Information systems on human capital in service sector organizations

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Abstract

The growing service sector leads to rapid changes of today's economy from an industrial society to a so-called knowledge society. Traditional values of organizations – often named "bricks and mortar" – become less important. Instead of those values of human resources with all their abilities and skills become the most important value drivers in many organizations. This paper illustrates the history of the measurement on human capital, gives a brief overview of the different concepts and methods of human resource accounting, and points out the problems of this research area. With the new possibilities of information technology, there is a new chance to solve some of the problems allied to human resource accounting. The paper demonstrates some main aspects that have become accountable by developing human resource accounting systems for the service sector.

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Introduction

"Our most valuable resource is our staff." Almost every management or business report includes such a statement or the like. Today's post-industrial society – often called the knowledge society – no longer focuses only on the traditional values of industrial organizations. The real value of modern organizations is less frequently "bricks and mortar". Especially in the growing service sector it has become generally accepted that the critical success factor of an enterprise is to be seen in the company's staff with all the knowledge and abilities. Therefore reporting about the value of an organization is more and more attached to the value of the personnel resources (human resources, human assets).

However, most of the organizations are not able to supply statements about the value of their human resources beyond the one mentioned above. Although these corporations have the insight that their most substantial value driver is the company's staff, they do not know how to assign any value to it. Human resource accounting (HRA) deals with the measurement of the value of human resources. The concepts and methods of HRA examine what information is necessary and how this information has to be combined to determine the value of human resources.

The article gives a brief overview of the origin, the development and the methods of HRA. After discussing some general problems of HRA, more details on what to have in mind implementing HRA in the service sector are shown. Finally, the role of information professionals during the implementation process of HRA for the service sector will be discussed.

Definitions and possible fields of application

There is no uniform use of the term human capital. The terms human resources and human assets are often used synonymously, as seen in the bibliographies. Beyond that there are also many different uses and allocations of the terms knowledge capital, intellectual capital, intangible assets and structural capital. There are more terms used for the research area of the measurement and evaluation of values, which do not find an

New Library World
Volume 104 · Number 1184/1185 · 2003 · 33-41

input in the classical assessment of a company's value. Generally spoken, the term human capital can be defined as the abilities and skills of a certain group of people or an individual person that have economic value (Schultz, 1961).

The term HRA was created by Brummet *et al.* (1968), which worked for the first time under this term on measurement of the human values in an enterprise in the year 1968:

> Human resource accounting is the process of identifying, measuring, and communicating information about human resources to facilitate effective management within an organization.

Although this definition clarifies the sub-areas of HRA, the restriction of HRA for internal purposes seems to be too constricting. In today's economy it is more and more important to reveal information about the values of organizations. Whenever there is a transition of a business share to another owner, the question is about the value of such a proportion of the corporation and therefore about the value of the enterprise in its whole. HRA can serve as a tool to reduce information asymmetries.

To reduce the lack of information (West and Courtney, 1993) the offeror of a business share wants to support his argument of the real values of the company as well as a potential buyer needs this information to ensure his investment.

> The point of departure in this choice is that it is the users of annual reports themselves (e.g. shareholders, capital providers) who prepare an economic valuation of the business. By providing them with reliable information on the development of intangible assets, they are enabled to prepare such economic valuation by making a more accurate estimate of the business' future cash flow potential and the accompanying risk profile (PricewaterhouseCoopers, 1999).

Historical development of HRA

HRA itself represents a still quite immature discipline, although it was already seen in bibliographies at the beginning of the 1960s. Admittedly the political economists of earlier centuries dealt with the evaluation of workforce. It was Sir William Petty who tried to find a monetary value for the effects of emigration and wars in Great Britain in the year 1676:

> ... suppose the People of England be Six Millions in Number, that their Expense at 7 £ per Head be Forty-two Millions; suppose also that the Rent of the Lands be Eight Millions, and the yearly Profit of all the Personal Estate be Eight Millions more; it must needs follow, that the Labour of the People must have supplied the remaining Twenty-six Millions, the which multiplied by Twenty (the Mass of mankind being worth twenty Years Purchase as well as Land) makes Five hundred and twenty Millions, as the Value of the whole people (Petty, 1691).

