Examining New Product Development Speed and Team Work Quality Relationship: Evidence from Telecom Industry

Asmat-Nizam Abdul-Talib [1], Turki Abdullah Alanazi[2], Hasbullah Ashari[3]
[1]*Universiti Utara Malaysia, Malaysia*
[2]*Saudi Telecom Company, Kingdom of Saudi Arabia*
[3]*Universiti Teknologi Petronas, Malaysia*
[1]asmat@uum.edu.my
[2]tanezi@gmail.com
[3]hasbullah368@gmail.com

***Abstract*—Although prior research has suggested that team work quality and internal market orientation can affect new product development (NPD) speed in a positive direction, however relatively little research has examined the incremental validity of team work quality to NPD speed after controlling for internal market orientation. To address this theoretical gap in marketing literature, the present study attempts to examine whether the dimensions of team work quality account for incremental variance in NPD speed, after controlling for the dimensions of internal market orientation. Using a random sampling, a total of 149 members of NPD teams in Saudi telecommunications firms responded to measures of each construct. Hierarchical multiple regression analysis was performed to access the incremental validity. Overall results suggest that cohesion accounted for a significant amount of variance relative to coordination, balance of member contribution, efforts, communication, mutual support and other dimensions of internal market orientation in the prediction of NPD speed.**

***Keywords*—** *teamwork quality, new product development speed, internal market orientation, incremental validity*

1. Introduction

Team work quality is one of the key factors that has been repeatedly suggested to affect new product development speed [1], [2], [3], [4], [5], [6], [7]. Team work quality can lead to success in innovative projects [8], [9], [10], [11], [12], [3]. Furthermore, teamwork quality can facilitate new product development speed and new product development projects success [2], [7]. In addition to the role of teamwork quality in predicting new product development speed, accumulating evidence suggests that internal market orientation is positively associated with new product development speed across various research settings [13], [14], [15], [16], [17].

However, despite numerous theoretical generalizations regarding the influence of team work quality and internal market orientation on new product development speed, the empirical research examining the incremental validity of team work quality after controlling for internal market orientation has received little attention [18], [19]. Hence, there is a need for greater attention to be paid to the investigation incremental validity of team Work quality after Controlling for other factors that may contribute in predicting new product development speed. The goal of this article was to extend what is known about the links between team work quality, internal market orientation and new product development speed by focusing on assessing the incremental validity of team work quality after controlling for internal market orientation in predicting new product development speed.

Thus, understanding the incremental validity of team work quality beyond internal market orientation in enhancing new product development speed has important implications for marketing researchers and practitioners [20], [21], [22], [23]. For example, marketing researchers may wish to use the findings of this study as a basis for incorporating either team work quality or internal market orientation in their future studies. In line with previous research speed [13], [2], [14], [3], [4], [5], [15], [6], [7], [17] it is hypothesized that team work quality has incremental validity beyond internal market orientation in predicting new product development speed.

Literature Review

Teamwork Quality and NPD

The construct of teamwork quality has been used in a number of recent studies. They found that teamwork quality was correlated significantly with team performance as evaluated by team members, team leaders, and project managers (although it explained more variance in performance rated by team members than performance rated by team leaders and managers). Teamwork quality was also found to be significantly related to perceived personal success of team members. These results were later replicated in a longitudinal study involving 39 cross-functional teams [24]. These teams engaged in both intrateam and interteam coordination in a new product development project. Results of the study indicated that although teamwork quality was significantly related to team performance, the effect was stronger at the initial phase of the project than at the later phase of the project. These findings suggest that teamwork quality is important for a team to deal with the challenge of uncertainty at the initial stage of the project. Its importance is somewhat reduced at the later stage when the low level of uncertainty requires less collaboration among team members. Additionally, teamwork quality was related to project commitment and coordination with other teams.

[25] investigated whether the effects of teamwork quality on performance may be moderated by team member proximity. They argued that the effects of teamwork quality on performance would be stronger when team members are more geographically dispersed, for two reasons. First, teamwork quality is more likely to leverage the knowledge potential of all team members who are dispersed. That is because as teams become more dispersed, teamwork quality becomes more relevant. In other words, in these teams, it is more important for team members to share information, exert sufficient effort towards team activities, coordinate each other's action, provide mutual support, use all team members' potential, and identify themselves with the team. Second, the role of team leaders in dispersed teams becomes less critical because they are less likely to have direct access to all team members. As such, in these teams, the weaker influence of team leaders on team activities can be compensated by a high level of teamwork quality. In other words, a high level of teamwork quality can ensure that dispersed teams continue to function even without the hands-on supervision of team leaders. Based on the same dataset used in [3], they found substantial support for their hypothesis.

[25] investigated the relationship between team member proximity and teamwork quality. They argued that proximity, defined as the extent to which teammates are physically close to each other, may have positive effects on the six facets of teamwork quality. The reasoning was that close proximity of team members may facilitate the frequent and spontaneous communication within the team, allow members to structure their activities to improve synchronization, draw on each other's strength, provide assistance to each other when needed, develop strong ties among team members, and reduce the tendency of social loafing. Results of a study using 145 software development teams from Germany showed that five of the six factors of teamwork quality were significantly correlated with team members proximity (with the exception of balance of contribution).

