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IMPROVING COMMUNICATION AT

SOLON WANDSWORTH HOUSING ASSOCIATION

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1. communication
2. technology
3. training

Abstract

In this project we determined how to improve communications between employees at Solon Wandsworth Housing through technology. We conducted interviews and focus groups to determine how the employees currently communicate and how they would like to communicate. We developed a work plan, consisting of recommendations for computer training, new policies, and new technologies that will improve communications between Solon's employees.

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Executive Summary

We determined the information needs of Solon's employees through interviews and focus groups, identified the technologies or training needed to meet these needs, developed a work plan for implementing these solutions, and implemented items from the work plan.

We first conducted background research on several topics to assist us in the tasks that we performed. This included research on organisational structure and social housing which allowed us to gain a better understanding of our sponsor's organisation culture and goals. Studying the effects of Information Technology in the workplace gave us an understanding of how IT is utilised in an organisation. We researched Internet access and the effects of introducing the medium. In addition, we investigated the security issues that arise when using IT. In order to obtain valid data from the employees through interviews and focus groups, we also studied interview techniques.

In order to improve the current communications at Solon, we investigated how the employees currently communicate by performing a network analysis and conducting interviews. The network analysis involved an examination of Solon's computer network. We determined how information travels through their network. This knowledge gave us a better understanding of what systems were working efficiently and those that needed improvement. We conducted the interviews with all of Solon's twenty-five employees, and identified who the employees communicate with, what methods they use to communicate, and why they use those methods. We also obtained the computer literacy level of each employee through the interviews. The data from the network analysis and the interviews allowed us to tailor our focus groups to our specific audience, since we determined which people used certain technologies and communicated in certain ways.

Once we determined how the employees currently communicate, we identified how they would like to communicate. We conducted focus groups with each of the six departments at Solon. The focus groups took the form of a guided conversation where we suggested improvements and recorded the employees' feedback. The transcripts from the focus groups provided us with clear indications of what technologies and ideas the employees liked and thought would be feasible.

After we conducted the interviews and focus groups, we performed content analysis that allowed us to identify and prioritise the employees' information needs. These needs fell into three categories: training of existing technology, writing policies on the proper use of technology, and implementing new technologies. Content analysis allowed us to quantify the feedback from the focus groups and identify every time a department felt that a specific improvement would improve their communications. This quantified data showed us which improvements are most important to Solon's employees. The next step was to arrange the items in a logical order for implementation. This includes training on Solon's current computer system before additional technologies are implemented, and writing of policies after the employees have been trained in the technology's uses and before its implementation.

Using these prioritised information needs, we designed a work plan for Solon. The work plan is a detailed list of what Solon should do to improve communications. In the work plan we address each information need, discuss implementation strategies, and identify the resources that will be needed. The final step we performed at Solon was to begin implementing items from the work plan. We wrote drafts of all policy items, conducted training, and began deploying a news server.

In conclusion, we feel that we have determined the information needs of the employees at Solon accurately using interviews and focus groups. We also believe our recommendations will allow them to improve their communications with each other through

technology. We began implementation of several technologies and training sessions and feel that the employees will utilise the technology available to them.

1 Introduction

Social housing in Britain was initiated in its current state after World War I, and is now mostly provided by semi-private organisations such as Solon Wandsworth Housing Association. Solon Wandsworth is a privately held social housing association located in south London. The association is organised as a collective, without any managers. Decisions are made at workers' meetings, where all employees have equal representation. The organisation is legally managed by a management committee, which has legal control of Solon and is composed of tenants and unpaid volunteers. Solon owns and operates about 900 properties that range from bedsits to family homes. In addition to providing general needs housing, they also cater to special needs groups, such as retirees, recovering drug abusers, and refugees. Furthermore, they provide short-term housing for young people undertaking job training.

Solon wishes to improve their current computer network in order to take advantage of innovations in Information Technology (IT). Solon currently has a network with email and file sharing between computers. Some of the computers have Internet access, but it is limited. Solon wishes to enable greater communication through their network by allowing the introduction of new technologies and for the enhancement of their current technologies. The improvement of an information system within an organisation will increase productivity and communication through the conversion of information from paper to electronic form. This conversion to electronic media will allow information to be exchanged between individuals and other organisations more quickly and easily. Solon has asked WPI students to assist them with their goal of increasing communication through technology.

The purpose of this project was to develop a design plan to enhance the current Intranet-based communication network already in use at Solon Wandsworth. The communication network will function on several levels, addressing the needs of different

internal groups that interact at Solon Wandsworth, including employees, departments, and workers' committees. The first task was to research and identify the information and communication resources currently in use at Solon. The second part of the project was an in-depth analysis of the information needs of the users. The third part of the project was to prioritise the needs, identify technologies that will address them, and develop a work plan for the implementation of these technologies. The final part was to begin the implementation of the highest priority issues on the work plan.

2 Literature Review

2.1 Introduction

The following literature review provides the background information necessary to understand and accomplish the project goals outlined in the introduction. We first discuss the difference in organisational structure in use at Solon. We then give details regarding social housing in Great Britain in comparison to the United States. We also define and discuss information technology and data security. We then give a brief overview of the usefulness of interviews and focus groups and how best to perform them in relation to our goals. Finally, we discuss developing a strategy for the training of employees within an organisation.

2.2 Organisational Structure

Solon operates as a collective non-profit organisation. For a better understanding on how communication occurs in this organisation in contrast to a hierarchical organisation we examined the aspects of working in a collective organisation.

Starting in the 1960s, the idea of working as a collective became an attractive concept in the UK. This attraction to collective working was partly a reaction of opposition to the predominant hierarchical organisational structures. Since the 1960s, collective ideas have attracted a lot of interest in every class of society. Many collective housing associations and housing co-operatives exist in the UK. It is important for us to understand the meaning and goals of collective working because this will offer our team an insight as to why collective working attracts interest across a broad spectrum of people.

There is no single definition of a collective. Collectives can exist in many forms. However, the model of a collective involves some central ideas and some secondary ideas. Central ideas include: being citizens of a small democracy and having democratic control by

all of the workers. The idea of being a citizen of a small democracy implies that the workers have individual rights and are entitled to democratic participation in the management of the collective. The idea of democratic control by all the workers implies that all of the workers have a share in decision-making, and that the workers' meeting has ultimate authority. Secondary ideas can include: equal power, equal pay, assumption of equal skill and knowledge, and job rotation. The organisation assumes that all of it workers are equivalent in skill and knowledge. Job rotation means that every worker should be familiar with more than one job. Collective working is an alternative to traditional organisational structures because it allows organisations to operate without any hierarchy. The employees at Solon have equal power and pay.

Collective working is similar to any other system in that it has advantages and disadvantages. The advantages of working in collective include: individual discretion, autonomy, liberating, improved motivation, workers have more rights, and ethics are involved in the working of the organisation. In addition, operating as a collective can reveal additional skill in people and help them grow. The disadvantages of collectives include: size, efficiency, and free-riders. Size is an issue because when collectives grow it is harder for collectives to practice their ideals. For example, it would be difficult to arrange a meeting with all of the workers. Free-riders also become more of an issue when the organisation grows. A free-rider is ambitious individual who tries to improve his or her status within an organisation rather than accepting equal status with other employees. Efficiency can become an issue when business or the organisation becomes more complex. Some people are better at management than others, and this can lead to the employees selecting a manager to ensure that the organisation operates effectively and efficiently. The idea of having a manager is against the concept of a collective where all workers are responsible for managing their own

work. Organisations can work well as collectives when they are small in size and exist in a simple market. (Spear, 2000)

2.3 Social Housing

All humans have basic needs of food, water, clothing, and shelter. One of the functions of the government is to provide, to some extent, these necessities for its citizens. However, the degree and means to which these needs, especially housing, are provided varies from nation to nation and changes over time.

2.3.1 Housing in Britain and the United States

A proper realisation of the difference in the way that housing is provided in the United States versus Great Britain is important so that we can work at Solon with a proper view of their particular type of social housing, and not just expecting a situation similar to the public housing projects found in America. In the US, the social expectation is that people will take care of their own needs, as far as they are able. Only when people cannot provide for themselves does the government provide assistance. However, in the UK, some basic needs are considered rights of citizenship, and are provided by the government. One of these needs is housing. This is not to say that there is free housing provided for all by the government, but social housing is like fire protection: it is an expected social service (Wolman, 1975). Another differing view is that the tenants in social housing associations such as Solon pay rent, unlike their American counterparts. However, the government can subsidise the rent for people in need.

Another difference is in housing cost and quality. The bulk of the British housing problem comes from a lack of suitable buildings and a glut of older, substandard ones. America's problem is much different-- the housing problem is part of a system that keeps the poor from improving their situation by only providing slums and communities that offer no

hope (Wolman, 1975). Solon Wandsworth does not provide slum housing; all of its properties are single houses, mostly for families (Solon, 1999).

2.3.2 Economic Status Distribution of British Social Housing

The current British public housing system began after World War I, when soldiers returned home to find a lack of liveable homes (Wolman, 1975). Social housing was not targeted at the poor who could not provide for themselves, but for the working class (Harloe, 1995). Despite this intent, there are still those in British social housing who cannot provide for themselves, and this gives social housing a far greater socio-economic distribution than would be expected in America. Solon Wandsworth's range of tenants illustrates a significant distribution in economic status. The results of a census taken of the heads of the household in all of Solon's properties revealed that 18% were employed full time, 9% were employed part time, 31% were unemployed or seeking work, 9% were retired, 5% were full time students, 13% were disabled and not able to work, 10% were not seeking work, and 5% refused information or fell into another category (Solon, 1999).

2.3.3 1988 British Housing Act

In the late 1980s and early 1990s, Britain's government began an effort towards privatisation of social housing (Pryke, 1995). Traditionally, there was council housing, which was run by both local government agencies and private social housing associations such as Solon Wandsworth. The 1988 Housing Act served to shift the focus and government policy regarding social housing, so that the local government organisations became enablers of housing, providing referrals and subsidies, while the private organisations became the providers of the physical housing (Pryke, 1995). Last year, Solon had 108 properties with new tenants. The breakdown was as follows: 69% were referrals from local authorities, 11% were referred from other private agencies, 12% were transfer from other Solon properties,

and the remaining 8% were from other programmes. This large number of referrals, combined with large grants (2.3 million pounds for construction and refurbishing homes) from the Housing Corporation, a government agency, shows the magnitude of government involvement in British social housing (Solon, 1999). One of the government's reasons for privatisation of social housing is to make it more cost effective than the previous system of government provided housing (Pryke, 1995). This is partially due to the increase in privately owned middle class houses, which removed the middle class from social housing. A side effect of the gradual exodus of the middle class from public housing was that a socio-economic cross-section of social housing became more polarised towards the bottom classes, making social housing less attractive to the government (Harloe, 1995). By making the housing providers, now the private associations, responsible for their financial bottom line, social housing now has to pay for itself through rent and private funding. This means that social housing associations are looking for ways to reduce costs and work more efficiently.

2.4 Information Technology

2.4.1 Solon's History with Information Technology

Solon has a history of using technology to assist with its operations. In 1972, Solon had an IBM terminal installed to assist with the calculations for determining feasibility of a housing scheme. This was one of the first uses of computers by a London housing association. Solon also believes in the power of innovation to help deliver the highest quality housing at the lowest cost (Armstrong, 1994).

2.4.2 Current Network

The current network at Solon consists of twenty-five workstation computers running the Windows 95 operating system. Each of these computers has a network card that allows all

of them to be interconnected using a 3Com network hub. Attached to this hub, along with the workstations, is a file server running Novell Netware software. This allows the twenty-five workstations to manipulate the files stored on the server via the network.

In February 1999, Solon also introduced an additional server onto the network. An electronic mail software package was placed on this server to act as post office for incoming and outgoing electronic mail within Solon. At that time, the mail server was the only machine with access to the Internet.

