# Information Technology in Human Resource Management: An Empirical Assessment

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**The present paper begins by introducing a number of observations on the applications of information technology (IT) in the field of human resource management (HRM) in general. This is due to the fact that IT and its wide range of applications have already made their presence felt in this area. This will be followed by a report on the findings of a survey on the present trends in organizations with in the different sectors in Turkey. Although the impact of IT on HRM has long been attracting the interest of academics, no empirical research has ever been realized in this field in Turkey, and few studies have been reported elsewhere. The survey was conducted among the 106 IT managers and professionals from various sectors, based on whose results, the data shows that IT is used extensively in the organizations to perform HRM functions in Turkey's dynamic economy. The results also indicated that, while IT has an impact on all sectors in terms of HRM to certain extent, the types of IT used vary significantly between recruitment, maintenance, and development tasks. However, the empirical results here reveal that these organizations are not applying these technologies systematically and maturely in the performance of HRM functions.**

**Keywords: Human Resource Management (HRM), Human Resource Management System (HRMS), Human Resource (HR), Information Technology (IT), ANOVA test, Chi-square test.**

The HRM function in organizations has gained increasing strategic emphasis, and the importance of its alignment HRM and business strategies is well-acknowledged.[1] In fact, effective HRM is vital in order to be able to meet the market demands with well-qualified employees at all times.[2]

Technology and HRM have a broad range of influences upon each other, and HR professionals should be able to adopt technologies that allow the reengineering of the HR function, be prepared to support organizational and work-design changes caused by technology, and be able to support a proper managerial climate for innovative and knowledge-based organizations.[3] These technological advances are being driven primarily by strong demands from human resource professionals for enhancement in speed, effectiveness, and cost containment.[4]

Snell, Stueber, and Lepak[5] observe that HRMSs can meet the challenge of simultaneously becoming more strategic, flexible, cost-efficient, and customer-oriented by leveraging information technology. Many experts forecast that the PC will become the central tool for all HR professionals.[6] Virtual HR is emerging due to the growing sophistication of IT and increased external structural options.[7] IT is beginning to enable organizations to deliver state-of-the-art HR services, and reduced costs have enabled companies, regardless of the firm size-to purchase HR technologies.[8]

One of the impacts of IT is that it enables the creation of an IT- based workplace,[9] which leads to what should be a manager's top priority-namely, strategic competence management.[10] Advances in IT hold the promise of meeting many of the challenges of HRM, such as attracting, retaining, and motivating employees, meeting the demands for a more strategic HR function, and managing the "human element" of technological change in the future.[11] HRM could support the efforts of technological innovation's to achieve high performance while such innovation; itself could serve as an approach to enable the HR function to focus more on value-added activities in order to realize the full potential of technology and organizational strategy.[12] The biggest benefit of using IT in HRM to organizations is the freeing of HR staff from intermediary roles, thus enabling them to concentrate on strategic planning in human resource organization and development.[13] Caudron[14] has also observed that IT can automate other routine tasks such as payroll processing, benefits administration, and transactional activities, so that HR professionals are free to focus on more strategic matters such as boosting productivity.

In the present context of increasing globalization, employing organizations and their environments have become increasingly complex. Managers in these organizations face growing difficulties in coping with workforces that may be spread across a variety of countries, cultures and political systems. Given such trends, IT has considerable potential as a tool that managers can utilize, both generally and in human resourcing functions in particular to increase the capabilities of the organization.[15]

Substantial benefits of communication and information technologies can seamlessly migrate to HR applications.[16] Those managing the human resource functions have not ignored such advice and, as a result a widespread use of human resource information systems (HRIS) has taking place.[17] An HRIS is a systematic procedure for collecting, storing, maintaining, retrieving and validating the data needed by an organization for its human resources, personnel activities and organization unit characteristics.[18] HRISs can also provide the management with a decision-making tool rather than merely a robust database.[19] Turek[20] offers numerous examples of how HR technology has reduced the response time and enhanced the quality of HR service in the workplace.