[26] hypothesized that the relationship between teamwork quality and team efficiency and effectiveness may be moderated by the level of innovativeness of the team project. They found that the relationship was stronger when the team projects were high on innovative, but lower or even non-significant when the level of innovation was low. The reasoning was that projects that are highly innovative require more collaboration among team members and exchange of resources. As a result, teams that have a high level of teamwork quality may be better equipped to head off these challenges. In contrast, when projects are low or moderate in innovativeness, they require less collaboration among team members. Thus, a high level of teamwork quality may be less relevant in these situations.

[27] examined the effects of the distribution of decision-making authority on teamwork quality. The decision-making authority can rest either inside or outside of the team. When decisions are made external to the team, team members may experience a low level of autonomy. As such, it may interfere with the distribution of information, create difficulties with the coordination of team activities, undermine task-oriented motivation (effort and task knowledge), result in less mutual support, and reduce team members' identification with the team. In contrast, when team members share the responsibilities to make decisions, they may be motivated to expend effort towards the tasks, exchange task-related information, coordinate

their activities, balance each other's contribution, and eventually lead to more mutual support among team members. Results of a study using 145 software development teams from Germany provided mixed support for these arguments. Specifically, external influence on team decision making was significantly related to effort, cohesion, and balance of contribution, but not significantly related to the other three dimensions of teamwork quality. Additionally, internal equality in decision-making was significantly related to five of the six dimensions of teamwork quality with the exception of team coordination.

[28] examined teamwork quality in the context of the use of team-based work systems. Using 24 teams of MBA students, they found that teamwork quality was related to a team's use of collaborative system, which in turn was related to the team's creativity performance. [4] examined the moderating role of teamwork quality on the relationship between team goal setting and team performance in innovative projects. They reasoned that a high quality of teamwork may reduce the uncertainties involved in innovative team projects, which may enhance the effects of team goal setting. Results of a study using 145 software project teams in Germany provided substantial support for this argument.

Overall the evidence suggests that teamwork quality is related to team performance, and NPD cycle time facilitates the team goal setting process and compensates for the lack of geographical proximity of team members. Additionally, the effects of teamwork seem more pronounced when the team project is innovative and when teams are at the early stage of development. Given the importance of teamwork quality as a team process, it is important to examine the impact of teamwork on NPD cycle time.

Internal Market Orientation and NPD

Being the first company to present the market with new innovative products has become an increasingly high priority for most businesses in technological driven industries. To achieve a better position in the market and better business performance, companies take great strides in their attempt to be more successful. In doing so, they understand it is imperative to meet the needs of their consumers [29]. They also realize that they must achieve this goal faster than their competitors. Determining whether to introduce to the market moderately modified products or to introduce new inventive products is based upon the desires of the consumer and the strategies of their contenders.

It has been advocated that the unequivocal way to achieve competitive advantage over the opponent is by speeding up the new product development process [30], [31], [32], [33], [34], [35], [36]. On the other hand, others argued that the association between performance and cycle time is nott as resilient as other researchers have indicated [37], [38], [39], [35]. Take [37] for example. He concluded that being timely was not significantly associated with sales or market shares. He alleged it was associated with profitability, however, to a moderate degree. Both [39] agreed that higher sales, returns, growth, as well as the overall performance cannot be achieved by faster development cycles solely. [38] stated that firms following the best practices do not develop new products faster than other ordinary firms.

On the contrary, continually trying to find ways to decrease the cycle time is one of the highest priorities for most senior managers. Inspired by the study of [38], 50% of firms have already managed to find ways to reduce their cycle time in manufacturing diverse novel merchandise. Since 1990, developmental phases have dropped nearly 15 to 20% [38]. [40] [41] predicted greater percentages of reduction in years to come. Success factors that aid the steadily declining cycle time include increased competitive pressures, market demand, rapid technological changes, shorter product life cycles, and a need to meet the company's growth objectives. Growth objectives include goals such as ensuring that a greater percentage of products being introduced are fresh, new, idealistic merchandise [42], [43], [44], [32], [36], [45]. In sum, external and internal pressure to perform faster, motivation, and the knowledge that time is money, are all vital factors that have enhanced the development process [11], [46].

Literature concerning product development stresses on the significance of market orientation. [47] concluded that a strong market orientation has a great influence on the separation of successful versus unsuccessful industrial products. Many product development studies view market orientation as the engine behind product development performance and among the controllable factors that impact new product success [13], [48], [49], [50], [35], [51], [52], [53], [54], [17]. In addition, in their meta-analysis, [51] concluded that majority of studies

stated that factors linked to market orientation primarily determines new product performance. These factors may be a part of market orientation like proficiency to pre-develop activities, marketing activities and protocol or they may be the result of market orientation (e.g., product advantage).