Currently the mail server and one additional workstation computer have access to the Internet. This access is intermittent via an ISDN dial up connection. Unlike a standard modem connection over an analogue phone line, ISDN allows for digital connections to the Internet, increasing bandwidth and throughput. Bandwidth refers to the amount of data that can be transmitted in one interval; the standard measurement is in seconds. Along with the ability to manipulate files on the server, the network runs a standard protocol that allows the workstations to share their own files with others on the network. Some of the employees at Solon have implemented this network option, whereas others have no knowledge of its existence (Solon, 1999).

Solon has also placed a majority of their printers onto the network. By placing a printer on a network, any machine attached to the network is able to send a job to the printer. This provides all Solon employees access to every printer on the network. However, not all of the employees are aware of this feature and its uses (Solon, 1999).

2.4.3 Effects of Introducing Information Technology

The effects of introducing a technological network into an organisation can not only influence operations of the company, but also affect the employees. A technological network can range from an Intranet, with local servers, to the global scope of an Internet. The

availability of information on an Internet versus an Intranet is what separates the two networks. The distinction between the two is the owner of the information. On the Internet, the information can be owned by anyone, whereas on an Intranet the information is owned by the corporation and not available to the public (Gupta, 1998). This indicates that Solon's Intranet will have limited access; that is, only the people within their organisation and certain selected others can access Solon's information.

2.4.4 Groupware

A general definition of groupware is any software that links people for collaboration. Internet groupware is the use of the web, email, and newsgroups together to allow people to collaborate. Email, the web, and news are tied to the three fundamental protocols of the Internet, the Simple Mail Transport Protocol (SMTP), the HyperText Transport Protocol (HTTP), and the Network News Transport Protocol (NNTP), respectively. A protocol is a series of rules that computers use to communicate with each other. These protocols are open, which means they are in the public domain and can be used on any computer platform or client software. The result of having these open protocols is that there are multiple options available for both the client and server software, some of which are even available for free on the Internet (Udell, 1999).

Each of these different protocols has advantages and drawbacks; however, each is often used in situations where another protocol would be more appropriate. HTTP is a 'pull' technology, where the user must seek out the content. This is appropriate for documents and non-urgent information, such as manuals, operating procedures, and querying databases. SMTP is a 'push' technology, where all the information is delivered to the user without any searching. NNTP, the protocol behind the Usenet, finds the middle ground between the two, since it provides all new content as 'push' messages, yet provides a searchable archive where

users can 'pull' content. Unfortunately, most organisations only have HTTP web documents and SMTP mail, without any NNTP newsgroups (Udell, 1999).

There are several reasons why email should not attempt to take the place of newsgroups. First, there is no central store of messages. This means that there is no single, searchable transcript of discussions, since the messages are scattered across several computers and dispersed further into inboxes and sent mail folders. Email also does not allow for a nested discussion structure, where newsgroups file messages in a tree-like pattern, much like the folders on a computer's hard disk. This tree is searchable, and allows older messages to be found more easily. Another push-pull difference is while email requires selecting the recipients, newsgroups allow the readers to self-select and only read the messages that concern them. Holding discussions over a push medium forces the discussion to be private, where a pull medium can receive input from everybody and still spawn private email discussions if needed. Email, as a push medium, takes priority over other media because each email has a definite number of recipients. An email is transmitted to each recipient once over the network, therefore causing only one instance of traffic. News is a lower-priority medium, since it allows the reader to ignore information that is not pertinent to him or her. Because of this, news is better suited to memos and FYI distribution (Udell, 1999).

Since Internet groupware is the interaction between the web, email, and news, there are ways to link them closely together. HyperText Mark-up Language (HTML) is the language in which most HTTP transmissions are encoded. HTML, also an open standard, allows for platform-independent formatting of a document, and can provide things such as inline graphics, tables, forms, and styles. Email and newsgroup messages can use HTML and integrate some of the aspects of web content. They also provide links to web documents by including Uniform Resource Locator (URL) links for the web (hyperlinks). HTML can include links to URLs for mail (mailto:// links), news (news:// links), other HTML documents

(http:// links), and even other files located on a server (file:// links). This allows the reader to instantly view the highlighted information with a simple mouse click. News can offer mail and web links, and users can continue private discussions over email (Udell, 1999).

2.5 Intranets

Along with the World Wide Web, an Intranet can also offer electronic mail, file transferring, and sharing of computer hard drives. Each of these types of communication can be utilised on an Intranet; Solon needs to determine which parts they would like to incorporate. Solon already has the ability to communicate using electronic mail. Along with each component of the Intranet comes a degree of security that needs to be taken into account to protect the data. The development of an Intranet brings up issues such as security and privacy (Bidgoli, 1999).

2.5.1 Introduction of an Intranet

The introduction of a communication medium known as an Intranet brings access to a plethora of information, and allows users to have simple continuous access to this information. One benefit to the introduction of an Intranet is the availability of information to all employees, regardless of the type of computers they use. An Intranet is not computer specific; it can incorporate Macintosh, Windows, Linux, or other computing platforms. Solon currently uses Microsoft Windows 95 as their desktop operating system and Novell NetWare 4.11 as their server operating system. However, if other computers were to be incorporated into their Intranet, these other computers could be configured to operate seamlessly. One of the best benefits of an Intranet is that the information contained within it is entirely controlled by the company or organisation.

2.5.2 Information used on an Intranet

Two types of data that can be circulated on an Intranet are static and dynamic information. Static information can include tabular lists of employees and other data that are updated periodically. Examples of dynamic information include sales, inventory data, or any type of electronic monetary transaction. These types of information are updated continuously. Solon should try to incorporate both types of data in their Intranet because static applications decrease costs and increase time savings, while dynamic information can play an important role in increasing customer satisfaction and employee awareness (Gupta, 1998).

2.5.3 Benefits of an Intranet

There are many different types of organisational departments within a company and the benefits of an Intranet are distinctive for each. Those that concern Solon include Human Resources, Management, Marketing, and Accounting and Finance. In the Human Resources department, an Intranet will reduce many labour-intensive jobs, such as the updating of employee lists, which could be maintained online. The use of an Intranet would make updating these lists instantaneous and easy for any employee. Solon could benefit by placing its databases online for use by the employees and the tenants, and understand that some jobs may disappear with the introduction of static and dynamic data to an Intranet (Gupta, 1998). This reduction in labour-intensive jobs will save money, due to the high cost of labour.

2.5.4 Advantages and Disadvantages of an Intranet

There are many distinct advantages of an Intranet, such as increased speed of information transfer, enhancement of productivity, and the ability to constantly revise data. Some disadvantages include security issues and complex implementation. Overcoming these difficulties requires an understanding of the needs in the organisation. All aspects of the

company were taken into account when determining how the Intranet will benefit the organisation.

2.5.5 Intranet Development

Bidgoli states that the development of an Intranet needs to begin with the definition of the problem. The information flow and needs within the organisation have to be identified (Bidgoli, 1999). Focus groups identified these needs, as outlined in the methodology. After defining these needs, the next step consisted of a cost benefit analysis of the Intranet; in most cases the benefits provided by an effective Intranet outweigh its costs (Bidgoli, 1999).

2.6 The Internet

2.6.1 Internet Explanation

The Internet is a loose association of thousands of networks and millions of computers across the world that all work together to share information. Each of these computers uses the same protocol, or language, which allows them to communicate. This network allows information to be transferred globally in a very small amount of time. The information available on the Internet is equal; meaning that one piece of information does not take priority over another. A user is able to obtain files from all over the world once connected to the Internet. One of the subsets of the Internet is the World Wide Web, sometimes referred to as the Web, which is a conglomeration of electronic magazines offered on computers connected to the Internet. These web pages can be reached from anywhere a connection to the Internet is available, regardless of global location. They can contain anything that someone is willing to create, making the World Wide Web a global canvas for anyone who wishes to paint a picture.

2.6.2 Offering Internet Access

Offering Internet access to employees is one of the biggest topics in the IT industry today, and many companies decide not to offer it because they do not know how to regulate information that will be available to employees. The different types of access need to be analysed before creating design solutions (Henry, 1996). Solon currently restricts Internet access to two machines on their network; each uses an ISDN connection to connect to the Internet. They are considering expanding this access to a network-wide level as part of their IT plan. By introducing the Internet to the entire organisation, network security and information safety risks are created. Balancing openness and security is the key to using Internet technologies successfully (Gunst, 1999). These risks can be mitigated by the use of a firewall and employee training in intelligent Internet usage. The organisation needs to determine whether or not introducing the Internet as a new communication and information channel will be an acceptable course of action.

2.6.3 Advantages and Disadvantages of Internet Access

The Internet offers organisations access to a surplus of information, offering many advantages over previous communication mediums. The greatest benefit of the Internet is that the information can be sent across the world almost instantly, with the ability to unite people in different locations. It allows individuals with similar ideas and interests to share information with one another. The Internet is based on non-proprietary standards, which allow any type of computer to be connected and exchange information. These non-proprietary standards are much less expensive for an organisation to maintain and use.

There are some shortcomings to the Internet, similar to problems with any new technology. The Internet was originally designed by the United States Military to enable communications after an enemy attack. If one system was damaged, communications could

be re-routed through another system in the network. This type of design provides a communication system that is difficult to interrupt. This system accepts that problems may occur, and security becomes an issue. Internet security is a huge business with devices such as firewalls and encryption being refined to protect information. Most computers that are used to access the Internet are complex to set up and difficult to use for someone that does not normally utilise a computer. The final issue with the Internet is the connectivity factor; a computer connected to the Internet can only process the information as it is received, and connections established through normal phone lines provide very slow connectivity (Gunst, 1999).

2.7 Information Technology Security Issues

To design an Internet-based telecommunications network, we must understand the security threats that exist in today's computer systems and networks. We should also know about techniques that will make the computer system and network safer. Besides the technical problems, we are also interested in knowing about the telecommunications data protection laws. It is wise to understand the laws that are related to our project.

All of the advantages gained with an Intranet are at the expense of possible security problems. Security risks become a major issue when an Intranet is connected to the Internet and therefore is a focus of this project. Computer system and network security has become increasingly important in the telecommunications world. Computer security problems are now so widespread that almost all major newspapers and periodicals have featured articles on various aspects of computer security (White, Fisch, and Pooch, 1996). Some problems of Intranets are caused by viruses, and of data being read, altered, and damaged by intruders. The basic techniques that anyone can use to protect an Intranet from outside attackers are creating firewalls, employing cryptography, using a digital signature algorithm, and requiring

a network login and password. These techniques are used when the Intranet is connected to the Internet. These methods will not completely eliminate security risks, but can reduce it to an acceptable level (White, Fisch, and Pooch, 1996; Kaufman, Perlman, and Speciner, 1995). We cannot completely protect Solon's Intranet from the most talented and persistent intruders, but these basic techniques will serve as useful weapons in combating most intruders.

2.7.1 Firewalls

One technique widely used by computer security experts in protecting network computers is creating firewalls. A firewall is a computer that serves as a relay between an organisation's internal network and another network, usually the Internet. Its purpose is to check each information packet that is sent into the network. Some computer scientists call this a security gateway because a firewall forces all incoming data packets to be transmitted through the firewall to reach a computer on the internal network, much in the same way the only way in and out of a walled city is through the gates (Kaufman, Perlman, and Speciner, 1995). A firewall serves the same purpose as a security guard checking identification at a door.

2.7.2 Cryptography

Cryptography is another method computer scientists use to protect computer networks. Cryptography is the ability to send information over a network in a way that prevents others from reading it. Cryptography encrypts data so that no unauthorised user can read or modify it (Kaufman, Perlman, and Speciner, 1995). Cryptographic systems involve both an algorithm and a secret key. The algorithm is a mathematical formula that scrambles the data. The secret key is a series of numbers that can be used with the algorithm to unscramble the data, and is similar to the combination of a combination lock (Kaufman,

Perlman, and Speciner, 1995). Therefore, access to the protected data is limited to only those individuals with a key. One of the drawbacks to cryptography is that large amounts of processing time are required for the encryption and decryption, making the process slow without powerful computers.

