Conceptual Design
For a Strategic Human Resources Quality Management System

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ABSTRACT

As companies begin to compete in the challenging business environment of the new millennium, an ever-increasing reason for success lies in the function of effective human resource management (HRM). Controlling these resources (physical, organizational, information and human) gives the company the competitive advantage. The main purpose of this paper is to deliver a decision support tool aiding the decision-making process concerning the strategic management of the department of human resource management. The goal of the strategic management in an organization is to assess, deploy and allocate resources providing the management with a competitive advantage. TQM is an overall organization strategy formulated at the top level and then diffused throughout the entire organization. It is primarily an organizational strategy works as a change program towards excellence. Increased human resource requirements, governmental regulations, and expanded computer and information technology capabilities justified the need of an information system within the human resource department (HRMIS). The core of an HRMIS is a database system that contains all relevant human resource information facilitating accessing, maintaining and processing activities.

This direct our attention to the urging need to formulate a conceptual design for a strategic human resource management information system that deploys the total quality management concepts. Looking to the problem from this point of view will enable us to employ different forecasting techniques to support the strategic human resource applications that meet the organization goals in the intermediate and long-term.

KEY WORDS

Strategic Human Resources Management - Human Resources Decision Support System (HRDSS) - Conceptual Design - TQM concepts - Statistical prediction techniques - Ratio Analysis - Trend Analysis - Time series analysis - Ranking methods.

1. INTRODUCTION

Organizations and companies succeed, or fail, based on the quality and effectiveness of their employees. Today's successful firms recognize that to compete in global markets, they must have world class Human Resource managers who are active participants in strategic and operational decision. Whether they are reengineering the pay and benefits of the company or implementing Total Quality Management (TQM) programs, Human Resources Managers play a central role. Most importantly, the

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practice of Human Resource Management is undergoing a technological revolution. We speak now of managing not only human resources and capital, but also information and information systems. HR functions, from employee selection to benefits planning, are being redesigned to take advantage of advanced information technology.

2. BASIC CONCEPTS

Business organizations exist in a competitive environment with scarce resources. Controlling these resources (physical, organizational, information and human) that gives the company the competitive advantage.

The goal of strategic management in an organization is to deploy and allocate resources in order to provide the management with a competitive advantage. It goes without saying that two out of three classes of resources (organizational and human) correlated with the human resource functions. Towards maximum effect, the HRM functions must be integrally involved in the company's strategic management process.

Strategic management process first analyzes a company's competitive situation, develops its strategic goals and mission, it's external opportunities and threats, and its internal strength and weaknesses to generate alternatives. In his second phase, strategic management process determines a plan of actions and deployment of resources to achieve the pre-specified goals. This kind of strategic approach should be emphasized in human resources management.

Strategic human resources management (**SHRM**) is the pattern of planned human resources deployments and activities intended to enable an organization to achieve its goals. Then we are addressing the question of the instruments that will make the odds of the competition in our favor.

Four levels of integration exist between the HR functions and the strategic management function:

- Administrative linkage: HR function's attention is focused on day-to-day activities
- One-way linkage: the firm develops the strategic plan and then informs the HR.
- Two-way linkage: strategic planing team informs HR of the various strategies, HR analyze them and present the results to the team. After deciding, the strategic plan is passed to HR to implement.
- Integrative linkage: it is a dynamic process, based on continuing rather than sequential interaction, done by the HR executive who is a member of the senior management team.

