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Investigating the administrative professional's information management role in a networked enterprise

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Contents

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1 Introduction

Applications of networked systems in general and Web-based systems in particular can

nowadays be found in even the smallest business. It has become nearly impossible to manage a competitive business without a computerized information system in an contemporary commercial setting. Global competitive pressures and continuous innovations are indeed forcing many organizations to rethink the manner in which they conduct business.

One of the major changes occurring in information and communications technology (ICT) is the ability to deliver systems via the Web. The major challenge in today's digital environment is for managers and staff to understand the role of ICT with regard to the strategic advantages it provides through the provision of solutions, increased productivity and quality, improved customer service, enhancement of communication and collaboration, and the enablement of business process engineering. Therefore, managing information resources, new technologies and communication networks are already critical success factors in the operations of many enterprises. The application of these technologies has become essential for the survival of businesses in the digital environment.

Furthermore, the rapidly increasing use of the Internet, the Web, intranets and extranets – systems beneficial to e-commerce – is changing the manner in which business is done in almost all organizations (Clinton and Gore 1997). The Web plays a major role in facilitating competitiveness, effectiveness and profitability. Second-generation e-commerce applications, such as m-commerce and e-government, as well as the integration of enterprise resource planning, customer relationship management and knowledge management are of immense value in today's digital economy. Similarly, qualified staff members are being employed who can fully utilize the functionalities being availed by modern e-facilities.

In this article, the expanding roles and skills required of the so-called administrative professional (AP) is discussed. The AP is a member of an extremely competitive profession that, by its very nature, must reflect the broadened scope of the heightened challenges of today's business world. Within the last few years, the specific role of the AP has created wide-ranging interest in both the academic and corporate sectors.

Research results reported in this article indicate that the AP (also called personal assistant, office assistant or secretary) often performs duties at a management level by not only supporting the chief executive officer (CEO) and top-level management, but also participating as a team member, playing a significant role within the corporate structure. Results also indicate that the AP can play a key role in any business environment, fulfilling an increasingly vital position in the present networked office. In this sense the AP's job probably requires skills in various management functions as well as technological proficiencies, including typical tasks such as:

- Developing a production report using spreadsheet software
- Preparing charts, slides and handouts for a management presentation
- Corresponding via phone, fax, or e-mail with clients all over the world
- Researching a topic via the Web
- Coordinating a video conference
- Supervising and training co-workers
- Representing management at a meeting (IAAP 2002).

There is a fundamental need to evaluate and clarify the AP's roles in the digital world of business and to identify his or her position and status in the corporate structure. The focus of this article is to show that specific skills have not yet been identified scientifically with regard to the information processing, retrieval, dissemination and repackaging tasks of the AP. There is a fundamental lack of clarity about how these new specialized skills add value to the organization and enhance its strategic positioning and competitive advantage in industry.

top

2 Research problem and research methods

As indicated above, the digital economy has changed everyday business practices and led to the need for research into aspects of the digital office environment, including the AP's role in this new environment. Critical questions with regard to the specific role and duties of the AP require detailed research. For this research, the following research question was addressed: *What are the typical technological and information management skills expected of the AP?*

The empirical study was twofold, namely an e-mailed questionnaire sent to managers in leading ICT corporations in South Africa, followed up by in-depth personal interviews with a selected group of these managers. Companies within the ICT field were chosen because they are leaders in the utilization of the latest technological applications in the digital environment. The research was done to establish to what extend APs were indeed utilized as knowledge workers, and what technologies they were already utilizing to perform their tasks in the processing, retrieval, dissemination and repackaging of information.

2.1 Obtaining respondents

Determining a survey group posed some problems. The wide variety of business units of, for example, a large corporation that have both managers and APs employed complicated the identification of the survey group since the profile of a manufacturing company and, for instance, an ICT company would differ in many aspects. The work relationship between the manager and the AP would also be influenced by industry type as well as the size of the enterprise.

Potential respondents were therefore identified according to the following variables:

- Enterprises listed in the ICT business sector and technology/computer services sector on the Johannesburg Stock Exchange (JSE)
- Enterprises operating in South Africa, thus with a physical presence and physical address in South Africa, even though the enterprise was represented globally
- Senior managers with at least one AP in their direct team
- The selected respondent's AP had to be either qualified at a tertiary level as an AP/office manager/executive secretary with a relevant degree or diploma, or any other applicable qualification, or have at least six years' experience in the specific industry.

All the ICT companies on the JSE for the year 2004 were selected to participate in the survey. Twenty-one companies were obtained in this manner. An alphabetical list, indicating the selected enterprises, is provided as an appendix. Senior managers in these enterprises were contacted individually by telephone and invited to participate in a structured interview. The researcher formulated a letter specifically for the managers in which the reason for the research, the conditions of the structured interview and privacy issues were stipulated. In the end, ten interviews were conducted.