Despite the acknowledgement of both marketing and product development literature of the significance of internal market orientation, studies concerning the conceptualization, ideation and operationalization of internal market orientation in the managerial context of crucial processes (e.g., process of product development) are few and far between [55], [56], [57], [58], [59], [60], [61], [62], [63]. Studies regarding the concerned topic are important because the ideation, conceptualization and operationalization of market orientation at the level of crucial processes will lead to the stimulation of academic research upon the implementation and enhancement of market orientation. Moreover, because managers are not aware of what to change, they perceive a dearth of guidelines regarding the enforcement of internal market orientation in their orginasations. According to some arguments, their ignorance of the guidelines lies in the lack of provision of the same in academic research [56], [64], [65], [66].

The previous research concentrates on new product development to become market-oriented for two reasons. It can be concluded from the studies above that adopting market orientation in product development can be highly critical for new product success [67], [48]. The new product development is among the most critical business processes. New products are the driver behind the organization which ensures future sales and development. Hence, the question arises of what product development looks like in the context of a market oriented organization. An internal market orientation should be created by considering that innovativeness and innovations (product and administrative) are the drivers behind organizational performance in an attempt to achieve competitive advantage [68], [69], [70], [71].

Second, authors claim that product development can be utilized as an initiation of the transformation of the organization into a market-oriented organization [72], [73] where it aims at developing customer value. To achieve market orientation, specific values, functional structures and processes need to be modified. In other words, product development is the main process for the creation of customer value through superior product owing to its inter-functional nature which is linked to many other critical business processes.

2. Method

2.1 Participants

This study employed a cross-sectional research design. Participants were 149 teams' members from Saudi Arabian Telecommunication Companies. The descriptive statistics of the key informants in terms of company background, nationality, age, educational level, job position and experience are presented in Table 1.

2.2 Measures

New product development speed. New product development speed is operationally defined as how fast or time taken between initial development efforts and the introduction of a new product in the marketplace [74], [75]. To measure new product development speed, four items were adopted from [75], [76], [77] measure of new product development speed. This measure was reported to have a high validity and reliability scores in their study. Respondents were asked about the time it takes them throughout the process of developing a new product from the time the product was an idea until the time the product was launched in the market. Each item used a seven-point Likert scale, ranging from '1' "Strongly disagree" to '7' "Strongly agree." Sample item is "This product was developed and launched (fielded) faster than the major competitor for a similar product".

Teamwork quality. Teamwork quality is operationally defined as the degree and quality of team members' interaction which focuses on how teammates collaborate with each other in the pursuit of team goals, but it includes neither task work behaviour nor human sentiments. In this study, [3] multidimensional teamwork quality scale was used to assess teamwork quality. Specifically, this scale consists of six dimensions, namely: communication, coordination, balance of member contribution, mutual support, effort, and cohesion. Ten items constitute the measurement sub-scale for communication, 4 items for coordination, 3 items for balance of member contribution, 6 items for mutual support, 4 items for effort and finally 10 items for cohesion. All items were scored on a seven-point scale, ranging from '1' "Strongly disagree" to '7' "Strongly agree." Communication was measured with a 10-item scale, reflecting the frequency and manner of exchange among team members. A sample item was "Team members communicate mostly directly and personally with each other". Coordination was measured with a four-item sub-scale intended to assess the extent to which team members synchronize their activities. A sample item was "The work within the project is

closely harmonized". Balance of contribution was measured with a three-item sub-scale. This scale measured the extent to which team members bring their expertise to the team. A sample item was "Team members contribute to the achievement of the team's goals in accordance with their specific potentials". Mutual support was measured with a six-item scale. This scale measured the manner in which team members resolve the conflict in the team. A sample item was "If conflicts come up, they are easily and quickly resolved". Effort was measured with a four-item scale intended to assess the extent to which team members exert effort towards the accomplishment of team goals. A sample item was "Every team member makes the projects their highest priority". Cohesion was measured with a ten-item sub-scale. This scale measured team members' identification with the team and interpersonal attraction. A sample item was "Members of our team feel proud to be part of the team."

Internal market orientation. Internal market orientation was measured using internal market orientation scale, which was originally developed and validated by [78]. Internal market orientation scale consists of 26 items measuring five dimensions of internal market orientation: informal information generation, formal face-to-face information generation, formal written information generation, information dissemination, and response. Participants respond to each statement using a 7-point Likert scale (1=strongly disagree to 7 = strongly agree). Sample item is "In our company we make changes to what we do when employee feedback indicates that they are dissatisfied with the status quo".

