A Theoretical Structure for Strategic Human Resource Management in Project Oriented Manufactures

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Abstract. Some of the manufacturers produce equipment for infrastructure projects as for oil, gas and energy projects. These kinds of manufacturers should manage their efforts based on production management and project management practices. One of the management areas is human resource that can play an important role to gain a competitive advantage for the company. Project oriented manufactures should manage their human resource in a strategic approach and should align their human resource strategies with the business strategies. This paper discusses a theoretical structure to align and manage human resource efforts such as designing work, selecting, motivating, training, managing performance, retention and developing career for the employees based on the business strategies to gain a competitive advantage for the company.

Keywords: Organizational Strategy, Human Resource Strategy, Human resource management

1. INTRODUCTION

Project is a temporary attempt carried out to create a unique product, service, or result [1]. Projects are the central activity in many companies and it can be used in manufacturing. The Project-Oriented Manufacturing style of is very different than that used by traditional and repetitive manufacturers. In a project oriented manufacture, every Equipment manufactured is similar to, yet different from, anything else previously engineered and manufactured. We often refer to these Equipment as “custom-designed-equipment”. Project-Oriented Manufactures have specific permanent organizations like a project portfolio group, or a project management office (PMO) to deliver integrative functions [10][12]. The degree project-orientation of manufactures can vary, depending on the scope and number of projects they carry out [4]. In addition to the engineering and manufacturing of the equipment, the manufacturer must often perform services as site preparation, on-site installation, and training. A custom-designed-Equipment is often a sub-system in a larger project as a constructing a refinery plant, building a power station, building a ship.

The right Execution of the project management can add great value to an organization. However, some organizations have gained little value from the project management because they have not applied the project management in a proper way [27]. Many prior studies have confirmed that most projects do not finish on time and on budget. Some failed to fulfill either the customer’s or company’s expectations[28]. One of the important areas of project management is human resource management. Human resource management is important in all organizations. It contributes to the success of the project and creates competitive advantage for a project oriented organization Hata! Başvuru kaynağı bulunamadı,[6].

A. Belout and C. Gauvreau [2] noted the importance of a proper human resource in the success of projects. R. Turner and M. Huemann [29] suggested to develop an effective employee career objectives to ensure the decrease in contentment of employees but did not consider it in a strategic approach. M. Huemann and A. Keegan [4] reviewed the literatures of human resource management and developed a process for managing human resource in a project oriented organization but did not discuss the human resource strategies in this process. M. Huemann [6] studied the development of the human resource management of a telecommunication company from an administration approach into a project oriented management approach; but did not introduce a final framework for these kind of organizations. A. A.
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Tabassi and A.H. Abu Bakar [10] explored the implementation of human resource training and motivation methods in construction projects but did not discuss that which method is most applicable in these type of projects. Fernando C.A. Santos [13] declared the relationship and alignment between four manufacturing competitive strategies (quality, delivery performance, product innovation and cost reduction) and human resource management efforts; but does not argue project oriented manufactures in the study.

The stated papers show that less research is done for integrating human resource strategies and project human resource management practices. This paper reviews the literature of strategic management based on Porter’s business strategy topology and then based on the competitive strategies and the human resource area of the PMBOK standard (PMI 2013) a structure for human resource management for a project oriented manufacture is developed. This structure can be used for further and more detailed researches for management of human resource in project oriented organizations.

2. STRATEGIC INPUTS FOR HUMAN RESOURCE MANAGEMENT

To study human resource management in a project oriented manufacture it is necessary to consider the project strategy which are directly connected to the competitive potential of this management area. Porter [16] claimed that organizations can achieve a sustainable competitive advantage, through reinforcing their efforts on one of the cost leadership or differentiation strategies. According to Porter’s generic strategies, when an organization chooses only one strategy provides the organization with the ability to achieve competitive advantages and outperform their competitors[35]. In this paper, based on the Porter’s business strategy topology and the framework by Milosevic and Sabin Srivannaboon[35], we used 3 strategies defined as bellow:

• **Cost leadership**

  Organizations pursuing a cost leadership strategy seek to gain competitive advantage by being the lowest cost producers in the industry[16]. The human resource management efforts related with the cost reduction strategy should include [13]:

  - a quite fixed job description which does not allow ambiguities;
  - job career with great focus, which encourages the professional specialization and efficiency;
  - performance assessments that are more likely to reflect long-term and group-based achievements;
  - monitoring of market pay levels for its use in the compensation programs;
  - compensation systems that emphasize internal fairness rather than external or market-based fairness;
  - Minimum levels of training.

• **Differentiation**

  Organizations following a differentiation strategy try to find a position for themselves in the market with a different identity that satisfies the desires of their customers[16]. This differentiation allows the organization to charge a premium price[36].

  The human resource management efforts related with the differentiation strategy should include [13] [18]:

  - Jobs that allow employees to develop skills that can be used in other positions in the firm and need close interaction and coordination among groups of individuals;
  - high levels of employee involvement in decisions relevant to instant work conditions and the job itself;
  - a mix of individual and group principles for performance assessment that is mostly short-term and results oriented;
  - Extensive and continuous training and development of employees.
  - Broader career paths to support the development of a broad range of skills.
• **Best-cost:**
Under certain conditions, many researchers claim that a combination of strategies may be the best way of creating a supportable competitive advantage [35].