2.2 Structured interview

Information was gathered as follows: a questionnaire concerning the enterprise's ICT infrastructure and architecture was e-mailed to be completed before the interview, after which the interview took place. The interview was recorded on tape to facilitate a conversation-style interview. The e-mail questionnaire was used to obtain an overview of the survey group and of how the technology available in the company was used by each manager and his or her AP. It also assisted to establish which technologies were used in the different

enterprises within the survey group. This further served to assist the interviewer in structuring the interviews to obtain the most relevant information from the managers in the survey group.

The interview method was chosen because it would allow managers to elaborate on their answers and thus provide an in-depth understanding of how the technology was applied and utilized by the managers and their APs. In addition, the interviewer had the opportunity to explain some of the terms used in the questionnaires and interviews.

A set of questions for the interviews was developed to obtain a comprehensive profile of the perceived role and utilization of the APs in a networked enterprise. This would also assist in the identification of their utilization within the enterprise and ultimately change perceptions as to their traditionally perceived role. Questions were structured in such a manner that the technology available in the enterprise as well as the manager's and his or her AP's use thereof could be established. It also included questions on the manager's expectations of assistance from the AP on the user as well as the technical level for different applications. Questions regarding the manager's perception of the level of training required were also included.

2.3 Questionnaire

The content of the questionnaire as well as the interview questions are briefly explained in the following paragraphs.

2.3.1 Biographical detail

Typical biographical detail of the participants was selected. It also requested relevant information about the APs assigned to the managers. Information obtained within this section enabled the researcher to identify individual respondents and their APs.

2.3.2 ICT in the enterprise

This section requested general information of the enterprise's current and prospective ICTs, including a discussion infrastructure and architecture. Also, information regarding the technological changes in the office environment, such as recent hardware and software developments, as well as changes in the information infrastructure, was requested. This included the use of Web-based systems and the advancement in wireless technology.

2.3.3 ICT skills of the AP

This section concerned AP-related technological developments in the office environment, such as recent hardware and software developments as well as enhancements in the information infrastructure, including the use of Web-based systems and the explosion of wireless technology. The information was used to indicate the integration of the roles and responsibilities of the APs with the roles and responsibilities traditionally performed by the manager.

2.3.4 Business skills of APs

Business or so-called soft skills and the perceived business insight of the AP were also investigated. Opinions in this regard could illustrate the possible higher-level support of the APs in the organization, and give an indication of the AP's utilization as a knowledge worker. It could possibly dispel the traditional categorization of APs as being mainly typists or secretaries. It could further illustrate their possible contribution as team members in managing the networked enterprise.

2.3.5 Information management skills

During the interview, the focus fell on the information management skills of APs, such as the processing, utilization, retrieval, dissemination, repackaging and storage of information. The

interview also wanted to establish the perceived skills with regard to information systems in place to support the manager and to establish to what extent APs meet the information needs of managers in the networked enterprise. Detailed questions regarding the AP's role and function in the support systems such as office information systems (OIS), transaction processing systems (TPS), electronic commerce (EC), business intelligence (BI), decision support systems (DSS), intelligent support systems (ISS), knowledge management systems (KMS) and data warehousing (DW) were asked and the answers recorded.

2.3.6 Other comments and suggestions

Provision was made for additional comments or contributions not covered in the questionnaire.

top

3 Interpretation of results

3.1 E-mail questionnaire to establish technological profile

The following profile of the companies and the APs working for them was built from the detail acquired from the questionnaire:

All respondents had access to the normal ICT facilities at the workplace, including desktop computers, intranets, extranets, Internet and e-mail, mobile wireless communication via cell phones, fax and conference facilities. This high-tech profile was similar for all the respondents with a few variations regarding ICT models and versions. All the enterprises had similar ICT infrastructures and architecture, with no major deviations in the infrastructure and architecture of the information systems in the enterprises. It came as no surprise that the APs utilized most of these facilities (presumably to meet the information needs of their managers). This finding has the following implications for AP training:

- PAs had to be proficient in the hardware devices resident in their immediate environment.
- They had to be competent in the use of the various input and output devices and able to assist the manager.
- Competency in communication devices at both user and basic technical level was required.
- They were required to be of assistance at user but not necessarily at technical level with regard to the various storage devices, including CD-ROM drives and CD writers, DVD writers and drives, USB storage devices, Internet back-up systems and storage area network (SAN).
- PAs were to be competent in the various software applications, including the installation and maintenance thereof. The software included MS Word, Excel, PowerPoint, Publisher, FrontPage, Access and Outlook. Some of the APs have worked in Pastel and none have had experience with Dreamweaver and Flash.
- The APs were proficient in information management and repackaging applications, although the majority of managers did not expect technical assistance.
- PAs were knowledgeable in integrating software applications to make data and information accessible on most types of PC configurations, although they were not expected to assist on a technical level.
- The software integration skills included being able to create dynamic links between applications; combine information for two or more programs; embed objects from one application in another; merge data between applications; embed and link charts; save and export applications to a Web browser; merge customer address databases with a form letter; export and import data from one application to another; convert word

processing documents to a presentation format; and create data access pages.
- Corporate portal applications such as browsing for information, downloading documents, searching for information and converting to HTML format were used by the majority of the APs although the level and frequency of use differed.