2.7.3 Digital Signature Algorithm

Digital Signature Algorithm is another way to secure a network. Digital Signature Algorithm works in a manner similar to signing your name on a check. It is the responsibility of the computer to check the signature of every data packet that it receives. Every information package processed through a computer connected to the network will be checked for a valid signature. It is an effective way to protect computer networks because nobody is able to generate a message that matches a given signature, and nobody is able to modify a signed message in a way that keeps the same signature valid (Kaufman, Perlman, and Speciner, 1995). Advantages of employing Digital Signal Algorithm include speed, since only the signature has to be validated, as opposed to the time consuming process of encrypting the entire message. However, Digital Signal Algorithm does not prevent snooping, because the data are transmitted in plain text and the Digital Signal Algorithm only shows where packets have been modified or forged by an attacker.

2.7.4 Username and Password

The most basic way to protect a computer network is to require the user to obtain a network login ID and password. Some of the more common applications of username and password security are restricting access to load a software package or to operate a computer. A software programme could require the use of a username and password before it will process sensitive data, or a computer can use a username and password to prevent someone without proper access from copying sensitive data to a disk. Only someone who has this

password should be able to access the protected data. Passwords are not impossible to break, but a good password will keep out all but very talented and persistent intruders. The requirement of a network login and password should be sufficient to protect the network from most intruders, and is a simple and effective way of restricting access (Kaufman, Perlman, and Speciner, 1995).

2.7.5 Network Security Improvements

One of the first steps in improving computer network security is to perform a computer security risk analysis. Computer security risk analysis is the process that identifies and evaluates the risk of being successfully attacked and subsequently suffering the loss of data and time versus the cost of preventing such a loss. The purpose of performing this analysis is to determine the strength of the computer network security and make a rational decision on how an organisation's Intranet can be made more secure. The results of this analysis should provide a better understanding of the network and its potential flaws. The risk analysis process compares the cost of preventing the loss or damage of data to the cost resulting from the loss of data (White, Fisch, and Pooch, 1996). The results from this process should provide ideas for improvements, whether the improvement should make, and how it can be improved on the computer network.

2.7.6 External Security

Another method that is important in making a secure computer network that does not involve technology is external security. External security measures the portions of the total security package of a computer system that do not include the hardware or software. These measurements include physical security, personnel security, and administrative security. Physical security measures pertain to the use of locks, guards, remote surveillance cameras, and alarm systems to protect important data and expensive equipment. Personnel security is a

process used to determine how much trust a company can have in any individual. Administrative security measures describe the method used by a company to implement a chosen security policy. These policies include how data are to be disposed of, how computer storage media will be stored and erased, and what sections are to be restricted to visitors (White, Fisch, and Pooch, 1996).

2.7.7 Personal Security

Personal security on the Internet is non-existent. Every piece of personal information on the Internet is accessible by anyone else on the Internet. This holds true for any Intranet; a successful Intranet has a set of conventions or policies outlining the personal security on the Intranet. Creating such a set of policies is an essential step in creating a secure network (Gunst, 1999). These policies ensure that all people within the organisation are aware that the Intranet is not only a reference tool, where an individual can find information with the answers he or she needs, but also one that is used appropriately.

2.7.8 1998 UK Data Protection Act

Since there is sensitive data stored in Solon's databases and transmitted over their network, we must consider the implications of the 1998 UK Data Protection Act. Sensitive data refers to any information relating to an identifiable person, such as medical records, credit card numbers, and checking account numbers.

The 1998 UK Data Protection Act deals with the right to access personal data. The law prevents the processing of data for direct marketing of data relating to subjects held by the data controller. Processing of personal data is any operation performed upon personal data such as recording, storing, altering, retrieving, and disclosing data through transmission. This law made it illegal for an individual to access someone else's private information. It was

designed to improve the quality and accuracy of personal data and the fairness of processing (Bainbridge and Pearce, 1998).

In the UK Data Protection Directive under Article 1 of Chapter 1, a Member State is responsible for protecting the fundamental rights and freedom of an individual. A Member State is a country that is a member of the European Union. A Member State must protect a person's right to privacy with respect to the processing of personal data. The Data Protection Act also ensures that personal data is processed fairly, lawfully, accurately, and is kept up to date. The Act states that Member States shall provide that personal data may be processed only if the data subject has given his or her consent. The processing of data is lawful when it is carried out to protect the interest of the data subject. The processing of data that violates the freedom and privacy of a person can only happen when the data subject offers his permission. For personal data the subject must know the existence of a processing operation, and where the data are collected from. Access to medical data can only be obtained by a health professional. The information from the articles and sections listed under the 1998 UK Data Protection Act gave us an idea as to which type of information should be made public and private. In order to design a layout for an Intranet-based communication network, it is crucial to understand the subjects' right of access. A data subject may make a request for access to data that relates to him or her. The design of a network should only grant access to personal data for an individual who would pass the security check (European Communities, 1998).

2.8 Research Methods

After reviewing the background information on Intranets, it is necessary to get a better understanding of the communication needs of Solon's employees. To do this we conducted interviews and focus groups with all of the employees. Interviews allow us to gather unique

information specific to the individuals within the organisation, while focus groups allow us to observe the interactions between participants and stimulate new ideas.

2.8.1 Interview Design

There are three distinct styles of interview design: standardised, semistandardised, and unstandardised. A standardised interview is a formally structured interview that has a schedule for each part. Standardised interviews thus operate from the perspective that one's thoughts are intricately related to one's actions. An unstandardised interview is the complete opposite of a standardised interview, and has no schedule of questions. Such unstructured interviews allow researchers to gain additional information about the various phenomena that they observe by asking questions of participants. The semistandardised interview combines the previous two interview types and involves some pre-established questions that focus on a specific topic. This format allows the researcher to approach the world from the individual's perspective. We conducted informational interviews that aimed to discover manifest or general knowledge. This kind of interview lends itself well to a standardised or semistandardised interview (Berg, 1998).

2.8.2 Focus Groups

Focus groups have been a social science method since the beginning of the Second World War, but found most use in marketing research. In the 1980s focus groups regained stature as a legitimate method, one that allows the observation of interactions in a controlled setting. A focus group is an interview with a small group. There is a moderator, whose function is to facilitate interaction and draw information out of the respondents (Berg, 1998). Since we are interested in the ways Solon's employees communicate and interact with each other, focus groups are a valuable tool.

2.8.3 Procedures and Techniques

Interviews and focus groups are social science instruments, and have procedures to obtain valid and accurate results. There should be at least two researchers present: one administering the instrument, and an assistant taking notes. After the instrument has been administered, the interviewer or focus group facilitator and the assistant should not talk or discuss the proceedings of the interview or focus group until a transcript has been produced from the assistant's notes. The assistant's notes are a shorthand that aims to capture the essential ideas and information that were said by recording key words and phrases in a sequence of events that is transcribed later. This extrapolation of the notes, or transcription, takes about four times as long as the interview or focus group. That is, a one-hour interview will take four hours to transcribe. The transcription occurs immediately after the instrument is administered, while the proceedings are still fresh in the assistant's mind (Berg, 1998).

2.9 Computer Education

Our recommendations could include some need for educating employees on their computer systems. To understand training on computer systems, we reviewed literature on effective training strategies.

In order to develop an effective training strategy, we examined a few areas. Some key training objectives need to be referenced, including:

- The teaching strategy depends on whether implementing a new project, providing refresher changing, or training newly hired staff.
- The facilities must be adequate and the trainer must have experience in instruction.
- Informal meetings may be an alternative to external training.
- Receiving feedback from the employees on training is necessary for improvements.
- It is vital to keep everyone up to date with new tips and offer refresher training.

When implementing a new project, the employees need to be trained as soon as possible, if not before the product is in use. Initial training is proven to work, but only after immediate floor support. Floor support refers to answering questions of employees after their initial training, and this is critical to having productive employees. Floor support is a necessity when the employees experience a major change in the way they work (Caddell, 1997).

The ideal trainer is one who has been educated in teaching, and has experience in computer training. Moving a staff member into the position of a trainer will yield less success than hiring someone properly educated in training. The staff member may not understand how to train or prepare for an instructional class. Large manuals should not be used, instead booklet-style instructional guides will yield better results. The trainer should tailor these guides to the organisation. For an employee to make an effective use of the system, the training must include an trainer. A trainer is able to determine if the employees understand the material, and adjust his lecture accordingly (Caddell, 1997).

Follow up training can be done in various ways, but one that is proven to be effective is a round table discussion. These are informal meetings which focus on a specific topic. These discussions are facilitated by someone, whose intent is not to direct the meeting, but spark conversation. This provides the staff with an open meeting to share what they understand and do not understand about the software with their peers. The organisation should establish In-house user groups, which contain people from each department. These people can express new ways to use current and future technology (Caddell, 1997).

The employees are kept up to date with refresher courses that can occur as a physical meeting, or as a document given to each employee. This document could be distributed via email and contain a quick "tip-of-week", for example. The physical meetings could be weekly or monthly and focus on a specific software and allow employees to get together and

discuss ideas. Newsletters have also been proven to be an effective way to get new ideas out to the employees.

2.10 Summary

To increase the understanding of our project, we compared social housing in Britain and in the United States. We investigated electronic communication of information, primarily Intranets, to understand the ways people interact through IT. We also reviewed the effects of introducing an Intranet into an organisation with access to the Internet and issues in data security and protection. Since a large portion of the project will be administering interviews and focus groups, we researched interviewing and focus groups technique and methods. This research allowed us to understand where Solon fits into the economic framework of London, and helped us improve the design of their communication network.

3 Methodology

3.1 Introduction

As part of their year 2000 IT project, Solon wishes to increase the efficiency of sharing information between employees through technology. Our goal was to provide a work plan that will identify strategies that will increase the efficiency of communication at Solon. We performed this in three main steps: determining how the employees currently communicate, determining how they would like to communicate, and identifying strategies that meet their specific needs.

To find out how Solon currently communicates, we analysed their computer network and conducted individual interviews. The network was analysed to determine what technologies are currently used, and how they have been implemented. This analysis involved investigating the current network configuration and showing exactly how electronic information flows through Solon. The interviews provided an overview of Solon's communications, describing the extent that different communication channels are used, and why the employees prefer specific methods of communication over others. To determine the employees' information and communication needs and how they would like to communicate, we conducted focus group interviews. These two steps gave us an understanding of how they currently communicate, and how they foresee improvement. Using the transcripts and data from the interviews and focus groups, we prioritised their information needs and identified technologies and training that can meet them. After identifying the technologies or training that can increase the efficiency of communication at Solon, we assembled them into a work plan for improvements to their IT network. This work plan described how these strategies should be implemented, what their benefits will be, and what training will be necessary. After

the work plan was been approved, we spent the remainder of our project time beginning the implementation of the higher-priority items from the work plan.

3.2 Determine Current Computer Network Structure

An overview of the current network structure was essential before we could recommend any improvements. To accomplish this, we met with individuals involved with the administration of the network. The purpose of this meeting was to gather information concerning the software in use by Solon, such as the operating system of the servers, the kinds of clients and software packages used, the level of Internet and email access, and the number of end users. This information allowed us to tailor our interviews to the specific circumstances at Solon. We created a flowchart design of the placement of computers throughout Solon's facility and how each is referenced to the network (see Appendix C). We used this information as the status of the network when we constructed the work plan.

3.3 Collection of Data

Our next step was to conduct interviews with all of Solon's current employees, discussing the communication channels currently in use, the types of information shared, and the employees' current use of computers to communicate. Then we conducted focus groups with all of the employees, which helped to determine the information needs and places that technology can assist in communication. Once we identified the information needs, we prioritised them. Then we identified the technologies or training that met these needs and developed a work plan for a series of improvements to Solon's Intranet so that Solon's employees will have the proper tools and knowledge base to make full use of their Intranet.

