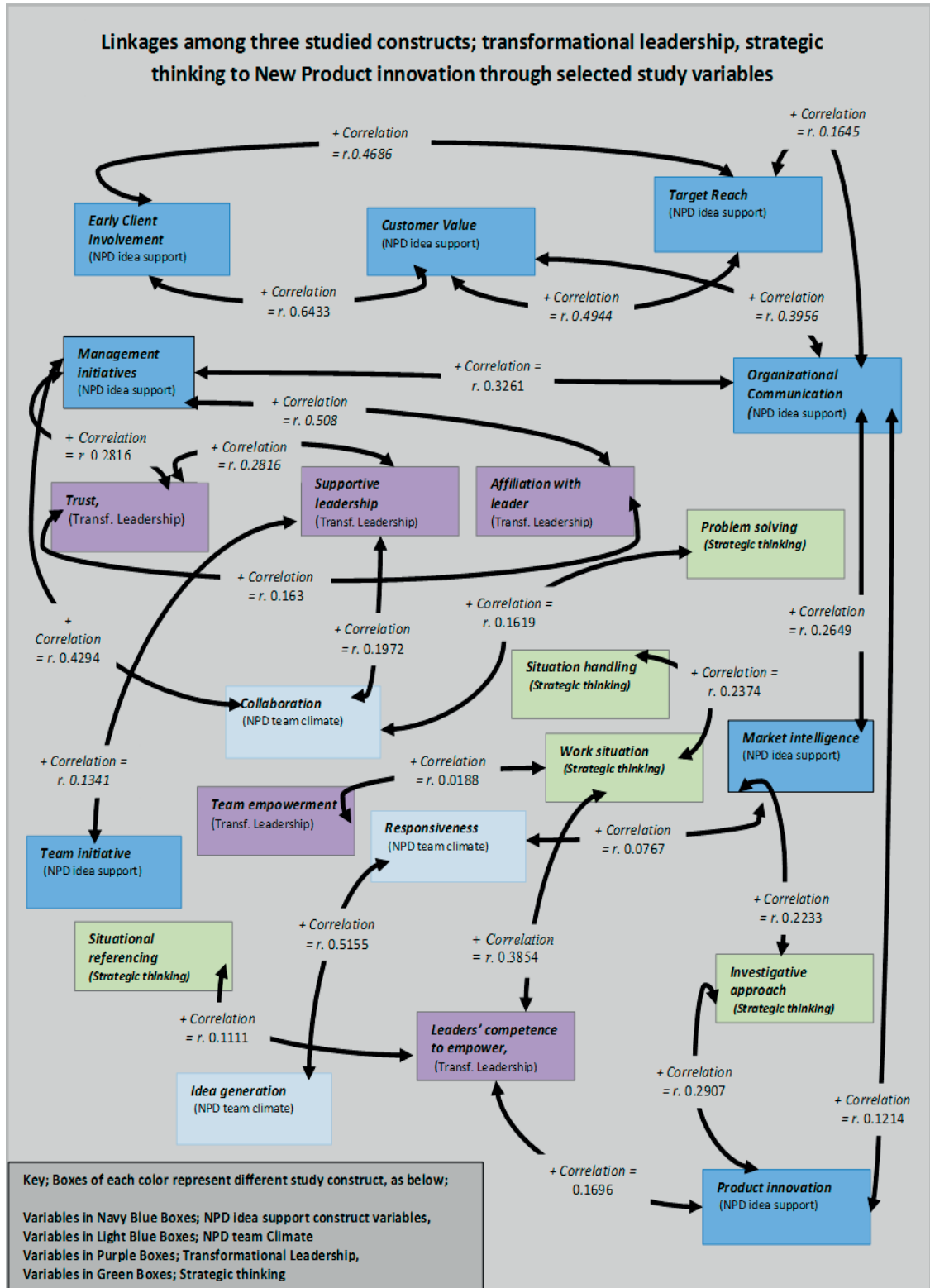
Figure 92. Linking the selected constructs through study variables

Figure 92 presents the positive correlation among all the variables, tested through the

25 hypotheses. This further confirms the success of the proposed extended theoretical framework which is presented through Figure.1 and its evolutional process model in Figure 17 of this dissertation.

Furthermore, in the light of the study results detailed above, a comprehensive list of recommendations is presented in Chapter 7 as the final outcome of the research study with reference to the subject company's perspective.

8.2   Practical implications of the research

The practical implications of the current research can be classified into two categories:

a-   Implications for strategic transformational leadership and

b-   Implications for an organization's communicational effectiveness.

8.2.1   Implications for work leadership practices

In today's turbulent economic environment, industrial management experts are more focused on exploring the best options to create work environments conducive for innovation and creativity to support industrial efficiency, productivity and sustainability.

Hence, modern organizations having the desire to gain authentic lead in the global scene, with special reference to the facts detailed above, have realized the significance of developing transformational leaders since such leaders immensely contribute to the human capital creation process to ensure effective operational transformations to achieve improved organizational performance (Birasnav, Rangnekar, and Dalpati, 2010) and profitability.

 Keeping in view the above, the current research study is an effort to propose and test an extended theoretical framework on new product development team dynamics by combining and extending the previous theoretical models of transformational leadership and strategic thinking. The proposed framework is supported by a quantitative and a qualitative survey tools to ensure dual analytical coverage through offering comparative analytical support in addition to the empirical confirmatory process.

The logic behind opting for transformational leadership as the key construct for the proposed framework is its significance for management experts who are searching for operational solutions through which their organizational teams can get help in attaining market leadership and sustainability. Leadership is in numerous reports defined as the guiding force for strategic goal settings, formulating strategies, providing guidelines, and incorporating values (Yukl, 1989).

Furthermore, the proposed framework, with the support of the extended qualitative and quantitative survey tools, is capable of assisting the management experts to pinpoint operational weak areas for assisting corrective and timely measures to support efficient organizational working to achieve innovative success. This is in line with the study conducted by Holmberg and Tyrstrup (2010), which concluded that commonly managerial workers, while pursuing every day leadership roles, perform their tasks as actors to ensure a sense-making process to run official activities. Such actions include interpretations, constant adjustments and formulations of impermanent work solutions. Henceforth, the managerial work approach is normally considered an event-driven phenomenon rather than an intention-driven long term activity due to the organizational management's required skills such as improvisation and ability to make adjustments. Leadership is considered a driving force (Kouzes and Posner, 1987) with leaders being capable of motivating their followers to achieve their ultimate aims and to do more than they even thought was possible (Bass and Avolio, 1990; 1992). This is the reason that the proposed theoretical framework is centered on the concept of transformational leadership with the support of strategic thinking to harness NPD team dynamics. In this context, figure 17 reflects, in detail, the proposed evolution process flow of new product development (NPD) related idea generation. In the current study, the author proposed a framework of strategic transformational leadership to strengthen the industrial process of new product idea generation mechanism instead of merely depending upon the concepts of leadership and strategic.

Furthermore, the proposed empirical tools in the current case study offered an added capability to pinpoint unconstructive managerial practices, if detected in routine work operations, for timely resolution. This is with reference to the established theoretical findings confirming that the leaders may cause obstructions within human systems which can generate lack of energy in the workplace by instilling fear, through their conflicting behaviors (Goleman, Boyatzis, and McKee, 2002; Fischer, 2012), or in other words dark leadership practices (Barling, Christie, Turner, 2008). This tendency is exactly the opposite of the precondition that helps in promoting a climate for positivity that work

teams require to be able to work effectively, by trusting and relying on their seniors. Fear in the work environment choke up human systems by blocking positive emotions (Goleman, Boyatzis, and McKee, 2002; Fischer, 2012) from emerging by preventing factors positively linked to organizational service efficiency and business profitability namely; creativity, employee well-being, and group affiliation (Fischer, 2012). Numerous researchers have highlighted the positive role of leadership studies (Judge and Piccolo, 2004; Howell and Avolio, 1993; Wofford, Goodwin, and Whittington, 1998) to support collaborative innovation process in work groups.

The next section presents possible repercussions and areas requiring improvements for the current and future organizational evaluations arising from this dissertation.