All managers who formed part of the research group acknowledged the fact that the technological revolution taking place in the business world affected the way business was done and how PAs did their work. The enhanced technological skills of APs have led to increased efficiency in their support to their managers.

3.2 Interpretation of the feedback from the interviews

The following trends were observed from the in-depth interviews regarding the perceived role of the AP by the manager, as well as the preferred level of assistance and education needs of the AP in the ICT environment.

3.2.1 Office information systems (OIS)

Discovery tools

All the managers were familiar with the various discovery tools available to facilitate the retrieval and provision of information. They expected the AP to be able to use the various discovery tools, although only half of the respondents perceived advanced education as vital, while the other half indicated that a basic knowledge of the discovery tools would suffice. None of the managers expected the AP to be able to assist at a technical level with the discovery and retrieval of information, although the majority considered assistance at user level important.

The Web, intranets and corporate portals were utilized by PAs in the discovery and retrieval of information at the companies. The margin of activity differed according to the level of utilization. Most APs used their intranet, Web and corporate portals to locate company reports, policies and procedures, as well as forms and templates. These facilities were used to discover information with regard to company profiles, persons, technical background information, competitive intelligence and information to help prepare for meetings. About a third of the APs made use of the hidden Web. About half of the managers considered AP training in advanced Internet searching important. A large proportion of the survey group let APs do their searching via the Web and corporate portals. None of the APs used intelligent agents (IAs) and soft bots to a significant extent.

Interpretation

Effective information retrieval has not yet been utilized to its full potential and training in the use of IAs and Internet soft bots will go a long way to establish familiarity with the tools. If the APs were more aware of them, they would use them more often to reduce information search and retrieval times. Although it was evident that APs used discovery tools on a regular basis in their information management and support function, they needed proper training in the various search techniques made available by information aggregators.

Communication tools

All the managers were familiar and expected their APs to be familiar with various communication tools available to facilitate the provision and dissemination of information. Examples of their utilization of communication tools included e-mail and accessing the Web via cell phone technology. The majority of APs assisted their managers at a user level and were not expected to assist at a technical level. Real-time communication was used within the majority of the companies; Windows Messenger and MSN Messenger had replaced internal memorandums and reduced paper communication.

All APs interviewed used e-mail on a daily basis as a communication tool; they used e-

messages to distribute information to clients and have done bulk e-mail advertisements. Not many of the APs made use of bulletin and message boards, while a third used chat rooms. Paging technology and video mail were not used at all. Education about communication tools was seen as vital by most managers, though a third believed that only a basic knowledge of all the components should be taught. Advanced knowledge of e-mail and cell phone applications was seen as important by all of the managers.

Interpretation
PAs provided important assistance with communication and as such skills to use various communication tools should be taught. Awareness of instant messaging systems is vital in the networked enterprise. It should form part of the curriculum, since this technology has changed the interface of internal correspondence.

Wireless communication tools
The majority of managers were familiar with and used various wireless communications tools on a regular basis. Examples in this category included wireless e-mail, bulk SMS usage, wireless application protocols (WAP), global positioning systems (GPS), general packet radio service (GPRS), Bluetooth technology and cellular conferencing. The majority of APs were not that knowledgeable and had not used wireless communication tools in the dissemination and repackaging of information on a regular basis. Less than half the managers required extensive knowledge about these technologies from their APs. Future training in using at least some of these technologies was seen as important, although the utilization by APs was still limited. The majority of the managers would like their APs to be able to assist them at user and technical level when the need arises, rather than as a daily function.

The survey group utilized SMS the most, followed by access to Internet through cell phones, cellular conferencing and cellular roaming technology. Only a few made use of multimedia messaging services (MMS). Although most of the APs were knowledgeable on WAP, GPD, GPRS, Wi-Fi, wireless software agents, wireless e-mail and instant messaging service (IMS), the number who had used it on a regular basis was not significant.

Interpretation
Although the managers interviewed made use of the above-mentioned wireless technologies, the APs were at the office most of the time and as such did not use these technologies as often as the managers, who travelled more. This may change in the future since today's technological advancements also makes it possible for a AP to perform many of his or her tasks from a remote office. Training about the nature and application possibilities of these facilities will create awareness of the possibilities thereof and the subsequent contribution to increased productivity and mobility of the AP.

Web-based applications
This includes management systems such as daily reports, database queries, report distribution in HTML format, the posting of project assignments for collaborative viewing by work groups, making team goals available online, posting meeting minutes, online referencing and customer relations management (CRM).

All the managers in the survey group were familiar with and used the various Web-based applications on the Web, extranet and intranet as information tools. Their APs were all knowledgeable about the various Web-based applications and their use in the discovery, dissemination and repackaging of information.

About a third of the managers regarded a basic knowledge of these tools as adequate for their APs, while another third believed these tools formed a very important component of efficient support by the APs and should be taught in depth with applicable teaching institutions. A

third of the managers did not see it as important at all.