***Table 1**: Respondents' Demographic Statistics Frequency Percentage*

	Frequency	Percentage
Company Name		
STC	83	55.7
MOBILY	45	30.2
ZAIN	21	14.1
Nationality		
Saudi Citizen	127	85.2
Non-Saudi Citizen	22	14.8
Age		
25-30 years	7	4.7
31-35 years	30	20.1
36-40 years	45	30.2
41-45 years	41	27.5
46-50 years	20	13.4
Above 51 years	6	4.0
Educational Level		
Secondary School	4	2.7
High School Diploma	42	28.2
Bachelors' Degree	80	53.7
Master Degree	20	13.4
PhD Degree	3	2.0
Job Position		
Director or higher level	5	3.4
Division Manager	28	18.8
Head section	25	16.8
Expert Employee (Consultant)	36	24.2
Employee	55	36.9
Experience		
Below 5 years	4	2.7
5-10 years	25	16.8
11-15 years	47	31.5
16-20 years	38	25.5
21-25 years	26	17.4
Above 25 years	9	6.0

3. Results

3.1 Data Analysis Strategy

To assess the incremental validity of the teamwork quality relative to internal market orientation in predicting new product development speed, a hierarchical linear regression model was developed and tested in two steps. In step 1, the six dimensions of teamwork quality were entered into the Statistical Package for the Social Sciences (SPSS) regression analysis menu. This is followed by entering the five dimensions of internal market orientation in step 2 to ensure any observed effects for the dimensions of teamwork quality were not due to shared variance with other variable (i.e., internal market orientation).

3.2 Means, Standard Deviations, and Correlations of the Study Variables

The descriptive statistics, which comprised means, standard deviations, scale reliabilities, and correlations among the study variables are presented in Table 2. As shown in Table 2, all the dimensions of teamwork quality were associated with new product development speed: Coordination (r=.365; p<.001), Balance of member contribution (r=-.178; p<.005), Efforts (r=.433; p<.001), Communication (r=.421; p<.001), Mutual support (r=-.344; p<.001, and Cohesion (r=.499; p<.001). Similarly, all dimensions of internal market orientation were related to new product development speed: Informal information generation (r.338; p<.001), Formal face-to-face information generation (r=.546; p<.001), Formal written information generation (r=.507; p<.001), Information dissemination (r=.435; p<.001), and Response (r=.392; p<.001).

Regarding the scale reliabilities, Table 2 shows that all constructs had alpha values above .70, which well exceeded the recommended thresholds of 0.70 (Nunnally, 1978). Hence, Table 2 suggested a high level of internal consistency reliabilities. Finally, Table 2 shows that among the constructs, Informal information generation had the highest mean (M = 5.513, SD = .844), followed by effort (M = 5.079, SD = 870), cohesion (M = 5.044, SD = .707), coordination (M = 4.884, SD = .919), communication (M = 4.942, SD = .746) and formal face-to-face information generation (M = 4.195, SD = 1.635). Likewise, formal written information generation had (M = 4.506, SD = 1.336), information dissemination (M = 4.785, SD = 1.186), new product development speed (M = 4.745, SD = 1.103), cohesion (M = 4.613, SD =. 1.459), while mutual support and balance of member contribution has lowest mean with their means and standard deviations as (M = 2.733, SD = 1.093) and (M = 2.868, SD = .725), respectively. All items were measured on a seven-point scale.

3.3 Incremental Validity of Teamwork Quality and Internal Market Orientation on New Product Development Speed

As shown in Table As shown in Table 3, the Hierarchical regressions demonstrated that balance of member contribution, efforts, communication, and cohesion significantly predicted new product development speed in a positive direction, but coordination and mutual support did not. The results further established that cohesion is the main predictor of new product development speed (β = 590; p< 0.01) relative to balance of member contribution, efforts, and communication with regression coefficients: (β = .267; p< 0.05), (β = .236; p< 0.10), and (β = .221; p< 0.10), respectively. Additionally, the results suggest that six dimensions of teamwork quality jointly accounted for an additional 29% of the variance in new product development speed (p<0.001).

Controlling for the dimensions of teamwork quality, the five dimensions of internal market orientation (informal information generation, formal face-to-face information generation, formal written information generation, information dissemination, and response) significantly accounted for 45% of explained variance in the second step for new product development speed. Specifically, formal face-to-face information generation (β = −0.11; p<.001) accounted for a significant amount of variance in new product development speed relative to response (β = .139; p< 0.05) and formal written information generation (β = .134; p< 0.05), but informal information generation and information dissemination did not.

***Table 2**: Descriptive Statistics, Scale Reliabilities and Correlations of the Study Variable*

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	Coordination	4.884	.919	**.740**	-.410**	.617**	.662**	-.682**	.609**	.394**	.430**	.371**	.408**	.361**	.365**
2	Balance of member contribution	2.868	.725		**.930**	-.560**	-.342**	.262**	-.526**	-.352**	-.277**	-.268**	-.194**	-.271**	-.178*
3	Efforts	5.079	.870			**.880**	.563**	-.664**	.791**	.520**	.418**	.443**	.544**	.462**	.433**
4	Communication	4.942	.746				**.860**	-.659**	.689**	.365**	.489**	.500**	.563**	.425**	.421**
5	Mutual support	2.733	1.093					**.900**	-.652**	-.494**	-.535**	-.471**	-.602**	-.513**	-.344**
6	Cohesion	5.044	.707						**.940**	.587**	.459**	.483**	.620**	.533**	.499**
7	Informal information generation	5.513	.844							**.910**	.409**	.365**	.442**	.413**	.338**
8	Formal face-to-face information generation	4.195	1.635								**.880**	.706**	.633**	.749**	.546**
9	Formal written information generation	4.506	1.336									**.840**	.622**	.587**	.507**
10	Information dissemination	4.785	1.186										**.840**	.697**	.435**
11	Response	4.613	1.459											**.920**	.392**
12	New product development speed	4.745	1.103												**.870**