8.2.2 Implications for organization's communicational effectiveness

This research study has yielded conclusions that have insights on organizational communication process effectiveness. This concerns the implementation of a strategy to incorporate organizational data sources, new product idea knowledge bank, employee related knowledge and market intelligence related financial data for analyzing and monitoring new product development process flow (Cooper, 1990), (i.e. the company's production initiative till it reaches the end user). This was the gap in the current organization study. The theoretical framework and its support survey tools, presented in the current study, offer the capability to management experts and organizational leaders to accurately identify and evaluate weaknesses, if present, in their organizational communication systems for timely resolution, upgradation and process effectiveness. This is with reference to the fact that a company's initiative should be significantly innovative, depending upon its capability to generate new ideas (Chermack, and Bernadette 2007; Westhues, Lafrance and Schmidt, 2001), the capability to effectively store those ideas (Hill, and Westbrook, 1997) and the effective utility of those new ideas as and when required (Crawford, and Di Benedetto, 2010). However, according to Peter Drucker (cf. Flaherty, 1999) and Edward Deming, (1986) stress and distress in organizational environment hinders innovative initiatives, effective communication and the overall performance. In addition, it is further suggested that organizational leaders and managers must acknowledge the significance of periodical information systems evaluation and advancement of communication systems (Delone and Maclean, 2003) to ensure global project success. This approach is directly connected to the process of organizational "information technology-enabled" service exchange through organizational

interactions (i.e. local vs. global) to ensure effective partnership to guarantee value co-production. In this context, Losada and Heaphy (2004) reported that the positivity vs. negativity ratio of a work team's communication is a benchmark to measure its performance level.

8.3   Limitations, and future avenues of research

8.3.1   Limitations and challenges

The first and the most significant aspect of the current research is that it is a challenging attempt to connect numerous highly specialized concepts (Pettigrew, 1990) in one study, namely transformational leadership Bass and Avolio (1990; 1992), pseudo-transformational leadership (Barling, Christie and Turner, 2008), strategic thinking (Pisapia, Reyes-Guerra, and Yasin, 2006) and NPD team climate and support (Sun, Xu and Shang, 2012). Each of the above constructs has its own evolutional background and profound scientific support due to the years of research work conducted by well-known theorists in their respective fields. Furthermore, when a researcher tries to cover multiple issues related concepts, there are strong chances that numerous vital dimensions of those concepts may either receive only partial attention or be missed out completely.

However, it is a natural phenomenon that one cannot cover the whole spectrum of knowledge even in a single research field or topic. So much so that a tested theory may not be considered as final, since there is always a margin to extend, revise or even completely discard pre-approved scientific logic, through an enhanced level of investigation on the same issue but from a different perspective. However, all the above may stress a researcher but cannot restrict his or her interest in proceeding further, investigate multi-dimensional issues and carved out new pathways for innovative resolve.

Furthermore, though the research results were obtained through validated qualitative and quantitative empirical procedures and supported by earlier theoretical work by researchers in the related study fields, this summative research contained merely three industrial units. This may affect the authenticity of the inferences obtained through the current study or at least create concern regarding the statistical relevance of the study data. Nevertheless, the data obtained related to new product development teams, leadership and strategy involved three well established industrial locations and is a considerable sample. In addition, the data in the current study is analyzed through a statistically validated tool which was partially devised and partially extended, based on

already validated study tools devised by known theorists (Bass and Avolio, 1990; 1992: Barling, Christie and Turner, 2008; Pisapia, Reyes-Guerra and Yasin, 2006; Sun, Xu and Shang, 2012). One limitation of the study was that while making concrete study judgments for the study's comparative analysis, at points the cross comparisons seemed challenging since the study sample represented three study locations which were involved in producing different products and dealing with different clients and stakeholder clusters, operating in different national cultures, and they were exposed to various different types of internal and external organizational factors.

Furthermore, the study data did not include demographic information keeping in view the data sensitivity, the subject company's privacy and the study's sample rights policies, which may be considered as a limitation. In addition to the above, though the current study involved samples from three different international locations (i.e. the UK, Norway and Finland) the impact of the national culture, politics, legislation or economic variations was not taken in to account. The final limitation of the current study might be the criticism on the study construct, transformational leadership, by numerous theorists and management experts (Yukl, 1999; Stevens et. al, 1995; Northouse, 2007). Some view this leadership style as being biased towards higher authority or top management (Stevens et. al, 1995), acting as the source of the followers' emotional exploitation and eventual burn out (Yukl, 1999), and according to some, the term "transformational leadership" lacks conceptual clarity (Northouse, 2007) or requires additional focus from the situational context (Bass, 1985; Podsakoff, MacKenzie and Bommer, 1996; Whittington, 1997).

However, the positive role of transformational leadership confirmed through number of empirical studies across samples and cultures (e.g., Birasnav, Rangnekar and Dalpati, 2010; Menguc, Auh and Shih, 2007; Judge; and Piccolo, 2004; Bycio, Hackett and Allen, 1995; Howell and Avolio, 1993; Koh, Terborg, and Steers, 1991; Wofford, Goodwin, and Whittington, 1998). In addition, a Jackson and Parry, (2008) have restored transformational leadership's image significantly through the following statement:

"We kept waiting for transformational leadership's bubble to burst and for it to be relegated to the historical scrap bin, but it never did".

8.3.2 Future Avenues

Numerous recommendations are provided as future research avenues with reference to the current research. Such suggestions can be classified into three groups that, follows;

i.   Recommendation that would verify the current study findings

Further testing is recommended of the proposed extended theoretical model and survey tool on the companies that are involved in offering different nature of products (e.g. service or entertainment industry etc.) to make cross comparisons with the results obtained through the current study for data authentication and inventory validation. In addition, future studies may also include the national culture, economic condition, legislation and political aspects to have a deeper empirical level and scope. The impact of global boundaries on the work teams and their integrations within the local setup as well as across various work units operating in different international locations would be an additional subject of interest for future research.

ii.   Recommendations for the targeted organization

Extended empirical research is required to propose separate versions of NPD stage and gate models by broadly classifying the products in accordance with their nature and scale (e.g. products related to marine solutions, energy solutions or the environmental solutions etc.). Future studies of a similar pattern may be conducted involving more work units of the same company operating outside the European region for cross comparative analysis. Here the impact of local culture on the company's culture would be an area of research interest.

iii.   Recommendations to exploit the potential of applying positive organizational communication and leadership studies and theories found in industrial and informational management literature.

The study findings reported by Delone and Maclean (2003) with reference to their decade long empirical work focusing on global boundary effects on global teamwork that involved communication systems development will be of interest. A longitudinal research project supported through extensive qualitative analysis enabled the researchers to propose six major global boundaries that affect virtual work teams. These global boundaries are geographical distance, time separation, organizational differences, functional differences, culture and language. The study presented a category of coping processes that global work teams use in order to counteract organizational productively. Such coping process variables

are notified as i) - team coordination and ii) - cognitive strategies in the form of task programming, team communication, shared knowledge, shared beliefs and trust. Extended studies can be done to link the current study with the specialized areas identified in the work of Delone and Maclean (2003).

iv.   Furthermore, four propositions have been formulated for constructive organizational knowledge to support industrial management literature linked to new product development (NPD) strategic leadership to explore future avenues;

The *first proposition* has its basis in the results of a study conducted by Patiar and Lokman, (2009) which highlighted the linkage among the factors of transformational leadership style, market competition and departmental performance. The above study examined the relationship among various departments' financial and non-financial performance level, market competition, and transformational leadership style. The transformational leadership style, market competition, and departmental performance were measured based on the factors highlighted in previous studies (Bass, Avolio, 1990, 1992; McDowelle, 2009; Jackson and Parry, 2008) on leadership for effective organizational improvement. The said theoretical phenomenon along with similar theoretical leadership trends are discussed in Section 2.2.1 of the dissertation.

Proposition 1: Transformational leadership elevates cross departmental performance to ensure overall organizational profitability.