About half of the respondents wanted their APs to assist them at user level with Web-based applications in the discovery, dissemination and repackaging of information on a daily basis, while others regarded it as important when human intervention was needed. A small group of respondents did not utilize the AP's knowledge and assistance at a user level. Not all the managers made use of the AP's assistance with regard to Web-based applications on a technical level.

Although the managers interviewed used personal digital assistants (PDAs), none of the APs did so. Most of the APs had access to the manager's PDA and make changes to dates or arrangements as the need arose. A third of the APs distributed reports in HTML and used Web-based applications to distribute information to employees, customers, suppliers and clients. Although all the APs were involved in CRM, only half used Web-based applications actively in CRM.

More than half of the APs used their intranet and corporate portals to view daily reports, invoke database queries and find company policies and templates. The majority of APs used the Web on a regular basis to view the latest information, promotions, discounts and find reference information on behalf of their managers. All the APs archived reports on the intranets and were also able to retrieve archived information.

Interpretation
At least half of the APs utilized Web-based applications as part of their managerial support role. Education on all available Web applications should lead to an increase of usage of PDAs and cell phone communication. The results indicated that the majority utilized the Internet as an information tool to a significant extent and it should therefore be taught in depth at teaching institutions.

Collaboration tools
All the managers interviewed were familiar with the different collaboration tools such as workflow systems, file and screen sharing, collaborative commerce, text chat and real-time collaborations tools, available to facilitate retrieval, dissemination and the repackaging of information. The APs used collaboration tools extensively in their support task for the managers. They used MS Outlook as a vehicle in the retrieval and dissemination of information to clients, fellow employees and managers. The majority of APs used file sharing, screen sharing, collaborative Web browsing and workflow systems. They used these tools mainly to schedule meetings, access and synchronize calendars and reach contacts. File sharing was used primarily in project teamwork. Only a small percentage used electronic discussion forums and collaborative commerce. None of the APs assisted in white boarding.

Interpretation
The majority of managers expected APs to have proficient knowledge of the various collaboration tools and regarded it as an integral part of the AP's job description. They agreed that the AP must be able to assist the manager at user and technical level.

Conferencing skills
Managers were in general familiar with the various conferencing tools available to them in the discovery, retrieval, dissemination and repackaging of information and expected their APs to be knowledgeable about them and to be able to assist the managers at both user and technical level. The majority of APs assisted with video, Web, data and telephonic, desktop and audio conferencing set-up, as well as troubleshooting. Only a third of the APs managed cell phone conferencing. From the interviews it became clear that managers regarded knowledge of and advanced user skills in respect of the various conference tools as essential

and saw their use as a major part of the AP's work in the new technological environment.

Interpretation
Modern technology opened a wide range of conferencing techniques. APs were very involved in the setting up of conferences and other work-related meetings. They not only had to be able to assist at user level but technical support was also required.

Dissemination of information
All the managers interviewed were familiar with the different tools available to facilitate the dissemination and repackaging of information, while about two-thirds considered technical and user-level assistance by their APs as important. The majority regarded training as essential. All the APs assisted in printing, faxing and e-mail distribution, although two-thirds made use of a central printing facility within the company and sent faxes and documents to be printed to the facility. They were thus only overseeing the process and most of them had on occasion installed a printer, fax facility or modem and have done troubleshooting.

Scanning of documents and e-mail formed a large part of the AP's daily functions as observed from the responses from the interviewed managers. The managers all agreed that a basic understanding of dissemination tools was needed, but most felt that faxing, printing, scanning and e-mail skills were the most important basic skills. Half the managers felt that their APs must be able to set up wireless facilities, connect modems and do basic troubleshooting. A small number of managers regarded advanced training in dissemination tools with regard to bulk dissemination of information as crucial, since the communication divisions managed the largest part. Most of the managers regard the ability to import and export data as important.

None of the APs used Bluetooth on a regular basis, though slightly less than half made use of wireless local area networks (LANs). Only a third were involved in the selective dissemination of information and none handled bulk dissemination of information, since central divisions within the companies handled this. Just over half of the APs did hyper-linking of contents, though only a few did this on a regular basis. Less than half exported and imported information from databases on a regular basis, though all the APs were familiar with the process.

Interpretation
Dissemination of information formed a major part of the APs' daily tasks. Therefore training in technology to enhance their capabilities in this respect was important. They were expected to be able to use all the facilities available to them to increase their efficiency.

Document and records management
The majority of the APs were involved in tasks such as

1. Indexing of controlled documents and deliverables
2. Registration of key information
3. Tracking of the progress and status information of documents
4. Incorporation of further documents as required throughout projects
5. Secure storage of documents
6. Delivering of documents to team members on time
7. Reviewing archived documents
8. Change management of documents and supporting of project teams through the Web, intranet and wide area network (WAN)
9. Analysis of document flow.

The APs in most cases used portable document formats (PDF) for securing documents before

distribution. Most of the APs were familiar with electronic document management systems (EDMs) and different filing programs. The majority of companies used Metrofile as a secure archiving system and managers expected the APs to have at least a basic understanding of the archiving system. Only a small percentage used MS Excel and had done conversions from Excel to other formats. All the APs used CDs, flash disks, network drives and external hard drives as additional backup systems for documents.

