

THE ROLE OF HUMAN FACTORS IN DEVELOPMENT OF IPPM CAPABILITIES (CASE STUDY: IRAN'S POWER INDUSTRY)

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Abstract: Survival in a dynamic competitive environment often requires consistent produce of successful new product and services. PPM capabilities can improve innovation decisions and outcomes of new products, thereby lead to higher competitive advantage. This study used an applied mixed method research design (qualitative and quantitative). Qualitative (explorative) approach is through multiple case study using semi-structured and in-depth interviews with 24 experts in six Iranian organizations producing equipment of the power industry. Quantitative approach tests the validity and generalizability of the findings resulting from qualitative approach and tests the hypotheses by survey and questionnaire distributed among 30 experts on the subject. The results of the qualitative approach present the identified human aspects effective on development of IPPM capabilities in five themes and highlight the role of human aspects in creation and development of IPPM capabilities. According to the statistical calculations, there is a positive significant relationship between five human factors raised in the hypotheses (as independent variables) and development of IPPM capabilities (as dependent variable). To develop PPM capabilities in Iranian power industry, this study provides managers interested in establishing or improving their PPM capabilities with recommendations.

Keywords: Project Portfolio Management, capability, innovation projects, new product development, human factors

INTRODUCTION

Organizations need to make decisions on projects to be provided with funding and resources, as well as value of current projects for funding. Processes used for these current decisions form the capabilities of project portfolio management (PPM).

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Effectively established PPM capabilities are associated with improved outcomes of innovation.

PPM capabilities provide a comprehensive view for decision making, which implies that the projects are align with strategy, types of projects are balanced and project portfolio is fitted to the available resources. A PPM capability is a source of competitive advantage which enables the organization to maximize the value gained from investing in projects (Cooper et al., 2001; Dawidson, 2004).

Organizations which use innovation project portfolio for development of new products encounter special challenges. In modern competitive environment which is changing rapidly, the survival of these organizations depends on permanent chain of new successful products. Although huge sums are invested in these project to develop new services products as well as new manufacturing products, significant number of these products is not successful.

Despite having new development strategy for new products and services to deal with these challenges, some organizations have created good methods and techniques for PPM. Studies have shown that organizations with established PPM capabilities provide better innovation outcomes than organizations with less established capabilities. Therefore, those organizations investing in development of their PPM capabilities constantly try to improve the success rate of new product development (NPD) projects.

This study addresses the findings of a recent survey as well as previously published research on PPM capabilities. For this purpose, this study uses literature and findings of previous research on organizational capabilities and strategies, organizational learning, creation and development of capabilities, and application of new product and service development.

Findings of this study highlight the role of human factors in creation, development and implementation of IPPM capabilities. These findings are based on recent research to identify and understand PPM capabilities within several leading organizations in the field of manufacturing and production of equipment for Iranian power industry. These findings provide managers with guidelines to develop an effective PPM capability. Although this study is not only focused on the human aspects of PPM, one of the main results of this study is a strong influence of human aspects on creation, development and application of PPM capabilities.

Theoretical Background and Literature Review

In recent years, many efforts have been made in Iranian power industry to achieve expertise and technology in various fields, including the design and manufacture of required equipments. The result of these efforts has been the development of domestic production and self-sufficiency in some areas, increased employment, reduced outflow of currency and even export of electricity. Nevertheless, the rate

of innovation in this industry is far from optimal and there are many problems in the way of innovation (from generating ideas to making the final product).

Now, large organizations and companies are active in the Iranian power industry (in the field of power generation). To survive in the dynamic markets (with continued advances in technology and shorter life of products) especially in the power industry, these organizations need to achieve competitive advantage in both domestic and foreign markets.

Since the main source of competitive advantage for these organizations is to define and implement innovative projects (NPD, R&D), they need to define and perform a series of these types of projects. Each of these organizations, depending on the nature of activity and type of production equipment, define a number of research and innovation projects and perform them by themselves or outsourced them.