The **second proposition** takes its roots from the discussion in Section 1.4.6 of the dissertation. It is linked to the role of `contextual intelligence` supported by `emotional intelligence`, as the key elements to ensure an effective communication process and employee empowerment to support effective leadership practices. The process of communication is the most basic requirement to initiate any mutual action between 2 or more individuals or groups (Roy et al., 2010). In addition, the basic communication process involving the elements such as a `message` sent to a `receiver` by the `sender` through some `medium` gets highly significant and meaningful action if supported by elements of `context` and `emotionality` during the communicational process (internal and external feedback systems). The core ingredients of emotional intelligence include empathy, self-confidence, and self-awareness and these are the core underpinnings of visionary leadership (Goleman, Boyatzis, and McKee, 2002). Emotional intelligence (Van Rooy and Viswesvaran, 2004,) is significant in enhancing the comprehension level of a person's ability to identify, produce, articulate, comprehend, and appraise not only one's own but others' emotions to strengthen the cognitive process and instigate events productively in conformity

with the environmental needs and pressures. According to Nye (2011) contextual intelligence is an `intuitive diagnostic skill` to assist leaders while selecting the best suited `tactics` to formulate innovative action plans to deal with unexpected events and settings. This ability is positively linked to effective `reformers and leaders` capable of altering their working style and strategies in accordance with the environment as well as the followers´ desires and aspirations.

Proposition 2: Level of organizational leadership effectiveness can be raised through effective communication process and employee empowerment supported by the mix of contextual intelligence and emotional intelligence.

The ***third proposition*** is linked to the discussion in Section 2.3.2 and the associated Figure 16 of this dissertation. According to Iansiti (1993), today's industrial setups are searching for work teams capable of handling multidisciplinary tasks through a broader knowledge base, referred to as persons having T-shaped skills. This is a strategic shift in the classical approach of having task specialists mostly to target higher work efficiency. However, the present day trend has shifted towards having work team members with variety of cross disciplinary skills while having in-depth command over their core specialty area to handle multitasking and support innovation with minimum resource wastage (Wu and Haar, 2013; Gilsing et al., 2011; David, 1991; Bannerman, 2003).

Proposition 3: Cross functional NPD teams are more productive if they consist of a considerable number of team members who have T- shaped skill sets.

The ***fourth proposition*** is linked to the discussion in Section 2.3 and the associated Figures 12 and 14 of this dissertation. An individual´s decision making is facilitated through creative thinking for exploring effective problem solutions (Mumford and Gustafson, 1988) while being flexible in opting from a variety of choices (Flach, 1990) to gain maximum benefits, opportunities, technologies, and changes to support their routine life (Runco, 2004). However, there are paradoxical approaches to the idea generation process. The traditional approach to generate innovate ideas for problem resolution through creative thinking is built upon the adoption of an 'out of the box and unstructured thinking approach'. Such a cognitive approach does not follow systematic patterns to be truly original and innovative by initiating the process by placing the 'problem first' to encourage `brainstorming` ideas till desired solution is reached. Contrary to `out of the box` thinking, a modern approach to new idea generation through creativity propagates the logic of thinking 'inside the box' (Boyd and Goldenberg, 2013), an enhanced and rapid process for innovation, referred to a counter intuitive approach. Theorists in favor of the notion defend the concept with the logic that humans think in patterns, or operate within their bounded

rationality (Gigerenzer, 1991; Simon, 1957) and usually depend upon cognitive factors, namely knowledge, familiarity and experiences during the problem solving process. 'Inside the box' thinking is a process of exploring problem solutions while remaining within one's familiar surroundings and taking the help of set patterns embedded in creativity and it is additionally termed as inventive solutions to lay the ground for systematic inventive thinking (SIT). This technique is currently being followed by a number of well-known companies (Boyd and Goldenberg, 2013) across the globe (e.g. SAP, Johnson and Johnson, GE, Procter and Gamble, and Philips).

Proposition 4: A combination of contrasting cognitive thinking approaches are currently helping modern industries to gain market lead.

The above propositions recommend that new product development operations can be further supported through strategic leadership to achieve enhanced level of organizational innovative activities. Hence, new ways, linked to the above propositions must be explored to further investigate options to ensure organizational efficiency as well as market leadership and productivity.

8.3.3   Research contribution

Despite the limitations and considerable room for extended future research investigation in the study areas, the present study offered a number of methodological contributions that are detailed below:

Firstly, this dissertation facilitated conceptualization and formulization of a unified research framework by combining multiple established theoretical models and associated case studies introduced by well-known theorists (transformational leadership (Bass and Avolio, 1990; 1992); pseudo-transformational leadership (Barling, Christie and Turner, 2008); strategic thinking (Pisapia, Reyes -Guerra, and Yasin, 2006) and NPD team climate and support (Sun, Xu, and Shang, 2012) to broaden the research scope and the outreach of analysis, that has not been done before (Chapters 2, 5 and 8). The author of this dissertation has tried to combine one management concept (i.e. transformational leadership) with a cognitive process (i.e. strategic thinking) to link a technical industrial management concept (i.e. new product development) to support industrial innovation process through a specialized diagnostic tool. Two separate but specialized survey tools were established to measure the survey results (i.e. quantitative as well as qualitative) related to the variety of study constructs (i.e. new product development, strategic thinking, transformational leadership and pseudo transformational leadership) to achieve a strong cross

comparative research analysis. The data was tested to validate the proposed extended theoretical model through the current study. In addition, the study results represented data collected through two forms of research questionnaires (i.e. qualitative and quantitative) to cover the unit-level field studies where the data was collected from three work locations and across multiple organizational hierarchical levels (Chapters 2, 5 and 6). The ultimate contribution of this research is to establish a validated analytical and diagnostic tool to enable organizational leaders to periodically investigate the management operational health of their industries for timely identification of weak areas, to run gap analysis and to facilitate problem solving for effective operational growth and organizational effectiveness.

8.4   Concluding remarks

To satisfy the ever changing corporate demands as well as face up to global challenges, today's industries are extremely interested in continuously improving their key processes and offerings.

This dissertation has presented the outcomes of a theoretical framework extension and its empirical testing in the context of transformational leadership and strategic thinking, how new product development idea generation practices can be enhanced to support innovation (i.e. formulation of the framework and supported qualitative and quantitative tools are presented in Chapter 2 of the dissertation).

The proposed theoretical framework supported by specially devised and partially extended survey tools (i.e. qualitative and quantitative) demonstrated that there are considerable imbalances based on the empirical framework's desired state and the practical realities. The research inferences were based on the actual NPD idea generational practices followed by the three work groups of the same organization operating in three different global locations (i.e. Finland, Norway, and the UK), as well as across various organizational work roles (i.e. general management, design, engineering, research and development etc.). The central objective of the current empirical inquiry was to evaluate the existing new product development practices of the subject company with specific focus on the idea generation process to identify gaps, if any, revealed through the survey recipients' feedback to further suggest refinement within their existing framework. The empirical investigation revealed that in general, the current new product development practices, related to idea generation were sufficiently supported in terms of technology infrastructure to ensure effective

communication and data storage capability. In addition, the current empirical testing confirmed that the extended framework and its linked survey had the ability to pinpoint weak and strong areas across selected constructs, i.e. transformational leadership, strategic thinking, NPD team support, NPD team climate and pseudo leadership.

Furthermore, the theoretical model testing and implementation of the specialized survey tools in the above work locations revealed discrepancies in the current practices with in the areas, namely the *management´s approach to acknowledging new idea generation potential, the potential of the company´s internal and external communication systems, the capacity for the data collection and record keeping, the empowerment of employees, recognition of the employees' effort, etc.* (detailed result analysis is presented in chapters 5 and 6).

All such areas are critically significant for any organization in terms of shaping its work teams´ innovative capabilities and potential to harness their new product idea generation capability. In addition, the data obtained through analysis of the three targeted work locations (i.e. Finland, Norway and, the UK) revealed that the products and services offered by each one of sites differ significantly (i.e. energy solutions, marine solutions, environmental sustainability solutions, respectively) in terms of nature, scope, size, etc. In addition, each of the locations deals with different types of customers, suppliers, competitors and financial and legal factors usually. It is therefore it is recommended that there is a strong need to adopt more than one stage gate model to cover the new product development processes keeping in view the variety in the nature of product and services offered by the company. This will ensure a more focused approach, focused working, less wastage of resources (i.e. time, money, and expert skill potential etc.) and more importantly, accuracy, control and accountability.