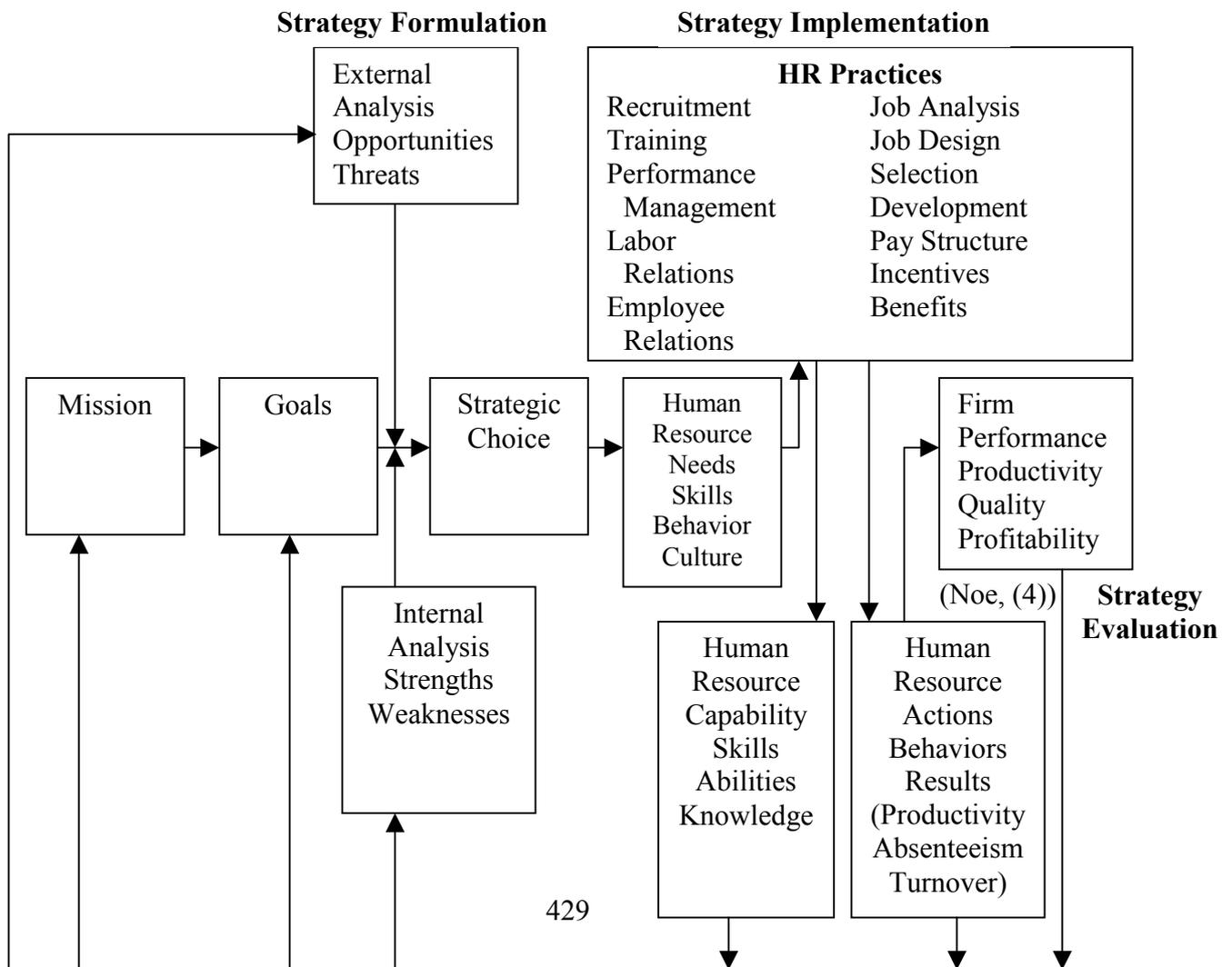### 2.1 Strategy formulation consists of five major components

- Mission is a statement of the organization's reason for being, customers served and their needs, and the technology used. Also presents the company's vision and values.
- Goals are what the firm hopes to achieve in the medium-to-long term future.

- External analysis examines the firm's operating environment to identify the strategic opportunities and threats.
- Internal analysis identifies the firm's strengths and weaknesses, focuses on the quantity and quality of resources available.
- Strategic choice is done after the Strengths Weaknesses Opportunities Threats (SWOT) analysis to define strategic alternatives, then the choice is made among these alternatives.

Mechanisms for integration the HR function into strategy formulation may help the strategic planning team to make the most effective strategic choice, since HR will implement it.

2.2 Strategy Implementation

It is now time to execute the strategy formulated, indicating certain HR needs. HR function can be viewed as having six menus of HR practices from which companies can choose the ones that are most appropriate to implementing the strategy. While, all of the strategy types require competent people in a generic sense, each of the strategies also requires different types of employees with types of behaviors and attitudes. The emerging strategic role of the HR function requires that HR professionals in the future develop business, professional-technical, change management, and integration competencies. The following figure will illustrate the model of the strategic management process.

Strategy Formulation   **Strategy Implementation**

HR Practices

Recruitment — Job Analysis
Training — Job Design
Performance Management — Selection
— Development
Labor Relations — Pay Structure
Incentives
Employee Relations — Benefits

External Analysis: Opportunities Threats

Mission → Goals → Strategic Choice → Human Resource Needs Skills Behavior Culture

Internal Analysis: Strengths Weaknesses

Human Resource Capability Skills Abilities Knowledge

Human Resource Actions Behaviors Results (Productivity Absenteeism Turnover)

Firm Performance Productivity Quality Profitability

(Noe, (4))   **Strategy Evaluation**

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3. TQM AND HR BUSINESS FUNCTIONS

The **TQM** is defined as " a management approach of an organization, centered on quality, based on participation of all members and aiming at long-term success through customer satisfaction, and benefits to all members of the organization and the society "(Rao, Ashok & et al, (6)). TQM is a continuous process of improvement for individuals, and whole organization.

