A framework for human resources development in Taiwan's high tech industry

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ABSTRACT: Vigorous developments have been achieved in the Taiwanese high tech industry due to effective breakthroughs with research, development and professional technology skills, in addition to human resources management (HRM), as powerful resources, plus a push ahead with economic growth in recent years. Nowadays, in this era of the knowledge economy, the high tech industry faces a big test regarding human resources management. In order to continue and develop the industry, the high tech industry depends on various employees with expertise knowledge and technological skills or capabilities; thus, key elements in human resource management, such as recruitment, training, appointment and evaluation, have become a top issue for the industry. In order to set up a strategy to develop human resources management for the high tech industry in Taiwan, research of human resources from related articles was undertaken so as to integrate, distribute and manage the analyses from the limited resources. In this article, the authors clearly state the contents of key performance indicators from a strategy map and explain the system's framework by advancing abilities. It is hoped that this research will be a reference for the testing and verification of subsequent research.

INTRODUCTION

The determination of Taiwanese high tech industry is based on six main principles, namely:

- The big potentials of markets;
- The relative level of industries;
- The level of technological arrangements;
- The level of added value;
- Low degree of pollution;
- Low degree of energy.

The industries of high tech industry include news reports, information software, consumer electronics, integrated circuits (IC), precision machinery, automation, navigation high-level raw materials, special chemistry, pharmacy, medical insurance, pollution prevention and cure, etc [1][2].

Successfully managing human resources in Taiwan is important for the high tech industry. Management techniques, such as *recruit*, *train*, *apply*, *apprise* and *maintain* combine organisational strategies and human resources plans that can effectively carry out human resources development, and directly influence the Taiwanese economy's success or failure [3]. It is universally considered that in order to stand out conspicuously in the business world, the high tech industry requires fine research development capabilities as an essential component. Furthermore, integrated human resources development strategies are the foundation for competitive superiority [4-7].

Current Situation of Taiwan's High Tech Industry

The Taiwanese high tech industry has scored various successes in innovation, but in running the development of business personnel matters, it has generally faced the following problems:

- Lack of talent,
- Difficulty in the acquisition of information on related technologies [3];
- High mobility rate of personnel in research department, and having to continue research work [5][8];
- Inadequate finance [5][9].

Because the research department is the main part of business innovation, a lack of research talents would bring limitations to the development of the high tech industry [8][9]. The authors have categorised learners' arguments, related processes and indicators of research, and these are listed in Table 1, which provides references for human resource planning [8][10]. In this report, Table 1 shows the main structure of human resource strategies in today's high tech industry as depicted in the human resource development (HRD) department [5][8].

Goldstein considered that the human resource development model is an important factor when analysing the employee's educational training process [11]. The model also provides the framework for a human resources development system in order to promote the added value of educational training. Li, Chen, Huang and Chao have expressed their views regarding HRD departments in the Taiwanese high tech industry [5][8][9][12]. They affirm that it has been built according to Swanson's and Goldstein's human resource development models [11][13]. A human resources development model is presented below.

Swanson described a human resource development system in 1987, and noted the importance of technological training. The purpose of the system was to enhance technology skills for internal and basic employees. The process of the system was divided into five stages, namely: analysis, design, development, implementation and evaluation [12]. This is described in more detail below.

Table 1: HRD strategies and key performance indicators.

Strategies	Composition	Key Performance Indicators
Finance	Growth Period	Gross rate of sales
		Sales growth rate of products
		Customer sales growth rate
		Regional sales growth rate
	Maintain Period	Cash flows
	Harvest Period	Investment remuneration rate
		Capital remuneration rate
		Added values
Customers	Segment Market	Market share (ratio of shares in the markets)
		Customer profit rate (net profit obtained from customers or market segmentation)
		Customer endeavour rate (rate of attracting customers or developing new businesses)
	Core Capabilities	Customers' satisfaction (specific performance standards viewed by customer values
		Customers' maintenance (rate of maintaining original customer or maintaining relationships between customers and company)
Internal Processes	Innovation	Key capability and steps to reach target market
		Numbers of patent technology
		Setting estimated indicators to lead the market area
	Operations	Time for information system to receive information and make decisions
		Ability to update new and correct information
		Utility rate of information of operating company
	After-sales Service	Time for customers' incidence (from customer's complaints to solving the problem)
		Rate of customer re-purchase. (customers' satisfaction to compensation)
Learning and Growth	Employees' Capabilities	Core technology
		Training results
		Bring training results into work
	Completely Information System	Complete information system
		Situations of internal database linkage and usage
		Degree of employees' maturity to using information system
		Updating and correcting information
	Encouraged Authorisation & Employees' Agreement	Degree of executing company rules
		Team spirit
		Working morale
		Degree of delegating authority
		Personal identification

- *Analysis stage*: In this stage, an estimation of needs is carried out in order to develop the organisation's future plan. The analysis stage helps in understanding employees' capabilities and their needs, as follows:

  – Drawing up a human resource development plan;
  – Analysing the number of labours and capabilities required for different works;
  – Segmenting and explaining the training system: different abilities to match different works;
  – Examining the feasibility of the needs analysis.