All in all, this empirical investigation is a unique endeavor in covering multiple factors (i.e. the unification of four concepts in one: NPD, transformational leadership, strategic thinking, pseudo transformational leadership), extension of earlier theoretical models and survey tools, validation of the proposed tool, implementation of the tool in a company having global presence, identification of gaps, proposals for the rectification of the gaps along with an additional proposal for adaptive new product development stage gate models.

Furthermore, this dissertation proposes a unique conceptual approach for future research of both services industries and management researchers to investigate the role of strategic leadership in supporting the innovation process.

Summary of Chapter 8 – Discussion of results

The closing chapter summarizes the research study by briefly touching upon the main tasks, i.e. the purpose of the research, objectives, empirical case study, data analysis results and discussion on the subject research based upon the perspectives of combining the concepts of transformational leadership and strategic thinking in the study organization´s NPD practices. The chapter additionally highlights the limitations and future avenues of research and ends with concluding remarks on the study. This chapter is followed by a list of literature references used in this dissertation.

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Appendices

Exhibits

1.   Transformational leadership based new product development practices

i. NPD idea support

(Question sequence of the closed ended questionnaire; items 1-16)

Sr.No.	Items	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agreed	Total	Average
1	New Products developed at our unit are highly different than our existing products.	1	5	14	5	5	30	3.26
2	Our flexible production capability allows us to modify our products faster.	2	12	7	8	1	30	2.8
3	We remain in contact with our key clients during the product development process.	0	2	5	19	4	30	3.83
4	We take advantage of all forms of media to connect with potential stake holders while NPD process.	0	8	16	6	0	30	2.9
5	Management encourages us to develop something novel instead of just a new shape of the product.	0	6	11	11	2	30	3.3
6	Management constantly looks for options to connect with external stake holders for NPD ideas.	0	5	15	9	1	30	3.2
7	I feel very comfortable if external stake holders give new ideas for NPD project.	0	2	9	15	4	30	3.7

8	We selects NDP ideas based on their technical feasibility to design develop and manufacture.	0	2	6	17	5	30	3.83
9	Our business strategy focuses on aligning NPD process with market needs.	0	0	3	13	14	30	4.36
10	We focus on all types of customers (i.e. Purchasers, influencers and end Users) while NPD projects.	0	5	10	10	5	30	3.5
11	Our success in NPD idea generation is due to our ability to reach potential stake holders.	0	3	15	10	2	30	3.36
12	There is a good fit between what the market needs and what we provide.	0	1	3	15	11	30	4.2
13	Our market intelligence strategy combines- customer's needs assessment, price sensitivity, suppliers capabilities, competitors NPD strategies and geo-political know how aligned with new product specifications.	0	4	10	12	4	30	3.5
14	NPD teams regularly travel to connect with potential influencers to search of NPD Ideas.	1	16	8	5	0	30	2.56
15	Our NPD projects are supported through extensive internal and external communication.	0	7	12	11	0	30	3.1
16	Our teams quickly share with each other, NPD ideas what they receive from outside.	0	9	7	13	1	30	3.2

ii. NPD Team Climate

(Question sequence of the closed ended questionnaire; items 25-34)

Sr.No.	*Items*	*Strongly Disagree*	*Disagree*	*No Opinion*	*Agree*		*Strongly Agreed*	*Total*	*Average*
25	Team members display agreement with the team´s objectives	0	0	7	22		1	30	3.8
26	Team members feel understood and accepted	0	0	6	21		3	30	3.9
27	Team members keep each other informed	0	2	8	17		3	30	3.7
28	Team is capable to take real attempts to share information	0	1	8	20		1	30	3.7
29	Team is strong in searching for new ways of looking at product development problems	0	1	7	19		3	30	3.8
30	Team is cooperative in developing and applying new ideas in collaboration with key individuals from other departments	0	4	10	14		2	30	3.46
31	We, as a work team, are capable to cooperation with other work groups	0	2	3	16		9	30	4.06
32	In our organization, work performance is considered as overall and combined phenomena.	0	1	10	18		1	30	3.63
33	We, as a work team, are able to complete work targets on time.	0	5	9	12		4	30	3.5
34	The team´s ability is considered as quick to respond to problems.	0	3	6	17		4	30	3.73

2.   Transformational Leadership

Sr.No.	Items	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agreed	Total	Average
17	Our experts are trusted for passing on genuine and quality knowledge to their teams.	0	1	6	19	4	30	3.8
18	Team members associate themselves with their seniors for their work skills and expertise.	0	0	8	20	2	30	3.8
19	Team leaders are capable of explaining the project work targets and procedures.	0	1	8	20	1	30	3.7
20	Leaders can help members to find out the significant ways to carry out NPD activities.	0	1	9	20	0	30	3.6
21	Experts challenge their teams to think about old NPD related issues in new ways.	0	4	13	13	0	30	3.3
22	Experts are capable to force their team s to rethink things that they have never thought before.	0	2	14	13	1	30	3.43
23	Experts are capable of helping their team members to improve work efficiency.	0	3	15	12	0	30	3.3
24	Experts are capable of providing support to their team members in special difficulties.	0	0	3	26	1	30	3.9

3. Strategic Thinking

Sr.No.	Items	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agreed	Total	Average
35	I ask myself how the parts of an incomplete Figure connect in certain situation.	0	0	16	8	6	30	3.66
36	I think intuitively about what is unique or unusual about certain problem situation.	0	1	9	15	5	30	3.8
37	I think about questions I am neglecting to ask.	1	5	15	8	1	30	3.1
38	I think about what's so important about this challenge.	1	3	3	17	6	30	3.76
39	I try to understand how the facts in the situation are related to each other.	0	1	4	15	10	30	4.13
40	I look at the "Big Picture" in the information available before examining the details.	0	0	4	14	12	30	4.26
41	I investigate the cause before taking any action.	0	0	8	14	8	30	4
42	I seek different perspectives while thinking about NPD ideas.	0	0	7	16	7	30	4
43	I try to find a common goal when two or more parties are in Conflict.	0	0	3	24	3	30	4
44	I engage in discussions with those who hold a different point of view.	0	0	8	17	5	30	3.9
45	I ignore my past experiences when trying to understand situations presented to me.	6	16	7	0	1	30	2
46	I create a plan to solve a problem before considering other viewpoints.	2	9	14	4	1	30	2.63

4.   Pseudo-Transformational Leadership

Sr .No.	Items	Strongly	Disagree	No	Agree	Strongly	Total	Average
47	When assigning tasks, I consider people's skills and interests through my judgment.	0	0	8	18	4	30	3.86
48	I expect my kind of work from my team members.	1	5	6	17	1	30	3.4
49	I encourage everyone to work toward the same goal through my way.	2	9	10	8	1	30	2.9
50	Teams` performance is best when members keep repeating the same tasks for perfection instead of learning new skills.	10	12	7	1	0	30	1.9

Permissions from the referred experts and theorists

i. Dr. Julian Barling, Professor of Organizational Behavior and Psychology, Associate Dean and Research Chair of the Queen's School of Business, Canada.

ii. Dr. John Pisapia, Professor of Leadership Studies at Florida Atlantic University, author of -`The Strategic Leader` (i.e. One of the ten best sellers in 2010) and the formulator of `Strategic Thinking Questionnaire (STQ)`.

iii. Dr. Bruce J. Avolio, Professor of Management, Mark Pigott Chair in Business Strategic Leadership, Executive Director, Foster Center for Leadership, University of Washington, USA, and the co-developer of `Multifactor Leadership Questionnaire (MLQ), along with Bernard M. Bass, the formulator of Transformational Leadership Theory.

From: **Mind Garden**
Sent: Monday, July 21, 2014
To: Asiya Kazmi

You can definitely use these items in your survey. We would not charge you. Attribution to Dr. Bruce Avolio's publication would be appreciated.

Thanks for asking.

Best,
Valorie Keller
Mind Garden, Inc.

On Mon, Jul 21, 2014, Asiya Kazmi wrote:

Dear Ms Valorie,
Thanks for your response.