Besides Petty, many of the well-known political economists such as Smith, List, von Thuenen, Marx and Marshall recognized the importance of the workforce and the necessity to take the human factor into economic account.

In the 1920s, there were the first corporate decisions dealing with the value of organizational workforce. As an example, General Motors paid for the acquisition of the German car manufacturer Adam Opel AG US$33 million, instead of the book value of US$18 million. The reason for this was named in the high potential staff of Opel (Sloan, 1963). Building up conceptual frameworks for the measurement of human capital in corporations only started in the 1960s.

In this first phase, it represented a derivation from different disciplines such as the human capital theory and the organization psychology. In the second phase, from the middle of the 1960s through the beginning of the 1970s, the research began with the development of approaches on the basis of historical and replacement costs as well as monetary and non-monetary values. The third phase, from the beginning through the middle of the 1970s, was characterized by broad attempts to bring the developed approaches of HRA into operation in different organizations. In the fourth phase, the time from the middle 1970s through the end of the 1970s, the development and research in HRA clearly leveled off. The discussions grew silent due to problems with data acquisition and evaluation. The methods of HRA had become so complex that only few people at all had the necessary qualifications for execution (Flamholtz, 2001).

However, at the beginning of the 1980s, the topic aroused multiple interest again, especially US enterprises, who found themselves in increasing competition with Japanese large-scale companies. The

Japanese, contrary to the US "hire-and-fire" philosophy, preferred a lifelong engagement in one enterprise. The competitive edge in productivity of the Japanese corporations was seen in the protection of the human capital by this completely different approach. Moreover, the industrial nations were on their way from an industry society to a service society. Thus the meaning of the term "human" in economics grew. Although it has been stated that the valuation of human capital makes sense, at the end of the 1980s, the statement remained that the existing problems with the applications of HRA were not yet solved (Scarpello and Theeke, 1989). At the beginning of the 1990s, many scientists saw HRA just becoming fashionable.

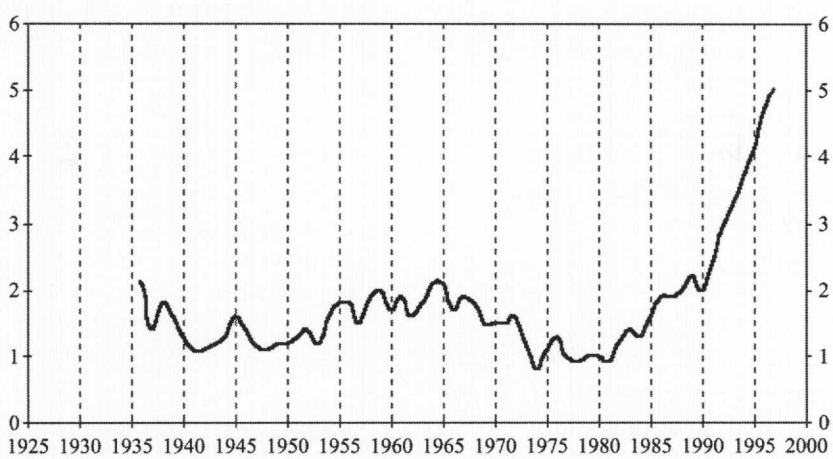
Development of HRA in recent years

Nevertheless, the need for more information about the constitutive factors for the value of a company continued to rise. This resulted from the ever-more increasing gap between the book values and the market values of many companies.

As shown in Figure 1, it has been shown that the relation of market prices to the book prices of the companies oscillated between one and two over several decades. Only at the beginning of the 1990s, was a strong rise of this relationship detected. Although an explanation of this development cannot reliably be supplied here, a basic approach can be seen in the rising interest of all society members in the capital markets. However, even with validity of such an acceptance the question remains: why would rational people pay prices for business shares of companies, which clearly deviates from the values that these companies prove in their balance sheets? Since, assuming these are rational human beings, these market prices rest on the basis of a benefit calculation for the respective investor, then a further assertion approach is thus situated in the fact that these investors obtain an equivalent for the paid market price, which is situated clearly over the book value. Thus there are assets in the respective organization, which do not become visible in the balance sheet of the company.

