

Important factors influencing personnel performance of construction companies

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Abstract—Human resource is the most valuable asset in construction industry. Human resource practices are mostly concerned with gaining value through increased skills, productivity, autonomy, contribution, and cost consciousness and Productivity is one of the most important factors affecting the overall performance of any construction company.

This paper applies a combination of quantitative and qualitative research methods. It analysis the factors affecting productivity and gaining value among construction companies. A survey of 120 construction companies was done by a questionnaire directed to managers, engineers, architects, and other technical staff.

The authors of this paper argue that it is important to discuss how much two groups of financial and psycho-social factors can affect productivity and gained value in construction companies.

Keywords—Construction industry; Human resource; Value; Organizational design

I. LITERATURE SEARCH

This part briefly reviews the history of other researchers' works that explain the current theory of HR discipline.

Gaining the best value of HR is a complex context especially in the labor-dependent market of construction where productivity is one of the most important drivers that affect the overall performance of any construction company. In a study [8] the changing construction labor market was investigated in the case of Hong Kong. The research addresses the important labor resource context related to the construction industry, including the trends of the critical indicators of the labor market in construction and the implications of the changing markets and technology on the future pattern of skill requirements and the government policies on construction personnel.

Decent work in construction sector is a much broader concept than the generation of paid work. Decent work is made of four key components: employment conditions, social security, rights at the workplace, and social dialogue [6].

New management thinking focuses on improving construction labor productivity by applying lean construction principles, like benchmarking and reducing variability in labor productivity [2,5].

In most business texts the importance of collective human capital is being highlighted; nevertheless at the same time, we also read and hear more about a firm's financial capital structure. However, the dialogue on the primacy of the human component is growing [7].

Much has been documented on what makes a successful organization. There are myriad frameworks, matrices, dimensions, definitions, best practices, and models [1]. Besides these vast collections of enlightening and useful ever-growing organizational literatures, there are a few elegantly simple accounts of basic organizational functions.

II. RESEARCH METHODOLOGY

Primary data was provided by studies of information we gathered through survey research techniques namely questionnaires and interviews. Secondary data about HR in construction industry was already published by researchers and authors in the public domain.

Phase one involved the completion of questionnaires (n=165) consisting of 20 detailed questions. Questionnaires consume a short time to be filled out and are source of highly reliable information

In the phase one, questionnaires were handed to a variety of managers, engineers, technical staffs, and HR professionals. Out of 270 questionnaires, 165 (61.11%) were completed. This high response rate represents the whole study population adequately. To analyze questionnaires' data, two statistical methods were used. At first, frequencies of the various answers were calculated (in percentage). Then the Relative Importance Index (RII) was calculated. In this case, a rating scale of 1-5 was chosen when '1' represents the lowest effect level and '5' represents the highest effect level.

$$RII = \frac{\sum_{i=1}^5 Y_i X_i}{\sum_{i=1}^5 X_i} \quad (1 \leq RII \leq 5) \quad (1)$$

Y_i represents the given rating by the respondents to each factor on a range of 1–5 (with '1' representing 'not significant' and '5' representing 'extremely significant')

X_i represents the percentage of respondents scoring i , i represents the order number of respondents

Secondly, the numerical values calculated by the formula were classified differently since a single number varying from 1 to 5 could not symbolize each verbal scaling. In this case, five other expressions were defined in significance intervals of 0.8:

- $1.00 \leq$ 'not significant' (NS) ≤ 1.80
- $1.80 \leq$ 'somewhat significant' (SS) ≤ 2.60
- $2.60 \leq$ 'significant' (S) ≤ 3.40
- $3.40 \leq$ 'very significant' (VS) ≤ 4.20
- $4.20 \leq$ 'extremely significant' (ES) ≤ 5.00

For each factor the percentage of informants in broader scale segments were calculated (those scoring two or fewer, those scoring three, and those scoring four or more). This scaling used to rank factors with similar relative importance indices.