Note. **. Correlation is significant at the 0.01 level (1-tailed). Entries shown in bold diagonal represents the Scale Reliabilities

***Table 3**: Hierarchical Multiple Regression Analyses Predicting New Product Development Speed from Dimensions of Teamwork Quality and Internal Market Orientation (n=149)*

Predictor	B	SE (B)	β
Step 1			
Coordination	.103	.132	.086
Balance of member contribution	.267	.138	.175**
Efforts	.236	.167	.186*
Communication	.221	.166	.150*
Mutual support	.139	.118	.137
Cohesion	.590	.211	.378***
Step 2			
Coordination	.094	.120	.079
Balance of member contribution	.357	.128	.235***
Efforts	.253	.151	.199**
Communication	.040	.156	.027
Mutual support	.287	.112	.284***
Cohesion	.608	.206	.390***
Informal information generation	.026	.107	.020
Formal face-to-face information generation	.334	.078	.495***
Formal written information generation	.134	.079	.162**
Information dissemination	-.037	.101	-.040
Response	.139	.083	.184**

Note. **. Regression is significant at the 0.01 level (1-tailed). **Step 1:** R Square = 29%; Adjusted R Square = 26%; F = 9.437; p < 0.001. **Step 2:** R Square = 45%; Adjusted R Square = 41%; F = 10.210; p < 0.001.

3. Discussion and Conclusion

The goal of the present study was to examine the incremental validity of the dimensions of teamwork quality and internal market orientation in predicting new product development speed among teams' members drawn from the telecom companies in the Kingdom of Saudi Arabia. The present study has provided additional evidence to the growing body of knowledge by suggesting that only cohesion accounted for a significant amount of variance relative to coordination, balance of member contribution, efforts, communication, mutual support and other dimensions of internal market orientation in the prediction of new product development speed.

This finding was surprising given that the results of the correlation analysis demonstrated a less correlation of cohesion with new product development speed compared to the other dimensions of teamwork quality and internal market orientation the present study. It is imperative to note that the individual beta coefficients for the dimensions of teamwork quality and internal market orientation must be interpreted with caution, given that these dimensions of teamwork quality and internal market orientation are so highly correlated, as such analyses of the individual betas may be misleading.

Accordingly, the findings of these study extended prior research demonstrating a relationship between teamwork quality and new product development speed [1], [2], [3], [4], [5], [6], [7], as well as between internal market orientation and new product development speed [79], [13], [14], [15], [17]. While the present study has extended prior research demonstrating a significant relationship between teamwork quality and new product development speed, as well as the link between internal market orientation and new product development speed; there are several limitations in the present study that ought to be acknowledged. Firstly, the present study mainly involved new product development members in telecommunication in Saudi Arabia. As such, it may not represent the general population of telecom industry because of the relatively few firms working in the selected industry used as evidence to the study.

Secondly, the cross-sectional research design could not allow valid conclusions to be drawn regarding the cause and effect. Additionally, because teamwork quality, internal market orientation and new product development speed are all dynamic factors, it is difficult to use the cross-sectional data to reflect ongoing transformations in relationships. Therefore, it is important to incorporate longitudinal research designs in the future research to enable better capturing of the dynamism of the constructs and better understand the incremental validity of the dimensions of teamwork quality and internal market orientation in predicting new product development speed.

Reference

[1] Barczak, G., & Wilemon, D. (2003). Team member experiences in new product development: views from the trenches. *R&D Management, 33*(5), 463-479. doi: 10.1111/1467-9310.00311

[2] Dayan, M., & Benedetto, C. A. D. (2009). Antecedents and consequences of teamwork quality in new product development projects. *European Journal of Innovation Management, 12*(1), 129-155. doi: 10.1108/14601060910928201

[3] Hoegl, M., & Gemuenden, H. G. (2001). Teamwork quality and the success of innovative projects: A theoretical concept and empirical evidence. *Organization Science, 12*(4), 435-449. doi: 10.1287/orsc.12.4.435.10635

[4] Hoegl, M., & Parboteeah, K. P. (2003). Goal Setting and Team Performance In Innovative Projects: On the Moderating Role of Teamwork Quality. *Small Group Research, 34*(1), 3-19. doi: 10.1177/1046496402239575

[5] Jaworski, B. J., & Kohli, A. K. (1993). Market orientation: antecedents and consequences. *The Journal of marketing, 57*(3), 53-70

[6] Pinto, M. B., & Pinto, J. K. (1990). Project Team Communication and Cross-Functional Cooperation in New Program Development. *Journal of Product Innovation Management, 7*(3), 200-212. doi: 10.1111/1540-5885.730200.

