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# Do the best new product/project development practices of the US companies matter in UAE?

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**RUNNING TITLE:** Product Innovation in the UAE

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**Abstract**

Despite the fact that past research offers a large number of "best practice" studies in New Product Development (NPD), an important characteristic of the earlier studies is that they are primarily based on US samples. Because management practices, cultures, and norms differ around the world, it has long been argued that NPD practices from the different parts of the world would be a fascinating future research. In response to this call for future research, we conducted a "best practice" study in the Middle East to understand the NPD activities of firms in the United Arab Emirates (UAE) and to compare these activities with the benchmarks established in the earlier studies. The findings reveal interesting similarities and differences between the Western and Middle Eastern NPD practices. Given the economic, political, and social significance of the Middle East in the world, this comparative study makes significant contributions to both the Middle Eastern and Western research and practice.

**Keywords:** Best NPD Practices, Emerging Markets, Middle East, United Arab Emirates (UAE).

## INTRODUCTION

The product innovation literature offers numerous "best practice" studies in New Product Development (NPD) (Barczak, Griffin, and Kahn, 2009; Booz, Allan, and Hamilton 1968 and 1982; Griffin 1997; Page 1993). Given the importance of the topic, the Product Development and Management Association (PDMA) has also initiated a serious of studies in the field, and Page (1993), Griffin (1997), and Barczak, Griffin, and Kahn (2009) have published the findings of PDMA-sponsored surveys. One important characteristic of these earlier "best practice" studies is that they are primarily based on US samples. Indeed, Griffin (1997) has acknowledged that because management practices, cultures, and norms differ around the world the findings of the PDMA studies will likely to be less applicable to firms managing NPD outside the US. She further argued that NPD practices from the different parts of the world would be a fascinating piece of future research (Griffin 1997; Griffin and Di Benedetto 2004).

In response to this call for future research, we conducted a "best practice" study in the Middle East to understand the NPD activities of firms in the United Arab Emirates (UAE) and to compare these activities with the benchmarks established in the PDMA studies (Barczak, Griffin, and Kahn 2009; Griffin 1997; Page 1993) (hereafter, the PDMA studies). The UAE is an important gateway to the Middle East and Africa. Furthermore, innovation has been an important part of the economic policy of the UAE Government. In fact, to sustain its growth and prosperity over the long-term, the UAE government recognizes the necessity of rebuilding the nation into a knowledge-based economy, rather than exclusively relying on its natural endowments, as articulated in the country's Vision-2021. More specifically, with this new vision, the government stipulates that one of their intended drivers for a more sustainable and diversified economy is to stimulate local innovation developments in the country. Indeed, the country has already started this transformation process by a host of innovative initiatives and programs since 2000. These initiatives and programs continuously attract local and global corporations to establish "innovation centers" in the country. As a result of this process, according to the World Business/INSEAD Global Innovation Index 2007, the UAE ranks as the 14th most innovative country in the world; and it was the only country in the Top 15 that is a non-Western and non-Asian economy.

Despite these recent strategic-radical changes and huge investments on NPD, there is not any single study conducted yet on the performance and best practices in NPD in the UAE. This

study will fill in this gap by surveying UAE companies and comparing the NPD activities in the UAE with those in the US. As a result, this study, being the first of its kind, will offer useful implications not only to local firms but also to global firms that plan to develop new projects/products in this part of the world as well as to the state and local governmental authorities that want to promote and support product innovation in the UAE.

The paper is organized as follows: It first outlines the research methodology and the survey instruments. Then, it presents the survey results with regard to the NPD processes, strategies, steps, organizational structures, team leaderships, selection of the team leaders, NPD team reward schemes, the use of multi-functional teams and the NPD outcomes. After that, it highlights key similarities and differences between the US and the UAE firms with respect to their NPD activities. The paper ends with various managerial and research implications.

## RESEARCH METHODOLOGY

### Survey Instruments

Past research about the "best" NPD activities offers a rich collection of potential questions to be included in a "best practice" survey. In order to be consistent with the earlier studies and to be able to compare the NPD activities of the UAE companies with the companies in the US, we adopted the survey instruments used in the PDMA studies. Similar to the PDMA studies, our survey questionnaire covered such various aspects of NPD as the NPD outcomes, the NPD process, organizing for product development and demographic information (Barczak, Griffin, and Kahn 2009; Griffin 1997; Page 1993).

*NPD Outcome Variables:* The questionnaire covered three types of NPD outcome variables including new product success, mortality rate and cycle time. Consistent with the PDMA studies, new product success was measured based on multiple criteria. The criteria measured the overall (industry), relative as well as market and financial performance of new products:

The first success measure was about the overall (industry) success. It was assessed based on a single item measuring the "position in your industry" and had the following options: (a) bottom 1/3; (b) middle 1/3; (c) top 1/3; and (d) most successful. The second success measure was about the firms' relative success compared to their stated objectives. It consisted of two items including "company's NPD program met the program objectives" and "company's NPD program is a success relative to its program objectives." Two nine-point scale measures ranging

from "completely disagree" (1) to "neutral" (5) and to "completely agree" (9) were used to assess the degree to which the respondents agreed with the statements. The third success measure was about the market and financial success. It consisted of four items including "percentage of products categorized as market successes in the last five years;" "percentage of total sales that are attributable to new products commercialized in the last five years;" "percentage of total profits that are attributable to new products commercialized in the last five years;" and "percentage of products categorized as financial successes in the last five years." All of these items were measured as percentages ranging from 0% to 100%.

In order to compare the NPD activities of successful and unsuccessful firms, the sample was split based on these success factors. Successful firms are those who stated that they were in the top third in their industry for overall (industry) NPD success, and who agreed that they were relatively successful, and who scored higher than the average of the entire sample with respect to the market and financial success. Thirty four firms or 32.38% of the sample were categorized as "successful" and 71 firms or 67.62% of the sample were categorized as "unsuccessful" for further analyses.

Finally, the two other outcome variables including the mortality rate and the cycle time were assessed by asking them to report the percentage of new product ideas (projects) they eliminated at different stages of the NPD process and the amount of time they spent at each step of the NPD process, respectively.

*New Product Process and Organization Variables***:** In order to be consistent with the PDMA studies and to be able to compare the results with those of the PDMA studies, the questions pertaining to the NPD processes, strategies, steps, organizational structures, team leaderships, selection of the team leaders, NPD team reward schemes, and the use of multi-functional teams were all adopted from the PDMA study. The respondents were asked to indicate whether they used NPD processes, strategies, steps, structures, and multi-functional teams and how long they used them. They were also asked to indicate the type of team leadership that they used in the NPD process, the way the team leaders were selected, and the way the team members were rewarded.

*Demographic Variables:* The questionnaire also included numerous demographic measures including the industry type, technological base, product type and market type.

TABLE 1: Descriptive statistics of the sample

| | | No. of Company | Percentage |
|---|---|---|---|
| Technology base[a] | High-tech | 17 | 16.2% |
| | Low-tech | 15 | 14.3% |
| | Mixed | 73 | 69.5% |
| | | 23 | 21.9% |
| Market type[b] | Consumer | | |
| | Business | 21 | 20.0% |
| | Mixed | 61 | 58.1% |
| | | 23 | 21.9% |
| Product type[c] | Goods | | |
| | Services | 14 | 13.3% |
| | Mixed | 68 | 64.8% |
| | Sample Total | 105 | 100.0% |
| | | Mean | |
| Success | Industry[d] | 2.62 | |
| | Relative[e] | 6.39 | |
| | Market-Financial[f] | 40.93% | |

a. $\chi 2=2.883$, df=2, ns.
b. $\chi 2=1.848$, df=2, ns.
c. $\chi 2=2.500$, df=2, ns.
d. 4 = most successful in industry, 3 = top third, 2 = middle third, 1 = bottom third.
e. 9 = completely agree, 1 = completely disagree with "company NPD program met the NPD program objectives" and "company's NPD program is a success relative to its program objectives."
f. Higher percentages are better.