The majority of managers viewed training with regard to the above applications as important. Very few believed that the company had enough departments to handle document and records management and therefore did not need the assistance of the APs at user level.

Interpretation
All the managers interviewed indicated that the role of their APs in terms of document and records management had changed from normal manual filing and support to an integrated role of management and control. The technological changes, according to them, had increased the importance of the AP's intervention and assistance in document and records management. Filing, as observed, had been reduced since a central system was in place, but archiving and retrieving archived documents on the central system was still done by the APs.

Data and information management
The operating system Windows XP Professional was used in more or less all of the companies from the sample group. Most of the companies make use of MS Outlook, while only a few used IMPACT and BIG BLUE, IBM's storage virtualization solution. Managers perceived their APs as competent in the sharing of data across platforms to facilitate the processing, retrieval, dissemination and repackaging of information. Only some APs made use of specialized personal information managers (PIMs) or assisted the manager in this capacity.

Lotus Notes was used by many of the companies in addition to systems, applications and products in data processing (SAP 2006), and the survey group saw competence in Lotus Notes as essential in the near future. The majority of APs used either Lotus Notes or MS Outlook and only stored information to the central system. The ability to store information was regarded in most cases as important. Managers perceived the ability to work on different platforms as part of the AP's job requirements.

Interpretation
The APs had to be competent in the use of different data and information packages and be able to share information across several platforms since they were involved in this on a regular basis.

Sharing of information
All the APs interviewed were able to convert documents to PDF, but none were familiar with extensible mark-up language (XML). A quarter of the APs had applied hypertext mark-up language (HTML) and created Web documents from office documents. Less than half of the managers believed it to be an essential part of training and expected their APs to assist them at user and technical level with regard to Web-based information processing.

None of the APs work on Web design with Dreamweaver and Flash. However, half of them converted text or designed Web pages with MS FrontPage. The majority of the managers did not expect their APs to be knowledgeable in the area and did not make use of their assistance with regard to Web design, since all of the companies had their own Web design departments.

All the APs made use of MS PowerPoint as a multimedia presentation tool. It was seen as an

important part of training at both advanced user and technical level.

Interpretation
Even though most enterprises had separate Web design and maintenance departments, the AP at least had to be able to publish MS Word documents to the Web, use MS FrontPage and use MS PowerPoint as a presentation tool. They were not expected to do graphic design, although the ability to create animations and advanced graphics and import them to MS PowerPoint would enhance their presentations. The inclusion of XML and HTML in the training programme of APs at this stage did not seem important, although future demands may change this.

Project management
Most APs interviewed were involved in supportive roles with regard to project management, but only half were actively part of the project teams, while less than half had minor roles and only a fraction of the survey group were not involved at all. MS Project, Mind Manager and MS Excel were used in project management. The APs who were actively involved assisted with the scheduling and monitoring of work progress and information flow. All the managers indicated that the underlying theory of project management and related software should form part of the AP's training.

Interpretation
Project management was an essential part of the corporate culture and the AP had to be increasingly involved in this. The level of involvement ranged from supportive to full integration in the project team. This was seen as a vital part of training.

3.2.2 Electronic commerce
All the companies in the survey group were involved in electronic commerce (EC). A third of the APs provided information to be published in internal and external e-newsletters and e-zines, but none of them were involved in their distribution. The majority of APs performed CRM, handled e-forms and questionnaires, and had done permission marketing. None of the APs was involved in banner and Internet advertisements. The responses from the managers indicated that half of the APs tracked consumer behaviour on occasion. None of the managers indicated that their APs were involved in electronic data interchange (EDI) on a regular basis.

All managers interviewed indicated that their APs were knowledgeable about the various e-commerce activities in existence, but also indicated that their APs were not directly involved in the electronic transfer of funds. Managers and account departments handled most of the EFT activities. APs only assisted in the transfer of funds and online payment of bills on behalf of their managers, and not for the companies as such. A third of the APs paid bills online and handled multi-currency banking, mostly when they scheduled workshops or conferences and made travel arrangements. The majority of managers indicated that the basic knowledge of e-commerce activities would suffice.

Interpretation
Even though most of the financial transactions of the enterprise were the responsibility of the account departments, managers required their APs to be able to handle their personal e-commerce transactions as part of their jobs. They were also involved in CRM and had to be trained to make use of e-commerce in respect of this function.

3.2.3 Business intelligence (BI)
Even though the majority of companies made use of SAP (2006), most of the managers indicated that their APs were not directly involved in using SAP and therefore did not regard advanced training in SAP or similar systems as important. Managers made use of SAP on a

regular basis and did not need the AP's assistance. However, most of the managers thought a basic knowledge of business intelligence systems (BI) was essential. In most cases, APs used SAP and other BI systems for extracting and importing data from the warehouse.