[7] Sun, H., Zhao, Y., & Yau, H. K. (2009). The relationship between quality management and the speed of new product development. *The TQM Journal, 21*(6), 576-588. doi: 10.1108/17542730910995855.

[8] Abdul Talib, A. N. (2005). Differences in market-oriented behaviour levels across firms' domestic and export marketing operations: a study of antecedents and consequences (*Doctoral dissertation, Aston University*).

[9] Alanazi, T. A., Abdul Talib, A. N., Ashari, H., & Islam, R. (2015a). Mediating effect of internal market orientation on new product development in the telecom industry. *Journal of Applied Sciences, 15*(2), 205-213.

[10] Alanazi, T.A., Abdul Talib, A.N.., Ashari, H. and Islam, R., (2015b). Moderating Effect of Environmental Turbulence on New Product Development Cycle Time in the Telecom Industry. *Journal of Applied Sciences, 15*(2), p.240-247.

[11] Cooper, R. G. (2019). The drivers of success in new-product development. *Industrial Marketing Management, 76*, 36-47.

[12] Gao, J., Huang, C., Su, J. & Xie, Q. (2019). Examining the Factors Behind the Success and Sustainability of China's Creative Research Group: An Extension of the Teamwork Quality Model. *Sustainability, 11*(4), 1195.

[13] Atuahene-Gima, K. (1995). An exploratory analysis of the impact of market orientation on new product performance. *Journal of Product Innovation Management, 12*(4), 275–293.

[14] Frishammar, J., & Åke Hörte, S. (2007). The Role of Market Orientation and Entrepreneurial Orientation for New Product Development Performance in Manufacturing Firms. *Technology Analysis & Strategic Management, 19*(6), 765-788. doi: 10.1080/09537320701711231.

[15] Li, Y., Liu, Y., & Zhao, Y. (2006). The role of market and entrepreneurship orientation and internal control in the new product development activities of Chinese firms. *Industrial Marketing Management, 35*(3), 336-347. doi: http://dx.doi.org/10.1016/j.indmarman.2005.05.016.

[16] Mostaghela, R., Oghazi, P., Patel, P. C., Parida, V., & Hultman, M. (2019). Marketing and supply chain coordination and intelligence quality: A product innovation performance perspective. *Journal of Business Research, 101*, 597-606.

[17] Wren, B. M., Souder, W. E., & Berkowitz, D. (2000). Market Orientation and New Product Development in Global Industrial Firms. *Industrial Marketing Management, 29*(6), 601-611. doi: http://dx.doi.org/10.1016/S0019-8501(00)00120-6.

[18] Hassim, A.A., Abdul Talib, A.N., A.T. and Bakar, A.R.A., (2011). The effects of entrepreneurial orientation on firm organisational innovation and market orientation towards firm business performance. *International on Sociality ND Economics Development. IPEDR, 10*, pp.280-284.

[19] Abdul-Talib, A.N. and Abd-Razak, I.S., (2012). Export market-oriented behaviours within the medical tourism industry: a case study. *International Journal of Tourism Policy, 4*(4), 289-301.

[20] Abdul Talib, A. N., & Md Salleh, M. F. (1997). Firm size and export attitudes of Malaysian exporters. *In the Proceedings of Second Asian Academy of Manage. Conference: Towards management excellence in the 21st century Asi*a (pp. 403-408).

[21] Mohd Zamani, S. N., Abdul Talib, A. N., & Ashari, H. (2010). The impact of strategic fit between resource orientation and market orientation towards new product development performance: A proposed framework. 37-44.

[22] Mohd Zamani, S. N., Abdul Talib, A. N., & Ashari, H. (2016). Strategic orientations and new product success: The mediating impact of innovation speed. International Information Institute (Tokyo). *Information, 19* (7B), 2785-2790.

[23] Mohd Zamani, S. N., Ashari, H., & Abdul Talib, A. N. (2017). The strategic fit of multiple strategic orientations and new product development performance in Malaysian manufacturing firms: A conceptual framework. *Journal for Studies in Management and Planning, 3*(1), 87-101.

[24] Hoegl, M., Weinkauf, K., & Gemuenden, H. G. (2004). Interteam coordination, project commitment, and teamwork in multiteam R&D projects: A longitudinal study. *Organization Science, 15*(1), 38-55.

[25] Hoegl, M., Ernst, H., & Proserpio, L. (2007). How teamwork matters more as team member dispersion increases. *Journal of Product Innovation Management, 24*, 156-165.

[26] Hoegl, M., Parboteeah, K. P., & Gemuenden, H. G. (2003). When teamwork really matters:Task innovativeness as a moderator of the teamwork-performance relationship in software development projects. *Journal of Engineering and Technology Management, 20*, 281–302.

[27] Hoegl, M., & Parboteeah, K. P. (2006). Autonomy and teamwork in innovative projects. *Human Resource Management, 45*, 67-79.

