Teamwork Quality Analysis of New Product Development in Telecom Industry in Saudi Arabia

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ABSTRACT

Teamwork is the activity of multiple interdependent individuals. It is a set of interrelated components of performance that are needed to efficiently and successfully facilitate coordinated and adaptive performance. The aim of this study is to obtain the teamwork quality analysis of new product development in telecom industry in Saudi Arabia. The paper has three parts. Firstly, the paper will discuss the concepts of teamwork quality, new product development, internal market orientation, and environmental turbulence. Secondly, it has revealed the theoretical framework and hypothesis development. Finally, it has clarified the telecom industry growth and broadband services. The present research offers a more detailed model of the impact of teamwork quality on new product development cycle time including internal market orientation as a mediating variable and environmental turbulence as moderator variable.

Key words: Teamwork quality, New product, Development, Telecom industry

INTRODUCTION

In Saudi Arabia, the telecommunication industry is highly competitive in nature particularly during the past decade with the emergence of a number of telecommunication companies into the local market. For example, after many years of dominating the market, the Saudi Telecommunication Company (STC) is now facing tremendous challenges of maintaining its market share as customers are moving to rival companies. According to El Emary et al., STC’s challenges that threaten its growth and profitability include attrition and erosion in the market share, reduction in telephone and Internet prices due to activities of rivals and increased demand from the customers for better services. But at the same time, rival companies are facing the challenge of attracting customers who have been with the STC that has been dominating the market for years. Furthermore, an intensified competition in the Saudi Arabia telecommunication industry took place in 2013 when customers could switch between all companies while at the same time maintaining their contact numbers. This system puts a great pressure on all service and new product providers in the Saudi telecommunication market to keep their customers loyal and to work hard to attract customers from other rival companies.

New products are the lifeblood of companies and innovation and early launching of products are perhaps the final frontier for companies to gain competitive advantage. With new products companies can fulfill new customer needs, capture new markets and extend their prominence in a competitive environment. The need for companies to innovate and develop new products at an accelerated pace is further heightened by corporate and market globalization. This can be viewed as a natural consequence of the steady decline in international free-trade barriers that have occurred over the past few decades. The result has been a substantial increase in competition among
suppliers of goods, services, and capital equipment across all industries [8].

The telecommunication industry is an example of an industry characterized by rapid changes given the rapid technological development in the past decade or so. Internet, advanced computers and mobile phones have contributed a great deal to this revolution where companies’ success and survival depend heavily on how fast they respond to such technological changes. In this context, Lynn et al. [38] argue that the target of today’s companies’ particularly technology-related industries is to manufacture products or provide services that would satisfy the increasing needs and desires of the customers and also to achieve a competitive advantage the market.

A number of factors have emerged in the literature to influence an effective reduction of NPD cycle time keeping in mind that developing new products is a complex process through different production stages that usually includes many functional teams within a firms as well as external teams such as suppliers [43]. One of the important factors that have been hypothesised to influence NPD cycle time is teamwork quality [28]. However, Hoegl and Gemuenden [26] identified two main limitations with regards to successful innovative teams: (1) previous research did not address the multifaceted nature of teams but rather focused on the relationship between team-based organizations and performance [7] and (2) there are conflicts in the literature about the impact of teamwork on team success (Cohen et al., 1996). In order to address these issues, Hoegl and Gemuenden [26] studied the influence of six teamwork quality (TWQ) factors which include communication, coordination, and balance of member contribution, mutual support, effort, and cohesion on the success of innovative projects. They based their model on the fundamental idea that the success of teams depends on the degree to which team members are able to collaborate with each other. Their results were promising: the TWQ factors were significantly correlated with performance ratings.

Recent literature in marketing researches shows that when it comes to obtaining success of newly new products launched in an organization, teamwork quality is of vital importance. Hoegl and Gemuenden [26] contended that innovative projects and success of a team depends on the quality of interaction or collaboration between team members. The quality of interactions between team members in teams is captured in the construct teamwork quality. Six teamwork quality factors are integrated in the concept of teamwork quality, encompassing the collaboration of team members working together. Both task-related and social interactions within the team are covered. Since the focus is on the quality of interactions within the team, the quality of interactions with external parties such as management, clients or other teams is out of the scope of the their study. In this research, we investigate teamwork quality with specific dependent variable, namely, NPD cycle time, which was not considered before.