Through field studies in the case study companies, experts and managers emphasized research and development (R&D) and NPD and innovation projects to achieve competitive advantage, defining project portfolio as well as proper performance appraisal of NPD projects.

Implementation of innovation projects portfolio management (IPPM) in the studied companies requires actions such as good analysis of the market, proper prioritization of projects and resources in the organization, recognition of the right time to release the product to market, analysis and categorization of projects, application of risk management system for portfolio risk assessment and will increase the success rate of these projects.

Therefore, the main problem of this study is the low performance of NPD projects due to the dynamic environment of power industry, the existing challenges, the need for innovation project portfolios and NPD and their effective management in order to achieve competitive advantage in the organizations. Therefore, it seems essential to identify IPPM capabilities as a guideline for organizations to improve the success rate of their new products.

Project Portfolio

Project portfolio is a set of programs, projects or operations which are managed as a group to achieve strategic goals (PMI, 2013).

Project Portfolio Management

Project portfolio management (PPM) refers to coordinated management of one or more portfolios to achieve strategic and organizational goals. This involves processes by which the organization evaluates, selects, prioritizes and allocates its

limited internal resources to achieve organizational strategies consistent with the vision, goals and values.

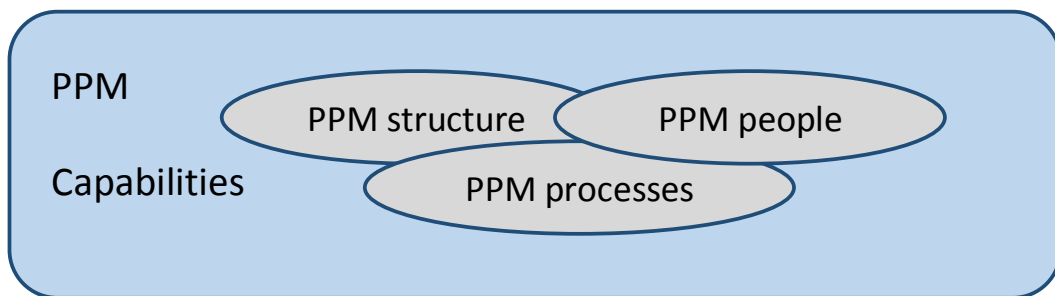
Innovation Projects

Innovation projects or R&D projects are used to develop new products including new manufactured products; new services products or combination of manufactured and services products. These projects can be defined in three areas including “product development”, “development of technology and processes” and “product improvement”. Any organization is able to define and implement a portfolio of those projects.

Definition and Components of PPM Capabilities

Killen et al. (2008b) defined PPM capabilities as an organizational capability including PPM structures, PPM processes and PPM people which influence the effective implementation of PPM processes. Figure 1 presents these three components.

Figure 1: Three components of PPM capabilities (Killen et al., 2008b)



PPM capability is a high-level capability which usually involves a team of senior decision-makers to match project investment. Decisions are made with regard to the strategic priorities to maximize yield of investments in projects within the portfolio.

Research repeatedly shows common components in many PPM capabilities; however, an organization customizes and adjusts its PPM capabilities based on its unique conditions (Cooper et al., 2001; Crawford et al., 2006; Killen et al., 2008b; Loch, 2000; McDonough III and Spital, 2003)

This study confirms previous results and highlights the role of organizational learning in continuous evolution and adjustment of PPM capability for alignment with ongoing changes in the competitive environment.

PPM Structures: includes organizational structure to support PPM capabilities. PPM structures involve the review board of project portfolios as well as the roles defined for IPPM. PPM structure improves a holistic vision in the level of portfolio, responsibilities and accountability for PPM (Killen et al, 2008b).

Although there is no standard organizational structure for PPM, it is common for organizations to invest in development of their organizational structure and job descriptions to show the growing importance of new products and enhance PPM capabilities (Blomquist & Muller, 2006).