Meanwhile, the concepts of HRA were taken up again in the Anglo-American and Scandinavian areas. It seems that the theories of HRA lived to see a resurgence and the advancements to practicable models started up again. Newer approaches concerning the improvement of information supply by annual reports are publicized under the designation of, but not limited to, HRA. They not only focus on human assets, but also on other values that are not included in the total assets of the balance sheets. This is, for example, the customer capital or a brand name. These approaches are termed intangible assets or intellectual capital (Sveiby, 1997; Bontis, 2000; Lev, 2001), and, more frequently, practical examples for the use of these approaches – such as the Skandia Navigator (Edvinsson and Malone, 1997) or the intangible asset monitor (Celemi, 2000) – can be seen.

Figure 1 Market/book price ratios



Note: Chart created by GOLD EAGLE Technical Staff. http//www.goldeagle.com
Source: Deutsch and Vronsky (1997)

New Library World
Volume 104 · Number 1184/1185 · 2003 · 33-41

Methods of HRA

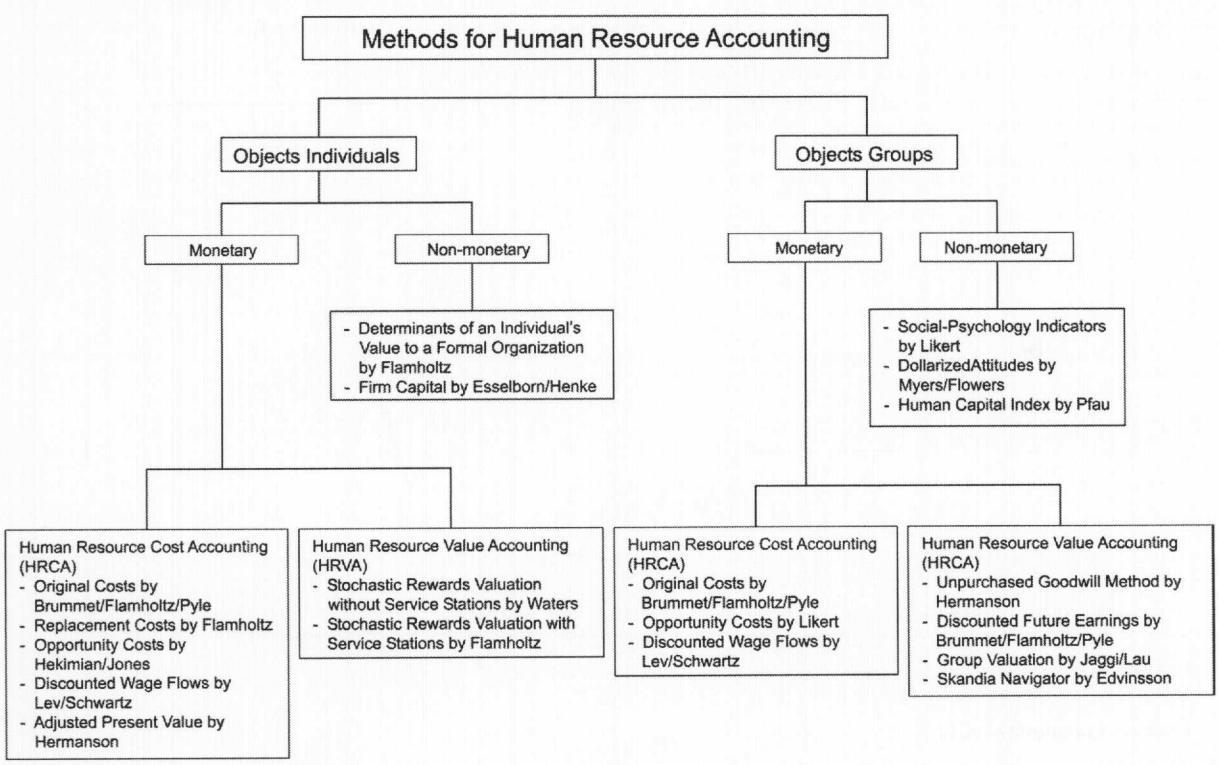
HRA set itself to the target to contribute to clarifying the gap between the market and the book value and thus to execute the evaluation of enterprises on the basis of a substantial factor, the available personnel. The procedures can be classified on the basis of two distinctive features – first, the evaluation object and, second, the dimension of the result. Regarding the evaluation object, some methods target the evaluation of individuals; other methods are aligned to observe the evaluation by means of groups (see Figure 2).

