

Human Resources Information Systems: Concepts, Functions and Objectives

G. A. ABBINK and K. TEJANI

1. INTRODUCTION

In Pakistan, there is a growing appreciation of the fact that the country's economic and social development is greatly dependent upon its ability to effectively develop and utilize its human resources. Moreover, it is increasingly realized, that, to effectively influence developments in this sector, it is essential to base the formulation and implementation of plans and policies on comprehensive (i.e. relevant, reliable, systematized and up-to-date) *information* on key aspects of *human resources*.

Unfortunately, such comprehensive information is not available to its users. As a result, it is almost impossible to obtain a realistic appraisal of the country's major labour market or, more generally, human resources problems, options and priorities. Besides being of limited use to formulate realistic plans and policies, the task of monitoring and evaluating the impact of policy implementation almost becomes unmanageable.

While reviewing studies on the 'Labour Market Information System' (LMIS) in Pakistan, it can be observed that the *information aspect* is emphasized, whereas the *system aspect* is left untouched. In addition, these studies more or less presume an already operating 'system', which may (or may not) deliver the expected Labour Market Information (LMI).

It is not coincidental that man studies on LMIS in Pakistan show numerous deficiencies which are purely information related. These deficiencies are a clear result of the absence of a well-structured system [see Tejani, working paper 90/11, (1990)]. In the absence of an information system with its checks and balances, deficiencies in human resources information are likely to result in mismanagement of scarce resources.

The overall lack of conceptualization has lead to ad-hocism and obviously frustrates efforts to establish a genuine information system. At this stage, it seems, therefore, imperative to provoke thoughts on the systematization of data and

information on human resources within a broad framework of a so-called Human Resources Information System (HRIS).

2. DEVELOPMENT OF A HRIS VIEWED FROM DIFFERENT PERSPECTIVES

In order to give due consideration to the observation that user needs change at different stages of development, the nature of a Human Resources Information System should be that of an open system. The system in other words should be dynamic of nature. Open systems do not operate in a vacuum and as such function within some sort of environment (immediate and remote). The environment, first of all, defines the rules of the game, i.e. provides the (political, legal, and socio-economic) setting for the HRIS. Secondly, the environment consists of actors (individuals or institutions) interacting with the system. The development of a HRIS can be viewed from two different perspectives, namely:

- The multi-user perspective emphasizing the system's capability of fulfilling the information requirements of different users; and
- The research perspective, highlighting the need for continuous research (e.g. to identify target groups and problem sectors in the economy, information gaps).

Multi-user Perspective

Users tend to perceive an IS as a collection of statistics on human resources supporting them in performing their tasks. As a result of this, there has been a morbid growth of information systems which mainly serve the purposes of individual users.¹ Such systems are in fact no more than single-user oriented data bases. The proliferation of such information systems severely limits their usefulness, since they normally lack compatibility with similar or complementary systems, and therefore could imply duplications and neglected areas.

Two groups of using actors can be distinguished: active and passive users. The first group consist of planning agents and executive agents (like policy-makers, captains of industry) belonging to the immediate environment of the system and who can influence the setting in the short or medium term or launch initiatives at the macro-level. The second group of passive actors belong to the remote

¹For instance, some researchers limit the scope of the LMIS to labour market statistics obtained from employment exchanges in order to sense the labour market.

environment and consist of individuals (like job-seekers, employees, employers, etc.) and institutions (like small or medium-sized establishments) unable to influence the setting and who are only in the position to initiate micro- or meso-level action and reaction. It is obvious that both groups of users would benefit from a comprehensive information system provided that it is responsive to the information they desire.

Research Perspective

The research perspective is basically problem oriented. It acknowledges the fact that for effective analysis of issues specific data are required. In this respect, a HRIS should (1) incorporate a systematic framework to enable identification of these specific data requirements, (2) contain a database allowing for retrieval of (and access to) relevant information, and (3) allow for identification of information lacunae. To fill identified information gaps, basic research activities have to be initiated resulting in the production of additional information, which needs to be incorporated in the existing system. Basic research activities would be for instance assessment of training needs, tracer studies of pass-outs from technical or vocational training centres, cost-benefit analyses (or cost-effectiveness studies) on the performance of employment exchanges, target group studies and specific informal sector studies.

3. OBJECTIVES OF THE HUMAN RESOURCES INFORMATION SYSTEM

Broadly speaking, systematized information on Human resources is needed for the following objectives.