3.1 TQM and HR role

3.1.1 Performing an HR audit which is the first step of a strategic human resource function. The audit examines every major aspect of HR management and identifies strengths, weaknesses and necessary corrective actions.

3.1.2 Designing the interventions to prepare the people and the organization for the proposed change.
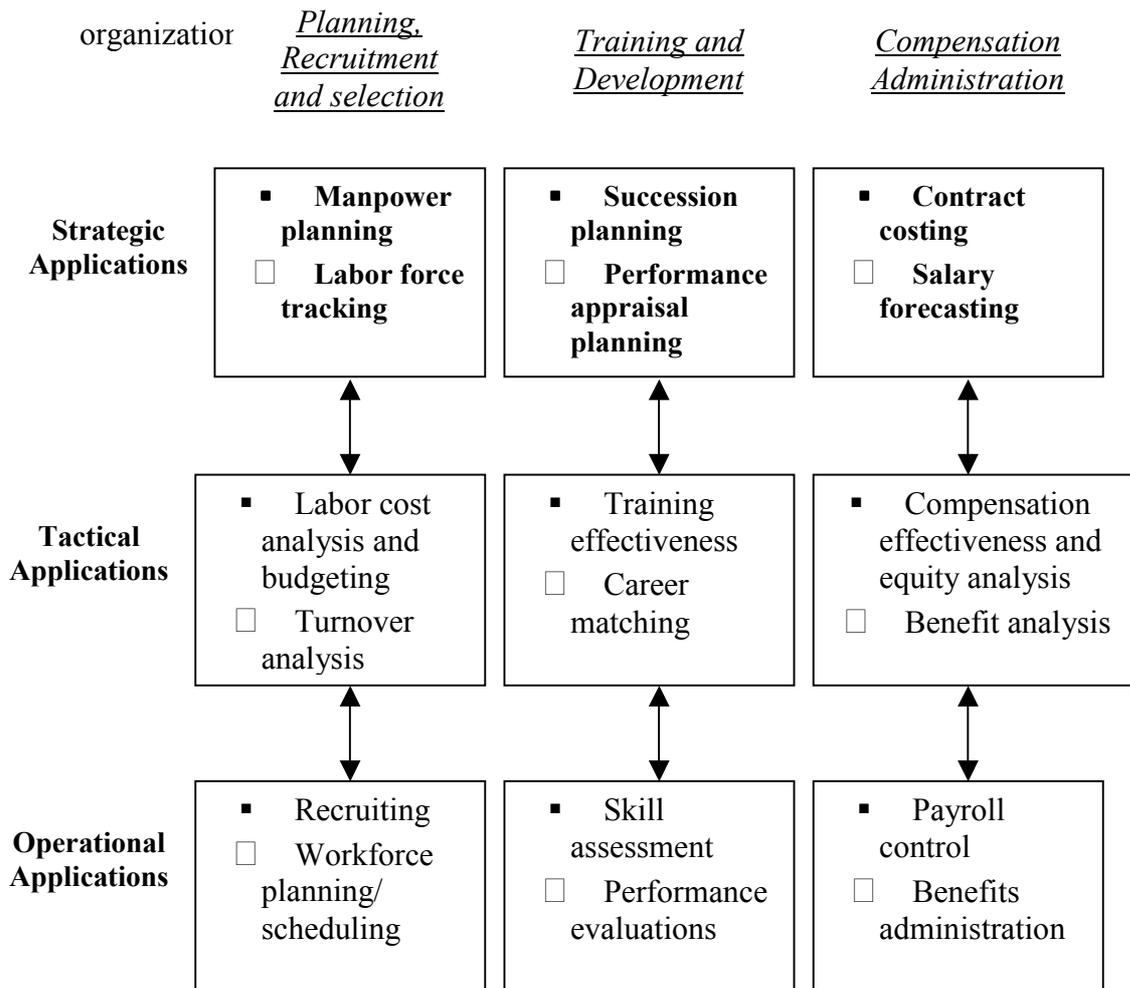
3.1.3 Providing intensive training of personnel programs in the topic of TQM methods

and tools and initiating employee involvement in TQM activity.