The second distinctive feature, the dimension of the result, deals with the determination of monetary and non-monetary values for human capital. The non-monetary methods are directed at the determination of percentage numbers or at a number on a specifically created scale. However, it is noted, that these non-monetary key figures implicate some problems. A monetary size is self-explanatory, which permits one's own interpretations or further calculations, without deep-going concentration on the scale, on which it is illustrated.

This is not mandatory with non-monetary sizes. In order to be able to meet predictions about non-monetary sizes, it is mostly necessary to attain knowledge of the scale that has been used. Thus, non-monetary sizes do not form a standard. Comparisons with other results, maybe calculated with a different method, will be hardly feasible. Beyond that, the danger of the manipulation is larger, since there are usually no definitions and control mechanisms for such key figures. This is frequently given with monetary sizes, i.e. with the certification of a financial statement. Furthermore, non-monetary key figures usually produce an additional expenditure. Many of the monetary key figures must be determined for legal or competitive reasons. There is often no obligation for non-monetary key figures to calculate them.

The monetary methods can be differentiated in cost- and value-based methods (Sackmann *et al.*, 1989). The cost-based methods used for valuation of the human capital parameters include spending, payoffs and expenses. These costs can be actually resulted or calculated. Likewise, the costs can be incurred in the past or prognosticated for the future. Value-based methods used for the determination return-based conception are usually rather benefit-oriented.

Figure 2 Methods of HRA



Cost-based approaches: HRCA

To present all approaches of human resource cost accounting (HRCA) would go beyond the scope of this article. The approach of "original costs" as described by Brummet *et al.*, (1968) is illustrated in Figure 3 in a nutshell. They try to seize the human capital on the basis of invested spending for staff.

Within the area of invested spending for staff, they name the positions acquisition and learning. The acquisition costs result from costs of recruitment, selection, hiring and placement. Brummet *et al.* (1968), for example, sum up the cost for a help-wanted advertisement, the expenditure to select between job applications, the writing of a contract and the finding of the right position for a new employee. The development costs include the costs for the adjustment to a new job, the gaining of experience, the training of abilities and the organizational development.

At that time, all partners of the research project knew that this system was an embryonic solution. They clearly put out that this represents the lowest level on the development to more global and more informative systems. However, this project supplied the first practicable approach to capitalize investments into staff like capitalizing other investments, i.e. in buildings.