A research paper by a Cincinnati, Ohio-based HRIS consulting firm, Insight Consulting Partners (ICP),[21] notes that enterprise applications tend to push organizations toward more centralized and integrated HR and IT infrastructures. Thus, HRIS can support long-term planning with information for labor force planning as well as supply and demand forecasts, staffing with information on equal employment, separations and applicant qualifications, and development with information on training

program costs and trainee work performance. It can also support compensation programs, salary forecasts, pay budgets, labor/employee relations with information on contract negotiations, and employee assistance needs.[22]

Doran,[23] a consultant with more than 25 years of experience, insists that behind every successful HRIS implementation there is a thorough need analysis. Further, literature suggests that success in the implementation phase relies on the ability of managers to manage change.[24]

Another organizational challenge is the creation of performance metrics to assess the value-added contribution of new HRIS initiatives.[25]

An extensive body of literature exists on the usage, adoption, and implementation of IT.[26] However, most of the existing studies have focused on the use of IT in general.[27] Regrettably, empirical studies and the theory on how IT influences organizations is still underdeveloped.[28] One area receiving little attention in the research on successful IT use is HRM practice.[29] In particular, there are three new areas of development which need more empirical research and application: the information technology innovation and e-HR developmental approaches, the globally distributed engineering and international technology entrepreneurship, professional service, and customer relations management modeling.[30]

This is further supported by Shrivastava and Shaw's[31] observations that, despite evidence of increasing use of HR related technology by individual firms, there has been little theory development in this area. Similar observations demonstrate that the existing literature has paid little attention to assessing the impact of IT on HRM in various organizations in different sectors in a systematic way. Studies conducted by Elliott & Tevavichulada[32] and Currie[33] represent some progress in this direction. They have indicated that the sector in which the organization operates is significant in terms of influencing the structure of IT activities.

Some authors have also attempted to identify differences of the role of IT between services and process oriented industries, and found significant differences.[34] Most of the existing studies were conducted in western Europe and in the United States, and their result may not be applicable to the other parts of the world due to social and economical differences.[35] Comparatively, very little has been researched in this field in the developing countries.

Turkey is a relatively highly populated republic, and is the world's 17th most industrialized nation. Turkey has undergone a series of major changes throughout the last decade, such as entrance into Customs Union with the European Union (EU) in 1996 and the inclusion on the list of candidate countries for membership in 1999.[36] These changes have had a certain impact on organizations' HRM strategies and, as such, these organizations have started to invest significant resources in automating their HR departments. Most of the research in this field in the country is based on rather general HRM issues, including as the need for international approach in HRM,[37] globalization and HRM,[38] computer-aided human resource evaluation in organizations,[39] scheduling jobs through multiple parallel channels by an expert system,[40] success factors in women's career advancement,[41] national profiles and regional differences,[42] impact of culture,[43] individual tendencies[44] and leadership values.[45]

Most relevant to this study appears to be the articles by Ardic and Bas[46] and Iraz and Yildirim.[47] Ardic and Bas[48] investigating public and private universities concluded that such universities differ significantly in terms of job satisfaction. Although their study, in a way, provides a comparative analysis between public and private sector organizations, it is limited to academic institutions and is not concerned with the impact of IT on job satisfaction as for their part. Iraz and Yildirim[49] studied the impact of IT applications on HRM. However, they have only considered the banking sector in Turkey and their study is limited to the investigation of the role of e-learning. Another salient point is that research sponsored by organizations in different sectors has only been devoted to finding quick solutions to their own HRM problems.[50] Thus, none of the existing literature in Turkey, to the best of our knowledge, has studied the impact of IT on HRM activities from a more general perspective.

Due to these conditions this study investigates in what ways organizations from different sectors are using IT technologies to perform various HRM functions in an effective way in Turkey. Here, organizations were selected from government, public and private sectors to ascertain IT's impact and its implementation to perform HRM functions in a systematic way. For the purpose of this study the term "government" refers to national government departments. We used "public" as the third category since it represents institutions which are concerned with decentralized services such as universities, local government, healthcare and non-governmental organizations (NGOs) aimed at providing nonprofit public services and hence do not easily fall into private or government sector category. Such a categorization is relevant insofar as the differences exist in the mission statements of these sectors.[51] Furthermore, this study attempts to identify those IT tools and technologies which are popular, alongside their rate of implementation in HRM in organizations.

The remainder of this article is organized as follows: The following section introduces the evolution of HRM systems from an early stage to the present through a review of associated literature. This is followed by research methodology. The results of the study are then presented and discussed. Finally, the paper ends with the conclusion and future research directions.