**Survey**

The survey was conducted among the UAE firms that were identified through commercial directories of chambers of commerce and industry in the UAE. A total of 145 firms were contacted. Managers in the selected firms were first contacted by visits of three research assistants to make sure that they engaged in NPD and that they were willing to participate in the survey. Copies of the questionnaires were distributed to the respondents once they agreed to participate in the survey, along self-addressed return envelops as well as a cover letter. The cover letter summarized the purposes of the study and stated that product managers or people who are responsible for new products/services should fill-in the survey. If the receiver of the questionnaire was not a product manager or was not responsible for new products/services, he/she was kindly asked to pass it to a relevant person. The letter finally assured the respondents

that the collected information would be summarized with respect to industries and would no way reveal the name of the firms and that the collected information would be kept strictly confidential. The respondents were notified that they could receive a copy of the results if they send a business card along with a filled questionnaire. Numerous follow-up phone calls and personal visits were also made to remind them about the survey. Overall, 105 usable questionnaires were collected, representing a response rate of 72.41%.

TABLE 2: Descriptive statistics of the sample across different industries

| | | Manufactured Goods Firms | | Sales & Trade Firms | | Service Firms | |
|---|---|---|---|---|---|---|---|
| | | # | % | # | % | # | % |
| Technology base[a] | High-tech | 10 | 25% | 3 | 7.1% | 4 | 17.4% |
| | Low-tech | 4 | 10% | 7 | 16.7% | 4 | 17.4% |
| | Mixed | 26 | 65% | 32 | 76.2% | 15 | 65.2% |
| Market type[b] | Consumer | 5 | 12.5% | 12 | 28.6% | 6 | 26.1% |
| | Business | 7 | 17.5% | 10 | 23.8% | 4 | 17.4% |
| | Mixed | 28 | 70% | 20 | 47.6% | 13 | 56.5% |
| | Sample Total | 40 | 100.0% | 42 | 100.0% | 23 | 100.0 % |
| | | | Mean | | Mean | | Mean |
| Success | Industry[c] | | 2.63 | | 2.57 | | 2.70 |
| | Relative[d] | | 6.33 | | 6.49 | | 6.32 |
| | Market-Financial[e] | | 38.8% | | 40.8% | | 20.4% |

a. $\chi 2$=5.345, df=4, ns.
b. $\chi 2$=4.938, df=4, ns
c. 4 = most successful in industry, 3 = top third, 2 = middle third, 1 = bottom third. ANOVA test: F=0.278, df=2, ns.
d. 9 = completely agree, 1 = completely disagree with "company NPD program met the NPD program objectives" and "company's NPD program is a success relative to its program objectives." ANOVA test: F=0.193, df=2, ns.
e. Higher percentages are better. ANOVA test: F=0.115, df=2, ns.

**Sample**

Similar to the PDMA studies, this survey covered a wide range of industries. As Table 1 shows, 16.2%, 14.3%, and 69.5% of the firms had a high-tech, low-tech, and mixed technological base, respectively. In addition, 21.9%, 20.0%, and 58.1% of the firms operated in consumer, business, and mixed markets, respectively. Finally, 21.9%, 13.3%, and 64.8% of the firms offered goods, services, and mixed products, respectively. The sample was fairly balanced with regard to the technological base ($\chi^2 = 2.883$, $df = 2$, *ns.*), market type ($\chi^2 = 1.848$, $df = 2$, *ns*.), and product type ($\chi^2 = 2.500$, $df = 2$, *ns*.). The average industry, relative, and market and financial successes for the overall sample were 2.62, 6.39, and 40.93%, respectively.

Table 2 shows the cross tabulation of different companies with regard to their technological bases and market types across different industries. Manufactured goods, sales and trade, and service firms were fairly evenly distributed across the different technological bases ($\chi^2 = 5.345$, $df = 4$, *ns.*) and market types ($\chi^2 = 4.938$, $df = 4$, *ns*.). Table 2 also indicates that these different types of companies had similar industry ($F = 0.278$, $df = 2$, *ns*.), relative ($F = 0.193$, $df = 2$, *ns*.), and market and financial ($F = 0.115$, $df = 2$, *ns*.) success rates.

## RESULTS

### Product Development Process

Past research has consistently shown that a high quality NPD process is one of the most critical success factors in NPD (Brown and Eisenhardt 1995; Cooper 1979; Cooper 1994; Cooper 1996; de Brentani and Ragot 1996; Edgett 1996). When we look at the type of NPD processes that different firms used, we can see from Figure 1 that up to 50% of the respondents used no process at all. This number is higher than the number reported in the PDMA studies that indicated that less than 20% of the US firms used no process at all. Further statistical analyses indicated that the industry type did not impact the type of NPD processes that the firms used ($\chi^2 = 10.676$, $df = 10$, *ns*.). The PDMA studies found that manufacturing firms used formal NPD processes more than service firms. This difference can be partially attributed to the lack of systems that foster discovery and innovation in this part of the world in general. The recent statistics (United Nations Development Programme, 2009) show that there is a serious decline in innovation systems of the most of the countries in the Middle East, given the fact that the quality of innovation systems has continuously improved around the globe (El-Sayegh, 2008)

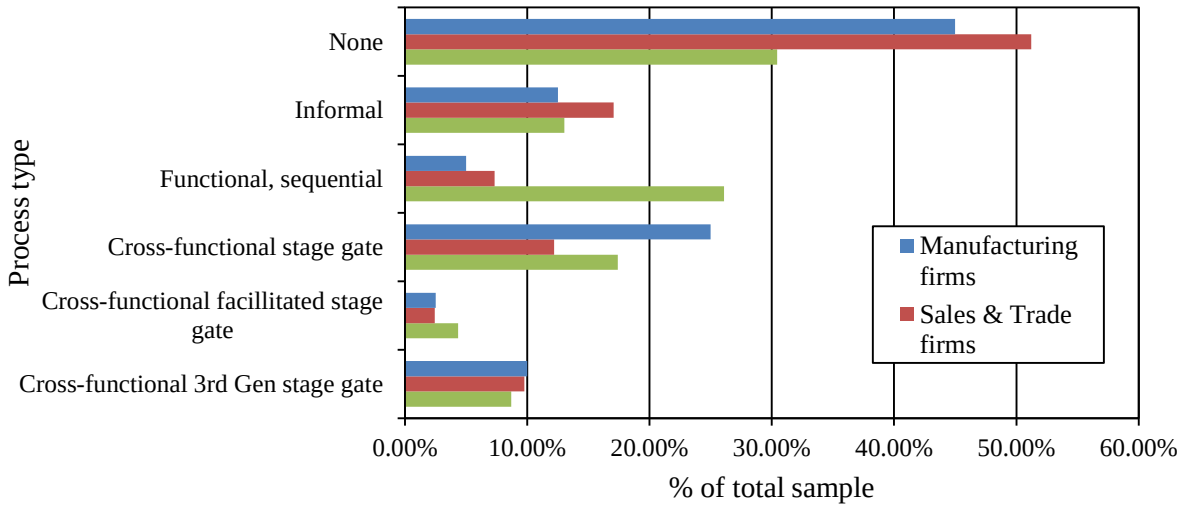


Figure 1. NPD process

When we compare the NPD processes used by the best firms and the rest, we can see from Figure 2 that best firms used formal NPD processes more than other firms ($\chi^2$ = 21.859, *df* = 5, *ns*.). This is consistent with the PDMA studies and in alignment with Arab business practices (Lewlyn, Rodrigues, Dharmaraj, & Rao, 2006).