Often, the organizational status considered for PPM delivers these decisions to a higher organizational level and defines the roles and responsibilities. In some organizations, it may be appropriate to define a specific role for the project portfolio manager or establish a separate PPM office.

In organizations considered by this study, business development director, engineering deputy of and product development manager are partially responsible for PPM and projects are executed by multi-functional management teams. This implies a close involvement of expertise and individuals directly engaged in development of new products and services.

PPM Processes: involves practices, experiences, procedures, methods and tools which are used by managers for continuously allocation and reallocation of resources among a portfolio of innovation projects in order to increase the level of participation in the ultimate success of organization. These processes are used for centralized coordination of projects within the portfolio (Killen et al, 2008b). Processes typically involve PPM activities such as identifying, prioritizing, authorizing, managing and controlling projects (PMI, 2013).

There are a variety of methods and tools which are commonly used for evaluation, select and monitoring of projects as part of the PPM processes. Moreover, a large chain of research is dedicated to development of new tools for PPM.

Although many researchers suggest mathematical modeling techniques and software optimization applications to improve the management of innovation portfolios, this study observed no evidence of these methods in the case study organizations (Cooper et al, 2001; Hall & Nauda, 1990; Killen et al, 2008b; Liberatore & Titus, 1983).

PPM research shows that typical methods and tools used for PPM include financial analysis (through financial indicators such as net present value); structured processes of product development (such as stage-gate for controlling individual projects); portfolio analysis to balance various project aspects such

as risk and return (by graphical tools such as portfolio maps, bubble charts, pie charts); top-down strategic approaches to allocate funds; and checklists or ranking methods which involve various criteria in PPM decisions.

Financial methods are the most commonly used in PPM process, but not the best method to use as the primary criterion for decision-making. Improved product outcomes are related to other criteria for primary decision-making. For example, effective PPM processes often include 'strategic fit' as the main criterion for 'Go' or 'No Go' projects. Often, strategic considerations are part of the checklist or decision templates used through a PPM process (Cooper et al., 2001; Killen et al., 2008b).

A subset of the tools and methods which are often used is selected, customized, documented and applied to form PPM processes which are currently used in successful organizations; however, this is not a static process. Evidence suggests that PPM processes undergo continual evolution; changeability and improvement of PPM process is an important part of this process (Killen et al., 2008a).

This study also shows that successful organizations use PPM tools and methods with team-based structures and face-to-face meetings. It is also important to use multi-functional teams and tools such as graphical displays which help group decision-making for effective PPM capabilities.

PPM People: involves people and cultural aspects required to support PPM capabilities. PPM people refers to organizational culture, people skills, incentive systems of participators in PPM, as well as the role of politics and management support for PPM. In fact, this component involves activities which develop human resources of an organization for the best support for PPM capabilities (Killen et al., 2008b).

Aside from structures and processes, people are responsible for PPM capabilities and group decisions essential for PPM capability. The above review on PPM structures and processes provides a framework for understanding the importance and role of people in PPM capabilities. These human aspects are considered in this study and will be discussed in more detail below.

Methodology

The methodology used in this study is mixed method research design with combination of qualitative and quantitative approaches. The qualitative (explorative) approach is based on multiple case studies in six successful Iranian organizations in the field of manufacturing and production of equipment in the power industry during 2014-2015 for a deeper understanding of the role of PPM

capabilities in increasing competitive advantage. However, any representative organization is leading and successful in its industry in at least a 5-year period.

A series of semi-structured and in-depth interviews was conducted in each organization focusing on creation, evolution and use of PPM practices in these organizations. In this part, interviews were conducted with representatives of 6 companies and 24 informed people who provided very valuable information. These experts included NPD and R&D project portfolio managers, R&D managers, business development managers, R&D project expeditor and product development managers. In addition to the publicly available documents as well as confidential documents, internal memos and process diagrams were analyzed and reviewed to understand the role of PPM capability in overall organization.

The sampling method used for semi-structured and in-depth interviews was snowball sampling. Theoretical sampling was used for sampling adequacy. To ensure the validity of the identified factors, the interviews were reviewed several times by the research team and once by the independent researcher.