Besides the business and project strategy there is another dimension that can affect human resource planning; is that whether the organization has an internal or an external employment orientation [14]. Organizations with an internal employment orientation seek long-term relationships with employees, while organizations with an external employment orientation seek flexibility and do not make long-term obligations to employees.

### 3. ROLES AND RESPONSIBILITIES OF MANAGERS FOR MANAGING HUMAN RESOURCE

The roles and responsibilities of the functional managers, portfolio managers, program managers and the project managers for managing human resource should clearly be defined to avoid conflict.

#### 1.1. The role of the functional manager

Functional managers are those who holds and manages the human resources in a specific department [1]. The amount of involvement of the functional manager depends on the organizational structure [31]:
- In a functional organization the project manager does little directing and most of the responsibility is done by the functional manager.
- In a projectized organization, the project manager is responsible for directing.
- In a matrix organization, the responsibility to managing the human resource is shared with the project manager.

The project manager and functional manager must coordinate their respective requirements regarding the use of human resources to avoid conflict.

#### 1.2. The role of the portfolio manager:

The portfolio manager is responsible for governance at an executive level of the projects or programs that make up a portfolio [38]. A portfolio manager manages various projects or programs that maybe largely unrelated to each other and ensures to get the best return from human resources and other resources invested.

#### 1.3. The role of the program manager:

The program manager is responsible for managing a group of related projects to accomplish results not reachable by managing each project separately [40].

#### 1.4. The Role of the project manager

The project manager leads and directs the project planning efforts and influences the project team and the atmosphere in which the team are working in [1]. The following is a list of the responsibilities project managers’ [31]:
- Determine what the needed resources for the project
- Negotiate with functional managers for the optimal available resources
- Create project job descriptions for team members and other stakeholders
- Make sure all roles and responsibilities on the project are clearly assigned
- make sure the team get the needed training
- Insert reports of team members' performance into their official company employment record
- Make sure team members' needs are taken care of
- Create recognition and rewards systems
4. A FRAMEWORK FOR STRATEGIC HUMAN RESOURCE MANAGEMENT IN PROJECT ORIENTED MANUFACTURES

Research on aligning the human resource efforts to organizational strategy has been examined by different areas in management literature; still, there is not much literature on a framework to fit human resource efforts to organizational strategy. In this section based on the PMBOK by PMI and other references that has been introduced in the introduction a framework for linking human resource management efforts to organizational strategy in a project oriented manufacture has been discussed. The inputs of this framework are organizational strategy and roles & responsibilities of managers for managing human resource. At the first level the human resource management plan should be developed and should be aligned with the organizational strategy. The next step is to select and assign human resource for the designed work. The project manager should develop the human resource through training and rewards and continuously manage performance. Finally employee retention and developing career for remaining employees should be managed. The frame work is showed in the figure No. 1.

Figure 1. A framework for strategic human resource management in project oriented manufactures.
1.5. Develop Human Resource Plan

Develop the human resource plan is the process that establishes organizational breakdown structures, resource breakdown structures, roles and responsibilities, human resource acquisition plan and timetable, training plans, team-building strategies, compliance considerations, safety issues, rewards and ground rules, appraisal plans, career plans, and retention and releasing plans based on the organizational strategy.

Effective human resource plan should consider the availability of or competition for limited resources [1].

1.6. Design Work

Design work is the process of assigning and coordinating work tasks [14][19]. Two key principles of work design to increase productivity and improve customer satisfaction is aligning differentiation and integration [14]; differentiate the related tasks so that the staff can focus in doing things well and Integrate the coordination of the efforts of the staff [19].

Two elements of work design is autonomy and interdependence [14]. Autonomy is the level of freedom and independence given to individual staff to plan and carry out work tasks [8][8]. Interdependence is the extent to which a staff’s work actions and results are influenced by other people [14][17]. Organizations using cost leadership strategy focus on efficiency [37]. Efficiency is usually gained by combining low autonomy and sequential handling; therefor jobs should be standardize so that staff can quickly learn a set of relatively easy tasks [14]. Organizations that use differentiation strategy focus on innovation [37]. Innovation is usually gained by high autonomy and reciprocal processes; therefor jobs should be designed in a form that allows staff to develop skills that can be used in other positions in the firm and need close interaction and coordination among groups of individuals [18].

1.7. Recruit and select human resource

Recruiting and selecting human resource is the process of identifying, attracting and selecting people to work for an organization. Effective selection improves the success other human resource processes and prevent many problems [14]. Recruiting can be done by job posting, employee referrals, print and electronic advertising, employment agencies or campus recruiting. Selection can be done by cognitive ability testing, personality testing, situational judgment testing, physical ability testing, integrity testing, work sample testing, gathering information and interviewing. In a project oriented manufacture selection can be done for the organization in general or for a specific project [29]. There are two attitudes used in this process [14]:

- Broad skill scope, is a strategy that tries to find and attract a large number of candidates when a lot of people have the characteristics needed to be successful in the job.
- Targeted scope, is a strategy that tries to find and attract a small number of candidates who have specific skills, expertise or characteristics that are needed to execute a particular job.