The majority of APs were involved in CRM through e-mails, automated response, setting up a help desk, SMS systems and in answering frequently asked questions (FAQ). None of the APs was involved in CRM via the Web. The minority had used personalized Web pages for CRM and PRM. BI was not used for public relationship marketing (PRM) or enterprise relationship marketing (ERM), since these functions were managed by the communication departments within the said companies.

Interpretation
Even though BI is not used for PRM and ERM, the AP is very involved in CRM and since most companies make use of BI systems, they should at least be trained to be able to import and export data from these systems.

3.2.4 Workflow systems

None of the APs were involved in publication and distribution rights management (DRM) or media asset management systems (MAM). The majority of APs used workflow systems for streamline asset retrieval, facilitating file transfers and file compatibility, controlled archiving and instant access to company information. Most of the APs performed back office functions, event scheduling, tracking errors and created descriptive information for each newly created data entry. The majority of managers perceived ongoing training about workflow systems as essential, since workflow systems were able to simplify the above tasks, reduce errors and increase productivity and reliability in output.

Interpretation
The use of workflow systems by APs enabled them to organize the work to be done more effectively. File transfer and establishing file compatibility and integrity had to be included in training since it was necessary for sharing information – not only between the manager and his or her AP, but also between the AP and clients or other employees.

3.2.5 Decision support systems (DSS)

Most of the companies in the sample group made use of desktop decision-support systems (DSS) and MS Excel in what-if analysis and goal seeking. However, APs had little knowledge of MS Excel and had used it only in a limited manner. Only a third of the APs have used spreadsheets in goal seeking and what-if analyses.

The majority of managers did not see advanced training in MS Excel and other desktop decision support systems important for a AP training programme. They perceived this as mainly a top-level function and saw the theory behind goal-seeking, forecasting and what-if analysis as more important.

Interpretation
The results from the interviews indicated that certain functions such as goal seeking and what-if analyses were still perceived as part of typical managerial functions. Only basic training in MS Excel and other desktop decision-making tools were needed. However, if the AP was able to utilize these software applications on a higher level, he or she would be able to assist the manager in what-if analyses and goal seeking. The underlying theory should be taught.

3.2.6 Intelligent support systems (ISS)

The majority of companies in the survey group made little or no use of artificial intelligence applications with regard to voice technology, speech recognition, language translators, user

interface agents, voice portals, creativity support agents and Web-based experts. As such, none of the APs used these applications and management did not expect them to be knowledgeable in applying them.

It was nevertheless regarded as a future option. Most of the companies still made use of APs in a more traditional role and made use of human translators. Only a third of the APs made use of spreadsheet agents, task management agents and network intelligent agents.

Interpretation
The above are all recent technological applications that are not fully utilized in the business environment. Some of the managers commented that there was still too much editing work involved, but that this type of technology needed to be explored. The use of these technologies may become more widespread in future as their uses become enhanced and more widely promoted. APs did not need advanced training at this stage but will benefit from gaining basic user knowledge. These technological applications could reduce time spent on translation, searching for information and typing, and thus lead to higher productivity within enterprises.

3.2.7 Knowledge management systems (KMS)
All the companies in the sample group had KMSs in place in the form of document management, e-mail solutions, directory services and internal portal technologies. Most of the companies used either Gartner (Meta), Lotus Notes or MS Outlook. Only a few made use of DocuShare. None of the companies made use of a single system, but rather used a combination of two to three applications. None of the companies used Corel CASE Central, WebCT, Groupware, MS Tahoe, Dataware KM Suite, or KnowWare to manage enterprise information and knowledge. However, all the managers wanted their APs to be proficient in the various KMSs on user level, but none required assistance on a technical level from their APs.

Interpretation
Even though Corel CASE Central, WebCT, Groupware, MS Tahoe, Dataware, KM Suite, and KnowWare were not used, training in Gartner, DocuShare, Lotus Notes and MS Outlook was essential. Since it was not possible to train the AP in all types of systems, the focus had to be on the optimal use of KMSs. All the companies from the survey group had KMSs in place, indicating that KMS played an important part of the AP's information and knowledge management role.

3.2.8 Transaction processing systems (TPS)
All the enterprises in the sample group used TPS. About half of the managers indicated that their APs were involved in TPS on a regular basis. The involvement of the APs was mostly limited to transmitting invoices to their central departments and customer tracking. None of them was involved in payroll activities, although about half of the APs tracked leave days, did capacity and facility planning, assisted in short and long-term forecasting, cost analysis and partial quality control. Only a few of the APs were involved in total quality management (TQM) and just-in-time (JIT) analysis. None of the APs was involved in materials management, computer-aided manufacturing (CAD), material requirements planning (MRP), manufacturing resource planning (MRPI), inventory management, technology planning and assessment or computer integrated manufacturing systems (CIM). A third of the managers saw full training in transaction processing as important since the AP was seen as the first person to initialize transactions. The managers regarded budget control assistance as part of the AP's job description. The remaining two thirds saw basic knowledge of the processes as adequate.