Quantitative approach tested the validity and generalizability of the findings resulting from qualitative approach and tested the hypotheses. In this part, data was collected by a questionnaire to test the effect of human aspects associated with PPM (as independent variables) on development of IPPM capabilities (as dependent variable) in Iranian companies active in the power industry.

For this purpose, the designed questionnaire which scored on a 5-point Likert scale was distributed among 30 experts from various levels in six selected companies and other relevant companies and data was collected. Therefore, these 30 experts were selected as the statistical population to which the results were generalized.

As noted earlier, this study used questionnaire to collect data. In order to assess validity, a number of experts and theorists were asked to review and modify the questionnaire. To assess reliability, the Cronbach's alpha was used which was equal to 0.87; this value is higher than acceptable value.

FINDINGS

Human Aspects of PPM

Human aspects of PPM were considered in each case study organization. Despite the fact that PPM literature noted human factors, most of the literature focused on methods and practices used in PPM (Killen et al., 2007). Table 1 lists the human aspects associated with PPM capabilities in five interrelated themes:

Table 1
Human aspects associated with PPM capabilities

<i>Category</i>	<i>Theme</i>
PPM human aspects	Commitment and support Ideas and creativity Structure and staffs Organizational learning processes Human versus computer- based approach to PPM

The remainder of this study discusses and describes the identified human factors.

Commitment and Support

The level of commitment and support for PPM capability is the most important factor frequently noted in previous studies and strongly emphasized in this research. Commitment and support is considered important at all levels of organizations studied.

A PPM capability requires transparent decisions made by a multi-functional team of individuals with a comprehensive view to make the best decisions. While the commitment and support of all participants is important, research findings consider the fact that senior management support is more important than others and should be considered first.

As most organizations change their processes or improvement activities, senior management support has been shown repeatedly to be important for PPM capability (Cooper et al., 2004; Killen et al., 2008b). Previous studies emphasized that senior management needs to show its commitment by providing resources, guiding, accepting and using PPM processes.

Unfortunately, there are many organizations where senior management verbally supports PPM process, but still believes that its favorite ideas or projects can overcome processes. Sometimes this can be justified by the fact that senior management is ultimate responsible of outcomes or the senior managers have a brilliant record of successful innovation. Nevertheless, research findings show that it can undermine the respect and support for PPM process. The studied organizations emphasize that respect and support are critical for effective PPM process.

In addition, PPM will be the best way for gain support, resources and commitment for the idea or project if it is well designed and it receives the support

and commitment of members. The studied organizations reveal the fact that an effective PPM requires participation of team members.

The studied organizations found evidence that the positive outcomes and achieved successes play an important role in PPM capability. They pointed out that it can be difficult at first to gain commitment and participation for the process, but it becomes easier when it is used transparently and consistently and people can see the outcomes.

Commitment and support for PPM causes an organizational learning pattern which will cause more support (Senge, 2006). This support must start from senior management which is committed and believe in modeling of behaviors that expected from other members of the organization. Some methods are used to facilitate organizational learning. These include effective communication of the goals, expectations and procedures for processes and outcomes of PPM.

Ideas and Creativity

PPM capabilities play a central role in creation, capture and filtering of new ideas. Innovation process is often modelled as a funnel in which there are many ideas leading to new products (Schilling, 2005).

While many new products represent incremental improvements of existing products and services, it is less observed that really new products require organizational renewal and sustainable competitive advantage.

Some estimates suggest that thousands of ideas are needed for every successful innovation (Stevens & Burley, 1997). Therefore, the main emphasis on PPM capability is to ensure the creation and capture of many ideas to increase the chance of successful innovation. In addition, the high level of quality and diversity of ideas is essential for ability to produce really new processes and products as well as common incremental changes in current products and processes. Diversification of ideas best results from various methods searching for ideas from outside the organization.