Following are the questions;

Questions:	Indicator	Reference
Our experts are trusted for passing on genuine and quality knowledge to their teams.	*TL- Idealized Influence*	
Team members associate themselves with their seniors for their work skills and expertise.	*TL- Idealized Influence*	*Based on the theoretical framework of*
Team leaders are capable of explaining the project work targets and procedures.	*TL- Inspirational Motivation*	*Transformational leadership.*
Leaders can help members to find out the significant ways to carry out NPD activities.	*TL- Inspirational Motivation*	*(B. M. Bass and B. J. Avolio 1990; 1992)*
Experts challenge their teams to resolve their usual NPD related concerns from new perspectives.	*TL- Intellectual Stimulation*	
Experts are capable to force their teams to rethink things that they have never thought before.	*TL- Intellectual Stimulation*	
Experts are capable of helping their team members to improve their work efficiency.	*TL- Ind. Consideration*	
Experts are capable of providing support to their team members in special situations.	*TL- Ind. Consideration*	

There are 30 respondents in my survey.
An early response will be much appreciated

Kind regards,
Asiya Kazmi

From: bavolio

To: asiyakazmi
Subject: RE: Permission required referring your literature!
Date: Mon, 21 Jul 2014

Dear Asiya

All formal permissions for use of the MLQ Form 5x or items/scales, should go thru www.mindgarden.com

Thanks, Bruce

From: Julian Barling
Sent: Saturday, July 19, 2014 3:12:02 PM
To: Asiya Kazmi

Asiya hi there

You don't need any permissions!   Good luck with your research!

Julian

Sent from Samsung Mobile

-------- Original message --------
From: Asiya Kazmi
Date:07-19-2014 12:24 AM (GMT-09:00)
To: Julian Barling
Subject: Permission required to referring your literature!

Respected Dr. Julian Barling,

I, S. Asiya Z. Kazmi, am an international PhD student, enrolled at the Industrial Management Program, University of Vaasa, Finland.

I am studying the organizational new product development team potential building by incorporating the elements of transformational leadership and strategic thinking as part of my PhD research study. While doing so, I want to partially refer your literature while constructing my survey tool (Ref. Barling, J., Christie, A., and Turner, N. (2008) Pseudo-transformational leadership: Toward the development and test of a model. Journal of Business Ethics, 81, 851-861).

In addition, the survey tool that I have established has a few items (4 items) on pseudo-transformational leadership, though not using your research tool/ questions exactly. My survey tool includes 50 items in total covering different subject areas (transformational leadership, strategic thinking and new product development etc.).Please apprise me if I as a student require formal permission or not? If not, then I am thankful, but if `yes`, then what will be the appropriate procedure to follow. An early response will be highly appreciated.

Kindest regards,

S. Asiya Z. Kazmi

Phd student - Industrial Mgt.

University of Vaasa, Finland.

From: **John Pisapia**
Sent: Monday, July 21, 2014 5:50:27 AM
To: Asiya Kazmi
          2 attachments
          Theoretical part.docx (33.2 KB) ,
          2011STQConfirmationFinal1.pdf (513.8 KB)

Asiya

I have taken the liberty to revise portions of your paragraphs to what I consider to be more accurate (Revision in 2011). The revised suggestion is attached – you have my permission to use it and the items that will help you in your study.

Also there is the reference list for those studies specified.

Finally I send you a copy of the validation study formulated in 2011

Best of luck

John

Correspondence between the project researcher and the study company

From: **Asiya Kazmi**
Sent:Friday, November 29, 2013 12:32:51 PM
To:
Cc:
       2 attachments
       Questionnaire2.doc (137.5 KB) , Questionnaire1.docx (75.4 KB)
Dear survey recipient,

The extended deadline for sending your feedback to the survey questionnaires is reaching its end shortly on **30 Nov. 2013.**

The research questionnaires used in the current study are devised with the aim of introducing an established research tool to be used in other organizations subsequently. A group of 30 study participants from the subject company in three international locations (i.e. Finland, UK, and Norway) were selected as a benchmark because of their rich professional experience and background with the purpose of helping the research team in formulating a valid study tool.

Keeping in view the above, we are aiming to collect feedback from all the 30 survey invitees. Therefore, it is requested that you share your valuable insights with the help of the provided questionnaires. However, we do understand your busy schedule so please feel free to ask for any assistance (e.g., clarifications on the content of survey questionnaires or addition time etc.) if required in this regard.

Please consider our reminder as a gesture to acknowledge the worth and significance of your feedback in this research activity. The purpose behind it is only to ensure having your valued response which will help future professionals.

A few minutes of your time and attention to participate in the survey will go a long way in accomplishing this research study for the subject company.

Thank you again and best regards,

S. Asiya Z. Kazmi
Researcher, Industrial Management,

From: **Asiya Kazmi**

Sent: Wednesday, November 27, 2013 12:20:33 PM

To:

Cc:

>   2 attachments
>
>   Questionnaire2.doc (137.5 KB) , Questionnaire1.docx (75.4 KB)

Dear survey recipient,

You are still left with a few days to give us your feedback till **30 Nov. 2013.**

This reminder requests your participation, as advisor/reviewer, in evaluating the new product development processes and related teamwork scenario at the study company. Keeping in view the nature and significance of the study for your organization, **it is important that we receive feedback from all the 30 participants**.

It is requested that this extended deadline is effectively utilized to ensure full participation from you. Please note that the recently extended deadline was to ensure your convenience as well. Your time and attention is highly appreciated.

Thank you again and best regards

Asiya Kazmi,

Researcher, Industrial Management,
University of Vaasa, Finland.

From: Asiya Kazmi

Sent: Tuesday, November 26, 2013 8:43:01 PM

Dear survey recipient,

You are still left with few a days to submit your feedback till 30 Nov. 2013.

We anticipate your feedback on the areas of improvement in the study company new product development processes and related teamwork which will not be possible unless you help us as advisors. It is strongly believed that the users of a system can highlight the most crucial and hidden aspects which may go unnoticed sometimes. Thus, we again request for your participation to make the system better suited for your work responsibilities.

Please fill-in the survey questionnaire and do consult me in case you find any difficulty in responding to the questionnaires. Your time and concern is highly appreciated.

Thank you again and best regards,

Asiya Kazmi,

Researcher, Industrial Management,

University of Vaasa, Finland.

Sent: asiya kazmi
To:
Date, Monday, November 25, 2013 1:11:56 AM
2 attachments
Questionnaire1.doc (210.4 KB) ,
Questionnaire2.doc (134.4 KB)

Dear survey recipient,

This email is in continuation of Mr. Juha Kytola´s initiative for a research study on product development culture in the study company. A specialized group of 30 participants was selected from three locations of the company (i.e. Finland, the United Kingdom and Norway).

Keeping in view the nature and significance of the study for the company, the aim to obtain feedback from all 30 selected study participants. However, since the allocated time period to collect the feedback through questionnaires has ended on 22 Nov. 2013, 1700 hours local time (at the respective locations) and only 50% participation has been achieved, it is important that we do our best in sharing feedback.

In order to facilitate all the required participation, the deadline for returning the completed questionnaires has been extended till 30 Nov. 2013. Please use this extension of deadline to complete the questionnaires.

Thus, we again request for your participation to make the subject system better. A few minutes of your time and attention to participate in the survey will go a long way in accomplishing this research study for the subject company.

Thank you again and best regards,

S. Asiya Z. Kazmi
Researcher, Industrial Management,
University of Vaasa, Finland.

From: Asiya Kazmi
Sent: 18 November 2013 22:49

To: Asiya Kazmi

Cc: Subject: Reminder - A study on product development culture.

Dear study participants,

If you have yet not completed the survey questionnaires, you are still left with a week's time to give us your feedback. This reminder anticipates your participation in evaluating the study on product development culture in the study company. Please fill-in the survey questionnaires to make the research study possible on the basis of maximum response variety; your time and concern is highly appreciated.

Please note that we aim to finalize this research survey by 1700 hrs on Friday, 22 November, 2014.

Thank you again and best regards,

S. Asiya Z. Kazmi
Project Researcher
University of Vaasa, Finland

_____

From: asiyakazmi
To:
CC:

Date: Thu, 7 Nov 2013 20:12:15 +0300

Respected Colleague,

This email is in continuation of Mr. Kytola´s correspondence on the above study.