3.3.1 General Information Interviews

Our interviews were informational, with the goal being the collection of general information about the methods by which Solon's employees communicate to others and the information that is shared during this communication. Informational interviews are conversations with the purpose of gathering information, where the information is not personal or private, and involves no disclosure risk to the person giving the information (Berg, 1998). We intended to discover the ways that the employees communicate, how often they use different types of communication, to what extent these communication types are used, and the information that is shared. We also determined each employee's level of computer literacy, and which software packages they are comfortable with.

We conducted a pre-test of our interview with employees at Mohegan Council, Boy Scouts of America, which is a non-profit semi-private agency in Worcester, Massachusetts. This pre-test allowed us to identify problems in our interview, giving us the ability to make modifications to help ensure precise responses. We only made a few changes to this pre-test, since the information collected was satisfactory. There were two changes from the pre-test. Our first correction was to add an introductory paragraph to be read to the interviewee, describing the purpose of the interview and defining the term communication channels. The second change was breaking down the questions into specific areas of response. The main example of this is question two, with parts a, b, and c clearly delineated. The interview with these changes is in Appendix A.

We conducted the interviews with all of the employees at Solon in order to evaluate the information and communication system currently in use. We conducted each interview for approximately fifteen minutes, and spent up to one hour transcribing each interview. Following the completion of the interviews, we analysed the information and obtained an

overview of the communication network in place at Solon. We completed the analysis of these interviews by the beginning of week three.

By conducting interviews with all of the employees, each had an opportunity to contribute important insight into the project. Each person gave us a unique perspective about the current information channels. By interviewing everyone, we eliminated sampling bias and ensured accuracy of the results. Our interview questions can be found in Appendix A.

3.3.1.1 Content Analysis for Interviews

The raw, unanalysed transcripts from the interviews could not help us determine current uses of the communication network at Solon. To produce useful quantitative data, we needed to perform content analysis on the transcripts. Content analysis is the systematic application of a counting scheme to the transcripts (Berg, 1998). We first determined the types of communication channels that Solon could utilise, the people they could interact with, and the information they could share. Through the analysis of each transcript if an employee used a specific communication channel we would count that occurrence. We repeated this counting process to determine whom each employee communicates with and the information that the people share. We used Microsoft Excel, a software package to sum and statistically analyse the counted data. The content analysis was completed by 1 February 2000.

3.3.2 Information Technology Focus groups

The interviews did not completely provide information regarding the communication needs of Solon. We also conducted focus groups with all of the Solon employees to determine what information and communication needs could be met or supplemented through additions to the IT network. Focus groups are interviews conducted with a small group of people. A moderator who has an overall goal and direction for the conversation guides the participants. A focus group will allow us to observe interaction between participants (Berg,

1998). These interactions lead to brainstorming, which is where the group develops an idea. Focus groups allowed us to retrieve more substantive information, such as example opinions, experiences, and attitudes. The disclosure of these kinds of information presents risk to the interviewee, such as expressing their displeasure with a current procedure in front of their peers.

Since Solon employs only twenty-seven people, we interviewed and conducted focus groups with all of them. By interviewing and conducting focus groups with everyone who works for Solon, we gained an extensive understanding of the capabilities of the current network and what is needed to improve the technology used for communication at Solon. We spent about thirty to sixty minutes in each of six focus groups where the participants were grouped by department, and spent about one hour transcribing the results from each discussion group. The focus groups were tape recorded to ensure accuracy of the transcription. We completed the discussion group and analysis process by the end of our third week in London.

The use of two different methods, focus groups and interviews, enabled us to use triangulation to minimise the bias in our results. Triangulation is the use of multiple methods to reduce the implicit bias in an individual method (Berg, 1998). By using the different methods on similar topics, we are sure that the different results can be compared and used together.

3.3.2.1 Content Analysis of Focus Groups

To determine the information and communication needs from the transcripts, we performed content analysis. Unlike with the informational interviews, we were unable to predetermine the content that was expected from the focus groups. In response, we identified all relevant points made by the participants in the transcripts. From these ideas, we were able

to distinguish parallel topics. Similar to the informational interview content analysis, we counted these ideas and concepts. We utilised Microsoft Excel to help sum the data. The content analysis was completed by 7 February.

3.4 Prioritisation of Needs

After we determine what types of communication should be improved by electronic implementation, we will arrange them in a hierarchy of importance and urgency. Our arrangement of the needs will be based upon the quantitative data from our content analysis, focusing on Solon's views of greater technology balanced with the cost of implementation. Our reference to cost not only indicates a monetary cost but also a length of time in both implementation and training. A study of their current network arrangement will enable us to observe which current technologies they utilise more than others. This knowledge will provide insight into what areas we should focus on when prioritising their needs.

3.5 Identification of Technologies

By applying the knowledge we gained from consulting IT professionals in Worcester (see Appendix B) and from reviewing our background research, we determined what specific technologies, policies, and training will benefit Solon. Using background technology research conducted in London, we were able to identify whether a certain technology is feasible, and the length of time needed to employ the technology at Solon. We researched each of these technologies, including the feasibility of integration into Solon's unique network architecture. This research will also identify the necessary equipment and length of time for completion of each technology implemented.

3.6 Development of Work Plan

Once we prioritised and identified the technologies or training that could fulfil Solon's information needs, we developed a work plan for the implementation and improvement of Solon's Intranet. The work plan detailed what configurations of software and hardware components Solon should deploy to maximise communication over their Intranet. However, just providing new technologies is not enough. The work plan included training on components of Solon's existing Intranet as well as for new technologies. This is important because without proper training we cannot ensure that Solon's Intranet will be fully utilised. The scope of the work plan is long term and it was designed to accommodate the needs defined by our research, but also provided a base for Solon to implement the rest of their year 2000 IT plan. This was completed by 24 Feb 2000.

3.7 Begin Implementation of Work Plan

After the development of a work plan that will define a set of procedures for Solon to improve communication and information sharing through IT, we begun implementing different parts of the work plan. We started with those items that rank highest on the priority list. We worked with the members of Solon's IT working party, giving them a full understanding of the changes that are going to be made. The implementation involved the deployment of an internal news server, printing solutions, and providing training on existing technologies.

4 Data

4.1 Introduction

After completing the twenty-five informational interviews with each Solon employee and the focus groups with each department, we organised the transcripts using content analysis. In order to organise the transcripts from our interviews, we determined target areas for each question. We reviewed each question and identified common responses. This information combined with the transcripts allowed us to identify specific responses to perform statistical analysis. The information from the six focus groups provided us with many of the employees' ideas about IT and clearly indicate either their enthusiasm for or scepticism about an IT solution. We identified the preferred solutions, new ideas and suggestions.

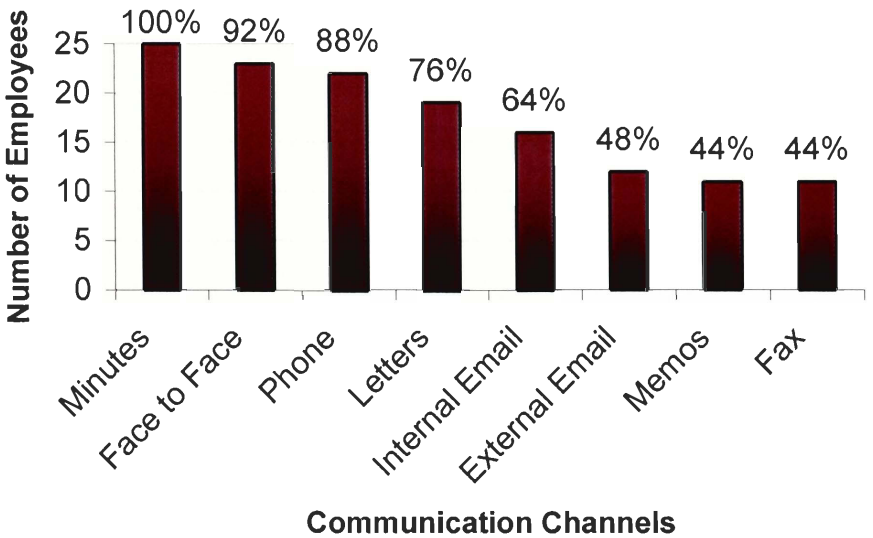
4.2 Data Collected from Informational Interviews

We designed the interviews to provide an overview of Solon's current communications. Some of these data are quantifiable, while others are not. We performed statistical analysis on the quantitative information, producing a view of how the organisation communicates. The qualitative data showed us the feelings of the employees, which allowed us to address personal concerns in the focus groups.

4.2.1 Quantitative Data

We used quantitative analysis to collect statistics from the transcripts of the interviews, such as the percentage of Solon employees that use email, or the percentage of employees that trust storing data on the file server. Figure 4.1 shows percentage summaries for the use of different communication channels at Solon.

Figure 4.1: Communication Channels in Use



To create these categories, we identified the communication channels that occurred most often. Figure 4.1 shows the usage of each of these channels. The one channel utilised by all employees is the record of minutes from employee meetings. All Solon employees participate in meetings and committees, and minutes are the records from these. The employees' discussion is recorded in the minutes, along with any decisions reached. This is similar to where a supervisor issues a memo in a traditional organisation, where the minutes serve as orders and directives from a supervisor. Several employees commented that the minutes are not properly and efficiently circulated. Face-to-face communication is an informal interaction between two employees, and we represent that channel in the column "Face to Face." The column "Letters" refers to any outside correspondence via post mail, whereas the column "Memos" refers to formalised internal mail, informal notes, or notices.

We also collected data on employees' reasons for the use of specific communication channels over others. These data exist in both qualitative and quantitative form. We determined each reason, and tallied up the occurrences of each. Table 4.1 lists the different

communication channels used and the reasons employees chose to communicate using each method.

Table 4.1: Why Employees Use Specific Communication Channels

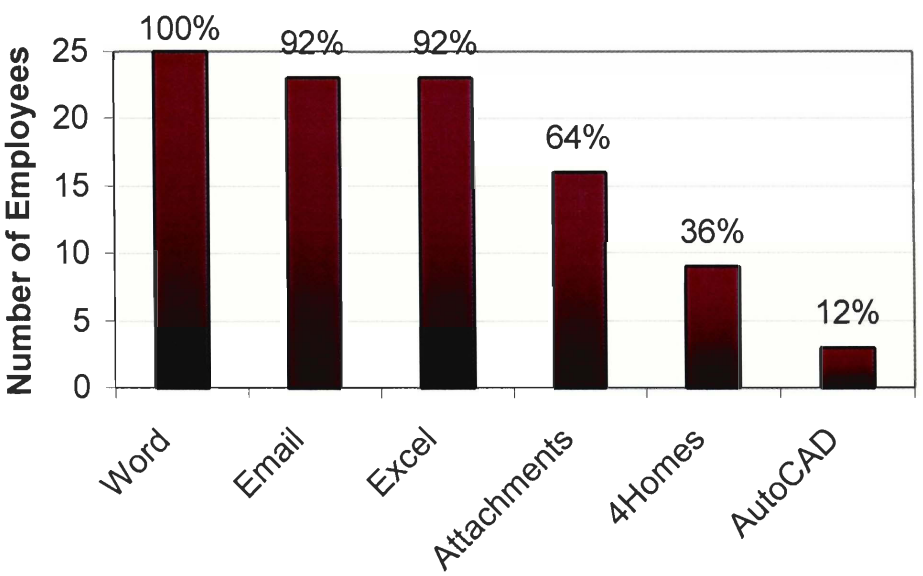
	Efficient	Same Office	Only available	Thorough	Recorded
Face to Face	40%	32%	8%	28%	0%
Letters	4%	0%	0%	0%	20%
Memos	0%	0%	0%	0%	24%
Internal Email	8%	0%	0%	0%	16%
External Email	12%	0%	0%	0%	4%
Phone	28%	0%	4%	8%	0%
Fax	28%	0%	4%	0%	12%

The categories listed do not recreate all of the reasons for using different channels. Instead, we identified common ideas, which explain the similarities between categories. If an employee used a specific channel because it was the most efficient method of communicating, we counted this under the corresponding category. The "Thorough" category indicates that the employee thought the channel provided the most comprehensive information. Some employees thought that face to face communication guaranteed them a comprehensive answer because they could observe facial expressions and be sure that their message was understood. The "Recorded" category indicates the employees believed the channel offered an accurate record of communication. This category was populated with reasons such as a letter placing some information on the record. This information could confirm a conversation that was held over the phone or face-to-face because this ensures a record of the communication. The category "Only available" refers to situations where a specific channel is the only effective method to communicate with someone; for example, face-to-face communication is the only effective way for the receptionist to communicate with a tenant in the entryway.