Interpretation

Even though none of the APs in the sample group was involved with CAD, MRP, MRPI, inventory management, technology planning and assessment or CIM, it could be argued that if the sample group had consisted of manufacturing-related enterprises, it was possible that they would have been involved. These tools could therefore not be excluded from training. Further studies with regard to related industries may be required to examine the AP's role in these areas. The AP provided support in transaction processing, although limited. Since most companies had accounting departments to handle the financial transactions, training on an introductory level would suffice.

3.2.9 Data warehousing (DW)

All the enterprises in the sample group made use of data warehousing, but the majority of managers indicated that their APs were only involved in archiving as well as the sending and retrieval of information to and from the data warehouse. They did not see the need for technical assistance in this regard and felt that education should be limited to the sending, retrieval and archiving of information. Most of the managers also made back-ups of their data on compact or external disks and APs were expected to do back-ups of their systems. Many of them used external hard drives as additional back-up systems. Metrofile was the data warehouse system used most, while a small group indicated that they also made use of the Athema archiving system.

Interpretation

Data warehouse systems make the storage of large amounts of information and data possible. Even though the AP did not need advanced training on a technical level, he or she still made use of these systems. Therefore an intermediate knowledge was needed of archiving, deciding how long a document should be archived, how to do back-ups and how to send and retrieve data from the warehouses.

3.2.10 General information management skills

An important trend was identified during the interviews, namely that all the managers indicated that they experienced an increase in technological pressure in performing their duties. Therefore, the majority perceived a AP's assistance in reducing the information overload in their day-to-day activities and on the Internet as vital. In most cases, their APs filtered incoming e-mails, calls, frequently asked questions and created responses. All the APs relieved their workload pressure by making information more accessible, thereby supporting the navigation for information. APs were perceived to a lesser degree to be of assistance in reducing technological pressures with regard to innovations. Managers perceived strategic goal setting in most of the cases as a top-level function and evaluated their AP's role in this regard as supportive but limited. They did, very importantly, consider a AP as part of the team and vital in reaching the overall goals of the company. The majority of managers agreed that their AP's supportive role in relieving technological pressures and information overload and his or her assistance in workflow and innovative information management actually increased the manager's decision-making abilities.

Interpretation

Advances in information technology had not replaced PAs, but had instead created opportunities to enhance their capabilities to support the manager and to perform as part of the team. APs could minimize pressures from technological innovations though assistance at user and technical level by, for example, setting up teleconferencing or Web conferencing, filtering e-mails, transferring data and preparing presentations. Training the AP as an information worker and advanced user of the ICT applications would ensure that he or she is able to contribute to the competitiveness of the enterprise. The AP had been freed from routine tasks trough technological innovation and was now able to perform more specialized tasks.

Business skills (soft skills)
During the interviews managers had identified a large number of qualities and business skills regarded as vital in their supportive roles for successful business management (in no specific order):

- Listening
- Following directions
- Initiative
- Communication
- Punctuality
- Ethics
- Diversity
- Leadership
- Productivity
- Team work
- Quality of work
- Project completion
- Flexibility
- Organization
- Professional
- Image
- Problem-solving
- Etiquette
- Dependability
- Accountability
- Confidentiality
- Time management
- Positive attitude
- Approachability.

Interpretation
The above-mentioned list indicates that basic business skills had not become redundant and should be addressed during training, although many of these qualities such as good ethics, confidence and a positive attitude were inherent to a particular person. Listening skills, effective management of time and communication skills could be taught.

Manager's perception of the AP's role
Interviewed managers were of the opinion that their APs formed an integral part of the team and were involved in all aspects of business management in a supportive as well as decision-making role. The role of the AP, according to these managers, had changed significantly with the advancement of technology, that is, from merely a receptionist to a knowledge worker who needs more than soft skills and good typing abilities.

In the majority of cases, the managers did their own typing, while the AP re-formatted their work. The AP was seen as instrumental in relieving the work and information overload, and his or her assistance in the use of technological applications was regarded as important.

Interpretation
The managerial perceptions of the changing role of the AP, because of technological change in the business environment, indicated that a shift from the classical hierarchical enterprise structure to that of the network enterprise had indeed taken place. Whereas the employee was previously seen as part of the cost, he or she was now perceived as an asset. Information was previously limited to the manager, but was now shared with the AP. In the researched enterprise environment, a AP needed to be knowledgeable not only in support functions, but

also in technological innovations, information management and enterprise knowledge. He or she typically formed part of the project teams and worked in close collaboration with the manager. In many instances, the manager expected him or her to assist at user level as well as technical level.

top

4 Conclusion

The questionnaires and interviews were applied to establish a view within the enterprise regarding the AP's role and the way the enterprise conducts business in a digital environment. The results indicated that information systems being utilized by the AP form the backbone of managerial and support functions of an enterprise. It is evident that computerized solutions to business problems often require the combined use of two or more systems.

The results of the questionnaires and interviews also indicated that APs working in a networked enterprise were actively involved and supported by information systems through the broad spectrum of their duties. They were also used in the networked enterprise's management triangle at the support level between top and middle management, according to the results of the interviews. Their abilities, level of education and skills enabled them to use and manage diverse information systems that were conventionally developed to assist only professional staff. They utilized these technologies effectively for knowledge-related work and thereby added value to the corporate entity.