Past research also noted that a careful execution of the steps of the NPD process leads to new product success (Brown and Eisenhardt 1995; Cooper 1979; Cooper 1999; Cooper and Kleinschmidt 1995; de Brentani and Ragot 1996). With respect to the steps of the NPD process, we asked our respondents whether they performed new product idea generation; new product concept screening; detailed market study for concept development testing; detailed market study for market identification, positioning and strategy; business/financial analysis; product

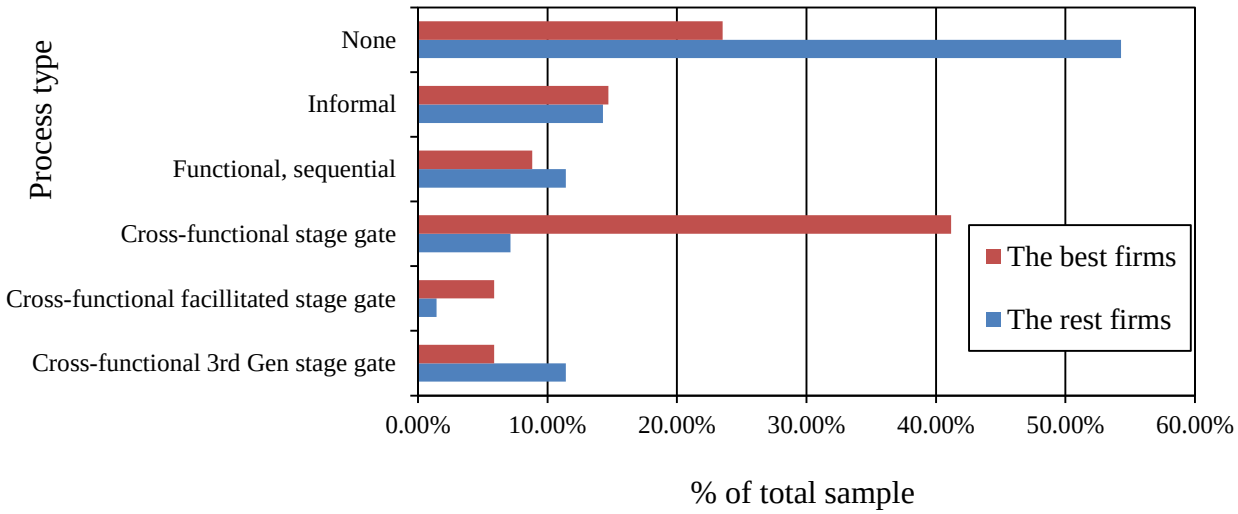


Figure 2. Product development and process: The best versus the rest companies.

development; customer test of products; pre-market volume forecasting using prototype; market test/trial sell; market launch planning; and commercialization. As Figure 3 presents, consistent with the findings of the PDMA studies, companies engaged in the product development step of the NPD process the most. This appears to be a culture-free dimension of the NPD process (Hofstede, 1983; Ozer, 2006).

With regard to the number of steps that the respondents used, inconsistent with the findings of the PDMA studies, our results suggested that successful and unsuccessful firms did not differ in terms of the number of steps in their NPD processes. More specifically, the former group, on average, engaged in 8.94 of the possible 11 steps whereas the latter group on the average conducted 8.59 steps. This inconsistency shows that most UAE companies, whether successful or not, are aware of NPD processes and execute them carefully. Future research should investigate the reasons of why some companies are not successful even though these activities are being executed by UAE firms. One of the reasons would be a wrong or incomplete execution of these activities due to the lack of absorptive capacity of unsuccessful companies as mentioned earlier.

A closer look at Figure 4 suggests that companies in different industries did not differ much in terms of their NPD activities. One exception is that the percentage of sales and trade firms (80.95%) engaging in pre-market volume forecasting using prototypes was higher than that of service firms (59.09%) ($z = 1.77$, $p < 0.10$). These results are slightly inconsistent with the results of the PDMA surveys, which showed that manufacturing firms always engaged in more activities than their service counterparts. This inconsistency would be the result of higher percentage of sales and trade firms in our sample than that of manufacturing firms, and as a consequent, the result should be interpreted in light of this context.

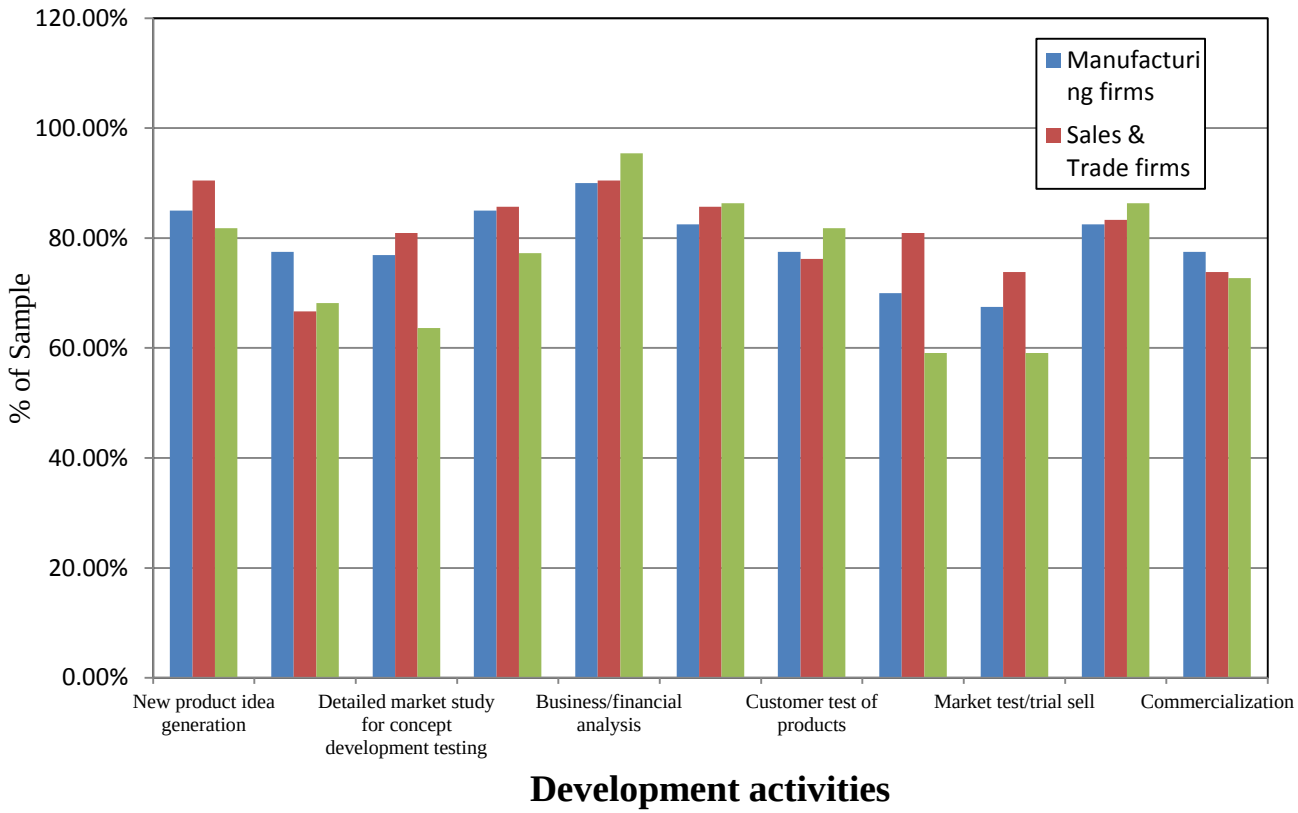


Figure 4. NPD process components across different industries.

† Z-test, *p < .10.*

**Organizing for NPD**

Another important issue in NPD is the way NPD is organized. Numerous organizational structures can be used in NPD as determined by the earlier studies. These structures include (a) a single function is responsible for NPD; (b) each business unit's general manager directs their own NPD effort; (c) NPD at each small business unit (SBU) with permanent staff; (d) a NPD process owner helps deploy the NPD process across the company; (e) a NPD committee; (f) a venture team; (g) a separate corporate NPD group; and (h) a combination of various functions develop new products (Griffin 1997).