Questionnaires do not tend to reveal anything unexpected, because they are limited to the questions fixed in advance by the researcher. Therefore we performed phase two which includes conducting forty semi-structured interviews within leader construction firms (n=28) and outside the industry to some general HR practitioners (n=12). The aim was to find how (and if) construction companies are using HR to gain the best value and to build organizational capabilities, and how they are structuring their strategic HR functions.

The companies with these features were selected: operating throughout the country, activities in a large range of majors within construction industry (multi-disciplinary firms) those who are enjoying a phase of rapid expansion allied to increasing economic activity within the construction industry. The interviews were recorded, transcribed verbatim and then analyzed. The findings organized in seven categories as Measuring HR effectiveness, Historical perspective on the profession, Values, principles, organizational maxims, and culture, Core activities and organization of the human resources function, Executive and firm-level presence, support and the HR brand, Talent sourcing of HR professionals and executives, Key challenges to HR in construction industry.

In this study construction industry members and HR professionals from a wide range of companies were interviewed. We also interviewed some consultants to the HR departments, and others who were familiar with human capital management practices in the construction industry. Interviews were semi-structured, with open-ended questioning organized roughly as follows: measuring HR effectiveness; historical perspectives on the HR profession; HR and the role of values, principles, organizational maxims, and culture; the core activities and organization of the HR function; executive and firm-level presence, and the HR brand; where HR talent (professionals and executives) is coming from today; and key challenges to HR in construction industry.

III. RESULTS AND ANALYSIS

A. Questionnaires Findings

In the first phase the project considered drivers of gaining value and improving productivity in two categories: financial factors and psycho-social factors.

The ten considered components of financial factor were Regular Remuneration, Amount of Remunerations, Incentive Payments, Social Insurance, Retiring pensions, Job Security, Overtime Payments, Promotion Possibility, Welfare Payments, Union Membership.

The ten investigated components of psycho-social factor were Company's policy for Employees Empowerment, Health-and-safety Conditions, Work Satisfaction, Creating Competition, Trusty Atmosphere of Workplace, Sound Information Flow in workplace, Worker Participation in Decision-making, Learning Opportunities, Self Auditing and Self Inspection Culture in the Company, Distance from Home and population centers.

Tables 1 and 2 reveal the results for financial and psycho-social factors, respectively. Table 1 gives a breakdown of Relative Importance Index (RII) of different economic elements in construction companies. On average, they have RII=3.811 which is considered 'very significant' (VS) in the terminology used here. However, those consisting of regular remuneration and amount of remuneration had relative important indices of 4.65 and 4.46 respectively that are extremely significant. Fig. 1 shows information about regular remuneration that is extremely significant factor in performance of construction companies and level of gained value. Welfare payments and union membership were generally less likely to be effective, though the trend favored welfare payments (RII=3.25) rather than union membership (RII=2.8). The other 6 factors had very significant effects on gained value and productivity improvement in construction industry.

TABLE 1. FINANCIAL FACTORS- STATISTICAL RESULTS

Rank	Economic factors	RII	Effect Level	Percentage of Informants Scoring		
				≥ 4	3	≤ 2
1	Regular remuneration	4.65	ES	96.7	3.3	0
2	Amount of remuneration	4.46	ES	82.25	15.35	2.4
3	Incentive Payments	4.16	VS	80	17.5	2.5
4	Social Insurance	4.05	VS	76.4	20	3.6
5	Retiring Pension	3.92	VS	70.75	21.25	8
6	Job Security	3.74	VS	70.1	20.32	9.58
7	Overtime Payments	3.62	VS	65.47	25.7	8.83
8	Promotion Possibility	3.46	VS	62.3	24.68	13.02