It was found that managers utilized the AP's skills effectively and perceived him or her as part of the team. The results obtained from the interviews showed that APs function as knowledge workers in the management team and so add value to the networked enterprise. Technological developments in the business environment had led to the integration of the roles and responsibilities of the APs with those traditionally performed by the manager. Views expressed on the business skills of APs illustrated that they functioned on a higher management support level within the enterprise. Results showed that APs were utilized as knowledge workers and were no longer only typists and receptionists. The results indicated that they made valuable contributions as team members in the management structure of the networked enterprises.

Results from the questionnaires and interviews also showed that APs met the information needs of managers in the networked enterprise through the utilization of their information systems. It can be concluded from the results regarding the AP's role and function in support systems such as OIS, TPS, EC, BI, DSS, KMS and data warehousing (DW), that PAs could become more supportive in decision-making that could add value to the enterprise. It can also be concluded from the input provided by managers during the interviews that training in all of the above systems was essential to empower the AP to provide support to the manager and to enhance his or her role as an active team member in the networked enterprise. Results showed that the teaching and learning process devised for this career path should not only concentrate on business skills that were seen as vital in the success of the AP's supportive role to strategic management, but that emphasis should be placed on the utilization capabilities of technological applications on both user and basic technical assistance level.

The results of the study indicated that managers' perception of the AP was changing to such an extent that he or she could be seen as an integral part of the team. Managers expected their APs to be well-qualified in ICT and soft skills. This change in perception was due to the advances in the digital environment, which meant that the AP might indeed be described as a knowledge worker, thus with a higher status in the enterprise. It also implied that the AP's

role would increase in importance and that the recruitment of staff should entail all the requirements discussed above.

Because of the changing role of the AP, managers should be aware of the need for new skills and abilities of the AP to assist at a much higher level of management, leadership, decision-making and teamwork. Managers should be aware of the fact that they can utilize their APs in areas such as e-commerce and even in advanced Web applications. The message to universities of technology is that APs must be trained at a more advanced level to meet the demands of their positions in the enterprise. These tertiary institutions should adapt their curricula accordingly. Training needs to focus on advanced technology as well but should not neglect the important soft skills as identified through the interviews for this research.

top

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top

Appendix

List of information technology companies currently listed on the Johannesburg Stock Exchange (JSE)

A complete list of the information technology companies listed on the JSE, as indicated in the year 2004, to take part in this study and their respective WWW site addresses. Complete lists can be viewed at www.jse.co.za.

	COMPANY	Sector	STATUS	COMPANY CODE	SHORT NAME	WWW SITE ADDRESS
1	AST Group Limited	Computer services	C	AAA	AST GROUP	www.ast.co.za
2	Business Connexion Group Limited	Computer services	C	BCX	BCX	www.bcx.co.za
3	Bytes Technology Group Limited	Computer services	C	BTG	BTG	www.btgroup.co.za
	Compu Clearing	Computer				www.compu-

4	Outsourcing Limited	services	C	CCL	COMPCLEAR	clearing.co.za
5	CS Computer Services Holdings Limited	Computer services	C	CSH	CSHOLDING	www.cs.co.za
6	Datacentrix Holdings Limited	Computer services	C	DCT	DCENTRIX	www.datacentrix.co.za
7	DataPro Group Limited	Computer services	C	DTP	DATAPRO	www.datapro.co.za
8	Datatec Limited	Computer services	C	DTC	DATATEC	www.datatec.co.za
9	Dimension Data Holdings plc	Computer services	C	DIDDT	DIDATA	www.didata.co.za
10	Elexir Technology Holdings Limited	Computer services	C	ELX	ELEXIR	www.elexir.co.za
11	Enterprise Outsourcing Holdings Limited	Computer services	C	EOH	EOH	www.eoh.co.za
12	ERP.Com Holdings Limited	Computer services	C	ERP	ERP.COM	www.erpcom.co.za
13	Faritec Holdings Limited	Computer services	C	FRT	FARITEC	www.faritec.co.za
14	Mustek Limited	Computer hardware	C	MST	MUSTEK	www.mustek.co.za
15	Paracon Holdings Limited	Computer services	C	PCN	PARACON	www.paracon.co.za
16	Pinnacle Technology Holdings Limited	Computer hardware	C	PNC	PINNACLE	www.pinnacle.co.za
17	Spescom Limited	Computer services	C	SPS	SPESCOM	www.spescom.co.za
18	Square One Solutions Group Limited	Computer services	C	SQE	SQONE	www.sq1.co.za
19	Vesta Technology	Computer	C	VST	VESTA	www.vesta.co.za

	Holdings Limited	services				
20	Xantium Technology Holdings Limited	Computer services	C	XAN	XANTIUM	www.altx.co.za
21	Y3K Group Limited	Computer services	C	YHK	YTHRK	www.y3kgroup.com

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top

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