Three interrelated themes resulting from the study are effective on generation of ideas and creativity within PPM capability: creativity tools, culture and motivation.

Creativity Tools

Organizational and individual creativity tools for generating innovative ideas are often prior to PPM process. A number of creativity and idea generation tools are used by the studied organizations such as idea capture and logging system. Special methods and tools are used by most organizations for creating ideas and

creativity in facilitated workshops or periodic sessions. These workshops, in some cases, include people from outside the organization such as customers or experts. All these organizations use a system to capture numerous ideas prior to process. In some organizations, the task of 'idea management' is implemented in the web-based interface which allows data entry, transparency, comments and idea development.

Culture

Organization's culture plays a huge role in the ability to generate new ideas chain. Many organizations make deliberate efforts to establish an innovation culture. Some methods used by the studied organizations to increase the innovation culture can be found below:

- Use of consultants to assess the organizational culture
- Improving communications and increasing transparency of innovative activities
- Conducting training courses and workshops to improve teamwork and culture for effective meetings
- Developing and implementing key performance indicators (KPIs) to encourage and appreciate innovative activities. Innovation indicators include measures such as the numbers of ideas generated or innovation projects sponsored and level of innovation success and amount of revenue gained.

Organizations know that it is highly difficult to change organizational culture, which needs time and collective effort. Some organizations rely on culture change through their recruitment policies and often seek to change the culture by arrival of new people instead of insiders.

Motivation

Some managers specifically highlight appreciation and reward to motivate employees to participate in innovation. Establishment of an innovative culture can enhance by regular appreciation of innovation efforts and successes. In several organizations, appreciation happens through innovation award programs or opportunities for greater participation.

Awards seems to be a powerful incentive for people who are engage in the process of innovation or creation of ideas in various organizations. Although some organizations paid less financial rewards for innovation, but they feel that the motivating effect of reward is the recognition and visibility the rewards give to individuals or teams.

Another benefit of regular innovation award program is more visibility and awareness of PPM process and its outcomes. It is shown that the relationship between job opportunities and innovation activities increases motivation and improves innovative culture. For example, participation in innovation and success rates increase opportunities for promotion and enable employees and innovative team members to join other teams and bigger and better projects. These opportunities increase participation in innovation programs of these organizations.

Organizational Structure and Staffs

All the studied organizations have changed their organizational structure over the past three years. In most of the organizations, the task of developing new products and services shifted to a higher level of hierarchy to acquire the needed visibility and support for innovation activities. These promoted functions are explicitly linked to the growing importance of new product and service development and they strongly influence the creation or evolution of PPM capability.

PPM capability is an important means of communication and visibility of innovation projects. Creation or promotion of PPM capability is associated with any of these organizational changes and has also occurred in organizations with insignificant changes in the structure.

PPM capabilities not only play an important role in making decision to determine projects which included in project portfolio and form new products on which the future success depends, but also they are important in developing the required organizational resources and skills for competitiveness in development of new product and services.

Many skills of experts are needed for innovation in the studied organizations. Any organization invests in development of existing staff skills and acquiring of skilled staffs. In these organizations, development of organizational resources (basic skills) is influenced by types of projects within the portfolio and, in turn, they influence a variety of development projects which PPM process is able to select and support.

The studied organizations also employ specific processes to ensure the assignment of best people to development teams for innovation projects. In particular, special attention is paid to risky or highly important projects in which trained staff is used. In one organization, these projects are given to most experienced staff, while other organizations may assign these projects to a combination of experienced staff and relatively new but motivated staff. The newer staffs bring a higher level of innovative thinking for those projects; on the other hand, experienced staffs provide the experience needed to guide these

projects to success. This study shows that innovation processes require training and development of team members and it is dangerous to deplete goodwill of staffs with frequent job demands which are not sustainable in long term.

This study specifically focuses on the fact that the staff should not be expected to shift from a stressful project to another project. Successful organizations know that they had to balance between the demands of highly experienced and valuable staff; they are aware that goodwill can be easily damaged and they may lose their valuable staffs if they are not careful.