Apart from the relationship between IMO and NPD cycle time, a number of researchers have reported the effect of IMO on business performance. However, research that looks into the antecedent of IMO such as teamwork quality and its effect on new product development within a single model is almost non-existent. Thus, by combining these constructs in a single study, we will be able to shed some insight into how teamwork quality can affect internal market orientation, which leads to reduced new product development cycle time. Despite the importance of teamwork quality within production teams, the current literature has not adequately identified nor empirically tested the mediating variable of teamwork quality. In this manner, this study attempts to fill this gap in the existing body of knowledge to meet the recommendation made by McGrath [40], who suggests that future work ought to take into account the possible mediating impact of IMO on the relationship between teamwork quality and NPD cycle time.

It has been mentioned earlier that in the literature on NPD cycle time, the relationships between teamwork quality, internal market orientation and NPD cycle time have been studied separately and very limited research has attempted to examine the multiple relationships among all these factors and their relationship with NPD cycle time. The present study takes a step further by examining the inter-relationships between all these factors and their effect on NPD cycle time together with the examination of the moderating influence of environmental factors. This contributes to the body of knowledge in that the purported links between the variables are grounded on recent recommendations suggested by researchers in the field of marketing and management.

**Teamwork Quality:**

Teamwork is the activity of multiple interdependent individuals [49]. It is a set of interrelated components of performance that are needed to efficiently and successfully facilitate coordinated and adaptive performance [44]. Even though they are distinct components, both task work and teamwork are important for teams to be effective in complex situations [24]. The multilevel process that arises when team members are involved in managing their individual task- and teamwork and the teamwork processes, is defined as team performance [34].

Teamwork quality is a superordinate construct that refers to the degree and quality of team members’ interaction [26]. Since this concept focuses on how teammates collaborate with each other in the
pursuit of team goals, it includes neither task work behavior (i.e., the technical aspect of the task that exists independent of the team, [41] nor human sentiments (e.g., emotion, motivation). Hoegl & Gemuenden [26] argued that the overall construct of teamwork quality is manifested in six dimensions. The conceptualization of teamwork quality as a six-dimensional construct is consistent with past research that tends to cluster teamwork into two categories: tasks and interpersonal processes [2]. Specifically, task processes include three dimensions: effort, balance of member contribution, and coordination. These dimensions are related to the accomplishment of team goals and perform functions that allow teams to provide solutions to the problem that the group is committed to [28]. Interpersonal processes include three other dimensions: mutual support, cohesion, and communication. These dimensions perform maintenance functions [17] that are designed to build, strengthen, and regulate group life.

The construct of teamwork quality along with its measures was investigated in empirical research conducted by Hsu et al. [28]. With regards to high teamwork quality, team members often practice open communication regarding task materials [25], activities coordination [15] and contribute their knowledge [52]. They also practice mutual support among them in discussions and individual tasks (Cooke & Szumal, 1994), lay down and sustain standards of great effort [62] and encourage team cohesion [22]. Therefore, different levels teamwork quality can have varying impacts on project performance [26].

New Product Development:

According to the industry they compete in, firms need to continuously engage in new product development in order to remain competitive. New products or improved products is not sufficient for a competitive environment that is modern knowledge-based. New product development (NPD) must be complemented with the rapid introduction of new or significantly improved products in order to prevent obsolescence. The following sections address the definition of NPD, and then introduce the construct of NPD cycle time including its measurement and reduction techniques.

New product development includes a set of activities that moves a new product project from the point of idea generation to market launch and post implementation review. Many firms employ NPD as a means of pursuing future profitable growth. Variants of NPD include identifying a market opportunity and trying to match the needs of that market with the appropriate technology (i.e. market demand initiates the NPD process), seeking a market that might be interested in a newly developed technology (i.e. pushing the new technology onto a market), building a new product from pre-existing technology (e.g. platform product), or making slight variations to a product in order to customize it for individual market segments [60].

A new product development process is essentially a guideline on how to go about a new product project beginning from the idea phase to the market launch and over [56]. One of the most common NPD processes is the stage-gate system developed by Cooper [6]. Different from the cumbersome and time-consuming NASA-based Phased Review Process of the 1960s, it focuses on business risks along with technical/engineering aspects of the product project [48]. It consists of five stages (workstation) that are opened by five gates (checkpoint), at which point a multidisciplinary team oversees inputs (clearly specified deliverables/a set of exit criteria (items upon which project is judged and potential hurdles), and the output in order for a decision to go, kill, hold, or recycle to be made [7]

A new product development process is not exempt from the need to respond to new environmental, organizational, or situational conditions. Until recently, it was believed that the NPD process indicated that a controlled approach should be adhered to throughout the phased-review process or "Stage-Gate" system. This was utilized in order to reduce NPD cycle time which, in turn, increases the probability of new product achievements [43]. This is referred to as die "structured school of thought." Inspired by this school of thought, an additional two other schools of thought have pursued to enhance the NPD process.