Effective Planning and Policy Formulation

The HRIS is to provide support for future planning activities and for policy formulation at macro, meso and micro levels related to e.g. investment decisions, employment promotion, human resources development and utilization etc. The historic HRI forms the basis for forecasting and estimating future human resources availability and requirements.

The HRI also enables identifying the imbalances and making policy recommendations based on the imbalances found and expected.

Labour Market Diagnosis

The HRI is essential for diagnosing the labour market. In this context Ghayur (1989) points out that the "exercise of labour market diagnosis is required

basically to be carried out at the local and regional level i.e. the villages and districts. This can then help in identifying the areas/sectors/occupations having scope for further employment *inter alia* also indicating the changing education and skill requirements. Similarly, the target and vulnerable groups in the labour force can also be identified by such diagnostic efforts”.

Labour Market Diagnosis contributes towards signalling (i.e. anticipation of changing trends and need for policy intervention) of changing occupational and sectoral labour demand and identification of vulnerable groups and areas. It also contributes towards an effective utilization of the available human resources.

Labour Market Intermediation

The HRIS is indispensable for facilitating the matching activities (i.e. matching of demand and supply of labour) and for vocational career guidance and employment counselling.

Monitoring and Evaluation

The continuous availability of HRI allows monitoring of the current human resources demand, supply and imbalances, and evaluation of the impact of policy implementation on the development and utilization of the human resources.

Research and Development

The HRIS is to provide a comprehensive and uniform basis for research and development. The HRI can be used as a basis for further research on issues related to the effective development and utilization of human resources. Examples of areas of such research are informal sector, training needs assessment, identification of vulnerable groups and problem sectors.

4. THE COMPONENTS OF THE HUMAN RESOURCES INFORMATION SYSTEM

A HRIS contains data and information related to economic characteristics of human resources. This implies that a HRI system does not merely contain data and information regarding individual human beings, but also on their economic relations.

A HRIS can now be defined as a “system that provides support to the immediate environment by effectively supplying information to authorized users in a timely manner”. The HRIS hence can be perceived as an open system i.e.

a system which continuously exchanges with the environment. These exchanges (through information, feedback, action and reaction) are specifically shown below in Diagram 1 because it is important for people perceiving the system to understand that such exchanges affect the future performance of the system. Diagram 1 depicts such an open system with its components where data is entering the system from the environment and being processed into information. Diagram 1 also reveals the interface function of the HRIS.

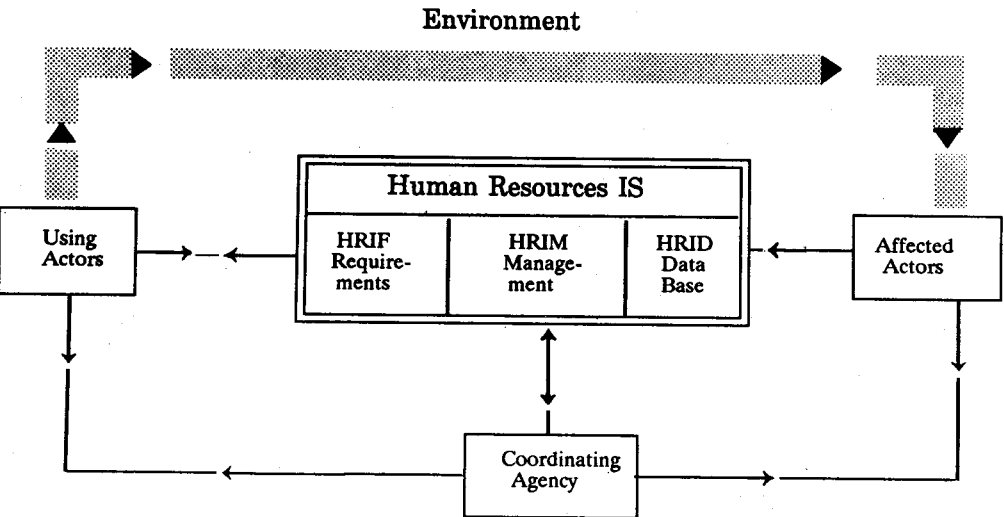


Diagram 1. The Human Resources IS and its Environment

Users of the information produced by the HRIS, in turn, utilize this information to make decisions. The actions resulting from the decisions have an impact on the environment [i.e. on the attributes of the (affected) actors]. The new values of the attributes, resulting from the reaction of the (affected) actors add new data to the system. This process resulting from the fact that the HRIS is an open system, with continuous exchanges with the environment, more or less forces the HRIS to be of a *dynamic nature*.