Figure 4.2 shows the number of employees that utilise a certain software package. We chose the word processing program and the spreadsheet program that was present on each

workstation at Solon. We found Microsoft Word and Excel to be some of the most used software packages by Solon employees. We found that almost all of the employees used electronic mail and a little more than half utilised file attachments. We inquired about other software packages on their workstations and discovered that two other packages were in use. 4homes is a software package that one-third of the employees use to manage tenant information. Three of the employees utilise AutoCAD to design and modify architectural drawings.

Figure 4.2: Software in Use



We also determined that about half of the employees are comfortable with leaving files on the server and throwing away paper copies. Nevertheless, some employees need to keep paper records, for legal purposes and contractor agreements.

4.2.2 Qualitative Data

In addition to the counts and statistics collected from the transcripts through content analysis, we collected qualitative data as well. These data are ideas and concepts, which we counted to produce data. However, due to the small size of the groups, listing was much more effective than counting them. We described the employees' reactions and feelings about the

current communication system in their own words. This is important since the data from the interviews were not the final result we sought, but a platform from which we conducted effective focus groups on the information needs of Solon's employees.

The transcripts tell us specific thoughts and ideas that are important, even if these ideas do not occur frequently enough to appear significant in quantitative analysis. The transcripts gave us the following ideas: The employees like direct personal contact. They prefer to use personal methods of communication, such as talking face to face or on the phone, whenever communicating with another individual. The employees will spend extra effort to use a personal method, for example walking downstairs to a different department to deliver a message, instead of using email, the phone, or a memo. The employees utilise email, but a number of employees believe that there is too much useless email. Solon currently does not have a policy about the content of email.

Several employees feel that they do not know how to use the computer-based tools they already have. Many of the employees fill out their time sheets using Microsoft Excel, print them out, and pass the sheets to the personnel manager. The personnel manager then inputs the data back into another spreadsheet. She knows there is a way to create a spreadsheet that automatically updates from electronic timesheets on the network, eliminating the use paper, although she does not know enough about Excel to accomplish such a task. Information such as this allowed us to conduct more effective focus groups by helping us identify areas where the current communication system could be more efficient.

4.3 Data Collected from Focus Groups

The focus groups had the purpose of determining the employees' communications needs. Quantitative data analysis listed the employees' needs, and explained how important

they believed these needs are, while qualitative analysis explained why they think these needs are important.

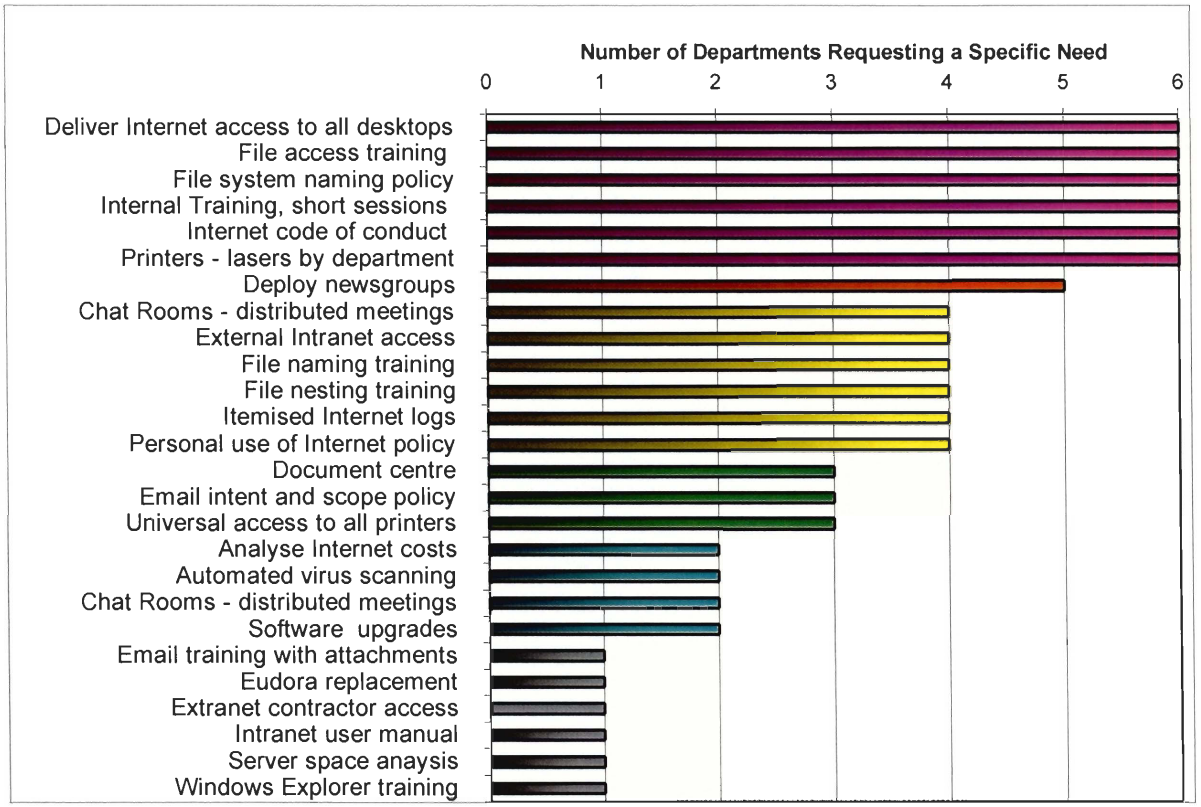
Table 4.2: Determined Information Needs

Item	Type	Total
File system naming policy	Policy	6
Internet code of conduct	Policy	6
Itemised Internet logs	Policy	4
Personal use of Internet policy	Policy	4
Email intent and scope policy	Policy	3
Analyse Internet costs	Policy	2
Chat Rooms - distributed meetings	Policy	2
Deliver Internet access to all desktops	Technology	6
Printers - lasers by department	Technology	6
Deploy newsgroups	Technology	5
Chat Rooms - distributed meetings	Technology	4
External Intranet access	Technology	4
Document centre	Technology	3
Universal access to all printers	Technology	3
Software upgrades	Technology	2
Automated virus scanning	Technology	2
Eudora replacement	Technology	1
Extranet contractor access	Technology	1
Server space analysis	Technology	1
File access training	Training	6
Internal Training, short sessions	Training	6
File naming training	Training	4
File nesting training	Training	4
Email training with attachments	Training	1
Intranet user manual	Training	1
Windows Explorer training	Training	1

4.3.1 Quantitative Data

We represented the employees' information needs in the focus group transcripts as ideas or concepts. We counted these ideas and concepts and summed the number of departments with each need. We placed each need into one of three categories: technology, policy, and training. These three categories were the most common themes among the items in the transcripts. Table 4.2 contains the list of items with their corresponding category. If a department was in favour of a particular item, the total of the item was increased by one. A score of six for an item indicated a favourable mention by all departments. These totals are also shown in Table 4.2, and they indicate those items that were main concerns of the Solon

Figure 4.3: Prioritised Information Needs



4.3.2 Qualitative Data

Even though the employees in a specific department like an idea, they may still have reservations or important thoughts about it. Although these thoughts appeared in the transcripts as ideas, they were unique and therefore not suited to be counted as quantitative data. The additional ideas from the employees relate to the topics that were discussed during the focus group interviews.

One department thought one laser printer per department was a good idea, but also indicated that any solution should be reliable. They also indicated that colour laser jet printers would not be a cost-effective solution, and that black and white laser jets would be sufficient. This group also indicated that simplicity and ease of use is necessary for all solutions. Another group thought the idea of internal training was a good solution, but thought the trainer should have formal education instead of just being able to use the software. The

employees. Items that received a zero total indicate that the employees did not feel those items were important.

By further analysing the data, we decided to evaluate the ranking of each category. Each category has two items that received unanimous approval. There is a good dispersion of items ranked from one through four, and "Technology" has the only item with a rank of five. To compare the categories we totalled up each category, and divided each total by the number of items in the corresponding category.

Table 4.3: Average Category Listing

Category	Total Rank	Number of Items	Average
Policy	25	6	4.17
Technology	44	13	3.14
Training	23	7	3.29

The results are depicted in Table 4.3 with the percent values indicating the percentage of departments in favour of the category.

We ranked the responses by counting the number of departments whose response was favourable to the idea, giving each idea a score from one to six, where a score of six indicates that all six departments believe that the method will improve communication at Solon. We then ranked the items according to their total score. Figure 4.3 lists the prioritised needs and their ranks.

employees suggested the possibility of a document centre to solve printing issues. A different group voiced concern over the compatibility between different software packages. One group wanted printer usage to be logged. They also indicated that any email usage policy should also describe the security of email. Concerning internal training, one group suggested the organisation should give a handout after each session, and that the organisation should determine the proper scope for internal training, as some users require longer training sessions. We identified one group that was concerned that providing Internet access would cause the intranet to operate more slowly. One group expressed their fear of the network crashing, and being too dependent on electronic storage.

4.4 Network Analysis

The information provided by network analysis gave us a better understanding of the current technology in use at Solon. This analysis allowed us to find solutions that worked properly with the current technologies in place at Solon.

4.4.1 Network Structure & File Server

The current network at Solon Wandsworth Housing Association consists of a single file server, which is in use by twenty-five different workstations. We completed a network structure diagram, to better show the arrangement of the network (see Appendix C). This file server runs Novell 4.11 for its operating system and has a license for fifty concurrent connections. The backbone of the network is two 3Com network hubs, which route all of the network traffic throughout the building. These each have the capacity for twenty-four connections and transfer the information at ten megabits per second using an Ethernet-style transfer. Solon Wandsworth utilises Backup Exec software to ensure that their file structure is saved onto tape backup daily. This allows for the quick restoration of the information if necessary.

4.4.2 Workstations

The twenty-five different workstations have a standard set-up of Microsoft Windows 95 as the operating system. Novell client software has been installed to allow connections to the file server. This software also allows each workstation to access all of the printers on the network. The workstations all have Microsoft Word and Excel installed. Some also have Microsoft PowerPoint 97, but there is no pattern to the distribution. In February of 1999, a workstation on the network was configured as the email server. This allows the users to send and receive email both internal and external to Solon.

4.4.3 Printer Structure

The printer structure at Solon Wandsworth relies primarily on inkjets. There are six different inkjets located throughout the organisation, with each department utilising one. Solon purchased a colour LaserJet in January of 1999, which has been placed in reception. Many organisations are transitioning from inkjet printers to laser printing solutions. This transition is not apparent at Solon. Most employees are satisfied with the inkjets, despite their higher operating costs. The finance department also utilises two line printers with which they produce reports with sizes of up to one thousand pages.

4.4.4 Internet Access

The Internet has been utilised by Solon for over a year. The introduction of the Internet has been only to select computers within the organisation. The mail server has Internet access to allow for the sending and receiving of electronic mail. The Internet is accessed through a static ISDN line that allows for the transfer of information at 64 kilobytes per second. This allows concurrent uploading and downloading of information. The Internet connection is not continuous, and is only used when a dial-up connection is established with

the provider. This occurs when the mail server checks for electronic mail every fifteen minutes or when a Solon employee wishes to utilise the Internet from one of the two configured workstations.

5 Results

5.1 Introduction

In this section we discuss our results from the analysed data, and make observations regarding the data. It is important that we review the communication channels that are currently in use by employees at Solon, so that we can determine how effective each channel is. This allowed us to suggest ways to improve the employees' communication. Another topic that we mention is the computer literacy of employees at Solon. We also discuss the information needs we identified and prioritised.