A new product development cycle time is critical because life cycles are shrinking, and obsolescence is occurring more quickly than in the past while competition has intensified [21]. In today's world economy, regardless of the industry, organizations are searching for new ways to compete more effectively and efficiently. In their efforts to do so, they are confronted with numerous competitive challenges. It is no longer sufficient to meet the traditional requirements of product cost, performance, quality and dependable delivery.

In order to be able to measure the actual steps of the development process, Griffin [20,21] used project timing, which chronicle[s] the dates when various phases of development [begin]. As mentioned already, Griffin measured NPD cycle time in terms of Time-to-Market, Concept-to-Customer and Development Time. Each one of the time variables begin with different stages of the NPD process, but the series of activities of interest end just before the product launch stage begins, which Kumar et al. [35] called the production stage of the NPD process, for the purpose of treating time as an internal variable. The stages described here become easier to measure as the development process moves forward. The earliest stages are the most difficult to uncover. Stages 0 and 1 are usually estimates kept informally with marketing or planning groups. The transition from stage 0 to stage 1 is especially fuzzy (general
uncertainties of start dates). Conversely, Stages 2, 3 and 4, are usually recorded in logbooks kept by design/development or manufacturing (Griffin 1993, 1997). Now that the stages have been identified, the time variables are defined in Table 1.

Table 1: Phase Timing Variables.

<table>
<thead>
<tr>
<th>Time variables</th>
<th>Definition</th>
<th>Measures</th>
</tr>
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<tbody>
<tr>
<td>Time-to-market</td>
<td>Stage 0 through production</td>
<td>Firm’s ability to identify a market opportunity and come up with a suitable product for the customers in that market.</td>
</tr>
<tr>
<td>Concept-to-customer</td>
<td>Stage 1 through production</td>
<td>How difficult it is to figure out the right product.</td>
</tr>
<tr>
<td>Development time</td>
<td>Stage 2 through production</td>
<td>How efficiently a product goes through production.</td>
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Source: Griffin [20]

The second stage is the ‘new product strategy’ which refers to developing a strategy to make this new product. In this stage, the market and the idea of the product has been approved. The third stage is ‘detailed design and prototype development’. In this stage, a new product stems from an idea – an idea refers to a descriptive statement that can be written or orally stated. Such an idea is then refined into a product concept that comprises of consumer benefits and product features. The concept is then transformed into a prototype – a prototype refers to a working model or the initial product version. Following several changes, the prototype is finally perfected and developed into the final product [58].

The fourth stage of NPD cycle time process is the ‘pre-production’ stage which refers to testing the prototype product to get feedback about its performance and also about the customers’ satisfaction with this new product. Finally, the ‘production’ stage is when companies finalize the product so it is ready for customers’ use in the market [20]. If a firm accelerates the pace of these five stages, the result would be gaining higher competitive advantage which in turn would result in better organizational performance.

The previous five stages are done by a number of departments in a company. Depending on how established the company is, this number is normally more than one department. In big companies worldwide, tens of departments might be involved in these five stages. This means that cycle time of NPD is directly influenced by the employees of these departments.

The problem with Griffin’s NPD process and hence the measure of time, however, is similar to that inherent in many other NPD models; Griffin does not account for the fact that the stages of NPD do not always occur sequentially. Figure 1, on the other hand, reflects the overlapping nature of various stages. Different functional departments all play important roles in developing the product and their involvement does not always commence after another department completes its role. Overlapping or concurrent development, often referred to as CE, has become a dominant feature of NPD. The most important aim for applying CE is shortening of the product concept, design and development process from a serial to a parallel one [53].

The initial duration of a five product development phases are needed for every project. The first stage (Stage 0) is referred to as the concept generation stage where the idea for the product surfaces. This is followed by Stage 1 which is the project evaluation where approval of product strategy and target market is sealed and the project is given a green light for specifications development. The actual times for the initiation of Stages of 0 and 1 are sometimes unsure as the idea may just be juggled around in marketing or development for some time without employment. The initial step of some projects may be listed down with clarity in memorandums bringing forward the idea or in case of a project conducted to satisfy competitor’s entry, the data the other product was publicized in the market. This is followed by Stage 2 where the first R&D money was spent on physical product development. Stage 3 is the manufacturing development where the documentation takes place concerning the development of the processes. This is followed by Stage 4 that concerns commercialization – in this phase, the manufacturing production trials are initiated. The initial dates are procured easily from the time sheets of engineering and manufacturing as well as business memorandums.