9	Welfare Payments	3.25	S	51	23.12	25.88
10	Union Membership	2.8	S	26.16	29.75	44.09
	Average	3.811	VS			

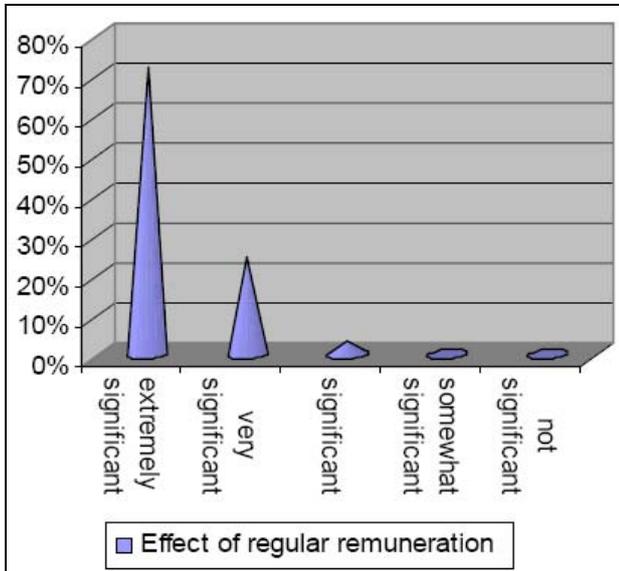


Figure1: Financial Factor

Table 2 is about psycho-social factors in terms of the different levels of effects on construction companies. On average, they have RII=3.55 which is considered 'very significant' (VS). There were not substantial differences in the effect of financial and psycho-social factors. Company's policy for employee empowerment has biggest effect on gained value and productivity improvement (RII=4.41). Fig. 2 shows information about this extremely significant factor. By contrast Self Auditing and Self Inspection Culture in the Company and Distance from Home and population centers had the smallest effects by relative importance indices of 2.55 and 2.46 respectively.

At the high levels of effectiveness we see Health-and-safety Conditions, Work Satisfaction, Creating

TABLE 2. PSYCHO-SOCIAL FACTORS- STATISTICAL RESULTS

Rank	Economic factors	RII	Effect Level	Percentage of Informants Scoring		
				≥4	3	≤2
1	Company's policy: Employee Empowerment	4.41	ES	83.25	13	3.75
2	Health-and-safety Conditions	4.18	VS	80.8	15.4	3.8
3	Work Satisfaction	4.04	VS	76.2	20.1	3.7
4	Creating Competition	3.9	VS	70.66	21.22	8.12
5	Trusty Atmosphere of Workplace	3.71	VS	69.8	20.43	9.77
6	Sound Information Flow in workplace	3.35	S	61.3	25.29	13.41
7	Worker Participation in Decision-making	3.19	S	50.22	23.44	26.34
8	Learning Opportunities	2.81	S	26.33	29.73	43.94
9	Self Auditing and Self Inspection Culture in the Company	2.55	SS	21	26.7	52.3
10	Distance from Home and population centers	2.46	SS	14.63	29	56.37
	Average	3.55	VS			

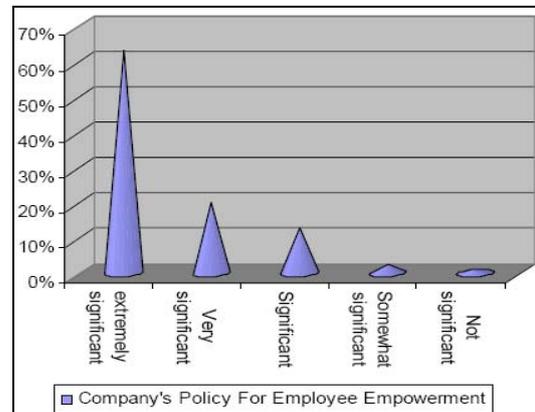


Figure2: psycho-social factor

with RII > 3.40 which are considered very significant (VS) in the terminology used here. The other 3 factors had significant effects on gained value and level of productivity in construction industry. Competition, and Trusty Atmosphere of Workplace

B. Interview Findings

In this section, the results of interviews are presented. Of the 40 interviewees, 12 were general HR practitioners and 28 were members of construction industry.

- **Measuring HR effectiveness**

Discussions of measurement yielded an overall sense that gauging HR effectiveness mostly involved conducting employee surveys on largely “qualitative” measures—thus making quantitative the qualitative or subjective assessments of employees. This seemed to be reflective of the level of support granted by CEOs and senior executives to HR leaders. Most practitioners felt that they didn’t have to make special efforts to provide proof of financial efficacy of their activities and policies. Support for strategic HR management was even present at the board level in some instances.