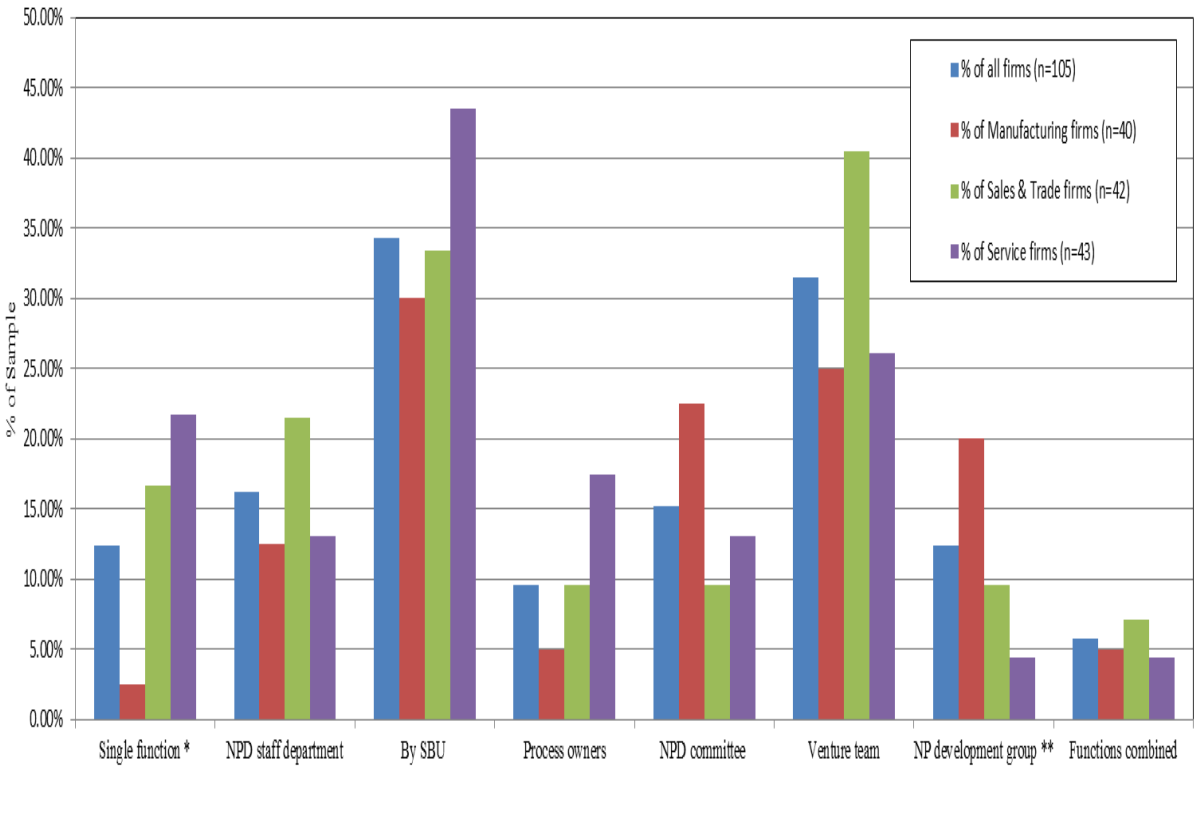


Figure 5. Organizations for NPD.

Consistent with the PDMA studies, firms in our sample also indicated that they used multiple structures in the NPD. 22.86% of the total sample used more than one type of structure, with an average of 1.37 structures per company. The industry type did not have any significant impact

on the number of organizational structures used. These results are slightly different than the ones found in the PDMA studies, which revealed that 61.9% of the surveyed companies used multiple structures, with an average of 2 structures per firm, and manufactured goods companies, on average, used more structures than service firms (2 versus 1.7, respectively).

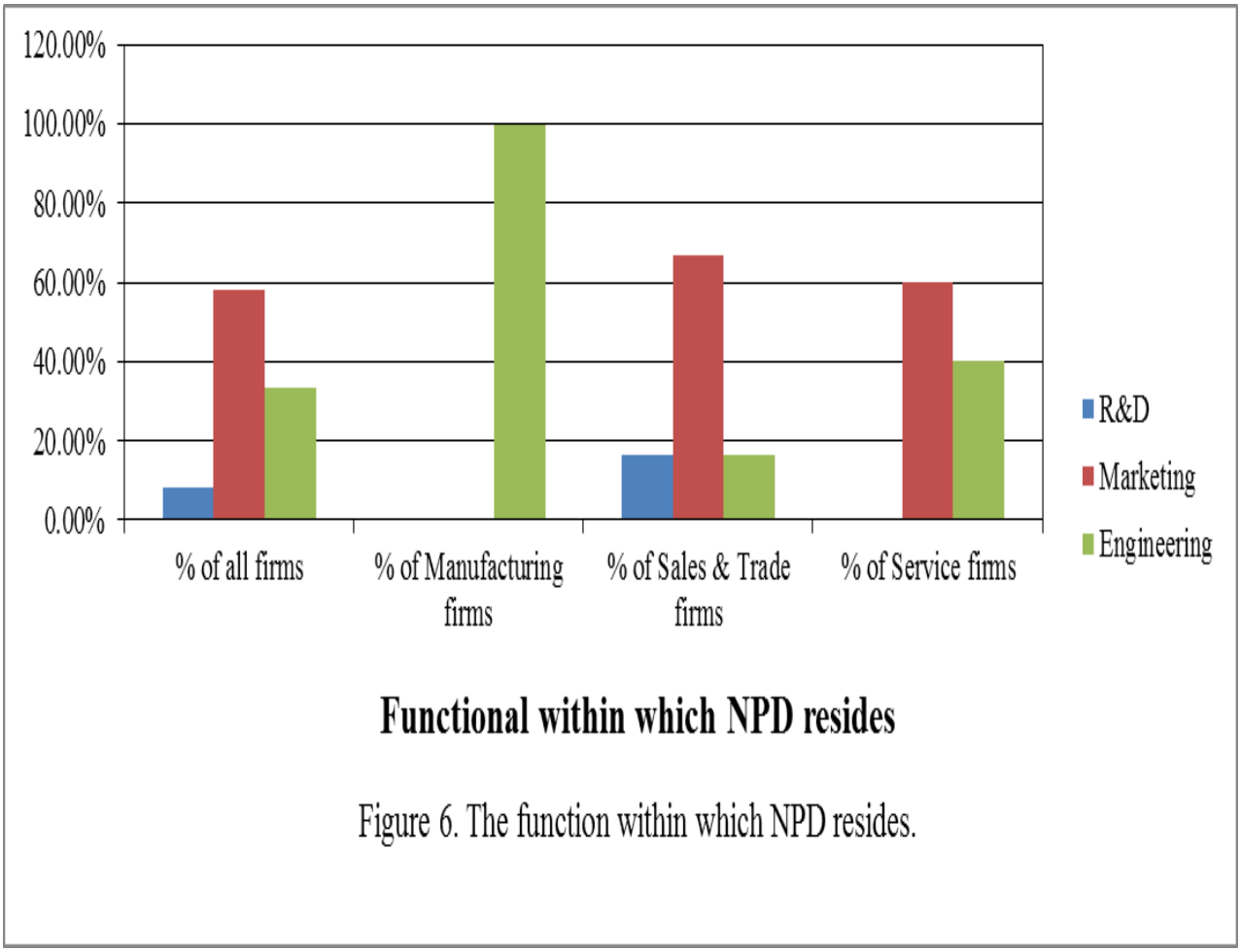


Figure 6. The function within which NPD resides.

When we look at the different types of organizational structures used by the firms, we can see from Figure 5 that two most frequently used structures were NPD within each small business unit (SBU) and the use of venture teams. These results are different from the ones reported in the PDMA studies, which indicated that the most frequently used structures included a single function, permanent NPD staff, and SBU's. Figure 5 also shows that the sales and trade firms used venture teams and SBUs more often than other types of organizational structures; the service firms used SBUs and venture teams more frequently than other types of structures; and the most frequently used organizational structures for the manufacturing firms were SBUs and venture teams. These results are slightly different from the results reported in the PDMA studies,

which indicated that service firms used permanent NPD staffs and process owners more frequently whereas manufacturing firms organized their NPD activities within a single function and/or an SBU more.

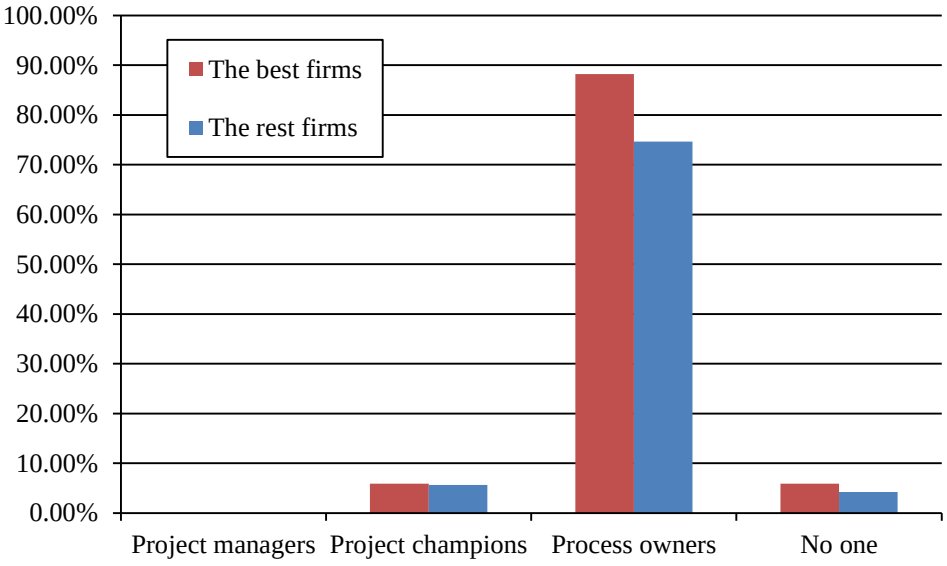


Figure 7. Who leads NPD projects.