Owing to the uncertainties existing in Stage 0 to 1, three various initial points are used to gauge cycle time namely, development time, concept-to-customer time, and total time. The development time (DT) starts from Stage 2 throughout introduction of product - this time identifies the efficiency of the firm in taking a product to production, provided that the functions of the product are clarified. The duration of (CTC) is Stage 1 through production introduction; the time identifies the difficulty of the firm in figuring out the functions of the product, provided a known set of customer targets. The total time (TT) is Stage 0 to product introduction indicating a firm’s ability to categorize a market, determine customer having issues that require resolution and lay down a strategy for product development.

Griffin [21] pointed out that the process of NPD cycle time consists of five main stages. The first stage is the ‘market finding’ in which the firm attempts to find a chance in the market where a possible product might find its way into this market.

In this stage, an idea of a produce first surfaces. The
Considering this problem, Griffin’s [20] model can be taken one step further for the purposes of meeting the objective of his research; addressing the CE practices that reduce NPD cycle time in terms of Time-to-Market, Concept-to-Customer Time and Development Time, whereby each time variable begins with a different NPD stage and the stages overlap. Figure 2 illustrates how time and the NPD stages coincide.

**Fig. 1:** Mechanism for Product Development Source: Saryeddine (2005)

**Fig. 2:** Time Metrics for NPD Stages Source: Saryeddine (2005)

*Internal Market Orientation:*

Market orientation (MO) is considered to be the very heart of modern marketing management and strategy to both academicians and practitioners [55]. In its current academic meaning, market orientation is a relatively recent term with only some studies attempting to find a suitable definition of its measurement (Gray, 2010). Other alternative terms synonymously utilized for the concept include market oriented, marketing oriented, and customer oriented.

Market orientation has been defined from two perspectives: (1) organizational culture [27] and (2) organizational behavior [33]. The cultural perspective refers to market orientation as the culture of the organization that produces the required behaviors effectively and efficiently for the development of superior value for buyers and
therefore, ongoing optimum business performance [27]. Within this school of thought, researchers theorize market orientation based on three magnitudes: (1) Customer orientation: The firms’ understanding that they must create superior value in order for their buyers to continue to return; (2) Competitor orientation: The firms’ understanding of the strengths and weaknesses in the short team, and the capabilities in the long-term, as well as both existing rivals and potential rivals; and (3) Inter-functional coordination: Inter-functional coordination is the synchronized use of company resources to create optimum customer value [19].

Market orientation has also been viewed from organizational behavior as it is referred to as an organizational culture that influences the behavior of the team members working in this organization [1]. When leaders adopt market orientation policies and set the goals to achieve market orientation objectives, such leaders tend to promote and encourage a workplace culture in which employees work and cooperate to achieve the goals of the organization [23].

Fig. 3: Theoretical Framework of Study.

**Environmental Moderator:**

Research concerning moderators of the market orientation-new product development has primarily concentrated on the moderating role of environmental conditions [51]. Three widely acknowledged factors that comprise environmental conditions are market turbulence, technological turbulence and competitive intensity [51]. Previous studies showed that environmental conditions influence the internal market orientation and performance link [32]. These three environmental factors have important roles in determining the strategic orientation of firms within the high tech division [54]. This study concentrates on effect of technological turbulence, competition turbulence, as well as market turbulence.

**Environmental Turbulence and Teamwork:**

In the past several years, telecommunication workers have been tackling changes in the environment [16]. Complex work environments call for worker flexibility in adapting various client needs and adapting to the environment particularly in telecommunication organizations. According to Bosco [3], environmental turbulence (ET) refers to the individuals’ interaction with their environment in reaction to instability and dynamic changes in their internal or external environment or both that are influenced by the individuals/groups or organization’s attributes, and that has the potential to eventually influence patient and nursing outcomes.