I am S. Asiya Kazmi (Researcher), from the Industrial Management Deptt., University of Vaasa, Finland, working on the topic under the supervision of Dr. Marja Naaranoja.

Please find attached herewith 02 questionnaires, (i.e. i) Closed ended questionnaire with 50 questions and ii) interview Questionnaire with 10 subjective questions) covering various dimensions of organizational product development culture.

You are kindly requested to answer both the questionnaires and resubmit them to the email contacts provided below, within 2 weeks. Please let me know if you require additional time or professional support in this regard.

Your feedback will be of high value in finalizing the research study and will be treated as completely confidential. Please feel free to contact me if required.

Thanking you in advance.

Kindest regards,

S. Asiya Z. Kazmi
Researcher/ PhD Candidate,
Faculty of Technology, Ind. Management Deptt.
University of Vaasa, Finland.

From: Juha Kytölä
Subject: A study on product development culture
Date: Thu, 24 Oct 2013 15:50:57 +0000

Dear Colleagues,

 This is an invitation to participate in developing our product development activities.

 As I myself have been for many years involved in product development in the study company and recently ...., I would like to develop our activities in this area further. I have, however noticed that we have origins in different cultures and have during the years developed various ways of working. Before initiating any improvement and further development, I would like to understand the status of today and here I would like to ask help from you all.

Your management has nominated you to participate in data collection regarding ways of working and culture in your units. This study will cover units in Norway, the UK and Finland. The plan is simply to send you a set of questions that you respond to. Through this information will be collected about working in your units in order to give us a platform for possible further development.

This kind of a study needs to be neutral and thus the research will be conducted by researcher Mrs Asiya Kazmi from Vaasa University and will be guided by Professor Marja Naaranoja. Your responses will be handled anonymously and individual responses will not be given to the study company. Thus you are free to respond as you actually feel and see. And, please, do so!

 Ms Asiya Kazmi will soon contact each of you and I wish that everyone will respond. Giving the response will not take a long time but will be of extremely high importance for this study.

 Thank you all in advance,

 Juha Kytölä

Support to the survey respondents

SENT: TUESDAY, NOVEMBER 19, 2013 12:57:38 PM
From:
To: Hello Again Asiya,

 Question 8 of the second questionnaire.
 Do you mean 'the openness of our working environment' or 'our environmental openness'?
If the second one, could you explain more this question please?

Thanks

 Manager (Design) –

From: **asiyakazmi**
Sent: Tuesday, November 19, 2013 7:38:53 PM
To:
Dear Mr ....

Thanks a lot for consultation.
The question number# 8 is aimed at obtaining information about the openness of your organizational work environment. In simple words, you can share how comfortable and easy it is to share work related knowledge among colleagues working in the same departments or employees representing different departments or operational teams.
 I hope that the above clarification can help you to respond to the referred question.

Kind regards,
Asiya Kazmi

From: **Asiya Kazmi**
Sent: Thursday, November 14, 2013 2:17:50 AM
To:

Hello

Thanks a lot for consultation.

Please consider the terms `leader` and the `member` (in question # 20) as the team leader and team member involved in the operations related to new product development. In addition, the term `expert` refers to the senior professionals or technical team members in the NPD related operational teams.
I hope that the above clarification is sufficient to explain the referred terms. However, please do let me know if you require any further clarification in this regard.
Kind regards,

Asiya kazmi

From:
To: Date: Wed, 13 Nov 2013 12:32:48 +0200
Subject: RE: A study on product development culture

Hello Asiya,

I am filling out your questionnaire and have got to questions 20/21/22.

Could you give me a definition of Expert / Leader / Member?

 Thanks

 Manager (Design) –

Survey Questionnaires,

    a- Quantitative
    b- Qualitative

Research Questionnaire

Synopsis

Research Inventory is designed to target key areas of analyses covering New Product Development (NPD) process at multiple selected locations of Wartsila, through respondents' feedback; the reason behind the research activity is to suggest extension in NPD process by combining new product idea stimulation from external as well as internal environments and especially highlighting Ux Leadership.

Project Leader - Dr.Marja Naaranoja, Project Researcher - S. Asiya Z. Kazmi

Key:

Sr. No	Subject Area	Questions
1	NPD Idea support	1-16
2	Work Leadership	17-24
3	NPD Team Climate	25-34
4	Strategic thinking	35-46
5	P-T Leadership	47-50

Research Inventory

Instructions for the respondents: Answer each of the following statements in accordance with the following response scale:

1 =Strongly Disagree; 2 = Disagree: 3 = neither Agree nor Disagree; 4 = Agree; 5 = Strongly Agree

Please note: NPD stands for 'New Product Development' in reference to this survey

Sr. No.	*Question Statement*	1	2	3	4	5
1	*New Products developed at our unit are highly different than our existing products.*					
2	*Our flexible production capability allows us to modify our products faster.*					
3	*We remain in contact with our key clients during the product development process.*					
4	*We take advantage of all forms of media to connect with potential stake holders while NPD process.*					
5	*Management encourages us to develop something novel instead of just a new shape of the product.*					
6	*Management constantly looks for options to connect with external stake holders for NPD ideas.*					
7	*I feel very comfortable if external stake holders give new ideas for NPD project.*					
8	*We selects NDP ideas based on their technical feasibility to design develop and manufacture.*					
9	*Our business strategy focuses on aligning NPD process with market needs.*					
10	*We focus on all types of customers (i.e. Purchasers, influencers and end Users) while NPD projects.*					
11	*Our success in NPD idea generation is due to our ability to reach potential stake holders.*					
12	*There is a good fit between what the market needs and what we provide.*					
13	*Our market intelligence strategy combines- customer's needs assessment, price sensitivity, suppliers capabilities, competitors NPD strategies and geo-political know how aligned with new product specifications.*					
14	*NPD teams regularly travel to connect with potential influencers to search of NPD Ideas.*					
15	*Our NPD projects are supported through extensive internal and external communication.*					
16	*Our teams quickly share with each other, NPD ideas what they receive from outside.*					

17	*Our experts are trusted for passing on genuine and quality knowledge to their teams.*				
18	*Team members associate themselves with their seniors for their work skills and expertise.*				
19	*Team leaders are capable of explaining the project work targets and procedures*				
20	*Leaders can help members to find out the significant ways to carry out NPD activities.*				
21	*Experts challenge their teams to think about old NPD related issues in new ways.*				
22	*Experts are capable to force their team s to rethink things that they have never thought before.*				
23	*Experts are capable of helping their team members to improve work efficiency.*				
24	*Experts are capable of providing support to their team members in special difficulties.*				
25	*Team members display agreement with the team´s objective.*				
26	*Team members feel understood and accepted.*				
27	*Team members keep each other informed.*				
28	*Team is capable to take real attempts to share information.*				
29	*Team is strong in searching for new ways of looking at product development problems.*				
30	*Team is cooperative in developing NPD ideas with members from other departments, if required.*				
31	*We, as a work team, are capable to cooperation with other work groups.*				
32	*In our organization, work performance is considered as a combined phenomenon.*				
33	*We, as a work team, are able to complete work targets on time.*				
34	*The team´s ability is considered as quick to respond to problems.*				

35	*I ask myself how the parts of an incomplete Figure connect in certain situation.*					
36	*I think intuitively about what is unique or unusual about certain problem situation.*					
37	*I think about questions I am neglecting to ask.*					
38	*I think about what's so important about this challenge.*					
39	*I try to understand how the facts in the situation are related to each other.*					
40	*I look at the "Big Picture" in the information available before examining the details.*					
41	*I investigate the cause before taking any action.*					
42	*I seek different perspectives while thinking about NPD ideas.*					
43	*I try to find a common goal when two or more parties are in Conflict.*					
44	*I engage in discussions with those who hold a different point of view.*					
45	*I ignore my past experiences when trying to understand situations presented to me.*					
46	*I create a plan to solve a problem before considering other viewpoints.*					
47	*When assigning tasks, I consider people's skills and interests through my judgment.*					
48	*I expect my kind of work from my team members.*					
49	*I encourage everyone to work toward the same goal through my way.*					
50	*Teams` performance is best when members keep repeating the same tasks for perfection instead of learning new skills.*					

PN: Please be informed that there are no correct or incorrect answers. However, this survey gives the reviewers an idea about what factors the inventory users display the most and which factors and what are used the least.