## Trends in the Utilization of IT in Human Resource Management

Given the scope of human resource management functions, an effective HRMS must address a range of administrative, statutory, functional and technological requirements in order to enable the HRMS to support the partnership between HR professionals, program managers, finance staff, executives and employees; while also providing accurate, reliable information for organization-wide planning and decision-making.[52] Companies are also advised to establish long-term relationships with technology vendors.[53]

Surveys have shown that more than 90 percent of HR departments operate with some form of computerized HRMS.[54] In a survey undertaken by the Institute of Manpower Studies, a number of key changes were found to have an impact on the use

of HRMSs.[55] These changes included the development of the HR function itself, which resulted in the closure of many centralized IT functions, and today, the majority of HR applications are networked.

In the mid-1990s, due to business process reengineering and integration of information from diverse applications, Enterprise Resource Planning (ERP) became popular among organizations. Watson Wyatt Worldwide[56] (now Towers Watson) discovered in a survey of 649 firms that nearly every organization had made significant investments in some combination of enterprise resource panning (ERP), HR service centers, interactive voice response (IVR), voice recognition systems (VRS), Web applications and employee portals. The value of ERP is its ability to integrate other functions with HR under a single vendor and common technology standards. In the leading ERP systems some of the HRMS components permit the use of the internet to reduce transaction costs.[57] For example, the HRM capability of the PeopleSoft package (one type of ERP software) was used to track the movements of 5,000 employees across 70 locations and calculate their salaries accurately. Consequently, when operational benefit in payroll processing was considered, cycle time was reduced from four days to four hours. Thus, accurate, time-effective information delivered to managers improved the speed and quality of decision making and assisted cost control.[58] Moreover, in keeping with changing demand patterns, most ERP vendors have introduced second-generation Web-based HRISs that are easier to integrate with other applications.[59]

Also, by integrating financial and HRMS applications, the value of the HR function itself has increased for the organization as a whole and now, in the best administrative systems, HRMS is a subset of ERP software solutions. One of the key values of enterprise applications is that they force companies to adopt a cross-functional view of the organization and lead to the integration of information and processes.[60] Ashbaugh & Miranda[61] outline a number of advantages or justifications regarding the selection of enterprise HRMS solutions.

Observations of some current trends and attitudes held by industry related organizations provide a fitting conclusion to this section. In the 2001 Human Resources Self-Service/Portal Survey prepared by Cedar, a software consulting and services company,[62] it was reported that HRMSs are used for such employee productivity applications as communications (e.g. employee manuals, corporate policies, directories, frequently asked questions), retirement services, enrollment for health benefits, benefit enquiries and training registration. In systems expanded to include managerial productivity applications, this survey study reports that the most widely offered services are travel and expense management, the supply of request forms for new employees, time card approval and reporting, budget analysis, and such managerial reports as head count salary listings and timesheets.[63]

With the "e-wave" also reaching the area of HRM, the terms e-HR or e-HRM are being used increasingly when referring to the next development stage in IT-based HRM.[64] A recent development in the functionality of HRM systems has been the transition from client/server-based systems to Web-based access. This has resulted in new options for "self-service" routines for various HR functions.[65] In terms of e-business, the implications for the HR function are not yet fully visible, but it is certain

that e-HR will revolutionize the HR function within the next few years. The main challenge in e-HR is the alignment of processes in the HR function according to the future e-business challenge.[66] In most companies, the shift to e-HR from a paper-intensive environment represents a significant cultural change, particularly for employees.[67] These e-HR systems also offer various search capabilities, such as those for conducting organization-wide searches related to global staffing as well as extensive report generation options.[68]

A survey reported that more than 80 percent of respondents used or had plans to use an HR portal tool in 2003 and organizations are using HR portals for company communication (50 percent), employee handbooks and policies (44 percent), work/life information and links (30 percent), benefits enrollment (25 percent), training (25 percent), employee message board (22 percent), HR record keeping (22 percent) and in areas other including recruitment and employment information (five percent).[69]

# Research Methodology

## Research Model

The present study performs a systematic and exploratory analysis approach to investigate the impact of IT applications on HRM functions. The hypotheses were categorized according to the following empirical factors:

- Use of IT
- Type of IT tools.

The justification for each empirical factor and the corresponding hypotheses are provided below.