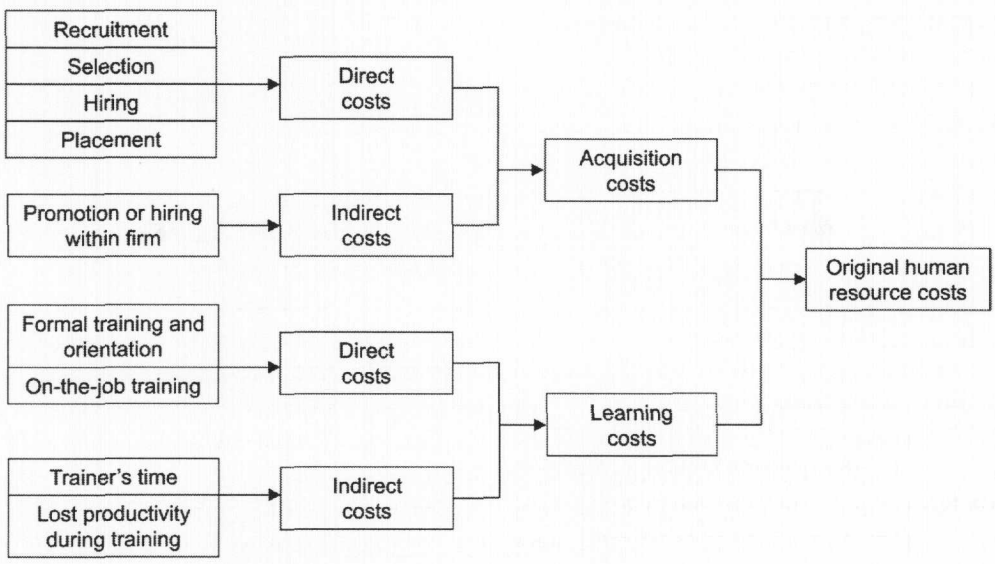
There are quite a few more cost-oriented approaches for HRA. In another approach of HRCA, the "replacement cost model", Flamholtz (2001) uses calculatory costs for the filling of vacant positions. He also adds separation costs like compensation pay. Assuming that there is only a value for something that has an alternative use, Hekimian and Jones (1967) suggest in their "opportunity cost model" the building of virtual internal labor markets. The human capital of a division then is the sum of money that is bidden for the staff of the division, no matter if the division "bought" the employee or another division made the bid for an employee, but could not win this virtual competition.

In contrast, Lev and Schwartz (1971) believe that the calculated future earnings of the staff are sufficient as an approximate value for the human capital. Therefore, in their model of "discounted future wage flows", they try to determine probabilities for the destination of employees in the organization. The basis for the computation of the human capital in the "adjusted present value" model, by Hermanson (1964), is the calculation of an efficiency rate that is built on comparisons of the organizations ROI with average ROIs of the industrial sector. This efficiency rate is than combined with future wages of the staff.

Value-based approaches: HRVA

As many approaches as there are for cost-based HRA, there are more for

Figure 3 Measurement model for original costs



Source: Flamholtz (2001)

New Library World
Volume 104 · Number 1184/1185 · 2003 · 33-41

value-based HRA. Tied up to the conclusion that the value of the organization's human capital cannot be measured by spending, but by the future contributions, the "stochastic rewards valuation model", created by Flamholtz, can be used to describe an example of human resource value accounting (HRVA). The determination of the human capital with the assistance of this model takes place within a five-stage process (Flamholtz, 1971). First of all, Flamholtz states all potential future hierarchy levels for each employee and then he identifies the contribution of the particular individual hierarchy level for the total output of the enterprise. In the next step he determines the destination times for each employee on its future hierarchy levels. Thereupon, Flamholtz allocates the potential passes of an employee through the company with probabilities. Finally, he sums up the calculated values and therefore determines the value of an employee to the company.

In contrast to the former approach, Jaggi and Lau (1974) try to classify the employees in their "group valuation" model to different homogenous groups. With the assistance of a rank transition matrix, they can show typical promotions through an organization. A newer approach is seated in the area of intellectual capital. The "Scandia Navigator", by Edvinsson, determines efficiency rates for the factors finance, customers, processes, innovation, and human resources (Edvinsson and Malone, 1997). Likert's (1967) "social-psychology indicators" (Likert) and Flamholtz's (2001) "determinants of an individual's value to a formal organization" are non-monetary approaches to identify the causes for performance of employees. There are additional approaches for HRVA; however, these models are mostly a variation or combination of the former approaches.

Problems of HRA

There is still a need for research in the area of HRA. First of all, there is no unique approach, because there are too many different goals. The cost-based models seem to be a better choice to implement HRA into financial reporting. Investments in staff could be handled similar to investments in property plant and equipment. The value-based models seem to be suitable for the valuation of companies, because they are closer to the methods, like discounted cash flow, and therefore integrate future regards.