5.2 Communication Channels in Use

The informational interviews provided data that indicate which communication channels are in use at Solon and why these channels are in use. Employees mainly use the current communication channels that they feel are the best method of communication known to them. Employees feel that their current communications are efficient. For example, employees see face-to-face communication as a good method between co-workers, since employees can easily walk over to each other's desks and address any issue quickly. There are several advantages to face-to-face communication. Employees can obtain answers quickly, and can read each other faces, which allows them to gauge reactions. However, in order to have a face-to-face conversation with a person, an individual must first find the person. The employees are not always at their desks, so face-to-face communication is not always available. Face-to-face and phone communication are examples of synchronous

communication, where responses are instantaneous without a delay. Another type of communication is asynchronous communication, where a delay exists in between each response. Email is an alternative for face-to-face communication in many instances. The only time the use of email or other delayed communications are not effective is when an employee needs a quick answer. Face-to-face communication provides quick answers.

Employees often use letters and faxes to communicate with other organisations. These are good communication channels to use for external communication because this way an employee can keep a record of his or her communications. However, written letters and faxes are not the most efficient communication method. Letter and fax communication cannot offer a quick answer. Also, letters and faxes cannot depict feelings as clearly as with face to face or phone communications.

Solon's employees also use the phone as a method to communicate externally. Employees can obtain more details with the phone than with letters or faxes. The phone offers a human touch to the communication and many of the advantages of face-to-face communication. Employees also receive quick answers from a phone call, since it is instantaneous communication.

The employees at Solon also utilise inter-office memos, which are created, copied, and distributed. One of the drawbacks to memos is the extensive consumption of paper. Solon can save money on paper if they decide to replace memos with email or newsgroups. One advantage to inter-office memos is that the information is recorded, but only in paper form. These individual paper messages are not easily searchable, unlike a newsgroup. Email can replace memos, but many employees may dislike reading messages on the screen instead of from paper.

Email allows employees to communicate internally and externally. An important advantage over paper-based communication is that email allows the employee to know

exactly who sent what message and when it was sent. An electronic-based communication system is also time-efficient. An employee only needs to keep one copy of a file on the computer. When employee needs another copy, he or she can update the file and print out a new copy. However, there are some drawbacks to email. Employees often get more details from the person with face-to-face or phone communication. Also, face-to-face and phone communication offer a human touch. Email is an informal letter and cannot fully convey the writer's feelings. The person who reads the email might not understand the email as intended. Another possible drawback of email is that employees might not check email often and miss important information. However, this is not a problem if the organisation encourages employees to check their email on a regular basis. The electronic communication system clearly offers a number of advantages over paper-based communication. Email can replace fax, letter, phone, face-to-face, and memos as a method of communication in some cases. Email is very useful when used to its full capability. Solon should develop a policy to ensure that email is effectively utilised as a method of communication rather than a source of annoyance to employees.

5.3 Computer Literacy within Solon

From the interviews we learned that the level of computer literacy among the employees is not very high, and most of the employees do not fully utilise the computer-based tools that they current have. Some employees use Excel as a word processor, and many employees just have only enough knowledge of their software to get their work done everyday. Most employees use Word and Excel. However, the majority of these employees are not aware of features such as templates and tables in Word and formulas in Excel that can improve the productivity. Many employees do not know how to create templates in Word, and some do not know how to create spreadsheets in Excel. Overall, Solon's employees are

not well trained in computer usage. Some employees do not know how they can send file attachments along with their email. Most employees also are not confident with Windows Explorer. It would be helpful for employees to learn more about Windows Explorer so they can name and nest their files. Solon's employees should learn additional basic information about Windows 95, Word, and Excel. Employees will be more efficient at their work if they can obtain more knowledge about the computer tools they currently have.

5.4 Information Needs

Originally, we believed that implementing newer or better technologies would solve most of Solon's communication needs. While there are several new technologies that can improve communication at Solon, many of the needs are policy or training based. We reached this conclusion after comparing the different needs that were assessed from the focus groups.

In order to better distinguish the different types of needs obtained from the focus groups, we created three separate categories of needs. Table 4.2 depicts the different needs determined from the focus groups, with the corresponding category. We chose these categories because each has a different type of implementation. Items in the Technology category require the introduction of new technology, or improvement of existing technology. If the adoption of a policy by Solon's employees would address the need, an item was placed in the Policy category. Finally, we placed items that involved educating the employees in the Training category. Each category contains items that relate to the overall categorical theme. We note that each category requires a different approach for implementation. For example, we categorised development of newsgroups as Technology and this could be solved with the introduction of a news server, which is the introduction of new technology.

To understand better the needs of the employees we distinguished how the departments consider each category (see Table 4.2). We determined the average total of each

category. We derived this value derived from totalling the ranks of items in a category and dividing by the number of items in the category. The emphasis of each department was clearly on the creation of policy. More than half of the departments were in favour of technological and training improvements, but seventy percent were in favour of policy improvements. When comparing the average totals, employee education ranked above technological improvements. These comparisons revealed that our original focus on just technology introduction was not correct, and we changed it to include policy development and employee education.

We realised that the ranking of the prioritisation list is based on the opinions of each department. In order to obtain the opinion of each employee, we examined all of the information from the focus group transcripts, not just the quantitative data. This ensured that we structured our work plan not only for the departments, but also for each individual employee.

There are several different reasons why employees would identify one idea as more important than another. Some employees may have a better understanding of a certain technology and would not require training. These employees, having mastered their current tools, are more ready for new technologies than other employees. Others may not feel a need for the introduction of the Internet, because they do not understand the benefits to be gained from its introduction. The employees gave comments that addressed the ideas approved by the departments. We restructured our recommendations after considering employees' comments. For example, we had originally planned for off site training, but an employee's comment on internal training being more beneficial changed our recommendation for that item. The responses received from individual employees allowed us to tailor each recommendation for the work plan.

5.5 Prioritisation of Needs

We placed all of the improvements into the work plan. However, the order of implementation is based both on the preference of the employees and on our determination of the feasibility of each improvement. To determine feasibility, we examined the different aspects of introducing any change into the current Solon network structure. This includes the time required to develop, implement, and educate. We also determined the cost of each improvement by considering not only the monetary cost, but also the amount of labour needed. For example, the data indicates that all departments would like a structured file system. However, in order to complete this task, the employees must all be educated in the use of the Windows Explorer. Though the employees did not consider education in the use of the Windows Explorer to be a high priority, it is necessary in order to accomplish the creation of a structured file system.

6 Recommendations

6.1 Introduction

Our recommendations to Solon take the form of a work plan, as found in Appendix E. This chapter summarises and explains the work plan, justifies the specific solutions recommended in the work plan, and describes our implementation.

6.2 Work Plan

The work plan is based on the needs prioritisation flowcharts of Appendix D, and describes each information need. The items in the flow charts are the specific needs from the analysis; every chart block corresponds to a need. Each item has the following descriptive subcategories: predecessor items, goals for completion, implementation recommendations, and successor items. The predecessors field refers to the items that must occur first, as

delineated on the needs prioritisation flowcharts. The goals field refers to specific things that must be accomplished in order to consider the item completed. An example of this is that a goal of Windows Explorer training is that the users must be able to move folders and files using the Explorer. The implementation recommendations item refers to methods or solutions that we believe will be the most effective means of implementation, in terms of effort, time, and cost. The successors field refers to the items that follow on the needs prioritisation flowcharts.

There are ten sections of items, which correspond to the ten independent groups of items on the flowcharts. These sections range in size from one to eight items. There is no order for implementing the different sections. However, the items within a single section need to be implemented in the order shown in the flow charts. This modular nature allows for time between the implementation of technologies to allow for proper training of the employees.

Section one of the work plan describes the items leading up to a file naming and hierarchy policy. It includes training for Windows Explorer, file naming, and file nesting, along with writing and approving a policy for file naming and hierarchy.

Section two is about the introduction of the Internet. It includes the writing and approval of several policy items, deployment of virus scanning, connecting the Internet to every desktop, setting up chat rooms, and providing Intranet access via the Internet. Solon needs policy on how the Internet usage should be logged, how much personal use should be allowed, how much money should be spent on the service, and how to structure a code of conduct for the Internet. After the policy is written, the next step is to distribute virus-scanning software to all workstations, and then introduce the Internet. After the employees are comfortable and properly trained with this new technology, the next step is to deploy chat rooms for holding meetings online. This will allow the employees to attend meetings from

home, and allow the management committee to meet without having to come to Solon's office. The next step is to offer access to Solon's Intranet from the Internet. This will allow tenants to check and pay rents online, and allow employees and management committee members to access files from home.

Section three is about email and newsgroups. The final item is the deployment of a news server and training on newsgroups. The prerequisite items for this final step include the upgrading or replacement of Eudora, the current mail client, training on email and attachments, and creating a policy on the use and purpose of email.

Section four describes improvements to the printing system. There is an item for providing access to all printers from every desktop, and providing additional laser printers. Providing access to all printers from all workstations is a software upgrade of installing drivers on all workstations. Black and white laser printers are more cost effective than Solon's current inkjets and have additional features that will increase efficiency at Solon, such as multiple paper feed trays, as shown in Appendix F. Because of this, we recommend that Solon deploy laser printers to supplement the existing inkjets. The amount of laser printers that are needed and their locations will depend on the results of a usage study.

The remaining six sections have one item each: setting up an internal training schedule, deploying a document centre, writing a user manual for Solon's Intranet, enabling electronic communications with contractors, analysing the file server storage usage, and upgrading software on all workstations to the same level.

Section five has only one item, setting up a training schedule where employees can offer and receive in-house training. This will provide the framework for the continuation of the training items after the completion of this project. This is intended to enhance the trickle-down effect of organisational learning. Trickle-down learning is where a person with a skill teaches his peers, providing training for all employees without providing expensive formal

training for all employees. This schedule will take the place of a sign-up sheet where employees can offer sessions to share their skills and other employees can sign up for the training.

The document centre recommended in section six will allow employees to print, staple, and collate multiple copies of documents from their computers. This will reduce the need to print and then copy, staple, and collate separately. This machine would replace the existing copier, and therefore implementation should coincide with the planned replacement of the existing machine.

In section seven we recommend an Intranet user manual. Such a manual could contain copies of all Intranet related policies and training sessions. Introducing a library of how-to books and software manuals will augment the Intranet manual.

Having electronic communications with external contractors is an item that Solon will implement in the future. Having a communications system is useless unless all parties can use it. Since the contractors are mostly small companies, they are not as technologically advanced as Solon, making such a system unfeasible for quite some time. Because of this, and the complicated nature of such a system, we are recommending that IT consultants be employed in the design and implementation of the system.

A number of employees felt that much of the data on the file server is stagnant, and has not been used for some time. Analysis of what data is rarely accessed can allow Solon to write this data to a different media, such as CD-Recordable. By doing this, storage space on the server would be saved for the most used data.

Since not all of the workstations have the same versions of all software packages, upgrading all workstations to current versions is necessary. This can coincide with the upgrade or replacement of Eudora in section five.

6.3 Justification and Explanation of Work Plan

We designed the work plan, as contained in Appendix E, for use by Solon's IT working party, who are the employees responsible for all of Solon's IT issues. The layout corresponds to the flowcharts in Appendix D. The work plan also provides descriptions of how to implement each step and how each step relates to other steps. One potential problem with the work plan is changing technologies. To address this, we did not identify specific technologies, especially for items that will be implemented in the future, such as accessing Solon's Intranet from the Internet. For the items that we implemented or items that Solon will implement in the near future, we identified specific technical solutions. These solutions are found in Appendix F. Instead, for the long-term goals, we listed the goals for completion of each item, which serve as the requirements any technical solution must meet. This method is consistent with the collective culture at Solon by leaving the specific solution up to the group while providing guidelines for acceptable solutions.

6.4 Implementation

We began implementing items from the work plan during the last two weeks of the term. The items on the work plan fall into three main categories: training, policy, and technology. Each of these categories requires different methods of implementation.