**Use of IT**

IT can bring numerous improvements to organizations.[70] Snell, Stueber and Lepak[71] pointed out that IT has the potential to lower administrative costs, increase productivity, lower speed response times, improve decision making and enhance customer service, simultaneously. The effective management of human resources also has an important role to play in the performance and success of organizations.[72] However, despite evidence of the increasing use of HR-related technology by individual firms, there has been little theory development in this area and academia has failed to give the impact of IT on HR in organizations from different sectors the attention it deserves.[73]

Raghunathan and Raghunathan[74] reported the existence of differences in structuring and managing IT activities between organizations from different sectors. Currie[75] supported the view that the relationship between organization structure and IT are sector specific. In other words, private and public sector organizations adopt an organizational structure to meet the different demands from their immediate environments and this will be reflected in the way IT is

structured. According to Laursen,[76] it is unlikely that new innovative HRM practices will be equally effective across different sectors. On the other hand, Budhwar and Boyne[77] compared HRM practices in public and private sector organizations and their results showed a number of differences in the HRM systems in these sectors. The key areas of their analysis include recruitment and selection, pay and benefits, training and development, employee relations with emphasis on key HRM strategies. These may be taken as evidence of the fact that the impact of IT on HRM functions may show differences between sectors.

The present study therefore proposes the following hypotheses:

$H1_a$: The use of IT adopts a different pattern according to the different sector for recruitment tasks.
$H1_b$: The use of IT adopts a different pattern according to the different sector for maintenance and development tasks.
$H1_c$: The use of IT adopts a different pattern according to the different sector for management and planning tasks.

**Types of IT**

A computer that runs faster with a great deal of storage space and high resolution graphics capability is useless without software that fits the organizations' needs.[78] According to Calhoun et al.,[79] IT is an important component of the organizational decision process. The use of IT is always based on the needs of an organization and the nature of information systems varies depending on the particular form taken by the organization.[80] Some researchers investigated the relationship between organization characteristics and the use of IT, and factors influencing the use of IT in organizations.

Seyal et al.[81] examined the extent of use of IT in various small and medium business organizations in Brunei Darussalam. Their study attempted to assess the depth and breadth of IT usage in business. They concluded that the chief executive's computer knowledge is positively associated with the use of IT and that businesses in different sectors have different information processing needs. Calhoun et al.[82] also studied the impact of national culture on information technology usage in organizations and reported the association between some organizational characteristics and use of IT.

On the other hand, culture, control and competition as the constitution of subjectivity, determine the locus of IT application in organizations.[83] These studies do not consider the relationship between types of software used in organizations and their internal operations. It is evident from previous studies that types of IT tools in HRM functions were given due consideration.[84] Elliott and Tevavichulada[85] bring some data that shed light on the types of software applications taking place in HRM and their integration to HRM activities. The results of their study reveal that most software applications used in both sectors are not significantly different except for in terms of statistics and utility programs.

Their study does not provide a comparative analysis on the types of software used for different HRM functions. They also pointed out that their sampling technique captures only one point in time and it is expected that the number of organizations integrating software and HRM functions will be constantly growing with the passage of time.

Against this backdrop, it is worth to analyze the usage pattern of the types of software for the main HRM functions and to this end, our hypotheses are postulated as follows:

$H2_a$: Type of IT tool used varies according to recruitment tasks.
$H2_b$: Type of IT tool used varies according to maintenance and development tasks.
$H2_c$: Type of IT tools used varies according to management and planning tasks.

## Research Instrument and the Data

A survey approach was adopted for this study and the data was obtained by means of a questionnaire prepared in Turkish. Thorough discussions were held with HRM experts to finalize the items of the questionnaire. Several HRM managers were interviewed in this regard and their suggestions were included as much as possible. Following this, a pilot version of the research instrument was developed and distributed to a group of IT professionals to obtain their suggestions and clarifications.

The questionnaire contains seven questions which involve seven variables to meet the objectives of this research (Table 1). It is structured in nature and does not contain any open ended questions. The respondents are required to choose one or more of the alternatives for questions 3-6. The range of values for questions 4-6 also shows the tasks for the corresponding HRM functions.

The respondents were the managers of IT divisions of major government, public and private sector organizations, who were also regular attendees of the annual workshop on the use of IT in organizations organized by the Turkish Informatics Association. The invitations were limited to 200 organizations and the distribution of invitations among sectors was based on "judgement sampling". A total of 104 completed survey questionnaires were received, giving a response rate of 52 per cent.