3.1.4 Creating TQM mindset through the following orientations:
1) The customer orientation 2) The process orientation 3) The people orientation

4. HR AND INFORMATION SYSTEMS

4.1 Impact of information systems on HR strategic management

1- Automating the paper work to save time and effort and to avoid the use of additional staff.

2- Storing data about applicants facilitates searching and selecting tasks.

3- Administrating of risk management by monitoring licenses, safety training, physical exams and report deviation.

4- Managing the training activities to specify the organization training needs.

5- Upgrading expertise and skills to provide training development.

6- Planning and simulating the financial impact and recommending strategy changes.

7- Analyzing turnover causes.

8- Elaborating iterative planning processes by identifying a logical path and monitoring its steps

9- Administrating flexible-benefits that save money.

10- Tracking and analyzing attendance reports.

11- Supporting the HR planning using IS capabilities in making projection.

12- Analyzing accident reports that help to prevent them.

13- Providing all regular calculations and statistical reports that assist managers.

14- Supporting the strategic, tactical, and operational use of the HR of an

organizatior

	Planning, Recruitment and selection	Training and Development	Compensation Administration
Strategic Applications	▪ **Manpower planning** **Labor force tracking**	▪ **Succession planning** **Performance appraisal planning**	▪ **Contract costing** **Salary forecasting**
Tactical Applications	▪ Labor cost analysis and budgeting Turnover analysis	▪ Training effectiveness Career matching	▪ Compensation effectiveness and equity analysis Benefit analysis
Operational Applications	▪ Recruiting Workforce planning/ scheduling	▪ Skill assessment Performance evaluations	▪ Payroll control Benefits administration

(O'Brian, (5))

This support makes the goals of the HR management a dream come true in a simple effective and efficient manner.

5. STRATEGIC APPLICATIONS OF HR BUSINESS FUNCTIONS

Human resources functions refer to " those tasks and duties performed in both large and small organizations to provide for the coordinate human resources. The Society of Human Resources Management identified six main functions:

1- HR planning, recruitment, and selection
2- HR development & training
3- Compensation and benefits
4- Safety and health
5- Employee and labor relations
6- HR research

5.1 Activities of the HR planning, recruitment, and selection function are:

▪Performing **job analysis** that is " the process of determining and reporting pertinent information relating to the nature of a specific job". This can be done using a motion study, a time study or a statistical sample to draw inference about the demands of

the job. Questionnaires, interviews and observation are tools to analysis jobs. This analysis produces job description and job specifications. The following step is the **job design** that is " the process of structuring work and designating the specific work activities of an individual or a group to achieve certain organizational objectives" (Byars, (1)).
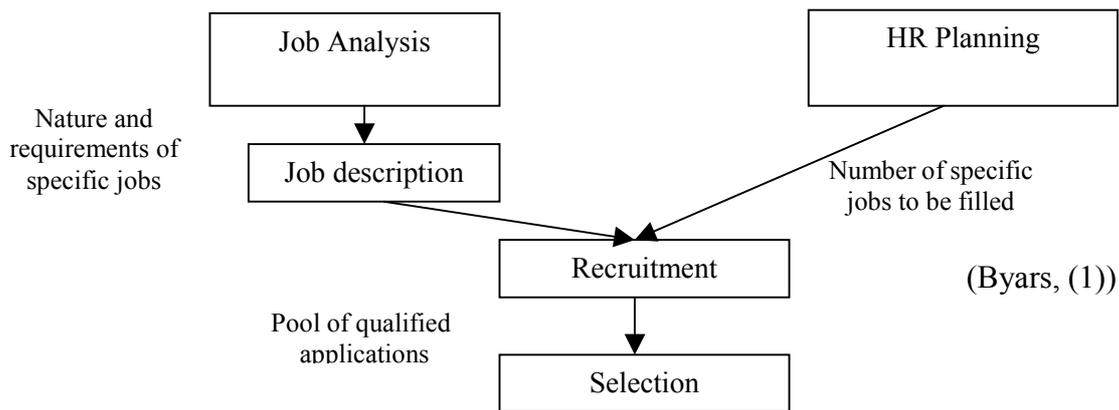
- **HR planning** that is " the process of determining the human resource needs of an organization and ensuring that the organization has the right number of qualified people in the right jobs at the right time ". (Ivancwich, (3)) First of all be familiar with the business strategy, define the impact of this strategy over the specific units of the organization. Define the skills needed and the additional human resources required and develop action plans to meet the needs.