There are two types of training items: setting up a system for internal short training sessions, and actually providing this training. Setting up a system for internal training will be coordinated with the training manager, mostly in the form of recommendations and suggestions rather than requirements. Once this system is in place, we begun training on specific topics, such as the use of Windows Explorer

Policy items require the approval of Solon's Workers' Meeting, the place where all of the workers meet and make the managerial decisions for running the collective. Because of

this we will not directly implement any policies, but will write draft policies for the approval of the workers' meeting. This will enable Solon to enact effective policies that can increase the efficiency of communication while still operating as a collective. We wrote the policy drafts by using the employees' recommendations from the focus groups and interviews.

Technology implementation was the last and most difficult item we addressed. Proper implementation of technologies requires time to find the specific product, install the software and or hardware, debug the system, train the administrators, and gradually train and introduce the product to the end users. In addition, money for acquiring the product must be budgeted, requiring Solon to plan for these improvements well in advance. On some of the technology topics, introduction of new technologies must coincide with the planned replacement of existing systems, such as replacing a copier with a document centre. Because of these reasons, we were only able to begin the implementation of some of the technology items, such as Internet access and deploying a news server.

7 Conclusion

In conclusion, we believe that the successful implementation of our work plan will improve communications between Solon's employees. The work plan contains three main areas of improvements that will improve communications not only by having technology, but also by properly using it.

The first area is policy. By having policies on the proper use of their electronic tools, these tools can be used by all employees in the same efficient manner. Some of the recommended policy topics include the proper use of email, personal use of the Internet, and how files on the network should be named and nested.

The second area is training. A tool is useless unless it is used properly. Our research found that many of Solon's employees lacked computer training in a large number of areas.

To remedy this, the work plan contains items for training in the areas it is needed, such as training in the use of the Windows Explorer, email attachments, and how to use file ownership permissions.

The third area is the introduction of new technologies. There are many technologies that Solon could deploy to improve communications between employees. We identified the technologies that met their specific information needs and are feasible for integration into their Intranet. These included newsgroups, connecting the Internet to every desktop, and replacing their copier with a network-integrated document centre.

After spending seven weeks working with the employees at Solon, we feel we have devised strategies to allow them to communicate better through technology. These strategies include the introduction of new technology, guidelines on employee education and drafts of policy. When fully implemented, the work plan will have enabled employees to communicate better through technology.

Appendix A – Informational Interview

Richard Jones
Hien Nguyen
Tom Solodyna
WPI Team

Questions for interviews, 19 Jan → 26 Jan.

Introduction, to be read:
Thank you again for your time. The purpose of this interview is to find out which communication channels are in use and the types of information transferred. The term communication channels refers to any method of communication, from the telephone, email, post mail, leaving sticky notes on someone's door, face-to-face communication, etc. As for the types of information, we are not concerned with the contents, but only with the general types, such as memos, letters, documents, etc.

Could you briefly describe what your duties and responsibilities here at Solon are?

1 - Walk me through an average day, describing:
Who you communicate with, and what their job is,
What types of information do you share?
What communication channels do you use to transfer this information?

2 - How typical is this day you just described, and what kinds of variations do you tend to see?

3- Why do you communicate in the ways you do? (Ease, convenience, only available, thorough)

4 - We would also like to get an idea of your computer usage. Do you feel comfortable with and / or use the following:
Email
Attachments
Documents (e.g., Word, letters, memos)
Spreadsheets
Other software packages

5- How much confidence do you have in electronic storage? E.g., do you feel safe leaving things on the file server without paper backups?

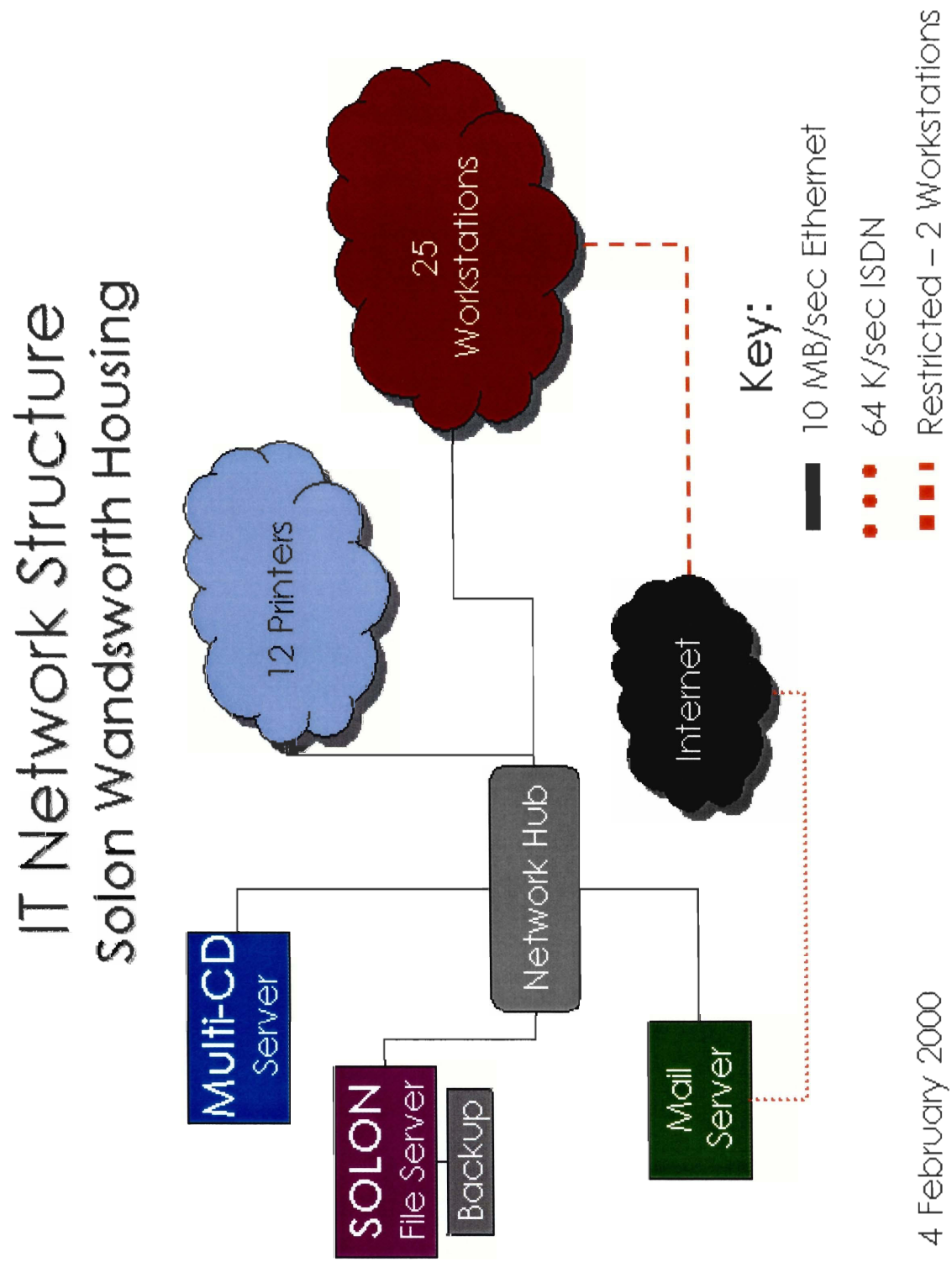
Appendix B – Information from IT Professionals

We interviewed two IT professionals, one a network administrator at EMC^2 Corporation, and another that was a professional consultant for several programming firms. By talking with these IT professionals, we were able to gather ideas that they had about the introduction and management of an IT network. Working directly in the field of Information Technology, these professionals gave their opinions on various topics concerning IT in an organisation. The introduction of the Internet brought up concern for security and misuse. The professionals mentioned that before the Internet is introduced, the organisation should develop a policy. This is true for any type of information technology that is introduced. The organisation should introduce any new technology at a slow pace, with a small number of users given access in the beginning to examine and test the new technology.

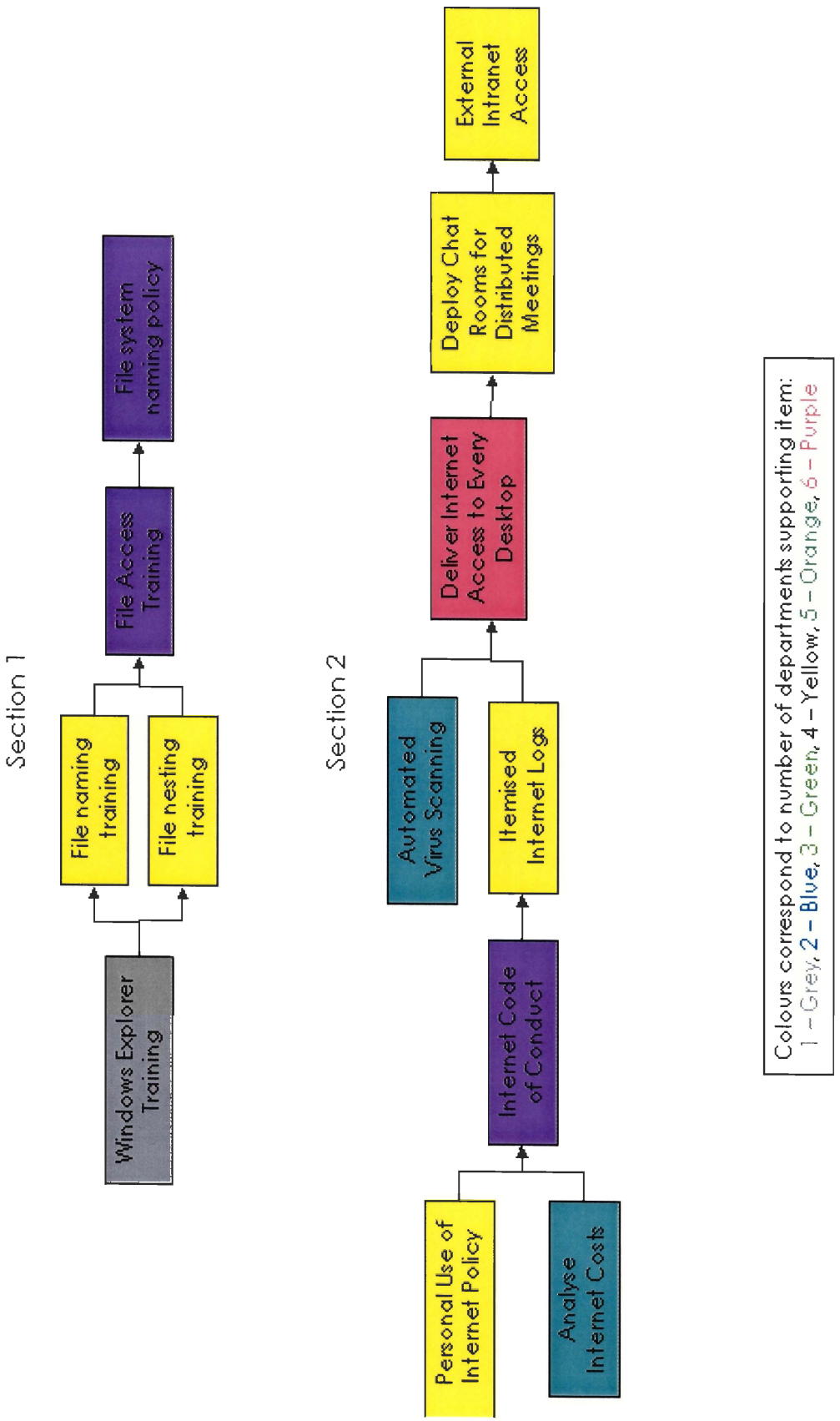
Another topic discussed with the IT professionals is which technologies had worked for them, and which haven't. Their responses varied, with each taking a strong stance on each technology discussed. In reference to email, the professionals thought it was essential to communication in an organisation, but stressed that without policies it would turn into a social medium. On the topic of newsgroups, both professionals thought it was a valuable asset. Employees can lose interest in newsgroups, if the information becomes static, not updated. Sometimes a topic can become so large, that individuals will not contribute because the number of responses to read through would require too much of their time. Both professionals thought training was a necessary process for an employee to operate and communicate efficiently in any organisation (Nichols, 1999; Shea, 1999)