The variables are grouped in two categories as dependent and independent variables. The proposed dependent variables of this study are "sector" and "IT tools" while the independent variables are "recruitment", "maintenance and development," "management and planning," "IT use" and "restructure".

Recruitment, development and maintenance, along with management and planning are selected as independent variables since they play important roles in shaping employee behavior.[86] Besides, almost all of the human resource management application software system provide features corresponding to these variables for the success of organizations.[87] Furthermore, as there is a scarcity of this type of research and as the selected variables have not been used by any other known study in this context, it is also sensible to compare these basic HR functions.[88]

**Table 1: Summary of research questions and variables**

| Quest. | Var. | Definition | Range of values |
|---|---|---|---|
| 1 | Sector | In which sector is your organization? | Government, public, private |
| 2 | IT use | Are your organization's daily HRM operations heavily reliant on computers and IT? | Yes/No |
| 3 | IT tools | What types of IT tools are used to accomplish HR functions? | Application software (such as DBMS, spreadsheets, data mining/data warehousing), information system software (such as decision support systems, executive information systems, expert systems), information and communication technologies (ICT) (such as LAN/WAN/neural network, internet/intranet, web portals) |
| 4 | Recruitment | For which of the following recruitment tasks does your organization use computers/IT? | Position inventory, recruitment using Internet, employee selection, employee management and workforce planning |
| 5 | Maintenance and development | For which of the following maintenance and development tasks does your organization use computers/IT? | Training and human resource development, performance evaluation, employee turnover, tardiness and absenteeism analysis |
| 6 | Management and planning | For which of the following management and planning tasks does your organization use computers/IT? | Personnel files and skills inventory, benefit administration, government reports, succession planning and implementation |
| 7 | Restructure | Does your organization have any plans to improve IT use for its HRM department | Yes/No |

The ANOVA test was selected to test the hypotheses. The ANOVA test provides a nonparametric alternative to the one-way analysis of variance and is robust in its resistance to the outliers and errors in the data relative to the usual normal theory F test.[89] The chi-square test method is used whenever there is a need to examine the relationship between the dependent and independent variables.[90]

## Results

The sectors of six respondents are not known and these are not included in the analysis. The distribution of the remaining respondents is as follows: 44 (45 percent) are from government, 28 (28 percent) are from public and 26 (27 percent) are from private sector organizations.

**Use of IT:** The test results are reported in Table 2. The analysis of p-values in Table 2 indicated that there is not sufficient evidence to accept $H1_a$ or $H1_b$. This means that the use of IT does not show a different pattern according to sector in terms of recruitment, and maintenance and development functions. This can also be interpreted as that the use of IT has no impact according to sector for these HRM functions. It can also be observed from the last column in Table 2 that the p-value is 0.01 for $H2_c$ and we accept this hypothesis. This means that the use of IT shows significantly different patterns according to sector and hence has significant impact in terms of management and planning tasks.

**Table 2: Test results for the impact of IT according to sector for HR functions**

| Dependent variable | Test variables | Hypothesis | F-value | d.f. | p-value* |
|---|---|---|---|---|---|
| Sector | | | | | |
| | Recruitment | $H1_a$ | 1.81 | 2/9 | 0.22 |
| | Maintenance and development | $H1_b$ | 0.88 | 2/9 | 0.45 |
| | Management and planning | $H1_c$ | 7.09 | 2/9 | 0.01 |

*table values are at a five percent significance level.

**Types of IT:** The test results are summarized in Table 3. The last column of Table 3 shows that, except for hypothesis $H2_c$, the results were found to be significant at 5 percent significance level in this category. This means that the type of IT tool used for recruitment and maintenance and development functions varies among organizations and has impact on these functions. On the other hand, the p-value for $H2_c$ indicated that there is not sufficient evidence to accept the hypothesis that the type of IT tool used varies for management and planning function.

**Table 3: Table 3: Test results for the impact of types of IT on HR functions**

| Dependent variable | Test variables | Hypothesis | F-value | d.f. | p-value* |
|---|---|---|---|---|---|
| Sector | | | | | |
| | Recruitment | $H2_a$ | 3.07 | 3/32 | 0.04 |
| | Maintenance and development | $H2_b$ | 2.74 | 3/32 | 0.05 |
| | Management and planning | $H2_c$ | 0.78 | 3/32 | 0.52 |

*table values are at a five percent significance level.