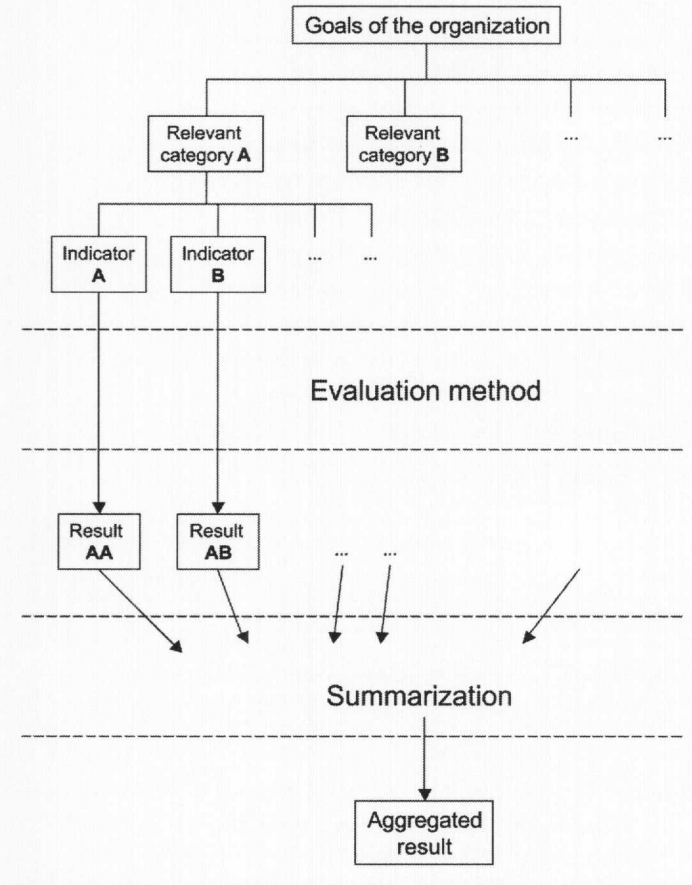
Furthermore, the varying requirements in different countries and of different branches seem to prohibit a unique model of HRA. The guidelines just for financial reporting differ from, i.e. US-GAAP to IAS. Also it seems to be obvious that HRA in the service sector will come with different characteristics than in the manufacturing industry. Most of today's concepts of HRA do not have the variability to be useful for all possible applications. Therefore there is always a need to fix the goals of the measurements first and then decide about the concept to start the evaluation.

If the goal-setting is fixed, more detailed problems emerge while using the models of HRA. Because employees are not the property of the organization, an individual can decide to leave and there is not a legal recourse the organization can do to stop it – except for the particular case of professional sports that has to be ignored here. Therefore, even cost-based approaches of HRA have a problem in measuring the value of the human capital. The value-based approaches have to deal with the supplementary problem to find the right surrogate for the valuation of the human capital. Even if there are surrogates that are accepted for the valuation of human capital, the operationalization will not be solved. Finally, there is the problem that the evaluation needs a lot of data. This problem will be addressed separately later on in this article.

HRA in the service sector

More than anywhere else, the performance of an organization in the service sector is attached to the performance of their human resources. The principle tasks of the organization are dependent on its mission or on its goals (see Figure 4). Therefore, the main question in valuing for human capital in the service sector should be: how far are the human resources of the organization able to fulfill these goals? Missions and goals of organizations can be quite different. Whereas one organization aims at maximum return, another organization tends to raise the market share. The different goals lead to different tasks and therefore to different demands on

Figure 4 Goal dependence

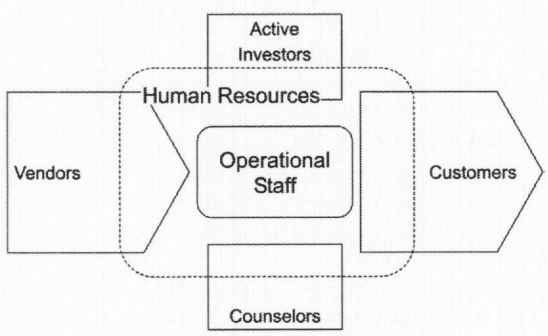


the human resources. This conditions that a HRA system (HRAS) for the service sector needs to be flexible.

The execution of tasks in a modern service sector organization is based on division of labour, which is not only limited to their own organization. In fact the organization is part of the value chain and the production of services needs networking. So the number and the quality of connections to other organizations can be defined as a value also (see Figure 5).