1.8. Acquire Project Team

Acquire project team is the process of confirming human resource availability and assigning project personnel to new projects [1] [4]. Sometimes resources are assigned before the project manager and the project manager has to work with them as part of the team there for this process involves knowing which resources are preassigned and checking their availability [31]. The project manager should know the needs of the project and its priority within the company and be able to prove the need of stated quantity and quality of resources to negotiate for achieving resources from the functional managers and the sponsor.

The acquire project team process does not end on a project and it is used during the project live cycle [32] there for a resource calendar that shows a reliable schedule of each person’s schedule conflicts should be developed.

1.9. Develop Performance through Training

Companies should plan training efforts to help employees learn knowledge, skills, and attitudes related to job in order to perform work or to improve their performance is an organization.
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Training helps employees perform their work more effectively and efficiently and can boost employees’ commitment and motivation [25][25]. A cost leadership strategy, requires that employees have knowledge, skills, and attitudes to improve efficiency and help to reduce costs; therefore organizations with this strategy should train their employees on quality control principles and practices [26]. A differentiation strategy, requires that employees be able to make superior products compare to products offered by competitors [37]; therefore organizations with this strategy should offer training in team-focused creativity and customer service [14][8].

1.10. Motivate Employees with Rewards
Rewards should be given to staff for the contributions they make to an organization. Reward includes both monetary and nonmonetary [14][5]. Motivation efforts are strategic because they boost employees to put forth their best effort and execute in ways that help the organization produce its specific goods in a competitive environment.

As mentioned in section two, external employment orientation usually hire new employees that are not expected to form a long-term attachment to the organization. In an external employment orientation, employees’ view towards reward is fairness of what the company is paying them compared with what they could get on the whole elsewhere; therefore in this strategy organizations must evaluate their reward compare to the reward offered by other organizations to be at the same level or better compared to them [14]. But in an organization using the internal employment orientation, employees compare what it is paid to them to other employees of the organization; therefore organizations should spend time and effort comparing and analyzing differences in pay among their own employees to gain fairness and should also use long-term motivations to reward employees who stay with them for long periods.

Besides having a reward system, organizations should do something about the bad behavior of the employees through the ground rules.

1.11. Manage Performance and Provide Feedback
This is the process of tracking staff performance and providing feedback to the individuals and to the team, solving problems and conflicts to improve the interactions and performance of team members during all stages of forming, storming, norming, performing, and adjourning the team[1][2].

Studies have showed that measuring performance and providing feedback improves employee performance [22]. Organizations use merit-based systems approach or parity-based systems approach in measuring performance [14]. Organizations with an external employment orientation that do not make long-term obligations to employees should use merit-based system with a forced distribution method for measuring performance; Which means a few of employee should be rated the highest, a few should be rated the lowest and a majority should be ranked in the medium [14]. In organizations with an internal employment orientation that seek long-term relationships with employees, teamwork is very important and grouping employees as high performer should be performed by meeting a certain standards; therefore a parity-based system is used that performance measurements are usually based on processes rather than results.

1.12. Release from Project
At end of the project, the project managers should perform a final measurement of the employees’ performance, then pay the final rewards based on the performance and finally develop a report of the employees’ performance with suggestions to the human resource department for further dissensions. In addition to developing a report for the human resource department the project manager should inform the employees about their performance and based on their experiences on the project advises about their future should be given.
1.13. Manage Employee Retention and Separation
At this stage the organization should decide whether to retain the employee or either to release them from the organization. Companies should keep and retain good employees; specially in an internal employee orientated company [14]. Companies can profit with retaining good employees through reducing costs of recruiting, persuading employees to work for lower salaries compere to other companies by providing security sense for them and helping to build unique skills for employees compare to competitors and gain a competitive advantage.

If the employees do not have a project to immediately be assigned to the organization might keep them sitting on the bench, develop their career through training or send them to the project management office to share their technical experience with others [38].

1.14. Develop Career for Remaining Employees
This process involves activities that influence employees’ personal and professional growth and includes activities that help employees manage the development of their work experiences across their lives [14]. There are many ways that can develop employees but we suggest Job rotation and Job transfer in a project oriented manufacture and to ensure that employees have the opportunities to work on interesting projects providing interesting career challenges [30]. But it should be noticed that continuous movement from project to project to developing employees’ careers should be critically studied to prevent inefficiency in the projects.

5. CONCLUSION
In this paper based on Porter’s business strategy topology and other researches we reviewed the literature of strategic management and pointed three strategies; Cost leadership strategy, Differentiation strategy and Best-cost strategy; that are considered strategic inputs for human resource management. Besides the business strategy another dimension for human resource planning is that whether the organization has an internal or an external employment orientation. finally based on the strategic inputs to the human resource management and the PMBOK standard (PMI 2013) a human resource management structure for a project oriented manufacture was developed. This structure can be used for further and more detailed researches for human resource management in project oriented organizations by using quantitative study.

6. REFERENCES
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