A case that established the impact of environmental turbulence on individual teamwork took place in the 1980s when ET was integrated into healthcare environment as part of the restructuring of patient care delivery system that came with a decrease in hospital funding [59]. Internal and external environmental factors in healthcare may be characterized by instantaneous and unpredictable changes that alter the patients, units and the resources’ characteristics (e.g., equipment, money and number of nurses). The internal environment refers to the forces operating external to the organization to which it is susceptible to (i.e., regulatory groups, personal issues, customers, suppliers and market and resource competition). Some environmental issues that complicate nurses’ work include missing information, lack of resources, missing medications and equipment, defective equipment, and lack of communication and team work ingrained in the culture.

Furthermore, the internal environment was revealed to influence job satisfaction, which in turn was related to patient outcomes. Specifically,
emotional exhaustion, which is a component of burnout [16] has been linked to unsafe work environments. This condition is often an outcome of long-term involvement in emotionally draining situations and the ineffective handling of long-term stress. Nurses that have been in profession for a long time were found to be more susceptible to burnout and were at a greater risk of quitting [12].

The external environment may develop turbulence in the form of the creation of countless rules, unrealistic mandates, or decreasing reimbursement or the combination of all. This turbulence may adversely affect the internal environment, which in turn may develop changes in the external environment. Additionally, the internal environment may also change and thus create perceived environmental uncertainty and add to the turbulence [61].

Theoretical framework and hypotheses development: Theoretical Framework:

The theoretical framework of the current study is grounded on the inter-relationships among a number of variables, namely, teamwork quality as the independent variable, NPD cycle time as the dependent variable, internal market-orientation as the mediating variable, and environmental turbulence factors as the moderating variable that affects the relationship between teamwork quality and NPD cycle time. Figure 3 shows the theoretical framework.

As shown in Figure 3, a new product development (NPD) cycle time is directly influenced by teamwork quality of the organization. Second, the internal market orientation is proposed to mediate the relationship between teamwork quality and new product development cycle time. Third, environmental turbulence factors are postulated to moderate the relationship between teamwork quality and the NPD cycle time. The importance of NPD cycle time is stressed in this model as success of new products depends on their being first to be available in the market [43].

In the present research, teamwork quality is conceptualized as a six dimensional construct, which is consistent with past research that tends to cluster teamwork into two categories: tasks and interpersonal processes [26]. Specifically, task processes include three dimensions: effort, balance of member contribution, and coordination dimension. These dimensions are related to the accomplishment of team goals and functions that allow teams to solve the objective problem to which the group is committed [17]. Interpersonal processes include other three dimensions: mutual support, cohesion, and communication. These dimensions perform maintenance functions [17] that are designed to build, strengthen, and regulate group life.

On the other hand, the mediating variable of internal market orientation policy is conceptualized by five main dimensions of informal information generation, formal face-to-face information generation, formal written information generation, information dissemination, and response [57]. The dependent variable of NPD cycle time is operationalized by four items adapted from Kessler and Chakrabarti [31]. Finally, the moderating influence of environmental factors is represented by factors of technological turbulence, competition turbulence, and market turbulence [30].

Based on this literature, a number of hypotheses are generated to propose the nature of the relationships between the four variables of the study, namely, teamwork quality, internal market orientation, NPD cycle time, and environmental turbulence, as follows.

Hypotheses Development:

In this section, a number of links are proposed to constitute the relationship among the four variables. The first link is the one that connects the dimensions of teamwork quality with new product development (NPD) cycle time and this link is reflected by H1 in the framework. The second link is the one that connects the dimensions of teamwork quality with the firm’s NPD cycle time through the mediating influence of internal market orientation and this link is referred to as H2. The third is the moderating influence of environmental turbulence factors on the relationship between teamwork quality and the NPD cycle time and this link is referred to as H3. Hypothese show in the following:

**H1:** Teamwork Quality positively affects new product development cycle time where more Teamwork Quality leads to shorter NPD cycle time.

**H1a:** Communication among team members positively affects new product development cycle time where more communication leads to shorter NPD cycle time.

**H1b:** Coordination among team members positively affects new product development cycle time where more coordination leads to shorter NPD cycle time.

**H1c:** Balance of member contribution positively affects new product development cycle time where more balance of member contribution leads to shorter NPD cycle time.

**H1d:** Mutual support within the team positively affects new product development cycle time where more mutual support leads to shorter NPD cycle time.

**H1e:** Efforts within the team affect new product development cycle time where more efforts within the team leads to shorter NPD cycle time.