As the evaluation object, human capital should be regarded in the broader sense. Past methods of HRA were mostly limited to the operational personnel, but this, however,

Figure 5 Human resources network



seems to be insufficient. The direct market partners of the enterprise are often involved in projects and therefore a part of the capital that the company is able to use. Good relations to the market partners can be a crucial part of the value drivers. The market partners can be customers as well as suppliers, investors that are active in the operational business of the company or people from boards that consult the company in their business. To calculate the value of the human resources best, an HRAS for the service sector needs to turn into account not only data from personnel controlling, but also from the interfaces to the organizational environment.

Information management on HRA

One of the most important problems with HRA is the fact that there is an enormous need for data to get valid results for an evaluation. The data have to be collected, analyzed and processed. As said before, this was one of the reasons why HRA could not prevail in former decades. In today's world of computerization, information management will be a great help in solving the data problems. Therefore, the support of information management and the design of a management information system will help to insure that the costs of an HRAS will not exceed the benefit. Concept and design of the model are important factors for the usefulness of such a system, as Roslander and Dyson (1992) emphasize clearly: "The information must be reliable, it must be useful in the decision-making context and it must be relatively easy to understand and employ. The history of accounting for the worth of employees is littered with highly sophisticated but impractical measurement models".

It is the nature of an HRAS to be in the interface of human resources management and accounting. The success of an HRAS depends on the comprehension of the model and on the acceptance inside the organization. Thereby, the social responsibility of an HRAS is a stringent premise for the acceptance (Gebauer and Wall, 2002). Considering the statement of Roslander and Dyson (1992), it is obvious that it is not only the technological part of information management that needs to be solved. The data within the system have to satisfy the demand for truth. Therefore, it

New Library World
Volume 104 · Number 1184/1185 · 2003 · 33-41

seems to be essential to involve information professionals also in the phase of the conceptualization of an HRAS (see Figure 6).

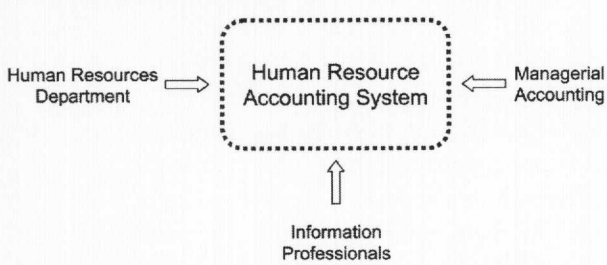
Within an organization there are a lot of information asymmetries. It is conceivable that they who are responsible to provide the system with data do not – because of their individual utility function – report truthfully. A lot of skills and knowledge about information management, especially about the insights of the behavioral and control school of information management (Marchand *et al.*, 2000), is needed to offer the right incentives (Lewis and Sappington, 1997). Without this part of information management the data of the HRAS could be incorrect and a determination of the value of the human capital cannot provide valuable results. This may also be the case for the data of the human resource network partners. As well as people within the organization, the concept of the HRAS should motivate the partners to provide reliable information.

Furthermore, particularly in areas that need to register, to save and to process personnel data electronically, there are a lot of either legal or contractual guidelines. In this case, one has to follow the regulations of the legislator as well as collective or individual agreements and rules.

Summary

Earlier concepts and methods of HRA often implicated more problems than benefits. To hit the demands of a thorough determination of the value of human capital in organizations, the concepts became too complex and needed a multiplicity of data. Due to the enormous advancements in information technology, there are new possibilities to solve the crucial problems of HRA. Admittedly, it remains doubtful that there is a chance for a unique approach of HRA. Rather there is a need to develop specialized concepts and methods for different sectors. The service sector can be seen as the sector with the greatest importance of human capital as a value driver. An HRAS for the service sector needs to integrate the goals of the organization, as well as the integration of the organizational environment. These integrations are the next steps in research on HRA for the service sector. The skills and know-how of information professionals not only for new technical solutions, but also, moreover, for the organizational information management is needed to lead new concepts of HRA to success.

Figure 6 Key players in conceptualization



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