B- Qualitative questionnaire

	Research Tool *(Open ended interview questions)*	
1	*How your company measures your products and services´ worth from the external stake holders' point of view (Customers, competitors, suppliers etc.)?*	**NPD Value**
2	*How your company identifies and removes the causes of customer dissatisfactions?*	**Customer services**
3	*How your company identifies new product and service opportunities with existing customers?*	**New Product opportunities**
4	*What sort of communication systems your company has to connect with the external as well as internal environmental segments?*	**Company's knowledge creation potential**
5	*What kind of systems your company possesses to store and utilize the creative data bulk related to NPD?*	**Company's knowledge creation potential**
6	*How one can rate the environmental openness of your company in terms of knowledge sharing?*	**Company's innovative potential**
7	*How your company innovate new products and service offerings?*	**Company's innovative potential**
8	*How your company creates a differentiated product option for the same target market?*	**Company's knowledge creation potential**
9	*Does your company offers any distinctive recognition to its staff members to encourage new initiatives?*	**Company´s potential to celebrate new ideas creation process.**
10	*Please describe that how convenient it is for the team members to get their new ways introduced in your company´s internal environment?*	**Company´s potential to celebrate new ideas creation process.**

PN: Please be informed that there are no correct or incorrect answers. However, this survey gives the reviewers an idea about what factors the inventory users display the most and which factors and what are used the least.

Correlation coefficient calculation for the Study's hypotheses to identify linkages among the selected study constructs

1. Calculation of correlation coefficient for H1

Result calculations

X Values (Variable – Early Client Involvement)
$\sum = 100.5$
Mean = 3.35
$\sum(X - M_x)^2 = SS_x = 12.075$

Y Values (Variable – Target Reach)
$\sum = 108$
Mean = 3.6
$\sum(Y - M_y)^2 = SS_y = 11.2$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 5.45$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 5.45 / \sqrt{((12.075)(11.2))} = 0.4686$
$r = 0.4686$

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

2. Calculation of correlation coefficient for H2

Result Details & Calculation

X Values- (Variable : Customer value)
$\sum = 118$
Mean = 3.933
$\sum(X - M_x)^2 = SS_x = 11.867$

Y Values (Variable: Target Reach)
$\sum = 108$
Mean = 3.6
$\sum(Y - M_y)^2 = SS_y = 11.2$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 5.7$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 5.7 / \sqrt{((11.867)(11.2))} = 0.4944$
$r = 0.4944$

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

3. Calculation of correlation coefficient for H3

Result Calculation

X Values(Variable- Early Client Involvement)
$\sum = 100.5$
Mean = 3.35
$\sum(X - M_x)^2 = SS_x = 12.075$

Y Values(Variable- Customer Value)
$\sum = 118$
Mean = 3.933
$\sum(Y - M_y)^2 = SS_y = 11.867$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 7.7$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 7.7 / \sqrt{((12.075)(11.867))} = 0.6433$
$r = 0.6433$

Key
X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

4. Calculation of correlation coefficient for H4

Result Calculation

X Values (Variable: Management initiatives)
$\sum = 98.5$
Mean = 3.283
$\sum(X - M_x)^2 = SS_x = 13.342$

Y Values(Variable: Trust)
$\sum = 114$
Mean = 3.8
$\sum(Y - M_y)^2 = SS_y = 14.8$
X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 2.2$

R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 2.2 / \sqrt{((13.342)(14.8))} = 0.1566$
$r = 0.1566$

Key
X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

5. Calculation of correlation coefficient for H5

Result Calculation

X Values (Variable: Management initiatives)
$\sum = 98.5$
Mean = 3.283
$\sum(X - M_x)^2 = SS_x = 13.342$

Y Values (Variable: Affiliation with leader)
$\sum = 115$
Mean = 3.833
$\sum(Y - M_y)^2 = SS_y = 10.167$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 5.917$

R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 5.917 / \sqrt{((13.342)(10.167))} = 0.508$
$r = 0.508$

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

6. Calculation of correlation coefficient for H6

Result Calculation

X Values(Variable- Trust)
$\sum = 114$
Mean = 3.8
$\sum(X - M_x)^2 = SS_x = 14.8$

Y Values(Variable- Affiliation with leader)
$\sum = 115$
Mean = 3.833
$\sum(Y - M_y)^2 = SS_y = 10.167$
X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 2$

R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 2 / \sqrt{((14.8)(10.167))} = 0.163$
$r = 0.163$

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

7. Calculation of correlation coefficient for H7

X Values (Variable- Supportive leadership)
$\sum = 110$
Mean = 3.667
$\sum(X - M_x)^2 = SS_x = 7.667$

Y Values(Variable- Team initiative)
$\sum = 113$
Mean = 3.767
$\sum(Y - M_y)^2 = SS_y = 9.867$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 1.167$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.167 / \sqrt{((7.667)(9.867))} = 0.1341$
$r = 0.1341$

<u>Key</u>

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

8. Calculation of correlation coefficient for H8

<u>Result Calculation</u>

X Values (Variable- Supportive leadership)
$\sum = 110$
Mean = 3.667

$\sum(X - M_x)^2 = SS_x = 7.667$
Y Values (Variable- Collaboration)
$\sum = 115.75$
Mean = 3.858

$\sum(Y - M_y)^2 = SS_y = 5.96$
X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 1.333$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.333 / \sqrt{((7.667)(5.96))} = 0.1972$
$r = 0.1972$

<u>Key</u>

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

9. Calculation of correlation coefficient for H9

Result Details & Calculation

X Values(Variable: Management initiatives)
$\sum = 98.5$
Mean = 3.283
$\sum(X - M_x)^2 = SS_x = 13.342$

Y Values (Variable- Collaboration)
$\sum = 115.75$
Mean = 3.858
$\sum(Y - M_y)^2 = SS_y = 5.96$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 3.829$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 3.829 / \sqrt{((13.342)(5.96))} = 0.4294$
$r = 0.4294$

<div style="border:1px solid black; padding:10px;">

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

</div>

10. Calculation of correlation coefficient for H10

Result Calculation

X Values(Variable- Supportive leadership)
$\sum = 110$
Mean = 3.667
$\sum(X - M_x)^2 = SS_x = 7.667$

Y Values (Variable- Trust)

$\sum = 114$
Mean = 3.8
$\sum(Y - M_y)^2 = SS_y = 14.8$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 3$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 3 / \sqrt{((7.667)(14.8))} = 0.2816$
$r = 0.2816$

<div style="border:1px solid black; padding:10px;">

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

</div>

11. Calculation of correlation coefficient for H11

X Values (Variable- Customer Value)
∑ = 118
Mean = 3.933
$\sum(X - M_x)^2 = SS_x = 11.867$

Y Values(Variable- Communication)
∑ = 103.5
Mean = 3.45
$\sum(Y - M_y)^2 = SS_y = 7.675$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 3.775$

R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 3.775 / \sqrt{((11.867)(7.675))} = 0.3956$
r = 0.3956

> <u>Key</u>
>
> *X*: X Values
> *Y*: Y Values
> M_x: Mean of X Values
> M_y: Mean of Y Values
> $X - M_x$ & $Y - M_y$: Deviation scores
> $(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
> $(X - M_x)(Y - M_y)$: Product of Deviation Scores

12. Calculation of correlation coefficient for H12

<u>Result calculations</u>

X Values(Variable- Target reach)
∑ = 108
Mean = 3.6
$\sum(X - M_x)^2 = SS_x = 11.2$

Y Values (Variable- Communication)
∑ = 103.5
Mean = 3.45
$\sum(Y - M_y)^2 = SS_y = 7.675$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 1.525$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.525 / \sqrt{((11.2)(7.675))} = 0.1645$
r = 0.1645

> <u>Key</u>
>
> *X*: X Values
> *Y*: Y Values
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> M_y: Mean of Y Values
> $X - M_x$ & $Y - M_y$: Deviation scores
> $(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
> $(X - M_x)(Y - M_y)$: Product of Deviation Scores