**H1f:** Cohesion among team members positively affects new product development cycle time where more cohesion among team members leads to shorter NPD cycle time.
**The Mediating Effect of Internal Market Orientation:**

In an attempt to examine the influence of a number of organizational factors that are related to teamwork on the performance of some of the large banks, Lancaster and Velden [36] examined this impact through the mediating influence of internal market orientation. The findings of their study revealed that the market orientation polices mediated the relationship between teamwork characteristics and the performance of the banks.

Deshpande and Farley [11] described market orientation as identical to customer orientation. This is consistent with the contentions of Deshpande and Webster [10] and Payne [45] that marketing orientation is aligned with the market. Wren, Souder, and Berkowitz [63] argued that products provided by highly market-oriented firms may fit existing customer needs best. As far as NPD cycle time is concerned, Griffin [21] introduced three components for NPD speed. These components are time to market, concept to customers, and development time. Organizations that have high levels of internal market orientation are expected to have shorter cycle time for their new product development. This because these organizations want to reach out to their customers and respond to their needs as fast as possible. In this way, organizations will not lose their customers to other organizations in a highly competitive market.

Jaworski and Kholi [30] conducted a study that attempted to examine the mediating impact of market orientation on the relationships the independent variables of top management, inter-departmental dynamics and organisational system and the dependent variable of business performance. The findings of their study revealed that the construct of market orientation did have a mediating influence on the relationships between the independent variables and the dependent variable.

Thus based on these arguments, the following hypothesis is generated:

**H2:** Internal market orientation mediates the relationship between teamwork quality and NPD cycle time.

And the following sub-hypotheses is generated:

**H2a:** Internal market orientation mediates the relationship between communication among the teamwork and NPD cycle time.

**H2b:** Internal market orientation mediates the relationship between coordination among the teamwork members and NPD cycle time.

**H2c:** Internal market orientation mediates the relationship between balance of member contribution among the teamwork and NPD cycle time.

**H2d:** Internal market orientation mediates the relationship between mutual support within the teamwork and NPD cycle time.

**The Moderating Effect of Environmental Turbulence:**

The highly turbulent environment has become core to the business management studies, which leads to the creation of various critical business issues [42]. Environmental turbulence has multiple dimensions, and each dimension has unique characteristics. This study concentrates on three types of turbulence. They are technological turbulence, competition turbulence, and market turbulence.

Technological turbulence refers to the ability of the firm to make use of technological knowledge effectively and to learn to develop and enhance products and processes [39]. Urged by the learning orientation literature, prior studies stated that technological consistency should precipitate the firms’ information processing [64]. In other words, firms having a good technological alignment level constantly gather information concerning the up-to-date technological developments and they perceive technological changes in their environment. In doing so, they can easily incorporate new technological solutions into their process of product development.

Technological alignment allows firms to have a clear picture of the technological areas to drive their product development activities to and the direction to take. This precipitates the activities of product development that ranges from initial development efforts to commercialization. According to this premise, Eisenhardt [13] stated that real-time information concerning the firm’s environment should contribute to expedient decision making. He highlighted the difference between real time information and planning information, and added that planning information may negatively impact the speed of decision making as it tries to predict the future. On the basis of this argument, it is expected that firms stress technological alignment to obtain information regarding future trends in technology and development. Technological alignment is expected to slow the NPD process.

Prior research contended that the effective use of intuition in specific situations, like turbulent times, while there may be lack of extensive information, hinges on the expertise level. Specifically, Sadler-Smith and Shefy (2004) demonstrated that expertise allows executives to use their intuition to make judgments that assisted them in moving to a logical solution during times of turbulence. Similar to executive managers, NPD teams encounter similar challenges in NPD processes during times of uncertainty. Owing to the rapidly changing customer’s needs and wants and the changes in the
technological advancement, NPD teams working under such times, face expedient technological and market knowledge depreciation. In this regard, during times of turbulent markets and technology, NPD teams are often under-equipped of enough information for rational decisions. Similarly, Dayan and Benedetto [9] stated that environmental turbulence moderate the relations between the team members’ past experience and intuition under turbulent conditions. Also, environmental turbulence moderates successful intuition-product and intuition speed-to-market associations under turbulent times.

Based on the above arguments, the following hypothesis is generated:

**H3:** Environmental turbulence moderates the relationship between teamwork quality and NPD cycle time.

And the following sub-hypotheses is generated:

**H3a:** Environmental turbulence moderates the relationship between communication among the teamwork and NPD cycle time.

**H3b:** Environmental turbulence moderates the relationship between coordination among the teamwork members and NPD cycle time.