- **Historical perspective on the profession**

There was agreement between the general HR practitioners and the construction HR professionals on the relationship between job market cycles and how HR is regarded in the firm in line with those cycles. Interviewees from both groups noted that when the talent pool supply was lean, with higher talent demand than supply, HR’s role has become more important. Likewise, HR’s importance and clout has suffered during economic downturns when supply overtakes demand. Professionals inside and outside the construction industry indicated they saw HR’s organizational power on the increase now, recovering from the difficult years following the technology market bubble collapse.

- **Values, Principles, Organizational Maxims, and Culture**

Both general and construction HR professionals and executives agreed that values need to be active on the ground in order to be relevant, and that actions based on values needed to be seen, and values followed by leadership. Professionals in both areas also agreed that documentation wasn’t necessary, although some general and construction practitioners from smaller firms supported the notion of documentation. In one small firm, the employees asked for the values and principles to be created and stated. There, senior leadership responded by involving the employees in the values and principles creation process.

Collaboration, hiring for culture fit, looking for culture match in acquisitions, and the holistic implementation of organizational principles was a common theme in most of these interviews both on the general and construction sides. There was generally more talk of values and principles in the construction members’ interviews. And on the general practitioner side, one HR lead who also serves as chief financial officer for the firm felt that values were about storytelling, and that visions were best verbally articulated.

- **Organization of the human resources function, executive and firm-level presence, executive support, core HR activities, and the HR brand**

Sometimes Human Resource is shown to be a subset of Administration, bundled with Finance and Administration, where a top level HR Director, reports to a Vice president

of Finance and Administration. While this might reflect perhaps the model of the past years, this picture did not really align with how we found HR to be organized within the firms we studied.

In all cases in the construction interviews, HR function reported directly into the CEO. On the general side, most HR heads reported to the CEO. Moreover, there was strong agreement within construction managers of the executive-level support, from both the HR practitioners as well as the executives they report to. This strong support was also noted on the general side, albeit with some skepticism from at least two interviewees.

As noted earlier, there was discussion on the topic of firm-wide HR support and power relative to the supply and demand of talent—when talent was in high demand, so was HR. This was echoed by construction practitioners, but some general practitioners cited HR’s lack of power more attributable to the HR being deemed a cost center, not a strategic profit driver. Oddly, two of the HR professionals agreed that “at the end of the day, HR is a cost center.”

The theme of centralization for alignment was common to both construction and non-construction environments and most HR professionals from large environments noted that the administrative tasks have been outsourced. With little exception, there was agreement across both general and construction practitioners that all activities “HR” be centralized within HR, including organizational development (OD). The minor disagreement that did exist was centered on the argument that HR doesn’t have the credibility to drive OD. All interviewees from large firms reported that organizational development and organizational learning roles report directly into HR. Some people noted that in the centralized environments, they also had HR business partners functioning as decentralized agents. Benefits from integrated learning, training, and development were cited as drivers for grouping the HR activities under one central function.

Most agreed that compensation was the primary driver of behavior and most interviewees reported mixes of base and incentive pay, both for individual and firm-level performance. A general practitioner supposed that the construction performance management system would be less structured, and this was indeed found to be the case. Most construction practitioners reported informal performance reviews, with high frequency ‘conversations’ being the primary activity. The theme of systems over programs was common within the construction community.

On the subject of the HR brand, there seemed to be a mix of views, with most claiming the name is less important than the action and work of HR, with others suggesting that “human capital management” might be a more appropriate term. In construction industry, interviewees noted that the scientific staff looked to HR to bring the ‘soft stuff.’

- **Talent sourcing of HR professionals and executives**

Practitioners, consultants and executives in both general and construction environments noted a desire for industry agnosticism in HR leadership. There was a suggestion that

construction HR could benefit from more heterogeneity in industry background. All of those interviewed noted that very rarely are firms bringing non-HR people from outside the industry in to lead HR.