## Discussion

This study found that more than 90 percent of the organizations use computers/IT for HR functions in general. This is in line with the studies reported by Watson Wyatt Worldwide[91] and Towers Perrin[92] who respectively found that more than 90 percent and 75 percent of HR departments operate with some form of computerized HRIS. According to their study, HR departments are also planning to increase investments in HR related technologies in the immediate future.

According to our survey, all sectors use word processing, spreadsheet tools, DBMS and Internet (81 percent) more for HRM tasks than DSS, expert systems, executive information systems and reengineering tools. This is consistent with the findings reported by Elliott & Tevavichulada[93] and Norris.[94] Their study revealed that, windows programs for word processing, creating databases and creating spreadsheets are the most commonly used programs in organizations. These programs are ubiquitous and widely used for the different HRM tasks.

Probably the most important finding of this study is based on the test results, which support the position that HR applications and the use of IT are not comprehensively integrated and structured together as one single HR portal providing service. The chi-square test results also showed that the type of IT used for different HRM functions change significantly between sectors ($\chi^2$= 23.194, df=4, p-value=0.000). This situation is expected to continue in the near future since most of the respondents (71 percent) stated that their organizations have no plans to restructure their human resource departments. This situation does not seem to be confined to Turkey. Some managers may simply see technology as a means of controlling, limiting and weakening their workforce.[95] In their study, Hannon et al.[96] pointed out that the poor utilization of HRISs is due to their perception by the managers as being slow and inflexible and the quality of the data input being frequently questionable. Thus such systems are not preferred for operations such as strategic management or re-engineering the HR role.[97] However, HRIS consulting firm Insight Consulting Partners (ICP)[98] observed that organizations are moving towards more centralized and integrated HR and IT infrastructures. Therefore, it seems that, in future there will be a proliferation of ERP implementation and its standardization thereof, although some small and medium sized organizations may find this process rather expensive.

## Recruitment

The present study revealed that the use of IT does not adopt different patterns between sectors for recruitment tasks. Although it was found that private sector organizations (73 percent) use IT more than government sector (52 percent) and public sector (43 percent) organizations do for recruitment tasks, the difference was not found to be statistically significant ($\chi^2$= 4.499, df=6, p-value=0.609). This conflicts with the results reported by Elliott & Tevavichulada,[99] who found that government sector organizations (70 percent) integrated computer software and recruitment tasks slightly more than their private sector counterparts (69 percent). The reason for the

conflicting figures of our study is likely to be due to the constraints stated by law, especially for recruitment using via the Internet and employee selection tasks in Turkey, and the attitude of top managers towards using traditional procedures for recruitment tasks in the government and public sector. This reasoning is also consistent with that reported by Allen et al.,[100] and Othman and Teh.[101] Their studies found that the necessary transformation in public sector governance and accountability is likely to be blocked by an administrative culture that may be ill suited to the digital world.

Interestingly, the government sector (91 percent) is far ahead of the public (71 percent) and private sector (76 percent) organizations in IT applications for the position inventory task of recruitment. One plausible explanation for this result is that the government sector organizations included in our sample are generally much larger in scale and characterized by over employment and thus position inventory operations cannot be handled efficiently without using IT.

Our test results also indicated that the type of the IT tool used for recruitment tasks has significant impact. It was interesting to find that, regardless of sector, ICT (30 percent) was identified to be the second highest used tool for recruitment tasks. This is probably due to the fact that the users who have experience with information and communication technologies prefer Internet and network technologies for their information and service needs.[102]

## Maintenance and Development

Similar to recruitment the test results indicated that use of IT does not show different patterns between sectors for maintenance and development tasks. However, type of IT tool used has been found to vary in terms of maintenance and development tasks. Additionally, only 29 percent of the respondents' organizations declared that the use of software falls into the information system software category. These contradictory findings are strong indications of the fact that although the use of IT for maintenance and development tasks is pervasive, their IT implementations are not systematic and mature yet.

The private sector (56 percent) uses IT more than the government (27 percent) and public sectors (34 percent) for maintenance and development functions. These figures are in line with those of Budhwar and Boyne,[103] who reported that Indian private sector firms have adopted a more rational approach than their public sector counterparts in this category. One of the reasons may be that although the private sector employs less people, the maintenance and development of their human resources is vital for their existence and IT seems to be the only effective solution in this respect. However, the difference was not found to be significant ($\chi 2 = 3.044$, df=6, p-value=0.803) in our study.