Methods for forecasting and planning the HR needs:

1- Judgmental methods such as managerial estimates, and Delphi technique. Finally, Scenario analysis using work force environmental scanning data to develop alternative work force scenarios. Brainstorming between managers and HR managers to forecast the future, then the managers will go back to define changing points.

2- Statistical and modeling techniques using historical data to predict the future.
Time series analysis, personnel ratios, productivity ratios and regression analysis

3- Benchmarking is to carefully examine internal practice and procedures and
measure them against the ways other successful organizations operate. Forecast
methods will be compared to other successful organizations.

4- Determining the additional need using both skill inventory and management
inventory to specify all available data about the
current employees.

Depending on a single method of forecasting is not always accurate, in fact a mixture of different types of these methods may be very helpful according to the activity of the organization and type of data.

- Developing and implementing an action plan to meet the requirements.
- Recruiting the HR needed to fulfill the organization's goals.
- Selecting and hiring HR to specific jobs needed. The following figure illustrates the whole process

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      ┌─────────────┐                      ┌─────────────┐
      │ Job Analysis│                      │ HR Planning │
      └─────────────┘                      └─────────────┘
                │
Nature and      │
requirements of │
specific jobs   ▼
      ┌─────────────┐            Number of specific
      │Job description│          jobs to be filled
      └─────────────┘
                  ┌─────────────┐          (Byars, (1))
                  │ Recruitment │
                  └─────────────┘
Pool of qualified      │
applications           ▼
                  ┌─────────────┐
                  │  Selection  │
                  └─────────────┘
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5.2 Activities of the HR development & training function are:

▪ Orienting and training employees. Orientation is to introduce a new employee to the organization, unit and job. Training involves the acquisition of new skills, concepts, attitude that improves the employee performance.

▪ Designing and implementing management and organizational development programs that develops the experience, attitudes and skills of actual or soon to become managers.

▪ Building effective teams within the organization to face any emergency possible

▪ Assisting employees in developing career plans. Career development is an ongoing effort done by the organization to enrich its human resource to meet both the organization and the employ's needs.

▪ Designing performance appraisal systems for the employees that is " a process of determining and communicating to an employee on the job and, establishing a plan of improvement".(Dessler, (2)) Performance appraisal can focus on individual or the process. Three different approaches exist for doing appraisals: employees can be appraised against absolute standards, relative standards or objectives, no one approach is always best:

   1-Management By Objectives (MBO): used with professional and managerial employee. Involves setting specific measurable goals with each employee and then periodically reviewing the progress made, take corrective action if necessary and set new objectives.

   2-Absolute standards: means comparing the employee to a standard, and their evaluation is independent of any other employee in a work group. Theses standard may be driven from time studies work sampling, average production, expert's opinion. This group includes the following methods:

- Essay appraisal in which the rater prepares a written statement describing the

   employee's performance, quantity and quality of work, knowledge…etc.

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- Critical-incident appraisal, the rater keeps a record of positive and negative incidents of the employee, this considered as a basis to evaluate his performance.
- Graphical rating scale, evaluating factors like quantity of work, accuracy, attendance and others using an ordinal scale.
- Checklist is a yes/no questionnaire about an employee
- Forced-choice appraisal is a special type of checklist, the rater has two choose between two or more statements, the most descriptive. Each may be favorable or unfavorable.
- Behaviorally anchored rating scales (BARS), the performance done based on
  whether or not certain specially described job behaviors are present.

3-<u>Relative standards</u>: means comparing the employee against other individuals. The most popular relative methods are:
- Group order ranking requires the rater to place employees into a particular classification, such as " top 20 %".
- Individual ranking, rater lists the employees in order from highest to lowest.
- Paired comparison ranking is calculated by taking the total of [N (N-1)]/2. The
  employee score is the number of pairs in which this employee was preferred.
  Applying this method is difficult in large numbers.
- Forced distribution, the rater compares the performance of employees and places a certain percentage of employees at various performance levels. Assuming that the performance level in a group of employees will be normally distributed, this assumption makes it inapplicable in small numbers.