We also looked at the functional departments in which NPD resides. As Figure 6 shows, consistent with the PDMA studies, the three most frequently stated departments were engineering, marketing, and R&D. When we compared the manufacturing, sales and trade, and service firms, we found that while engineering function was used in manufacturing firms, service as well as sales & trade firms report used marketing function. These results are consistent with the ones reported in the PDMA studies, which found that service firms were more likely to report to the marketing function and less likely to report to the engineering function. When we compared the successful and unsuccessful firms, consistent with the PDMA studies, we did not find any difference with regard to the functions in which they conducted their NPD activities. These results again indicate that certain dimension of the NPD process are universal and culture-free (Hofstede, 1983; Ozer, 2006).

We also asked our respondents about the leadership in their NPD activities, namely the type of people who led the NPD process and the way the leaders were selected. As Figure 7

shows, the most frequently mentioned leader was process owners. The PDMA studies found that the three most often mentioned leaders were project managers, project champions, and process owners. This is again a difference between the US and the UAE NPD practices.

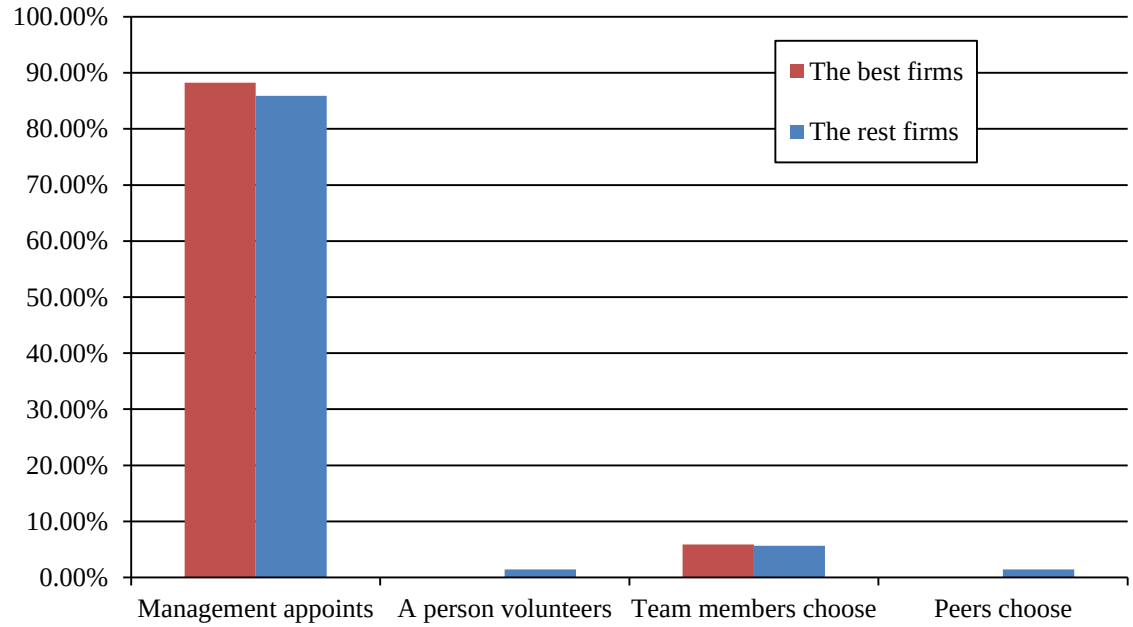


Figure 8. Who appoints NPD project leaders.

With respect to the selection of the leaders, we found that in almost 90% of the surveyed firms, the team leader was appointed by management. When we compare the successful and unsuccessful firms, we see from Figure 8 that management appointed the team leader in 88% of the successful companies whereas it appointed the team leader in 86% of the unsuccessful firms ($t = 0.324$, $p > 0.10$). These results are again different from those reported in the PDMA studies, which found that team leaders were appointed by management in around 70% of the surveyed companies and the function in which NPD resides dictated who should lead the team in close to 30% of the companies. These inconsistencies about the type of NPD team leaders and the appointment of the NPD team leaders would be attributed to cultural differences between the West and the Middle East. The Middle Eastern culture is generally characterized as

authoritative, in which business decisions are usually made in a "top-down" fashion and project owners actively participate in the decision-making process (Ali, 1998).

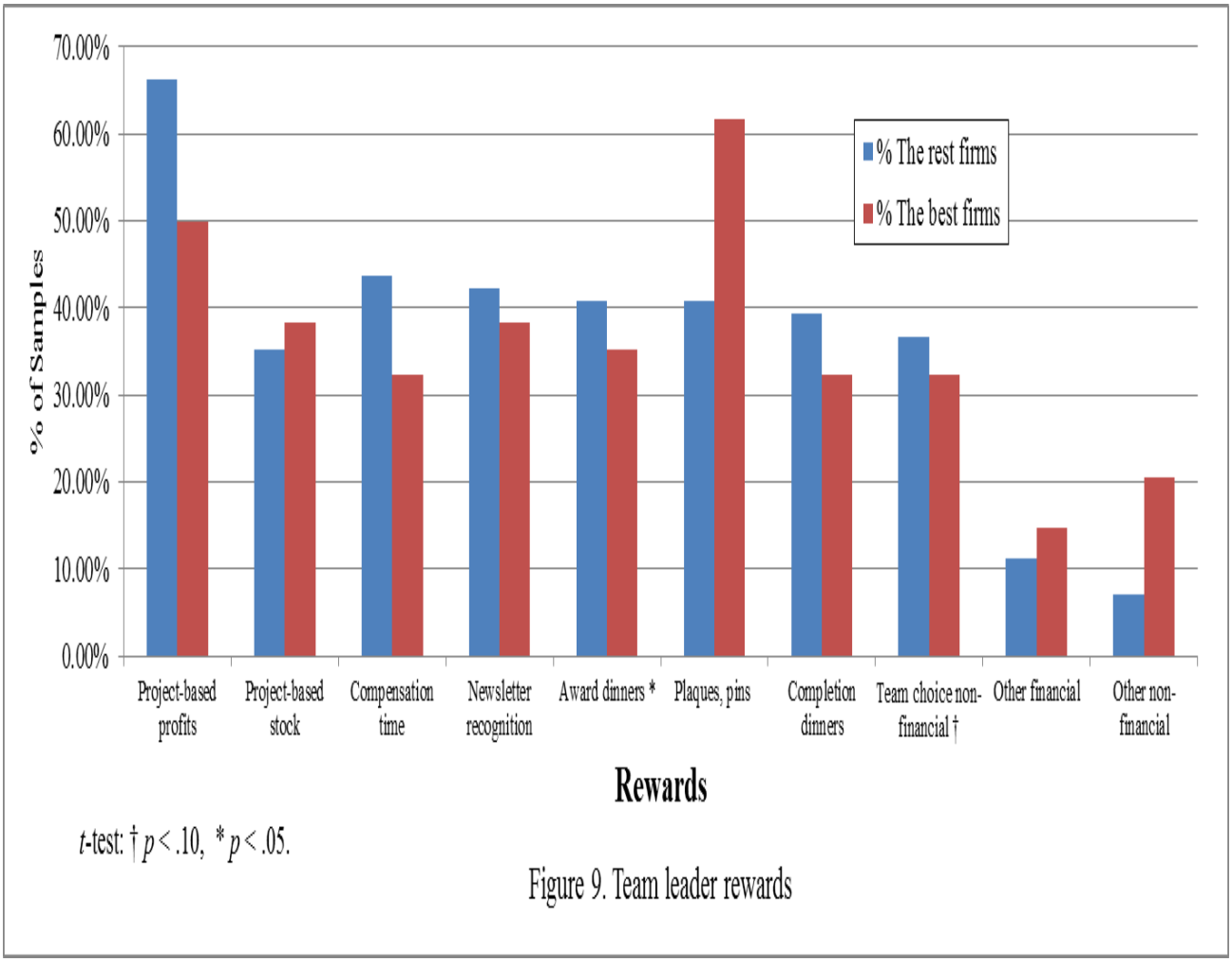


Figure 9. Team leader rewards

Another aspect of the survey was about rewarding the NPD personnel. As Figure 9 shows, we found that both financial and non-financial rewards were used in rewarding the NPD personnel. Project-based financial rewards such as profits and stocks were also popular. This is very inconsistent with the findings of the earlier studies that consistently found that project-based financial rewards are seldom used in NPD (Barczak, et al. 2009; Feldman 1996; Griffin, 1997; Kuczmarski 1994; Page 1993). Griffin (1997) noted that the rewards used in the US are usually related to compensations that do not increase the employee's reported earnings. This inconsistency could be explained with the following reasons: First, the tax rates in UAE are much lower than those in the US, thus most of the companies reward their employees with financial-incentives. Second, since most of the financial markets were founded recently (after

2000) in the UAE, rewarding employees with profits and stocks has become a common practice to promote these markets. Third, to promote innovation that leads to a sustainable knowledge-based economy, the UAE government has started offering financial rewards to those companies who are innovative in their businesses (Kohl & Al Hashemi, 2011).