Interestingly, organizations in all sectors use IT almost equally for training and HR development task (61 percent on average) of maintenance and development. This finding is also supported by Budhwar and Boyne,[104] who concluded that the training and development tasks present a similar picture for both private and public sector organizations. It was also interesting to find that application software (49 percent) and

ICT (30 percent) are the mostly used tools for this task. This is to be expected since recent technologies such as multimedia, e-learning, distance education etc. are providing innovative and exciting teaching tools for society and most of the organizations intend to make use of such recent technologies.[105]

However, private organizations use information technology practices more for performance evaluation, employee turnover and absenteeism analysis tasks. This is consistent with Elliott & Tevavichulada,[106] who reported that 74 percent of private sector organizations and 59 percent of government sector organizations use IT for tasks related to the performance appraisal of employees. Of the available tools, application software (46 percent) was found to be the mostly used.

## Management and Planning

The test results indicated that the use of IT significantly shows different patterns according to sector and the type of the IT tool used among organizations does not vary for management and planning tasks.

On average, government (69 percent) and public (64 percent) sector organizations use IT slightly more than their private sector counterparts (60 percent) for HR management and planning. This seems to be logical as the number and content of activities falling into this category is large in the government and public sectors and they are required to be regularly documented by the central government authorities. Furthermore, most of these activities are standardized in terms of both quantity and quality in these sectors. The difference between sectors was not found to be significant ($\chi^2$ =1.361, df = 4, p-value = 0,851). This result is also supported by Budhwar and Boyne,[107] who concluded that the gap between the Indian private and public sectors is not significant. Application software was found to be the mostly used tool for government (47 percent), public (58 percent) and private (46 percent) sector organizations for this function.

This study, interestingly, obtained contradictory figures for the tasks in this category. Our findings reveal that the government and public sectors use IT more than the private sector for benefit administration and government report tasks. The respective figures for the government are 91 percent and 73 percent, for the public 71 percent and 79 percent, and for the private 54 percent and 69 percent. One plausible explanation is that these tasks are required in a standard form by law for the government and public sectors and computerization is naturally the most effective way to accomplish this. On the other hand, the private sector uses IT more in maintaining personnel files and skills inventory tasks (77 percent) in comparison to the government (68 percent) and public (71 percent) sectors. This is because, when compared to private sector organizations, skills (background) required for different positions are standardized in the government and public sectors and additional skills might affect the employee's position only at the recruitment stage. Furthermore, these files contain confidential data most of the time and managers tend to rely on traditional approaches in this case.[108]

## Conclusion

As a consequence of the advancement of information technologies and evolvement of e-HR organizations have become more competitive by reducing costs and improving productivity, quality and profitability in HRM area.[109] Modern businesses and industries are taking suitable steps for the implementation of IT in the key area of the management of human resources by enabling the employees to make their optimum contribution to the gaining of a competitive advantage.

This study investigates the extent and comparative impact of IT use on HRM functions in organizations from different sectors. It has also taken into account the usage pattern of different IT tools to perform different HRM functions in organizations. Based on the survey data, the results firstly indicated that IT has significant impact on all sectors in terms of management and planning tasks and, secondly, that type of IT used varies significantly for the tasks of recruitment, and maintenance and development functions.

The findings also support the conclusion that the use of IT is pervasive in the organizations for their HRM activities. However, there is no standardization in the integration of computer software into main HRM activities. This may be explained by the gap between job requirements and the ability of employees to perform HRM tasks. Low levels of integration of software and HRM functions can be related to fear based on ignorance and low levels of knowledge and training in IT. In general, organizations do not have portals exclusively for HR functions and use different computer software for similar HRM functions. This also means that these technologies are not systematically and maturely used for HRM functions included in the analysis in Turkey and this situation is expected to continue in the near future. With this backdrop, HR departments should spend more attention to the education and training of employees in HRM departments in the area of IT.

Future empirical studies should examine the impact of IT on more HR functions in different organizations in other parts of the world to make a comprehensive assessment. Futhermore, in Turkey this study could also be conducted with more breadth and depth in terms of HRM functions and IT tools.

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## Notes

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