Number of employees

Does not meet expectations (20%)

Meets expectations (60%)

Exceeds expectations (20%)

(Byars, (1))

Performance evaluation ratings
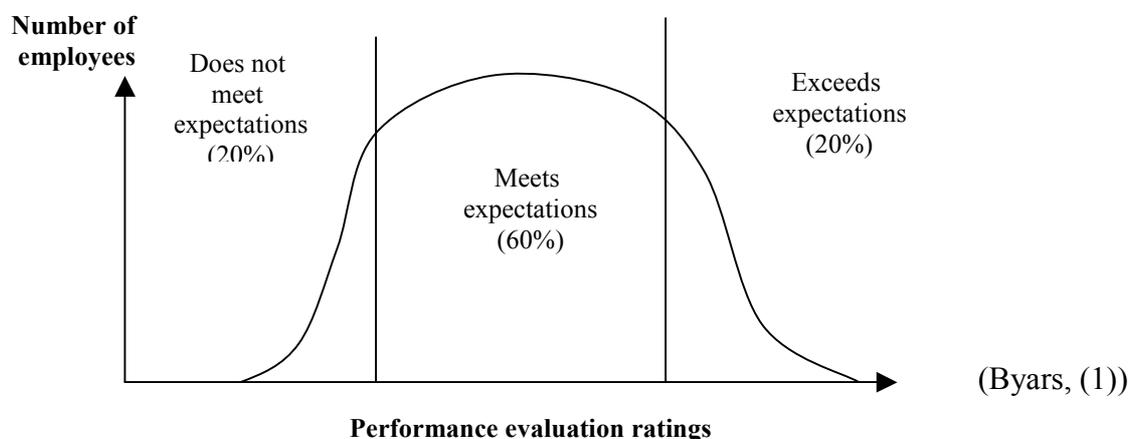
Several common errors have been identified in performance appraisals such as:

- Leniency when the manager's rating are grouped in the positive end and not spread through the scale
- Central tendency when the manager tend to rate his employees near the middle of the performance scale
- Recency when the manager rates his employee on work recently done only

- Hallo effect when the rater is influenced by a single prominent characteristic of the

employee, which effects his judgment resulting in giving this employee the same rating every time.

The usage of a single method is not recommended, actually a mixture is more appropriate.

5.3 Activities of the compensation and benefits function are:

- Designing and implementing compensation and benefits systems. The HR managers have to assist in this design and administer the system to minimize reward inequities. Payroll and HR applications should always be logically integrated - but not necessarily physically - because they have a lot of data in common and because they both support the same conpensation process.
Wage and salary curves show the relationship between the relative worth of jobs and their wages or salary rates.
- Ensuring that compensation and benefits are fair and consistent.

5.4 Activities of the safety and health function are:

- Designing and implementing programs to ensure health and safety. Improving safety of the working conditions can be done using the following approaches:
- Safety design and preventive approaches of the workplace through safety engineering.
- Inspection, reporting and accident research. The safety specialist is looking for: application of the safety rules, availability of safety guards and equipment, potential hazards and potential health hazards. Accident research involves computation of organizational accident rates and compares them with industrial and national figures to determine the organization's relative safety performance. Several statistics are computed.
The organization's statistics should be compared with the industry's statistics and government statistics. Also the trend of these ratios over time must be observed.
- Safety training and motivation programs. Safety training is part of the orientation program.

- Providing assistance to employee with personnel problems influencing their work performance.

5.5 Activities of the employee and labor relations function are:
- Serving as intermediary between the organization and the unions
- Designing discipline grievance handling system.

5.6 Activities of the HR research function are:
- Providing a human resource information base
- Designing and implementing employee communication systems

6. HR MANAGEMENT INFORMATION SYSTEM (HRMIS)

6.1 Benefits of HRMIS

Larger companies are integrating their separate HR systems (HRIS). An HRIS may be defined as interrelated components working together to collect, process, store, and disseminate information to support decision making, coordination, control, analysis, and visualization of an organization's human resources management activities. There are many reasons for installing such a system:

1- *Competitiveness*, HRIS can significantly improve the efficiency of the HR operation and therefore a company's bottom line, even for mid-size firms

2- *Improve transaction processing*. HRIS packages provide computerized processing of a wider range of the firm's HR transactions than would be possible if individual systems for each HR task had to be used.

3- *On-line processing* making the company's employee literally part of the HRIS.

4- *Improved reporting capability*. The HRIS can bump the firm up to a new plateau in terms of the number and variety of HR-related reports it can produce.

5- *HR system integration*. Because its software components are integrated, a true HRIS enables an employer to reengineer its entire HR function by having the IS take over and integrate many of the tasks formally carried out by HR employees.

6.2 HRMIS and the *Internet / Intranet* technology

As we've seen there is a wealth of information available on the *Internet* that employer and employees can use to help them carry out their HR tasks. Many employees find that the *Internet* is especially useful for searching for and finding jobs. Firms are reporting extraordinary results with their recruitment Websites. Synchronous and asynchronous *Internet*-based training are two other examples of how forms make the Internet part of their HR systems today.