TABLE 3: Average success by demographic category

| | Success rate (%)[1] | % Profit success[2] | NP sales %[3] | NP profit %[4] |
|---|---|---|---|---|
| Full sample | 44.56 | 45.22 | 27.80 | 15.00 |
| | | | | |
| The best | 61.38 | 72.79 | 35.62 | 13.40 |
| The rest | 37.03 | 32.01 | 24.06 | 15.77 |
| | *t*-test, $p < .001$ | *t*-test, $p < .001$ | *t*-test, $p < .001$ | |
| Industry | | | | |
| Manufacture | 45.60 | 40.00 | 25.24 | 14.15 |
| Sales & Trade | 45.73 | 48.26 | 33.57 | 19.96 |
| Services | 46.67 | 45.22 | 21.73 | 07.43 |
| | | | | |
| Product type | | | | |
| Goods | 54.21 | 50.87 | 33.19 | 13.36 |
| Services | 29.23 | 35.00 | 22.33 | 06.11 |
| Mixed | 44.88 | 45.41 | 27.11 | 17.39 |
| | $F$=3.08, $p$ <0.05 | | | |
| | | | | |
| Technology base | | | | |
| High-tech | 45.59 | 57.65 | 14.52 | 08.05 |
| Low-tech | 35.00 | 32.00 | 30.77 | 17.27 |
| Mixed | 46.77 | 45.04 | 30.29 | 16.16 |
| | | | $F$ = 3.01, $p$ < 0.00 | |
| Market type | | | | |
| Consumer | 40.23 | 41.30 | 27.59 | 15.77 |
| Business | 39.62 | 44.90 | 25.55 | 11.66 |
| Mixed | 48.56 | 46.80 | 28.66 | 15.61 |

[1] Success rate (%): % of products commercialized in the laste 5 years categorized as successes.
[2] % Profit success: % of products commercialized in the last 5 years categorized as financial successes.
[3] NP sales %: $ sales of products commercialized in the last 5 years as a % of total sales.
[4] NP profit %: $ profit from products commercialized in the last 5 years as a % of total profits.

As can be seen from Figure 9, when we compare the successful and unsuccessful firms, the incentives did not differ, with one exception that the successful firms offered plaques and pins (t = 1.93, p = 0.07) significantly more often than the unsuccessful firms. These results are again

different from those reported in the PDMA studies, which found that the successful firms rewarded their NPD personnel significantly more than their unsuccessful counterpart by offering such incentives as profit sharing, stocks/stock options, compensation time, recognition newsletters, recognition award dinners, plaques and pins, project completion celebrations, non-financial rewards, and the opportunity to work on a bigger project next time (Barczak, et al. 2009).

**Outcomes from Product Development**

We looked at several outcome measures to assess the end results of the NPD activities of the UAE companies, including the success rate, the mortality curve, and the cycle time:

*Success Rate***:** With regard to the average success rate, the results suggested that 44.56% of the new products commercialized in the last 5 years were categorized as successful. This is relatively lower than the success rate of 59% reported in the PDMA study. As can be seen from Table 3, average market success rates among the UAE companies ranged from 29.23% to 54.21% while they ranged from 53% to 61% among the US companies. Similarly, average profit success rates ranged from 32.00% to 57.65% in the UAE while they ranged from 49% to 58% in the US.

The success rates do not change across different industries. On the other hand, the results indicate that physical goods were more successful service products (ANOVA: $F = 3.08$, $p < 0.05$) in terms of the percentage of products commercialized in the last 5 years categorized as successes and high-tech new products were more successful than low-tech new products (ANOVA: $F = 3.01$, $p < 0.05$) in terms of the percentage of products commercialized in the last 5 years categorized as financial successes. These results are consistent with the results of PDMA studies.

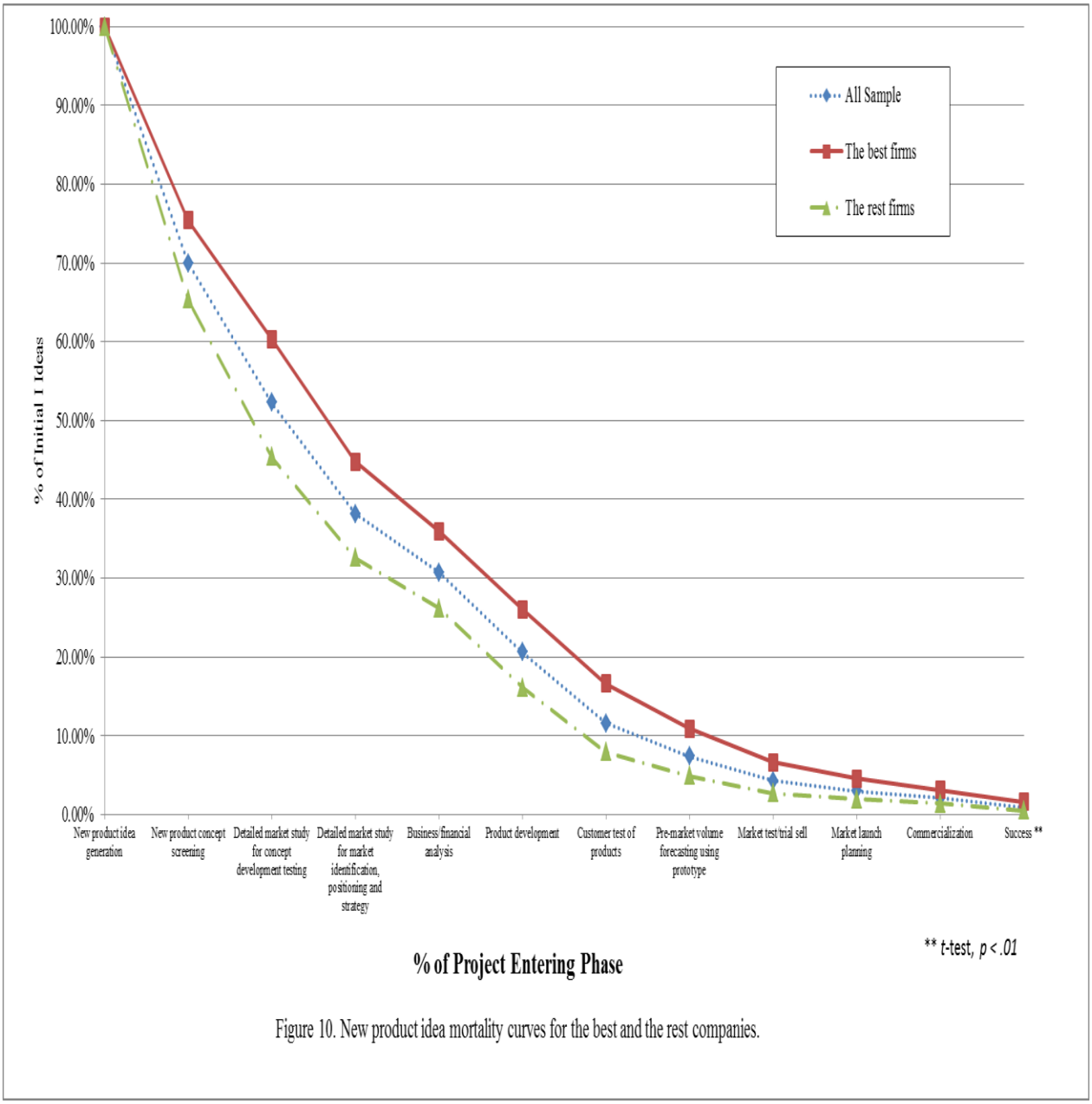


Figure 10. New product idea mortality curves for the best and the rest companies.