Compensation was the common theme among all interviewees regarding where the deep expertise in HR resides—the single most called for technical HR skill. However, there was agreement between the construction and non-construction interviewees that compensation specialists infrequently rise to top leadership positions in HR. And in construction, there seemed to be a bit of hesitance to invest in compensation specialists.

- **Key challenges to HR in construction industry**

Several interviewees remarked on the challenges of retention and shared some of their visions of how firms could better hold onto talent in the future. Several HR leaders suggested that HR needs to take bold steps to reinvent itself, not unlike how other organizational functions have had to in the past (e.g. purchasing, IS/IT, etc). Some experts suggested looking globally for exemplary practices, concepts, and ideas.

IV. CONCLUSION

Gathered data proved the hypothesis of the thesis that two groups of financial and psycho-social factors have very significant effects on efficiency and gained value within construction companies.

For each factors, 10 components were defined. If this hypothesis is validated then it is needed to rank components of financial and psycho-social factors from most to least effective within construction industry. If this hypothesis is not validated then it is necessary to understand whether there are other neglected factors that should be considered simultaneously.

Of 165 completed questionnaires and 40 conducted interviews 8.6% claimed that apart from financial and psycho-social factors, there are others significantly affect gained value and productivity in the construction industry. In the other word, 91.4 per cent of respondents were agreed that these two groups of factors are main drivers of efficiency and gained value.

On average, they have RII=3.811 which is considered ‘very significant’ (VS) in the terminology used here.

On average, they have RII=3.55 which is considered ‘very significant’ (VS) in the terminology used here. Therefore, there were not substantial differences in the effect of financial and psycho-social factors.

Combining the interviews and questionnaire results, the authors came up with the following eight conclusions:

1) The administrative tasks of HR, classified as “record-keeping, compliance, and personnel service delivery,” have been either diminished in their role in HR, or have been outsourced [3]. HR is now more centralized than in the past for the purpose of integrating all aspects of human capital management for firm-wide effectiveness. HR is ‘high touch’ in the construction firms I studied.

2) HR is a member of the top-level management team in the construction firms we studied, with the head of HR reporting to the CEO, and is more focused on the strategic and long-term activities of the firm including strategy formulation, organizational design, leadership and organizational development.

3) A broader search for HR talent has been called for in the literature, and appears to be underway in some firms. Some CEOs seem to be looking for HR leaders who have a variety of HR experience in different industries and cultures. However, HR in construction is perceived by some as perhaps too heterogeneous.

4) In the construction environment, there was a noted preference for informal performance management characterized by frequent dialogue as opposed to formal annual reviews that are highly structured and documented. Additionally, in the construction firms we learned about, general management (GM) development is relatively unstructured —culture plays a role in an ‘organic’ or systemic development of talent.

5) Values and principles are important to managers, but they have to be matched with action to be relevant. There needs to be an active, clearly visible connection between the values and principles and the actions taken by the firm, the firm’s leaders, and the employees.

6) With increased outsourcing and splitting off of the administrative functions of HR, some have suggested new measurements of HR effectiveness are required. HR departments can no longer rely on traditional measurements of transactional activities. Indeed, most of the data indicated that many in the profession are making this transition. Companies are using employee surveys designed to measure subjective aspects of the individual’s experience in the firm.

7) Consistent differences between construction and non-construction managers’ impressions of HR were noted before. A Master’s thesis notes some features of Japanese human capital management [4]:

- Long-term focus throughout the firm, including training and long-term performance management
- Bi-annual incentive compensation (bonuses) for all employees (to motivate in short-term)
- Minimal compensation disparity between top managers and new hires (13:1 in Japan, vs. over 100:1 in U.S.)
- Transparency in compensation systems
- Strong preference for promotion from within
- Consistent investment in internal education of personnel

These features could contribute to explaining why some managers perceive HR as being of greater value, more strategic and contributing to more organizational effectiveness. Thus, these attributes HR could serve as models for all construction HR managers to consider when designing organizations and human capital management strategies.

8) *Finally, we must assume that this sample of firms we studied in this paper is representative of many firms in the region. We believe much could be gained by looking globally for effective human capital management practices.*

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