Employers are also creating internal company *Internet* or "*Intranet*" as part of their HRMIS. A list of other HR related ways in which employers use the *Intranet* include:

- create an electronic employee directory
- automate job posting and applicant tracking
- set up training registration
- provide electronic pay stubs
- publish an electronic employee handbook
- offer more enticing employee communications and newsletters
- let employee update their personal profits and access their accounts
- conduct open benefits enrollment
- create discussion group
- manage succession planning
- provide leave status information
- conduct performance and peer review.

7. CONCEPTUAL DESIGN OF HR STATISTICAL PROCESS MODEL

As we mentioned above, this paper would provide a conceptual design for selected HR strategic applications identified in some HR functions in order to construct a HR decision Support System HRDSS. Our methodology for elaborating the conceptual statistical process model is based on using the hierarchical Inputs Process Outputs (HIPO) technique.

Hierarchical Inputs Process Outputs Diagram		
HR Function : Planning, recruitment and selection Strategic application: ***HR planning***		
INPUTS	PROCESS (Statistical Techniques)	OUTPUTS
- Past staffing levels (# of employees) in different departments - Amount of available budget - A standard for evaluating the work done	Time series analysis - Isolate cyclical effect - Isolate seasonal effect - Eliminate irregularities if possible - Project the trend using a suitable model (Regression, **M**oving **A**verage models, **A**uto **R**egressive models, **A**uto **R**egressive **I**ntegrated **M**oving **A**verage, Exponential smoothing models, …etc).	Projection of the staffing needed in the following period according to the budget and work needed to be done
- Personnel data	Personnel Ratios Projection done to total or key group of	Projected ratios for

	requirements using regression or different ratios. Productivity = [output/ inputs] $$= \frac{[\text{goods and services}]}{[\text{people, capital, material, energy}]}$$ Effectiveness = [sales in \$/ # of employees] The trend of scrap loss per unit of the firm	the productivity and effectiveness usage of raw material and sales per employee. Personnel ratios are then used to allocate total requirements to various categories or non-key groups.
- Sales - Scrap loss		
- Historical data on the department's workload - Number of employees in the concerned department	<u>Productivity ratios</u> P = [Workload / Number of people], see if it was constant or systematic? After establishing this relationship, HR requirements can be computed by dividing predicted workloads by P.	Prediction of HR requirements. Ratio such as output in units per employee hour worked for the entire organizational unit can then be computed.
- Production levels per period unit – Value added (outputs – inputs) - Staffing level	<u>Regression analysis</u> Building a regression model (linear- simple or multiple – or curvilinear) to establish the correlation between staffing levels and other related data, and define this relationship by an equation used for prediction later on.	Predicting the workload indicators help to identify the HR needs

Hierarchical Inputs Process Outputs Diagram

<u>HR Function</u> : Training and development <u>Strategic application</u>: ***Performance Appraisal***

INPUTS	PROCESS (Statistical Techniques)	OUTPUTS
- Questionnaires input data	<u>Absolute standards</u> Rating each question with in a questionnaire, and then using a predefined method to evaluate the rates (parametric/ nonparametric methods). A macro doing the routinely the analysis and compare it to standards.	Questionnaires results and reports
- Questionnaires input data	<u>Absolute standards</u> Rating technique and according to this technique draw inference by comparing different groups either to a selected group or to certain curve if the samples were large enough	Questionnaires results and reports

	to consider it normally distributed ($> = 30$).	

<u>Notice:</u> In absolute standards statistical consultant can help in writing different questionnaires, rating each question with in a questionnaire, and then selecting a method to evaluate the rates. All depend on the test chosen and the performance needed to be evaluated. Can also help in time studies work sampling to define standards.

In relative standards statistical consultant can help in deciding a rating technique and according to this technique draw inference.

Hierarchical Inputs Process Outputs Diagram		
HR Function: Compensations & Benefits Strategic application: *Compensation & Benefit System*		
INPUTS	PROCESS (Statistical Techniques)	OUTPUTS
- Information from the payroll system (such as salaries, allowances, incentives, deductions,…etc)	<u>Statistical reports and curves</u> - Different statistical estimates (mean, variance, coefficient of variation,…etc) - Draw wage and salary curve by placing the jobs in ascending levels of difficulty along the x-axis, and the wage rate along the y-axis. - Effective rations such as payroll cost by unit per employee grade could be also calculated.	Statistical reports expressing the relation between the payroll and HR application. Also wage/ salary curve and effective ratios.