*Mortality Curves:* As was done in the PDMA studies, we also looked at the mortality curves, which represent progressive rejection of ideas or projects through the stages of the NPD process (Griffin 1997). As Figure 10 shows, on average, 100 initial ideas led to 0.86 successful products. In other worlds, in order to generate a successful new product UAE firms needed to start the NPD process with 116.28 initial ideas. These numbers are considerably lower than those reported in the PDMA studies, which indicated that 100 initial ideas led to 15.2 successful new products or a successful new product required only 6.6 initial ideas. From the figure, it is interesting to note that only less than 40% of the initial ideas could go beyond the business and

financial analysis phase whereas the PDMA studies show that around 50% of the initial ideas could pass this stage and proceed to the development phase. This suggests that UAE firms have a high rate of eliminating new product ideas early in the NPD process. One positive note about this is that since UAE firms eliminate a majority of their ideas before the expensive and time-consuming development phase, they, at least, do not need to waste their resources.

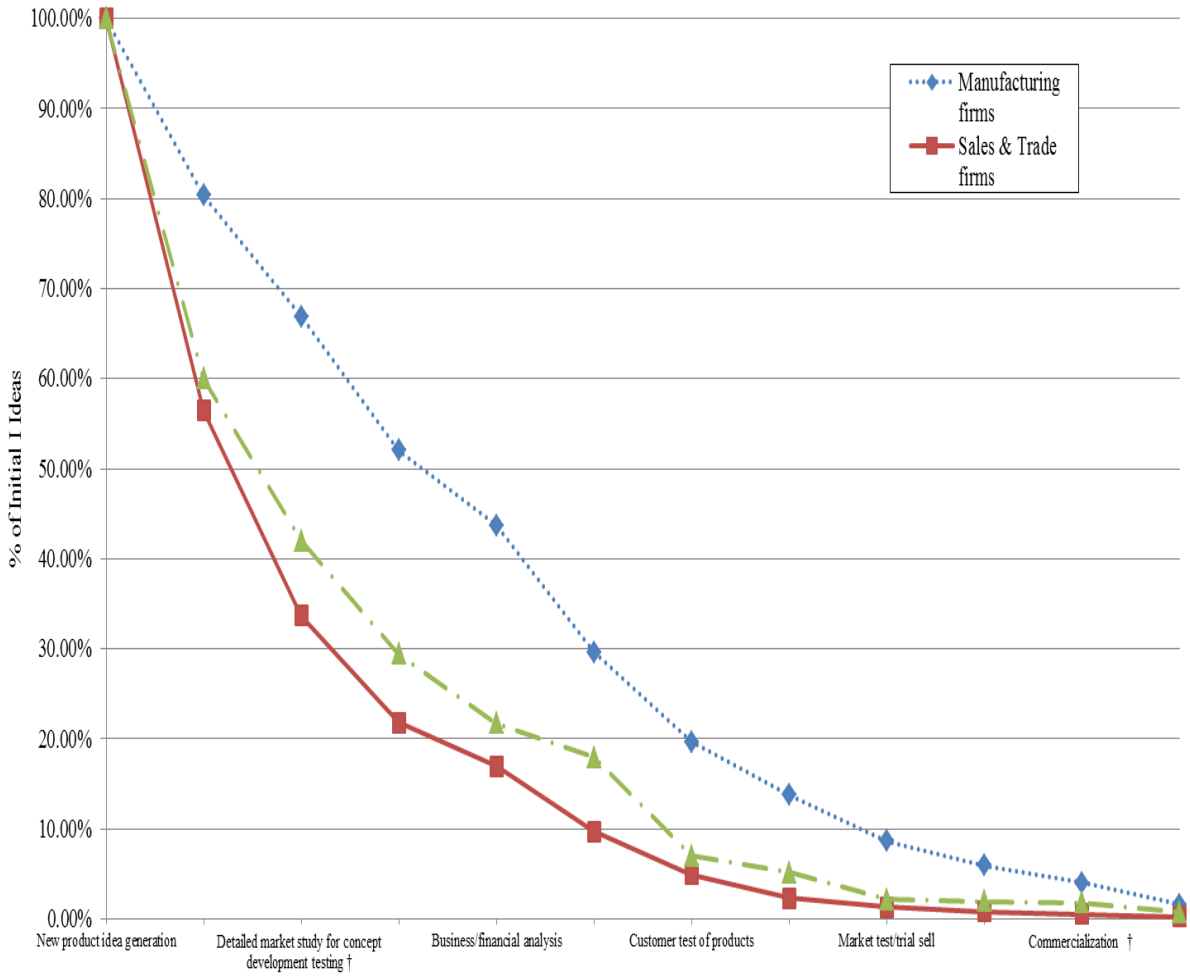


Figure 11. New product idea mortality curves by industry.

Figure 10 also shows the mortality curves of the successful and unsuccessful firms. The survival rate of the ideas in the NPD process is much better for the successful firms than for the

unsuccessful firms. The PDMA studies reported that for every three projects that entered the development phase in the successful firms two went on to be successful. Our results suggest that for every 23.99 projects that entered the development phase one subsequently became successful. This interesting finding reveals one more time that the lack of expertise and absorptive capacity, particularly related to the NPD process, seems to be a major problem for companies in the UAE.

When we compare the mortality curves of products in the different industries, we can see from Figure 11 that manufactured goods firms were more successful than sales and trade firms. As such, for every 100 initial ideas in manufactured goods firms 1.61 products subsequently succeeded in the market whereas it was only 0.22 products for sales and trade firms. In other words, it took 62.11 initial ideas for manufactured goods firms to generate a successful product while it took 254.55 initial ideas for sales and trade firms to generate a successful product. The service firms performed worse than the manufactured goods firms but better than the sales and trade firms. More specifically, for every 100 initial new ideas 0.73 subsequently succeeded in the market or in order to generate a successful new product these firms needed to start the NPD process with 136.99 initial ideas. The PDMA studies reported no difference between the manufactured goods and service companies. The higher success rate of manufacturing firms over the others would be the use of international consultancy agencies (e.g. Turner, Bechtel and Parson) by these firms, (Kartam, Al-Daihani & Al-Bahar, 2000).

*Cycle Time:* As part of the NPD outcomes, we also looked at the amount of time that companies spent in developing their new products, commonly referred to as "cycle time." Overall, UAE firms spent 15.58 months in developing their new products. When we compared the cycle times of the successful and unsuccessful firms, we found that the successful firms spent 14.54 months whereas the unsuccessful firms spent 15.13 months in developing their new products. These cycle times are not statistically different, consistent with the results of the PDMA studies. When we compared the cycle times for the manufacturing, sales and trade, and service firms, the results suggested that the cycle times were 18.49, 9.52, and 16.99 months for these companies, respectively. Consistent with the PDMA studies, the cycle times for the manufactured goods and service firms were not significantly different. When we compared the manufacturing goods firms and sales and trade firms, we see that the cycle time was longer for the former (18.49 months) than the latter types of firms (9.52 months) ($t = 3.31$, $p < 0.01$). This can be attributed to the fact that compared to sales and trade firms, manufactured goods firms spend a considerably

longer time in the new product idea generation ($t = 2.599$, $p < 0.05$), new product concept screening ($t = 8.732$, $p < 0.01$), and the market launch planning stages ($t = 2.459$, $p < 0.05$) of the NPD process.

## CONCLUSION

Product innovation has been recognized as one of the most important aspects of companies' survival. Although product innovation has been an important business activity of the UAE, there are no established local benchmarks with which these companies can compare their NPD activities. As Griffin (1997) argues earlier "best practice" studies may not be helpful for non-US companies to guide their NPD activities, as the US and non-US management practices may not comparable. This study fills this gap by surveying the UAE companies and comparing the NPD activities in the UAE with those in the US.