- *Design stage*: This stage aims at an entire training system and planning it completely:

  – Planning a completed training system;
  – Arranging a weekly schedule for training courses.

- *Development stage*: This stage prepares materials for teaching and implementing a teaching trial. This stage seeks to ensure the preparation of teaching materials and tools;
- *Implementation stage*: This entails implementing a teaching plan after completing it. A daily record should be filled out so as to help in future reviews;
- *Evaluation stage*: The teaching objectives serve to determine how the training system should be evaluated:

  – Make effective reports from evaluated results;
  – Interview trainers and trainees in order to adjust and improve the training system;
  – Provide a complete report after training to the director and then decide whether or not to continue the training system.

Core strategies and human resource plans have mutual influences. Currently, parts of Taiwanese high tech industry companies study their core strategies within the organisation and then organise their personnel and human resource planning. This method is generally based on a five-force analysis. There are also some organisations that adopt a SWOT analysis (Strengths-Weaknesses-Opportunities-Threats) by analysing the outside environment first and modifying internal human resource management in order to maintain expertise advantages and market development. Both of these methods are used commonly in the Taiwanese high tech industry.

A report gathered experts' opinions and combined them with the needs of the Taiwanese high tech industry. This helped to provide a visual representation of a human resources development strategy (see Figure 1) This strategy is based on strategically developing a company's position and core subject in order to plan the strategy process. Strategy management is the key for developing human resources management (HRM).

After constructing a strategy for human resources management, a strategic framework could be developed into concrete processes. This would help to ensure that the objectives of human resource development are realised in the various departments, along with items that can be measured and key performance indicators (KPI). In order to make certain that the evaluated results come out into the open and to ensure a sense of justice, there needs to be a level of integrity across the functions and operations of the organisation within the various departments and sections. During the period of developing the organisational objectives for management, it is essential to rule according to the SMART principle: specific, measurable, attainable, realistic and time-limited. Thus, other departments can easily join into each stage [14].

Regarding the setting of performance indicators, Becker, Huselid and Ulrich suggested that KPIs could be set according

Develop strategy

allocation

Confirmation core strategy issurs

Strategy of HRD

Top quality of products and services

Complete core value, to be worth trust company

Become the customers best only choice

Maintain available management system

Strategy of HRD

Strategy of HRD

Strategy of HRD

Commitment and objective

technology

alignment

Commitment and objective

Leading fashion wave

price

quality

service

Custom need

effective

Competency advantage and Strategy

Flexible organization

Benchmarking of HRM

Excel employee (HR, Learning, Innovation)

Provide what Customers nedd

Ensure Techniques competitivene

Enjoy achievement

Enrich HRD plan

Encourage Organization Innovation
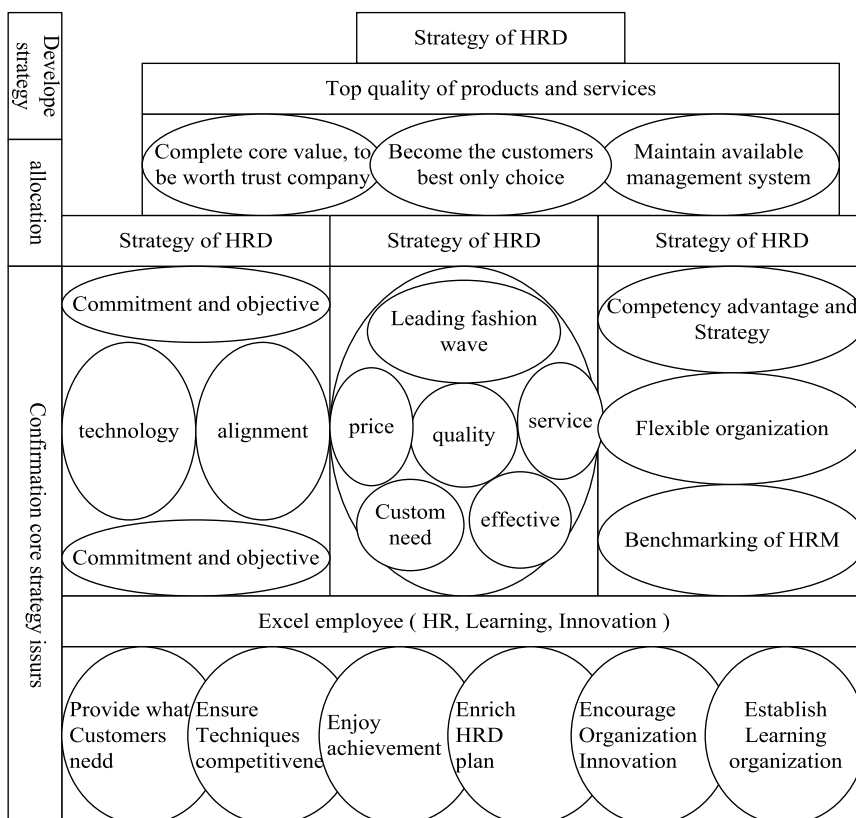
Establish Learning organization

Figure 1: Management diagrams of human resource development strategies of Taiwan's high tech industry.

to employees' opinions, with an analysis based on past statistics or referenced to internal and external information [7]. It is also good to set KPIs by the experiences of managers or from feedback from customers and interest groups. Industry standards could also be used as a target.