[28] Easley, R. F., Devaraj, S., & Crant, J. M. (2003) Relating Collaborative Technology Use to Teamwork Quality and Performance: An Empirical Analysis, Journal of Management Information Systems, 19:4, 247-265

[29] Osuagwa, L. (2006). Market orientation in Nigerian companies. *Journal of Marketing Intelligence and Planning, 24*(6), 608-631.

[30] Buganza, T., & Verganti, R. (2006). Life-cycle flexibility: How to measure and improve the innovative capability in turbulent environments. *Journal of Product Innovation Management, 23*(5), 393-407.

[31] Karagozoglu, N., & Brown, W. (1993). Time-based management of the new product development process. *Journal of Product Innovation Management, 10*, 204-215.

[32] Langerak, F., Hultink, E. J., & Griffin, A. (2008). Exploring mediating and moderating influences on the links among cycle time, proficiency in entry timing, and new product profitability. *Journal of Product Innovation Management, 25*(4), 370-385.

[33] Lynn, G. S., Skov, R. B., &Abel, K. D. (1999). Practices that support team learning and their impact on speed to market and new product success. *Journal of Product Innovation Management, 16*(5), 439–454

[34] Marco, J. N., Casado, M. B., & Moya, B. R. (2019, in press). Coopetition as an innovation strategy in the European Union: Analysis of the German case. *Industrial Marketing Management*.

[35] McGrath, G.E. (2009). Internal market orientation as an antecedent to industrial servicequality. *DBA thesis, Nova Southeastern University*.

[36] Parry, M., Song, M., de Weerd-Nederhof, P. C., & Visscher, K. (2009). The impact of NPD strategy, product strategy, and NPD processes on perceived cycle time. *Journal of Product Innovation Management, 26* (6), 627-639.

[37] Cooper, R. G. (1995). Developing new products on time, in time. *Research Technology Management, 38*(5), 49–58.

[38] Griffin, A. (1997). PDMA research on new product development practices: Updating trends and benchmarking best practices. *Journal of Product Innovation Management, 14*, 429–458.

[39] Ittner, C. D., & Larcker, D. F. (1997). Product development cycle time and organizational performance. *Journal of Marketing Research, 34*(1), 13-23.

[40] Scott, A. J. (2000). *The Cultural Economy of Cities: Essays on the Geography of Image-Producing Industries*. .London: Sage Publication.

[41] Bakar, A., Rahim, A., Talib, A., & Nizam, A. (2013). A case study of an internationalization process of a private higher education institution in Malaysia. Gadjah Mada International Journal of Business, 15(3).

[42] Gupta, A. K., & Wilemon, D. L. (1990). Accelerating the development of technology based new products. *California Management Review, 32*(2), 24-44.

[43] He, B., Luo, T., & Huang, S. (2019). Product sustainability assessment for product life cycle. *Journal of Cleaner Production, 206*, 238-250.

[44] Johnson, W. H. A., & Luo, C. (2008). NPD project timeliness: The project-level impact of early engineering effort and customer involvement. *International Journal of Product Development, 6*(2), 160-176.

[45] Rasiah, R., & Yap X. S. (2019). How much of Raymond Vernon's product cycle thesis is still relevant today: evidence from the integrated circuits industry. *International Journal of Technological Learning, Innovation and Development, 11*(1).

[46] Kessler, E. H., & Chakrabarti, A. K. (1996). Innovation speed: A conceptual model of context, antecedents, and outcomes. *Academy of Management Review, 21*(4), 1143–1191.

[47] Cooper, R. G. (1979). The dimensions of industrial new product success and failure. *Journal of Marketing, 43*, 93-103.

[48] Carbonell, P., & Rodriguez, A. I. (2006). The impact of market characteristics and innovation speed on perceptions of positional advantage and new product performance. *International Journal of Research in Marketing, 23*(1), 1-12.

[49] Fierroa, J. C., Gao, L. X., Polo, I. M., & Seseb, F. J. (2019). What drives consumers' active participation in the online channel? Customer equity, experience quality, and relationship proneness. *Electronic Commerce Research and Applications, 35*.

[50] Li, T., & Calantone, R. J. (1998). The impact of market knowledge competence on new product advantage: Conceptualization and empirical examination. *Journal of Marketing, 62*(4), 13−29.

[51] Montoya-Weiss, M. M., & Roger, C. J. (1994). Determinants of new product performance: A review and meta-analysis. *Journal of Product Innovation Management, 11*(5), 397-418.

[52] Pantano, E., Priporas, C. V., & Dennis, C. (2018). A new approach to retailing for successful competition in the new smart scenario. *International Journal of Retail & Distribution Management, 46*(3), 264-282.

[53] Sulaiman, Yaty., Abdul Rahim Othman., Perumal, Selvan & Hussin, Zolkafli. (2013). Escalating the Employee Organisational Commitment through Internal Market Orientation: Childcare Centre's Perspective International. *Journal of Business and Social Science. 4*(6), 257-262.

[54] Swink, M., & Song, X. M. (2007). Effects of marketing–manufacturing integration on new product development time and competitive advantage. *Journal of Operations Management, 25*(1), 203–217.