The HRIS consists of three components namely: Human Resources Information Framework (HRIF), Human Resources Information Database (HRID) and Human Resources Information Management (HRIM). The integration of these three inter-related components forms the HRIS. Actually, the HRIS functions as an interface between various actors of the HRIS's environment. This

interface function enables information dissemination to users to base their decisions upon, i.e. to allow them to monitor their specific field of interest and to allow them to identify options for possible action.

Human Resources Information Framework (HRIF)

The HRIF has an Infological function, which specifically refers to the type of information required by the users. In practice, this function is necessary to enable a comprehensive and systematic organization of information requirements regarding human resources.

The HRIF can best be illustrated in a matrix form as shown below in Table 1. In this matrix, four broad categories of actors are distinguished, notably FACTORS (labour, capital, land), SECTORS (civil services, productive sectors), INSTITUTIONS (private, public), and the rest of the world (ROW).

The structure of the matrix is most simple.² Row and column headers represent actors. There are direct and indirect relations between the four major (groups of) actors, which are enumerated in each intersection of a row and a column.

For the intersection of factors and sectors there are two possible cells: FACTORS * SECTORS and SECTORS * FACTORS. The former contains the primary factor allocation which leads to the delivery of factor services to sectors, while the latter shows the delivery of training services from sectors to factors. Thus, row entries indicate real outputs of actors, while real inputs of individual actors are listed in their respective column entries.

Cell items preceded by a dash (-) also have a financial aspect. The factors employed in sectors deliver their labour services to sectors but are compensated by a payment (wages, salaries, etc.) from sectors to factors. In other words, these items generally imply genuine economic relations (or transactions).

There are, however, transactions that have no (or a less important) economic aspect (in the sense that they do not incur financial flows), but nevertheless signify meaningful elements in the HRIF. These items are preceded by an addition (+) sign. For example, sectors (establishments in the form of training programmes) provide training directly to workers normally without any recompensation. As another example, the only relevant 'intermediate deliveries' (from the

²The presented framework for the structuring of human resources information is similar to that of the social accounting matrix (SAM). The SAM and HRIS may be called supplementing aspect systems since they focus on different attributes of the same system entities: the SAM highlights the economic transactions while the HRIS emphasizes the human resources aspect.

Table 1
Human Resources Information Framework

	FACTORS	INSTITUTIONS	SECTORS	ROW
FACTORS	Labour/Capital/Land			
	- On-the-job Training		- Primary Factor Allocation	- Overseas Employment
INSTITUTIONS				
Private	* Legal Framework	* Legal Framework	* Legal Framework (e.g. Licensing, Warranties for Competition, Labour Laws)	* Legal Framework
Public	+ (Re) Production of Primary Factor Services	- Social Security Scheme - (Re) Distribution of Civil Services * Socio-economic and Political Environment		
SECTORS				
Civil Services	+ On-the-job Training	- Health Services	+ Apprenticeships	- Training of Expatriates
Education	+ Vocational Training	- Education	* Embodied Technology	
Health		- Educational/Vocational Guidance		
Other Civil Services		* Science		
Productive Sectors		- Research and Development		
Private		- Civil Works		
Public		- Public Services		
ROW				
	* International Legal Framework	* International Legal Framework	* International Legal Framework	
	- Expatriate Workers	- Foreign Education	- Foreign Training * Embodied Technology	

human resources point of view) between the educational/vocational training sector and the other sectors are apprenticeship training programmes, which, again, normally do not entail any financial flow between sectors.

Finally, items lead by an asterix (*) indicate the constraints imposed by the environment. The legal framework and the socio-economic and political environment provided by institutions, but also the present state of science and technology provided by sectors are all obvious examples that determine the setting.

In an open economy like Pakistan's, the rest of the world (ROW) plays an important role as an actor competing for scarce labour resources (in parallel with the domestic labour market).

For the development of human resources, labour economists normally assume a direct relation with training and education imparted by the educational sector. This sector, however, provides educational services to households (belonging to institutions), or in the case of public education to the government as an intermediating institutional actor. Households, on their turn, decide on the type and amount of labour services to be made available for the labour market.