KPIs are a quite useful tool for human resources development, although it is not necessarily the case that the greater the number of KPIs, the better. Indeed, Niven indicated that 20-25 performance indicators are suitable quantities [14]. KPIs should avoid copying or setting standards of quantified contents and ignore suitability. It is appropriate to associate KPIs with the salary management system and adjust them over time for the effective and efficient practice of human resources management. Researchers have categorised KPIs for human resource development in the Taiwanese high tech industry, as shown in Table 1.

METHODOLOGY AND PROCEDURES

The study visited and interviewed three companies. The interviewees were senior directors in their respective administration departments, responsible for advancing small groups. Furthermore, the target interviewees each had more than four years experience in their companies. Therefore, their stated companies' objectives and ways of running the business were detailed and correct.

For the first step of the research, most efforts focused on a review of the theories and investigation. Analysis, generalisations, articles and theories helped the investigators to understand all the problems that needed to be addressed. The second step involved constructing interview questions that had to be accurate and easily understood by the interviewees. Precision is needed when composing the questions and they need to be recorded completely. During the interviewing, apart

from writing down all of the important notes, researchers also had to record the contents of each interview. After the interview, the recording was carefully listened to in order to avoid any important information being omitted or misunderstanding of original ideas. If there was any confusion, it was necessary to contact the interviewees by telephone and have any confusion rectified.

At the same time, using the comparative method, all information from related articles was divided into categories, re-arranged, and similarities and dissimilarities identified. This also involved re-organising the observations and sourcing information as broadly as possible, so as to increase the study's authenticity. During the period of generalised information, the different types of information from various sources was revised using a triangulation process, thus increasing the decisions' accuracy and objectivity.

The interviews of this research were divided into two phases. The first phase was from 5-7 October 2005, with the main target interviewees being directors of the R&D departments and directors of the HRM departments. The second phase was from 5-9 December 2005, with the target interviewees being CEOs, presidents and vice-presidents of the programmes. These two phases took 11 hours and five persons were interviewed in total. After each interview, there was some time for the researchers for contemplation and self-examination, such as reconsidering the contents and meanings of the received information, and what could benefit descriptions of the situation correctly and appropriately.

DISCUSSION AND CONCLUSIONS

As human resource development in Taiwanese high tech industry is still in its early days, most of the related articles and theories come from the USA. Although some theories are from

the perspective of the Taiwanese high-tech industry, the reality is that human resource development still needs continued research. HRD is usually misunderstood as human resources management (HRM). However, HRD is utilised to develop the education area only, without strategic partners and performance consulting. It is disadvantageous to HRD's future development.

In other words, valued human resource development not only improves professional skills and capabilities, but also solves the problem of measuring the effect of human resources on an organisation, as indicated by Becker, Huselid and Ulrich [7]. As most of people believe affirm the *no measurement no management* principle, it is important to determine the measurement for evaluating the relationship between human resources and the organisation. No matter what the real problem of human resources development in Taiwan really is, Gilley, Eggland and Gilley, as well as Gilley and Maycunich, have stated that HRD department must be independent and self-reliant [15][16]. This is because not all senior directors support HRD departments, especially when a business is encountering financial difficulties; HRD departments are often on the list of employees to be downsized.

Facing internal pressure, HRD must show its expertise and strength, then develop suitable employee training systems and help staff members improve their added value with personal development and alignment towards organisational objectives. This helps to increase employees' pleasure in training education and also promotes senior management's confidence in the HRD department.

In evaluating the future situation of the high tech industry, Gilley, Eggland and Gilley considered that HRD must play a more active role, especially regarding the partnership relationship between developmental and strategic matters, which is the most important issue for HRD departments [15]. Gilley, Eggland and Gilley provided five steps for developing the function and value of HRD. These steps are as follows:

- Establishing strategies for customer service;
- Examining the function and consultation services of HRD to measure HRD's value and efforts;
- Developing cooperative relationship with customers;
- Improving an organisation's image and developing decision-making for organisational development;
- Getting close to customers to understand their needs and gather feedback [15].

HRD can then build these five steps as a foundation in the organisation. HRD can also strengthen customers' faith in the organisation, helping it to reach its objectives.

Finally, if the human resource development task belongs to the HRD department, then the first challenge for the HRD department is to understand details and to improve the human resource development [17]. From recruitment, selection, position, evaluation to employee education and increasing employees' added value, etc, HRD should carefully consider and provide a complete human resources programme.

In order to promote the human resources system and working efficiency in an organisation, HRD should not only consider the inner organisation, but also take into account the external environment, such as business partners, related industries and customer relationships.

In summary, HRD is not only limited to training education. HRD should also be close to performance-based analysis, execution and evaluation. Therefore, human resources can be successful and integral component of the Taiwanese high tech industry.

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