[55] Brown, T. J., Mowen, J. C., Donavan, D. T., & Licata, J. W. (2002). The customer orientation of service workers: personality trait effects on self and supervisor perfomance ratings. *Journal of Marketing Research, 39*(1), 110-119.

[56] Chryssochoidis, George, Gounaris, Spiros, Boukis, & Achileas (2018). Internal market orientation adoption: why and how it is important for new service development. *European Marketing Academic Annual Conference: EMAC, University of Strathclyde*.

[57] Day, G. S. (1994). The capabilities of market-driven organizations. *Journal of Marketing, 58*, 37-52.

[58] Gounaris, S. (2005). Measuring service quality in business to business services: an evaluation of the SERVQUAL scale vis-à-vis the INDSERV scale. *The Journal of Services Marketing, 19*(6/7), 421-435.

[59] Gounaris, S. (2006). Internal-market orientation and its measurement. *Journal of Business Research, 59*, 432-436.

[60] Kennedy, K. N., Lassk, F. G., & Goolsby, J. R. (2002). Customer mind-set of employees throughout the organization. *Journal of the Academy of Marketing Science, 30*(2), 159-171.

[61] Lings, I. N. (2004). Internal market orientation constructs and consequences. *Journal of Business Research, 57*, 405-413.

[62] Lings, I. N., & Greenley, G. (2010). Internal market orientation and market-oriented behaviors. *Journal of Service Management, 21*(3), 321-343.

[63] Poolton, J., & Barclay, I. (1998). New product development from past research to future applications. *Industrial Marketing Management, 27*(3), 197-212.

[64] Kahn, K. B., & Mentzer, J. T. (1994). Norms that distinguish between marketing and manufacturing. *Journal of Business Research, 30*, 111–118.

[65] Länsiluoto, A., Salo, S. J., Varamäki, E., Viljamaa, A., & Sorama, K. (2019). Market Orientation and Performance Measurement System Adoption Impact on Performance in SMEs. *Journal of Small Business Management, 57*(3), 1027-1043.

[66] Narver, J., Slater, S. F., & Tietje, B. (1998). Creating a market orientation. *Journal of Market-Focused Management, 2*, 241–55.

[67] Carbonell, P. & Escudero, A. I. R. (2019). The Dark Side of Team Social Cohesion in NPD Team Boundary Spanning. *The Journal of Product Innovation Management*, *36*(2), 149-171.

[68] Han, J. K., Kim, N., & Sirvastava, R. K. (1998). Market orientation and organizational performance: Is innovation a missing link? *Journal of Marketing, 62*, 30–45.

[69] Hurley, R F., & Hult, G. T. M. (1998). Innovation, market orientation, and organizational learning: An integration and empirical examination. *Journal of Marketing*, *62*, 42-54.

[70] Iyer, K. N. S., Srivastava, P., & Srinivasan, M. (2019). Performance implications of lean in supply chains: Exploring the role of learning orientation and relational resources. *International Journal of Production Economics*, *216*, 94-104.

[71] Khan, H., & Wisner J. D. (2019). Supply Chain Integration, Learning, and Agility: Effects on Performance. *Journal of Operations and Supply Chain Management, 12*(1), 14-23.

[72] Deschamps, J. -P., & Nayak, P. R. (1995). *Product juggernauts.* US: Harvard Business School Press.

[73] Tooranloo, H. S., & Saghafi, S. (2019). Investigating the Impact of Using Knowledge Management on Organisational Agility through Competitive Intelligence and Strategic Thinking. *Journal of Information & Knowledge Management.*

[74] Alanazi, T. A., Abdul Talib, N. A., Ashari, H., & Islam, R. (2015c). Relationship between Teamwork Quality and New Product Development Cycle Time in Telecom Industry. *Asian Journal of Scientific Research*, *8*(1), 41.

[75] Kessler, E. H., & Chakrabarti, A. K. (1999). Speeding up the pace of new product development. *Journal of Product Innovation Management, 16*(3), 231-247. doi: http://dx.doi.org/10.1016/S0737-6782(98)00048-4.

[76] Abdul-Latif, S. A., & Abdul-Talib, A. N. (2017). Consumer racism: a scale modification. Asia Pacific *Journal of Marketing and Logistics*, *29*(3), 616-633.

[77] Zamani, S. N. M., Abdul-Talib, A. N., & Ashari, H. (2016). Strategic orientations and new product success: The mediating impact of innovation speed. International Information Institute (Tokyo*). Information*, *19*(7B), 2785.

[78] Lings, I. N., & Greenley, G. E. (2005). Measuring Internal Market Orientation. *Journal of Service Research, 7*(3), 290–305.

[79] Ashari, H., Yusoff, Y.M., Zamani, S.N.M., Abdul Talib, N.A. (2018). A Study of the Effect of Market Orientation on Malaysian Automotive Industry Supply Chain Performance. *International Journal of Technology. Volume 9*(8), pp. 1651-1657.