Human Resources Database (HRID)

The Human Resources Information Database focuses on the structure of the database of the IS and as such represents the system's Datalogical function. It systematizes procedures for data collection, storage, retrieval, compilation, etc. The HRID incorporates the main aspect included in all current data systems, viz. the sources of data regarding human resources. It also implies that an information system need not to be started from scratch but is to be based on the available and existing sources of data. In other words, the HRID basically provides an inventory of available data sources. These sources do not only contain statistical but also non-statistical data.

In its rudimentary form, the HRIS should contain data and information regarding:

- The Labour Market (Table 1 : it is the cell Factors * Sectors);
- Human Resources Development (Table 1 : Sectors * Institutions, for public education Institutions * Institutions, and for on the job training Sectors * Factors); and
- Potential Workforce (Table 1 : Institutions * Factors).

Concerning non-statistical intelligence, information on the following phenomena, and on the reasons for them, may be included: employment problems

which are particularly acute for specific categories of workers, such as females and young workers; employment problems related to the recruitment, retention and effective utilization on workers; adequacy of educational and training programmes; labour legislation in relation to employment practices; problems relating to labour mobility; and issues pertaining to multiple job holding.

Rural workers suffer from acute underemployment and earn dismally low incomes. Many Asian countries increasingly feel that their development strategies must place greater emphasis on the rural hinterland. Special attention should be given to collecting human resources information on the rural workforce as a prerequisite to raising the standard of living in rural areas. Specifically, data and information would be needed to:

- (a) Identify the poverty groups in rural localities;
- (b) Ascertain the magnitude and characteristics of labour surpluses and skill shortages in specific rural localities during different seasons of the year;
- (c) Ascertain income levels in rural areas, including prevailing wage rates; and
- (d) Identify the possibilities of increasing productive self-employment in rural areas.

Human Resources Information Management (HRIM)

The HRIM has a Systelological function. The concept of Systelological function refers to an indispensable component of the HRIS namely system monitoring and system management. It assures proper functioning of the system.

Frequently, the terms data and information are used synonymously. Technically speaking, this is incorrect as data refers to facts whereas information refers to what people use to make decisions. When data is filtered through one or more processors (i.e. the human mind or computers) it then transforms into meaningful information. As this information is generated from data, it too eventually becomes part of the same database.

The distinction between data and information is important to clarify that the HRIS is not merely a collection of statistics or data on Human Resources. As there are many users of the same database, data *per se* is not meaningful. For data to become meaningful information, it has to undergo appropriate filtering and processing procedures. By applying different filtering processors for different users, the data on Human Resources can be transformed into meaningful Human

Resources Information. As such information becomes a *key resource* for planning and decision-making processes.

Human Resources Information Management is a concept by which information is recognized as a *key resource* that should, as any vital resource, be properly managed. Sound Human Resources Information Management ensures effectiveness (which addresses system outputs) and efficiency (which addresses the use of resources to produce results).

The function of the HRIM is to ensure and safeguard the below described information properties as much as possible through a continuous process of monitoring, evaluation, feedback and course-correction:

- Information is accessible to those who need it (i.e. availability);
- Information is understandable to those who need it (i.e. comprehensibility);
- The information has a bearing on matters pertaining to the user (i.e. relevance);
- The information is in a form that makes it capable of being used (i.e. usefulness);
- The information is available at the right time (i.e. timeliness);
- The information is counted on to be trustworthy (i.e. reliability);
- The information is correct (i.e. accuracy); and
- The information is not self-contradictory (i.e. consistency).

Within the system, it should manage the process of filtering and processing of data into appropriate information as required by a particular user. This is the internal management task as opposed to the external management task of the coordinating agency. In this context, Richter (1978) mentions that it is useful to distinguish between producers and users of HRI though such a distinction is not always clear-cut. While central statistical services approximate what may be called a “pure” producer and planning ministries or agencies a “pure” consumer, other ministries, public institutions and services and semi-public and private organizations are both producers and consumers of the HRI [cf. Richter (1978)]. It is for this particular reason that instead of using the terms “producer” or “user”, we use the term “actors”.

Hence the role of the coordinating agency is to provide an institutionalized forum for a continuous dialogue to stimulate joint efforts and close working relations. This is the primary external management task of the coordinating agency. This external management task supports the implementation of the HRIM func-

tions which are purely inward oriented or internal.

Periodically the functioning of such an information system should be monitored and evaluated. Monitoring can be done through periodic performance reports on the system's performance (i.e. internal monitoring). Evaluation can be done through user surveys (i.e. external evaluation) to determine how satisfied users have been in terms of meeting user needs.