Hierarchical Inputs Process Outputs Diagram		
HR Function: Safety and Health Strategic application: *Inspection, Reporting and Accident Research*		
INPUTS	PROCESS (Statistical Techniques)	OUTPUTS

- Accident data (such as # of accidents, compensations paid, cost of accidents, medical report data, …etc)	<u>Statistical reports and trend determination</u>
	Accident frequency rate is computed per million hours of work, accidents used are the ones causing lost of time:
	- Frequency rate =
	  <u>Number of accidents x 1,000,00</u>
	   Numbers of work hours in the period
	 - Accident severity rate =
	   <u>Number of workdays lost x 1,000,000</u> ,
	   Numbers of work hours in the period
		Statistical reports relating to different accident ratios. Deviation in the ratios calculated against the standard levels is marked.

- The national standards of accidents	- [Number of illnesses and injuries x 200,000]/ Total hours worked all employees for the year - Other ratios like: compensation paid for accidents per 1,000 hours worked, accidents by type, accidents classified by type of injury to each part of the body, and average cost of accident by part of the body involve. The organization's statistics then compared with the industry's statistics and government statistics. Observe also the trend of these ratios over time.	The trend in rates is also drawn

8. CONCEPTUAL DESIGN OF HR STATISTICAL DATA MODEL

The nature of data elements needed to perform the above calculations is detailed and aggregate data. Those data will be gathered and stored in the application data models of different departments in the organization (HR dept., marketing dept., accounting and finance dept, production dept. and quality control dept).

The needed fundamental data entities:

- **Employee entity** (Emp-code + Nationality-code + Emp-name + Emp-sex + Religion- code + Military-status-code + Job-code + Section-code + Emp-birth-date + Emp-birth-place + Emp-address + Government-code + Union-code + Social-Security # + Emp-file # + Assignment-date).
- **Employee contract** (Emp-code + Emp-contract # + Contract-date + Section-code + Emp-contract-end-date +Emp-contract-job-code + Emp-contract-type + Emp-contract-salary + Emp-contract-salary-type + Emp-contract-audit-stat)
- **Employee jobs** (emp-code + job-code + job-vac-method-code + emp-job-start-date + emp-job-end-date + emp-job-status)
- **Salaries-period** (Work-place-code + Salary-start-date + Salary-end-date + Salary-month)
- **Special-rais** (Rais-year + Rais-percent + Rais-type + Rais-add-year)
- **Allowance-region** (Specific-allow-code + Work-place-code + Allaw-region-value-type + Allaw-against-attend + Allaw-against-productivity + Allaw-region-min-attend + Allaw-region-base)
- **Bonus-gifts** (Bonus-date + Decision-year + Decision # + Deserving-type + Bonus-period + Bonus-max-value + Bonus-reasons)
- **Medical-report** (Emp-code + Medical-report # + Medical-report-year + Medical report-date + Medical-abroved-vacation + Note # + Note-year + Medical-report-description + Medical-report-abroved)
- **Work-infection-notification** (Emp-code + Infection-date + Sec-code + Infection-place-type + Accident-place + Infection-notification-date + Infection-reason + Infection-part)
- **Termination** (Emp-code, Termination-date + Termination-type + Termination-reason + Decision # + Decision-year)
- **Age terminate settlement** (Emp-code + Termination-date + Avg-variable-salary + Avg-basic-salary + Tot-insurance-periods)
- **All or partial inability** (Emp-code + Termination-date + Avg-variable-salary + Avg-basic-salary + Tot-insurance-periods)

During the technical design of the data models extra types of data entities will be added in order to satisfy the performed statistical calculations included in the conceptual process model presented above.

Other aggregate and standard data are also needed such as: Total number of employees per staffing category – Total amount of compensation in the budget –

Standard and actual number of administrative transactions per day – Total sales per month/ year – Total scrap loss per month / year … etc.

9. CONCLUSION

HR managers become able to reengineer the way HR department executes its job, accomplishes those transactional HR job's cost-competitively, and increasingly turn its attention to truly being a strategic partner with the firm's top executives.

A HR function can and should be strategically integrated with a company's business plan to help the company to achieve its business objectives.

Firms are increasingly moving beyond manual HR systems today, by computerizing individual HR tasks, installing HR Information Systems, and using the Internet and Intranet technology. In this context, information technology can support HR managers not only in achieving the traditional HR functions but also in applying the concepts of strategic planning.

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