Organizational Learning Processes

All the studied organizations continuously participate in monitoring, analyzing and improving their PPM capabilities. PPM processes clearly have central role to the ability of an organization to adapt to the dynamic allocation of resources to the project activities in order to face variable environmental demands and evolve their organizational capability.

One of the important factors related to PPM capabilities is the length of time when this capability has established in the organization. Some have more established PPM capabilities and always depend on NPD which is the backbone of the organization. In contrast, others do not traditionally rely on new products; for them, NPD is not still a major concern for their operations. However, they consider NPD an important tool for future growth and survival of the organization and invest in PPM and their NPD capabilities. While some organizations newly familiar with the concept of PPM have a faster learning curve and make further investments in learning and use effective PPM capabilities.

Continuous monitoring and adaptation of PPM capabilities is evident in all cases. One of the main reasons for organizations to adapt to their PPM processes is to establish balance between short-term exploitation projects and long-term exploration projects. For example, one of the organizations recently began a new element in its PPM process to increase idea generation and implement exploration projects; another organization redesigned its PPM process, because the current process caused imbalance in the short-term projects.

Organizations determine how PPM capabilities are dynamic in nature and change regularly while they dynamically manage processes and resources for innovation. Throughout the literature, this supports those organizational capabilities which dynamically manage other organizational resources and constantly adapt to the environment to bring a series of competitive advantages (Eisenhardt & Martin, 2000; Fiol, 2001; Helfat & aubitschek, 2000; Teece et al., 1997). The ability of an organization to learn and adapt PPM practices is an important capability for sustainably successful innovation (O'Regan & Ghobadian, 2004).

The studied organizations display a combination of implicit and explicit organizational learning activities in development of their PPM capabilities. Implicit learning activities are often experiential and use trial and error method, while explicit learning activities include processes for articulation and codification of knowledge. An example of an explicit learning activity for PPM is the feedback loop in which processes and results are evaluated, discussed and modified (knowledge articulation) and then documented (knowledge codification).

The studied organizations show that organizations invest in learning. This improves both Implicit and explicit learning processes for development of PPM capabilities. These capabilities are established by common evolution of tacit experiences and explicit articulation and codification processes (Killen et al., 2008a, Zollo & Winter, 2002).

Human versus Computer-based approaches to PPM

The literature describes many software modeling and weighting systems to quantify the competitive factors in PPM process. This study confirms previous findings which indicate that low level of these tools and methods are used.

The interviewed managers know PPM as a human-based process; they do not believe in the advantage of a method which requires a complex input for its many factors. Managers do not believe that efforts to consider all aspects of decision-making in the computer system can replace the need for managerial oversight and analysis or the role of intuition and gut feel in decision-making. In addition, managers feel that the dialogue with human resources is necessary for its success, and that any change which reduces opportunities for face-to-face dialogue threatens the process.

None of the studied organizations used a comprehensive PPM computer system; however, some organizations used web-based tools for developing input ideas and to manage idea pool. The studied organizations use a set of tools and methods to support human-based processes. Project data is generally stored and presented using spreadsheet applications and evaluated in face-to-face meetings.

Although some managers reject the notion that computers may be important for decision-making PPM processes, they recognize the potential benefits that computerizing other aspects of the process could deliver. For example, if data on which decisions depend is stored in a computer database, it will help producing effective reports of projects. These graphic reports are especially useful for communication and presentations at meetings. Portfolio maps and roadmaps are used in most organizations in some form to help PPM teams to review their project portfolios and make decision.

Major future changes presented for PPM methods in the studied organizations include improved portfolio view and idea management capabilities.