**H3c:** Environmental turbulence moderates the relationship between balance of member contribution among the teamwork and NPD cycle time.

**H3d:** Environmental turbulence moderates the relationship between mutual support within the teamwork and NPD cycle time.

**H3e:** Environmental turbulence moderates the relationship between efforts within the teamwork and NPD cycle time.

**H3f:** Environmental turbulence moderates the relationship between cohesion among the teamwork and NPD cycle time.

**Telecom industry:**

**Telecommunication Industry in Saudi Arabia:**

A critical key factor in the future growth and success for every firm is the process of new product development; telecommunication firms are not an exception. This factor may be more crucial for such high technology industries where change in products and market requirements is a continuous venture. The life cycle of these products is diminutive, and technologies in this industry run the risk of rapidly being outdated. It becomes really difficult for customers to form their future needs and requirements; thus, innovative emerging technologies cause a revolution in the market. To achieve competitive advantage, businesses must have a need for certain essential resources, in addition to, possess efficient technical skills. Persistent change and complexity render highly technological businesses a fertile ground for studying the potential introduction of state-of-the-art products.

The Telecommunication industry represents the highly technological domain; however, it has its own distinguished features and properties. Various products remain viable for a short period of time. New emerging technologies increase the rate at which products diminish. This industry is highly competitive and government regulated. In addition, due to motivation via the expectations of the information super highway, the industry has been subject to great changes, new technologies and competitive mergers. Such characteristics made this industry a fascinating subject for studying the NPD process.

Previous studies have explored the effectiveness of new product performance [43]. An outlined number of factors that are related to high performance, such as such as activities undertaken during the NPD process, product differential advantages, as well as, technological and market collaboration. These studies are useful; however, they still have their limitations. For example, a majority of these studies embark upon several industries without focusing primarily on only one. They neglected to investigate performance in a particular industry; they merely averaged the outcomes across all industries as a whole. They failed in presenting a detailed description of how performance and main elements of success differ in various industries.

In 2002, Saudi Arabia joined the World Trade Organization. This led to government acceptance and paved the way for the introduction of the new telecommunication sector. It also made STC a leading competitor in the telecom field. Due to the joining of the World Trade Organization, KSA government called for all international companies to bid for the second GSM license in Saudi Arabia; UAE Etisalat prevailed as the clear winner. Acquiring a third GSM/3G in 2007, Zain of Kuwait began its operations in 2008. The price was not cheap; Zain was charged about $6.1 billion as a fee for acquiring the third mobile license. This was twice the cost afforded by Eisiat in gaining the second license, which was $3.4 billion. For that time, $6.1 billion was the highest fees to ever be paid for a license in the telecommunication industry. The Zain GSM/ 3G commercial operations launch of August 2008 has resulted an unexpected increase in the Saudi mobile industry. Greatly attracting consumers, this new mobile operator boomed during the fourth quarter of the year. Zain gained almost 2 million clients in KSA by the end of 2008; according to statistics, all of which were 90% active. By the end of that same year, it was reported that 38.462 million of Saudi Arabia’s residents were mobile service subscribers. This was almost a 150% as an infiltration rate and shows a growth of 35.5% during 2008; in 2011, the number reached to 191% in the 1Q.

KSA became a source of attraction for many telecommunication companies for many reasons. The biggest reasons were namely due to population
mixture, wealth, and size. With a population of more than 27 million inhabitants, over 8 million are foreigners. Saudi Arabia’s GDP per capita is significantly higher than other Gulf countries. Its citizens are wealthier and the nation is smaller in size; therefore, its GDP per capita of US $16,017 is the highest in the Middle East & North African region. This calculation includes countries with a population of over 5 million. Another advantage (in some ways) is that it benefits due to a slower developing market among other Middle Eastern countries. Moreover, in 2008 the United Nations Conference on Trade and Development (UNCTAD) released the report on the world investments; they considered Saudi Arabia at the top of competitors for attracting forms of foreign investments in 2007 among all Middle Eastern countries. In addition, a 2009 report by Doing Business, ranked Saudi Arabia 13th out of 183 in the world as the best investment environment; further more they ranked them in first place among all Mid-Eastern countries, including North Africa.

**Telecommunications Industry Growth in the Saudi Arabia:**

**Mobile telecommunications market:**

The number of subscriptions to mobile telephones by the end of the first quarter 2012 is characterized by a penetration rate of 188.50% with the prepaid subscription of 85% of the entire mobile subscriptions. The high growth rate achieved by the mobile sector in recent years is expecting continuous growth although not at same increasing rate.