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Comments on
“Human Resources Information Systems:
Concepts, Functions and Objectives”

Effectiveness of employment and manpower development policies, if any, are crucially linked with the availability of a comprehensive labour market information system (LMIS). A system which properly addresses to its three main functions, namely (i) labour market information, i.e. generation of data, (ii) labour market diagnosis, i.e. continuous monitoring and evaluation of changes occurring in the labour markets, and (iii) labour market intermediation, i.e. on the basis of the first two functions, undertaking employment counselling and vocational guidance as well as doing matching operations. The development of such a mechanism in Pakistan, unfortunately, remained a low *prioritised* area for a long time. This resulted in a haphazard development of the system nearly devoid of a meaningful integration among different actors, i.e. producers, users, different institutions and individuals, as well as establishment of institutions without necessary legal and administrative support. The obvious consequences of such an environment were the duplication of efforts and activities in some areas coinciding with almost nil on others as well as insignificant attempts at employment counselling, vocational guidance and matching operations.¹

The earlier works in this field, with some exceptions,² did not seem to have gone into a detailed analysis of the existing system, thereby identifying the gaps and suggesting concrete remedial measures – hence failed to serve as a feed-back to policy-makers. Realising this gap, the National Manpower Commission devoted two out of its thirteen chapters to this issue, wherein a comprehensive institutional mechanism has been suggested. But there is always room for improvement and need for additional investigative work.

The present paper is a welcome addition to this area. It deals with the conceptual and methodological issues and addresses in detail the components and functions of the system and elaborates the major aspects of a HRIS data base. The efforts of the authors are commendable for giving a systematic treatment to the issues covered in the paper.

¹For details see [National Manpower Commission (1989), Chapters 12 and 13] and Ghayur (1990),²

²In addition to 1 above also see Government of Pakistan (1984).

So far as the generalisations of the authors concerning the system as a whole are concerned there are no disagreements. I would also like to emphasise the need for establishing a well-defined information system, LMIS or HRIS, or whatever other name is given to it, so as to avoid duplication of efforts and mismanagement of scarce resources.

I feel that there are certain areas in the paper which needs further discussion and elaboration. Similarly, some of the broad conclusions of the authors at least need a re-examination. Both of these are discussed separately in the following paragraphs.

GENERAL COMMENTS

Despite some of the references given in the text, it appears that the authors have carefully read some other studies especially Chapters 12 and 13 of the Report of the National Manpower Commission. Otherwise serious limitation of the existing works concerning (i) conceptual clarity (ii) confining to the information aspect; and (iii) inability to provide framework for the establishment of a system and its component, would not have been stated.

Similarly, I would disagree with the authors about their contentions of non-existence of the system. This system does exist, but certainly is far from the satisfactory level.

One area which surprisingly remained aloof of the ad-hoc approach of our policy-makers towards a given situation has been the LMIS. This may be due to preoccupation with other pressing engagements which did not allow them to experiment with such an approach here! Nevertheless, it is clear that the system which developed incoherently did receive continuous support for its upgradation. Therefore, I would tend to disagree with the authors' assertions about the use of ad-hoc approaches for the LMIS.

The observation of the authors that labour is a scarce resource in Pakistan and is being affected by the international environment does not hold to seem true in the sense it has been argued in the paper.

SPECIFIC COMMENTS

The authors have given a fairly elaborate treatment to concepts, objectives and functions of the system. But one is amazed when he finds important linkages missing. One would have expected discussions on how to make the system operational by identifying the action (s) specific actor (s). And also as how to make

the intermediary and diagnostic role more effective.

Similarly, discussions on the existing institutional mechanism of the information system is missing. These are the areas where a feed-back to policy-makers is to be provided regularly. Their omissions from the paper is especially felt more when one sees an extensive treatment to the procedural formalities in sections one to four of this paper. In fact, such a space could have been used either for undertaking an analysis of the existing system or discussing its operational aspects.

CONCLUDING REMARKS

Obviously an elaborate treatment of the issues involved in developing an effective information system is a big task. And to expect such a delivery in a conference paper is somewhat too demanding. But one really expects such treatment from the present authors as they are among the few experts who are really putting extra efforts for developing such a mechanism under the Dutch Project in Pakistan. In the end, let me once again congratulate the authors for presenting an extremely useful paper in an area where very little work has been done. This paper, even in the present form, is a useful addition but with certain additions would serve as a good reference in the field of information systems.

Sabur Ghayur

Friedrich Ebert Stiftung,
Islamabad.

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