DISCUSSION

Research Hypothesis

According to the findings of qualitative approach and five human factors identified to generalize these findings, the following hypotheses are defined proportionally:

1. 'Commitment and support' positively impact on the development of IPPM capabilities in the Iran's power industry.
2. 'Ideas and creativity' positively impact on the development of IPPM capabilities in the Iran's power industry.
3. 'Structure and staff' positively impact on the development of IPPM capabilities in the Iran's power industry.
4. Organizational learning processes' positively impact on the development of IPPM capabilities in Iran's power industry.
5. 'Human versus computer-based approach to PPM' positively impact on the development of IPPM capabilities in the Iran's power industry.

T-test was used to testing the research hypotheses. The questionnaire was scored on a Likert scale; therefore, the number 3 was considered as mean and hypotheses were tested as follows. Table 2 shows the calculations to test hypothesis:

Table 2
Statistical calculations to test hypotheses

<i>Hypothesis</i>	<i>T-value</i>	<i>df</i>	<i>Sig.</i>	<i>Mean difference</i>	<i>Test Result</i>
1	2.715	29	0.011	0.500	Confirmed
2	2.841	29	0.008	0.466	Confirmed
3	2.984	29	0.006	0.566	Confirmed
4	3.254	29	0.003	0.633	Confirmed
5	4.097	29	0.000	0.733	Confirmed

By analyzing data gathered through the questionnaire using SPSS software, as shown in Table 2, the following findings can be driven from the quantitative approach:

First hypothesis: given the mean difference (0.500) and significance level (0.011), the hypothesis is confirmed; thus, 'commitment and support' positively and significantly impact on the development of IPPM capabilities in the Iran's power industry.

Second hypothesis: given the mean difference (0.466) and significance level (0.008), the hypothesis is confirmed; thus, 'ideas and creativity' positively and significantly impact on the development of IPPM capabilities in the Iran's power industry.

Third hypothesis: given the mean difference (0.566) and significance level (0.006), the hypothesis is confirmed; thus, 'structure and staff' positively and significantly impact on the development of IPPM capabilities in the Iran's power industry.

Fourth hypothesis: given the mean difference (0.633) and significance level (0.003), the hypothesis is confirmed; thus, 'organizational learning processes' positively and significantly impact on the development of IPPM capabilities in the Iran's power industry.

Fifth hypothesis: given the mean difference (0.733) and significance level (0.000), the hypothesis is confirmed; thus, 'Human versus computer-based approach to PPM' positively and significantly impact on the development of IPPM capabilities in the Iran's power industry.

CONCLUSIONS

A PPM capability is an important dynamic capability which can increase competitive advantage. This study was based on a multiple case study to reveal that human aspects play an important role in creation, development and use of PPM capabilities within Iranian organizations active in the field of manufacturing and production of equipment for the power industry.

Considering the specific requirements of industry and population, this study evaluated five human factors: 1) commitment and support; 2) ideas and creativity; 3) structure and staff; 4) organizational learning processes; and 5) Human versus computer-based approach to PPM as independent variables impacting on the development of IPPM capabilities as the dependent variable.

By data collection and statistical analysis, the hypotheses were confirmed given the significance level calculated for each human aspect. Thus, there is a positive significant relationship between human factors considered in hypotheses and development of IPPM capabilities.

According to the results, managers who are interested in establishing or improving their PPM capabilities are recommended to consider the followings to develop PPM capabilities:

- Start the work with senior management support and commitment to PPM process, because this is the best mechanism to direct the organization to successful PPM.
- Take steps to create an organizational culture which encourages creativity and keeps innovation on every one's mind in the organization. Senior management considerably influences organizational culture and needs to be directed by examples.
- Consider regular and clear rewards to appreciate innovative activities and achievements. These incentive programs motivate employees for innovative activities and help the establishment of innovative culture in the organization.
- Ensure that their PPM capabilities are a visible and clear place in the organizational structure, and a team of senior managers who represent different perspectives is involved in PPM decisions.
- Invest in activities which enhance learning capability for organizations. These activities include the collection, communication and evaluation of information from different sources or creation and application of feedback loops to improve the processes. Organizational learning is essential for evolution and development of PPM capability and enables the organization to continue to participate in competitive advantage in a dynamic environment.

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