13. Calculation of correlation coefficient for H13

Result calculations

X Values(Variable- Market Intelligence)
X Values
$\sum$ = 92.5
Mean = 3.083
$\sum(X - M_x)^2 = SS_x = 14.042$

Y Values (Variable- Communication)
$\sum$ = 103.5
Mean = 3.45
$\sum(Y - M_y)^2 = SS_y = 7.675$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 2.75$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 2.75 / \sqrt{((14.042)(7.675))} = 0.2649$
$r = 0.2649$

Key

X: X Values
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$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

14. Calculation of correlation coefficient for H14

Result calculations

X Values (Variable: Management initiatives)
$\sum$ = 98.5
Mean = 3.283
$\sum(X - M_x)^2 = SS_x = 13.342$

Y Values(Variable- Organizational Communication)
$\sum$ = 103.5
Mean = 3.45
$\sum(Y - M_y)^2 = SS_y = 7.675$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 3.3$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 3.3 / \sqrt{((13.342)(7.675))} = 0.3261$
$r = 0.3261$

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

15. Calculation of correlation coefficient for H15

Result calculations

X Values(Variable- Investigative approach)
$\sum = 126$
Mean = 4.2
$\sum(X - M_x)^2 = SS_x = 10.8$

Y Values(Variable- Market intelligence)
$\sum = 92.5$
Mean = 3.083
$\sum(Y - M_y)^2 = SS_y = 14.042$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 2.75$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 2.75 / \sqrt{((10.8)(14.042))} = 0.2233$
$r = 0.2233$

Key

X: X Values
Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

16. Calculation of correlation coefficient for H16

X Values(Variable- Market intelligence)
X Values
$\sum = 92.5$
Mean = 3.083
$\sum(X - M_x)^2 = SS_x = 14.042$

Y Values(Variable- Responsiveness)
$\sum = 109$
Mean = 3.633
$\sum(Y - M_y)^2 = SS_y = 16.467$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 1.167$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.167 / \sqrt{((14.042)(16.467))} = 0.0767$
$r = 0.0767$

Key

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Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

17. Calculation of correlation coefficient for H17

<u>Result calculations</u>

X Values(Variable – Idea generation)
$\sum = 110$
Mean = 3.667
$\sum(X - M_x)^2 = SS_x = 9.167$

Y Values(Variable- Response)
$\sum = 109$
Mean = 3.633
$\sum(Y - M_y)^2 = SS_y = 16.467$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 6.333$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 6.333 / \sqrt{((9.167)(16.467))} = 0.5155$
$r = 0.5155$

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> $(X - M_x)(Y - M_y)$: Product of Deviation Scores

18. Calculation of correlation coefficient for H18

<u>Result calculations</u>

X Values(Variable- Leader's competence to empower)
$\sum = 101.5$
Mean = 3.383
$\sum(X - M_x)^2 = SS_x = 10.842$

Y Values(Variable- Situational referencing)
$\sum = 70$
Mean = 2.333
$\sum(Y - M_y)^2 = SS_y = 10.167$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 1.167$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.167 / \sqrt{((10.842)(10.167))} = 0.1111$
$r = 0.1111$

> <u>Key</u>
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> $(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
> $(X - M_x)(Y - M_y)$: Product of Deviation Scores

19. Calculation of correlation coefficient for H19

Result calculations

X Values(Variable – Work situation)
$\sum = 111$
Mean = 3.7
$\sum(X - M_x)^2 = SS_x = 12.3$

Y Values (Variable – (Variable – Situational handling)
$\sum = 102$
Mean = 3.4
$\sum(Y - M_y)^2 = SS_y = 18.7$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 3.6$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 3.6 / \sqrt{((12.3)(18.7))} = 0.2374$
$r = 0.2374$

Key

X: X Values

Y: Y Values

M_x: Mean of X Values

M_y: Mean of Y Values

X - M_x & Y - M_y: Deviation scores

(X - M_x)^2 & (Y - M_y)^2: Deviation Squared

(X - M_x)(Y - M_y): Product of Deviation Scores

20. Calculation of correlation coefficient for H20

Result calculations

X Values(Variable – Product innovativeness)
$\sum = 91$
Mean = 3.033
$\sum(X - M_x)^2 = SS_x = 17.967$

Y Values(Variable- Organizational Communication)
$\sum = 103.5$
Mean = 3.45
$\sum(Y - M_y)^2 = SS_y = 7.675$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 1.425$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.425 / \sqrt{((17.967)(7.675))} = 0.1214$
$r = 0.1214$

Key

X: X Values

Y: Y Values

M_x: Mean of X Values

M_y: Mean of Y Values

X - M_x & Y - M_y: Deviation scores

(X - M_x)^2 & (Y - M_y)^2: Deviation Squared

(X - M_x)(Y - M_y): Product of Deviation Scores

21. Calculation of correlation coefficient for H21

<u>Result calculations</u>

X Values(Variable- Team empowerment)
$\sum$ = 108
Mean = 3.6
$\sum(X - M_x)^2 = SS_x = 5.2$

Y Values(Variable- Work situation)
$\sum$ = 111
Mean = 3.7
$\sum(Y - M_y)^2 = SS_y = 12.3$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 0.15$
R Calculation
r = $\sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
r = 0.15 / $\sqrt{((5.2)(12.3))}$ = 0.0188
r = 0.0188

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$(X - M_x)(Y - M_y)$: Product of Deviation Scores

22. Calculation of correlation coefficient for H22

<u>Result calculations</u>

X Values(Variable- Leader's competence to empower)
$\sum$ = 101.5
Mean = 3.383
$\sum(X - M_x)^2 = SS_x = 10.842$

Y Values (Variable- Work situation)
$\sum$ = 111
Mean = 3.7
$\sum(Y - M_y)^2 = SS_y = 12.3$

X and Y Combined
N = 30
$\sum(X - M_x)(Y - M_y) = 4.45$
R Calculation
r = $\sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
r = 4.45 / $\sqrt{((10.842)(12.3))}$ = 0.3854
r = 0.3854

<u>Key</u>

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$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores

23. Calculation of correlation coefficient for H23

<u>Result calculations</u>

X Values(Variable- Collaboration)
$\sum = 115.75$
Mean = 3.858
$\sum(X - M_x)^2 = SS_x = 5.96$

Y Values(Variable- Problem solving)
$\sum = 120$
Mean = 4
$\sum(Y - M_y)^2 = SS_y = 10$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 1.25$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 1.25 / \sqrt{((5.96)(10))} = 0.1619$
$r = 0.1619$

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> $(X - M_x)(Y - M_y)$: Product of Deviation Scores

24. Calculation of correlation coefficient for H24

<u>Result calculations</u>

X Values(Variable- Leader's competence to empower followers)
$\sum = 101.5$
Mean = 3.383
$\sum(X - M_x)^2 = SS_x = 10.842$

Y Values(Variable- Product innovativeness)
$\sum = 91$
Mean = 3.033
$\sum(Y - M_y)^2 = SS_y = 17.967$

X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 2.367$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 2.367 / \sqrt{((10.842)(17.967))} = 0.1696$
$r = 0.1696$

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25. Calculation of correlation coefficient for H25

Result calculations

X Values(Variable - Investigative approach)
$\sum = 126$
Mean = 4.2
$\sum(X - M_x)^2 = SS_x = 10.8$
Y Values(Variable- Product innovativeness)
$\sum = 91$
Mean = 3.033

$\sum(Y - M_y)^2 = SS_y = 17.967$
X and Y Combined
$N = 30$
$\sum(X - M_x)(Y - M_y) = 4.05$
R Calculation
$r = \sum((X - M_y)(Y - M_x)) / \sqrt{((SS_x)(SS_y))}$
$r = 4.05 / \sqrt{((10.8)(17.967))} = 0.2907$
$r = 0.2907$

Key

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Y: Y Values
M_x: Mean of X Values
M_y: Mean of Y Values
$X - M_x$ & $Y - M_y$: Deviation scores
$(X - M_x)^2$ & $(Y - M_y)^2$: Deviation Squared
$(X - M_x)(Y - M_y)$: Product of Deviation Scores