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**Fig. 4:** Mobile Service Market Growth-Total Subscriptions Source: Saudi CITC, 2012.

**Fig. 5:** Fixed Telephone Market Evolution Source: Saudi CITC, 2012.
**Fixed Telephony Market:**

By the end of the first quarter of 2012, the fixed telephone lines were recorded at 4.63 million with 3.3 million (71%) residential lines. This constitutes a household tele-density of approximately 68.4% with population tele-density of around 16%. The figure (2) depicts a relatively stable demand rate for fixed line service since 2004 which is attributable to the increasing spread of mobile telecom services, ease of subscription, and the gradual fall in prices leading to the lower number of customer requests for fixed service. Nevertheless, the demand for fixed services particularly in main cities is expected to increase owing to the growing demand for broadband services (e.g. fiber-optic network (FTTx) services).

**Fixed Broadband Services:**

Fixed Broadband subscriptions such as DSL, Fixed Wireless (WiMax), FTTx and other fixed lines have shown a growth rate of approximately 2.16 million subscriptions by the end of Q1 2012. The penetration rate of Fixed Broadband was reported around 36% of the households.

![Fig. 6: Fixed Broadband Market Evolution Source: Saudi CITC, 2012](image)

**Mobile Broadband Services:**

The number of mobile broadband subscriptions was reported to be at 11.9 million at the end of the first quarter of 2012 with a population penetration rate of 41.4%. In addition, the mobile broadband market shows a continuous momentum in Saudi Arabia owing to vigorous competition, a healthy expansion of smart phones and the various data packages offerings by mobile operators. Currently, it has become convenient to access networks through mobile devices such as smart phones. In addition, the mobile networks are also showing improvement as the deployment of 3.5G (HSPA) continues and as wireless broadband technologies (4G) are introduced over the next few years.

Thus, with the increased number of users of the telecommunication industry in Saudi Arabia and with the rapid changes technology brings about in the
industry causing increasing and changing demands on the side of customers, Saudi telecom companies ought to respond very fast to all these changes and failing to do so will result in lagging performance and thus losing customers over time. In other words, Saudi telecom companies ought to be highly market-oriented as this would ensure shorter NPD cycle time which in turn results in faster delivery of products and services to the end users. The following section addresses the first construct of the present study, namely market-orientation.

Conclusions:

The present study aimed to contribute to theory and practice with regards to the impact of teamwork quality on new product development cycle time in telecommunication industry and to assist in addressing some gaps in the body of literature by expanding the research in this area. This expansion is possible by developing an extensive empirical model that determines the critical factors that have an impact of NPD cycle time. This study, thus, has a number of significant implications for managements and theorists.

Since teamwork is essential to new product development (NPD) cycle time, managers need to be concerned about how to improve team effectiveness so that it reduces new product development cycle time. Managers vigilant about launching new products should facilitate an environment conducive to teamwork to realize superior course of reflective activities.

This study also has theoretical implications, as follows. First, it contributes to the understanding of a recent concept in marketing, namely internal market orientation, which has been identified as essential by many authors and was investigated here in the context of new product development cycle time. In addition, rather than being concerned with the impact of internal market orientation on the new product development cycle time only the study also acknowledges the important role of internal market orientation process in ensuring business success.

Second, this study’s disaggregating variables lead to reduction of new product development cycle time. It thereby attempts to provide a more detailed understanding of the teamwork quality that drive new product development cycle time by showing that some strategic components are more important than others.

Third, it conceptually differs from most studies in the literature by investigating components of internal market orientation, teamwork quality in specific field which is telecommunication industry which faces environmental turbulence. The findings showed environment turbulence to moderate the relationship between teamwork quality and new product development cycle time, where teamwork quality predicted NPD cycle time in turbulent conditions – this is consistent with literature on innovation. The study results partially support prior studies by Hoegl and Gemuenden [26] and Sethi and Nicholson (2001) that stressed on the collaboration of team members in turbulent times, as they perceive greater loads and trade-off decision accuracy relative to the decision-making time.

Finally, not only does this study stress the importance of acquiring new knowledge, but it also recognizes the role of specific aspects of the structure of an organization by indicating that teamwork quality may be particularly needed to foster the effectiveness of internal market oriented behaviors in more uncertain environments. Overall, the present research offers a more detailed model of the impact of teamwork quality on new product development cycle time including internal market orientation as a mediating variable and environmental turbulence as moderator variable.

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