The results revealed interesting similarities and differences between the US and UAE firms. Most notable, these firms were similar in the areas of NPD strategies, the use of the "product development" phase of the NPD process, the number of steps used in the NPD process, the use of marketing, R&D or engineering department as a base for NPD activities, the use of multiple organizational structures and cycle time. On the other hand, these firms differed significantly with respect to the use of a formal NPD process, the type of organizational structures, the type of NPD team leaders, the appointment of the NPD team leaders, rewarding NPD personnel, and with regard to the NPD outcomes.

The study findings have clear implications for the UAE firms. More importantly, the UAE firms fall way behind the US companies in terms of new product success. Although market conditions might affect the success of new products, the UAE companies need to find ways to enhance their innovative capabilities by, at least, adopting more formal NPD processes and completing the stages of the NPD process more carefully. Moreover, they can acquire and use foreign technologies and expertise to build their innovative capabilities. In order to adopt a high quality NPD process and innovative capabilities, as suggested by Zahra (2011, p. 8), a sustainable absorptive capacity needs to be built among companies in the UAE through open innovation and “smart co-specialization.” Developing the requisite absorptive capacity and smart co-specialization would help them realize the importance and value of externally or internally created knowledge (e.g., new product ideas during the NPD process), acquire that knowledge, assimilate it, and use it to develop successful new products (Zahra & George, 2002).

They can also utilize alternative organizational structures for NPD. Finally, they can explore different ways of appointing NPD team leaders rather than expecting top management to appoint a leader. Successful co-specialization may help them identify and appoint the right leader who can lead the NPD process to develop successful new products.

For the US companies who are interested in developing new products in this part of the world, this study suggests that they can certainly utilize many of the NPD activities that they have been using in the US in the UAE, as the UAE companies also engage in similar activities to a certain extent. Their primary challenge will be to reduce the mortality rate of new product ideas initiated in the UAE. They can either train new product managers in UAE as how to generate and select potentially successful new product ideas and as how to turn those ideas into more successful new products or generate new product ideas in the US and get new product managers in the UAE involved in the NPD process in its later stages.

It is obviously impossible to solve all the research issues with a single study. Thus, this study will also lead to other future studies for further investigation. For example, future studies can look at the NPD activities of other Middle Eastern companies. The results of all these companies can be compared against each other and against their market performance so that meaningful lessons can be drawn. Future studies can also repeat this survey to see whether NPD activities in the UAE change overtime and the political and business landscape rapidly change in this part of the world.

## REFERENCES


Ali, A. (1998). The typology of the Arab individual: Implications for multinational corporations. *International Journal of Sociology and Social Policy* 18: 1-19.

Barczak, G., Griffin, A., Kahn, K. (2009). Trends and Drivers of Success in NPD Practices: Results of the 2003 PDMA Best Practices Study. *Journal of Product Innovation Management* 26 (1): 3-23.

Bart, Christopher K. (2002). Product Innovation Charters: Mission Statements for New Products. *R&D Management* 32 (1): 23-34.

Booze, Allen and Hamilton. (1968). *Management of New Products.* New York: Booze, Allen and Hamilton.

Booze, Allen and Hamilton. (1982). *New Products Management for the 1980s.* New York: Booze, Allen and Hamilton.

Brown, Shona L. and Eisenhardt, Kathleen M. (1995). Product Development: Past Research, Present Findings, and Future Directions. *Academy of Management Review* 20: 343-378.

Cooper, Robert G. (1979). Identifying Industrial New Product Success: Project NewProd. *Industrial Marketing Management* 8: 124-135.

Cooper, Robert G. (1987). Defining the New Product Strategy. *IEEE Transactions on Engineering Management* EM-34 (3): 184-193.

Cooper, Robert G. (1996). Overhauling the New Product Process. *Industrial Marketing Management* 25: 465-482.

Cooper, Robert G. (1999). From the Experience: The Invisible Success Factors in Product Innovation. *Journal of Product Innovation Management* 16 (2): 115-133.

Cooper, Roger G. (1994). Perspective: Third Generation New Product Process. *Journal of Product Innovation Management* 11: 3-14.

Cooper, Robert G. and Kleinschmidt, Elko J. (1995). Performance Typologies of New Product Projects. *Industrial Marketing Management* 24 (5): 439-456.

Crawford, C. Merle (1980). Defining the Charter for Product Innovation. *Sloan Management Review*: 3-12 (Fall).

de Brentani, Ulrike and Ragot, Emmanuel (1996). Developing New Business-to-Business Professional Services. *Industrial Marketing Management* 25: 517-530.

Edgett, Scott J. (1996). The New Product Development Process for Commercial Financial Services. *Industrial Marketing Management* 25: 507-515.

Eisenhardt, Kathleen M. and Tabrizi, Behnam N. (1995). Accelerating Adaptive Processes: Product Innovation in the Global Computer Industry. *Administrative Science Quarterly* 40: 84-110.

El-Sayegh S.M. (2008). Risk assessment and allocation in the UAE construction industry. *International Journal of Project Management* 26 (4): 431-438

Feldman, Laurence (1996). The Role of Salary and Incentives in the New Product Function. *Journal of Product Innovation Management* 13 (3): 216-228 (May).

Griffin, Abbie (1997). PDMA Research on New Product Development Practices: Updating Trends and Benchmarking Best Practices. *Journal of Product Innovation Management* 14 (6): 429-458.

Griffin, Abbie and Di Bendetto, C. Anthony (2004). Six-Year Recap and New Editor Introduction: C. Anthony Di Benedetto. *Journal of Product Innovation Management* 21 (1): 1-3.

Group EFO. (1995). *1995 Innovation Survey: Report on New Products*. Weston, CT: Group EFO Limited.

Hofstede, G. (1983). Cultural dimensions for project management. *International Journal of Project Management* 1 (1): 41-48.

Hultink, Erik Jan, Griffin, Abbie, Hart, Susun and Robben, Henry S. J. (1997). Industrial New Product Lunch Strategies and Product Development Performance. *Journal of Product Innovation Management* 14: 243-257.

Jassawalla, Avan R. and Sashittal, Hemant C. (1998). An Examination of Collaboration in High-Technology New Product Development Processes. *Journal of Product Innovation Management* 15: 237-254.

Kartam, N., Al-Daihani, T.G. & Al-Bahar, J.F., (2000). Professional project management practices in Kuwait: issues, difficulties and recommendations. *International Journal of Project Management* 18 (4): 281-296

Kohl, H. & Al Hashami, H. (2011). Science Parks as Main Driver for the Development of National Innovation Systems in Resources-driven Economies! The Importance of Intellectual Capital Management for Sustainable Manufacturing. *Advances in Sustainable Manufacturing* 2: 45-50.

Kuczmarski & Associates, Inc. (1994). *Winning New Product and Service Practices for the 1990's*. Chicago IL: Kuczmarski & Associates, Inc.

Little, Arthur D. (1991). *The Arthur D. Little Survey on the Product Innovation Process.* Cambridge: MA: Arthur D. Little.

Lewlyn L.R. Rodrigues, N. Dharmaraj, B.R. Shrinivasa Rao, (2006). System dynamics approach for change management in new product development. *Management Research News* 29 (8): 512 - 523

Mercer Management Consulting, Inc. (1994). *High Performance New Product Development: Practices that Set Leaders Apart*. Boston, MA: Mercer Management Consulting, Inc.

Mitchell Madison Group. (1995). *New Product Development: Organization and Process in Service Companies.* New York, NY: Mitchell Madison Group.

Ozer, Muammer (2006). New Product Development in Asia: An Introduction to the Special Issue. *Industrial Marketing Management* 33 (3): 252-261.

Page, Albert L. (1993). Assessing New Product Development Processes and Performance: Establishing Crucial Norms. *Journal of Product Innovation Management* 10 (4): 273-290 (September).

United Nations Development Programme. (2009). *Arab Knowledge Report 2008-2009: Towards productive intercommunication for knowledge*. Dubai: United Nations Development Programme, Regional Bureau of Arab States and Mohammed bin Rashid Al Maktoum Foundation.

Zahra, S. (2011). Doing Business in the (new) Middle East: Sailing with the Wind. Academy of Management Perspectives http://dx.doi.org/10.5465/amp.2011.0128.

Zahra, S., & George, G. (2002). Absorptive capacity: A review, reconceptualization, and extension. *Academy of Management Review* 27 (2): 185–203.