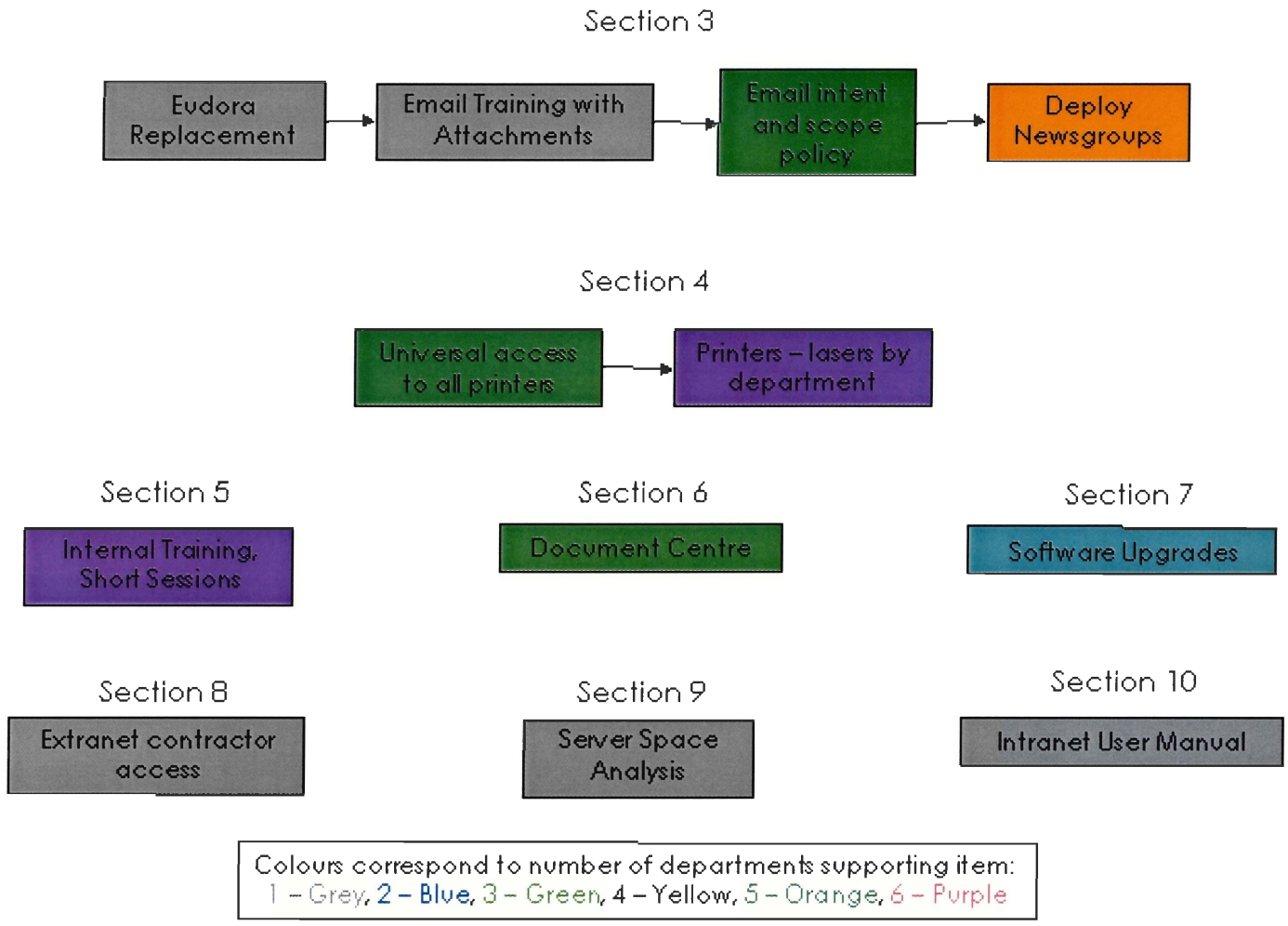
Appendix C – Network Structure Diagram

To show the flow of information across the physical network, we constructed this diagram. It depicts the different parts of the network, and how they are connected. The connection line type indicates the speed of the transfer.



Appendix D – Information Needs Flowcharts




Section 3
Eudora Replacement
Email Training with Attachments
Email intent and scope policy
Deploy Newsgroups
Section 4
Universal access to all printers
Printers – lasers by department
Section 5
Internal Training, Short Sessions
Section 6
Document Centre
Section 7
Software Upgrades
Section 8
Extranet contractor access
Section 9
Server Space Analysis
Section 10
Intranet User Manual
Colours correspond to number of departments supporting item:
1 – Grey, 2 – Blue, 3 – Green, 4 – Yellow, 5 – Orange, 6 – Purple

Appendix E – Work Plan

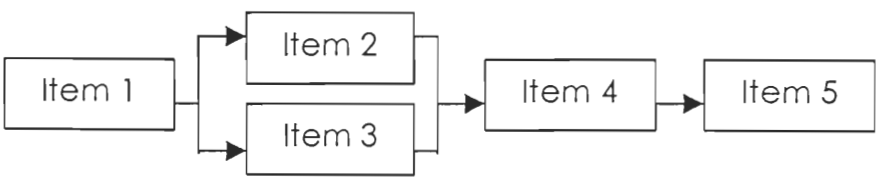
Structure:
10 sections – each section contains one or more linked items.

Items: each item has the following properties:

Prerequisites: items and conditions that must be met before this item is executed
Goals: specific goals and criteria for completion of item
Implementation: strategies or method recommendations for execution of item
Resources: time, monetary, or other expenses expected during implementation
Successors: other items that require completion of this one to begin; dependant items

Sections with more than two items contain flow charts that delineate the relationships between items.

Section 1 – File Naming, Access, and Hierarchy



Item 1 – Windows Explorer Training

Prerequisites: Internal training setup
Goals: Teach users how to:

- Browse directories using the tree
- Add folders and files
- Delete folders and files
- Move folders and files
- Rename folders and files
- Understand and create shortcuts or links

Implementation: Multiple short internal sessions
Resources: Employee time, time preparing session
Successors: File naming and file nesting

Item 2 – File Naming

Prerequisites: Windows Explorer training
Goals: Teach how to make useful and easily understood file names using:

- Dates
- Topics
- Audience

- Using all available characters
- Get employees thinking about a policy

Implementation: Small internal sessions
Resources: Employee time, time preparing session
Successors: File access training

Item 3 – File Nesting

Prerequisites: Windows Explorer training
Goals: Teach how to use nesting effectively

- Folders by date
- Folders by topic
- Personal or public folders
- Proper naming of folders
- Links to other folders

Implementation: Small internal sessions
Resources: Employee time, time preparing session
Successors: File access training

Item 4 – File Access Training

Prerequisites: File naming training and file nesting training
Goals: Users gain an understanding of:

- Privacy and trust
- File permissions
- Current network file permissions
- Gather ideas on how employees want file permissions to be set

Implementation: Short training sessions with discussions
Resources: employee time, setup (includes analysing network-wide file permissions)
Successors: File system naming and hierarchy standards

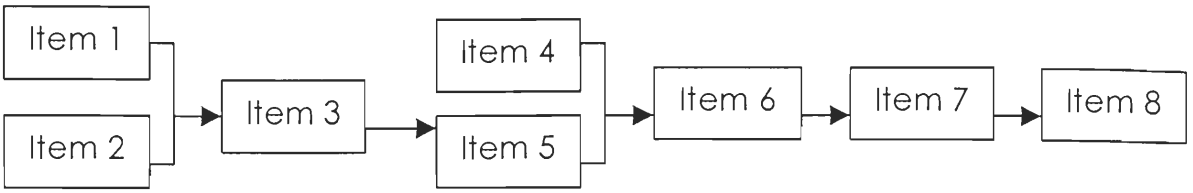
Item 5 – File System Naming and Hierarchy Policy

Prerequisites: File access training
Goals:

- Policy should address:
- Naming conventions, by department
- File hierarchy (explaining how to find anything on the network)
- File permissions and rights for each user
- Create draft policy based on employee opinions from interviews, focus groups, and training sessions
- Submit policy to workers meeting for revisions and approval

Implementation: Research data from interviews, focus groups, and training sessions; write.
Resources: Time for research and writing, time for employee review and approval
Successors: None

Section 2 – Internet deployment



Item 1 – Develop Personal Use of Internet Policy

Prerequisites: None
Goals:

- Policy should address:
  - How much personal use of the Internet should be allowed
  - Types of personal use allowed
- Create draft policy based on employee opinions from interviews, focus groups, and training sessions
- Submit policy to workers meeting for revisions and approval

Implementation: Research data from interviews, focus groups, and training sessions; write.
Resources: Time for research and writing, time for employee review and approval
Successors: Develop Internet code of conduct

Item 2 - Analyse Internet Access Costs

Prerequisites: None
Goals: Research ways of providing Internet access

- Continuous access, or on-demand
- Amount of initial bandwidth required
- Most cost effective solution

Implementation: Research specific solutions and product offerings and make comparisons
Resources: Research and writing time
Successors: Develop Internet code of conduct

Item 3 – Develop Internet Code of Conduct (Policy)

Prerequisites: Develop personal Internet use standards and analyse Internet access costs
Goals:

- Policy should address:
  - Include personal use of Internet policy
  - Intent of Internet access
  - What the firewall logs should record, and how this information should be distributed to all employees
- Create draft policy based on employee opinions from interviews, focus groups, prerequisite items, and training sessions
- Submit policy to workers meeting for revisions and approval

Implementation: Research data from interviews, focus groups prerequisite items, and training sessions; write.
Resources: Time for research and writing, time for employee review and approval
Successors: Deploy virus scanning on all desktops and deploy itemised Internet logs

Item 4 – Deploy Virus Scanning on Every Desktop

Prerequisites: None
Goals: Install virus-scanning software on each computer that has the following features:

- Automatically updates virus list via Internet
- Recognised quality reputation
- Run automatically and stay resident in background

Implementation: Research specific software, install on all workstations, train users
Resources: Time for research, installation, and training; monetary cost of software
Successors: Deliver Internet access to all desktops

Item 5 – Deploy Itemised Internet Logs

Prerequisites: Develop Internet code of conduct
Goals: Deploy logging software that creates logs consistent with Internet code of conduct. Logging software may be included in firewall, router, or gateway software, making deployment concurrent with delivering Internet access to all desktops
Implementation: Research router software, enable logging to file server, read-access: All
Resources: Time for research and installation; monetary cost of software
Successors: Deliver Internet access to all desktops

Item 6 – Deliver Internet Access to all Desktops

Prerequisites: Deploy virus-scanning software to all desktops and deploy itemised Internet logs
Goals: To provide access to the Internet to all Desktops securely.
Implementation:

Step 1:

Option 1:

- Research Router software/hardware
- Purchase
- Software: Server software will allow routing
- Computer: Standard server
- Research Firewall software/hardware
- Purchase
- Software: Most cost-effective and reliable
- Computer: Same or separate from router

Option 2:

- Research all-in-one Router/Firewall hardware solution.
- Purchase
- Hardware: Router/Firewall Product

Step 2:

- Connect router/firewall to network

- Configure router/firewall
- Train administrators
- Configure desktops for Internet access
- Train users

Resources:
Time for research, install, debug, train administrators, and configure desktops.
Money to purchase hardware and software components.
Successors: Deploy chat rooms for meetings at home

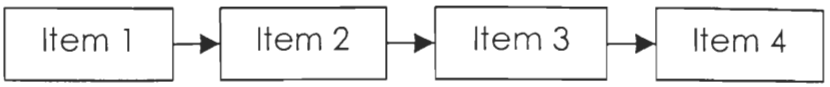
Item 7 – Deploy Chat Rooms for Distributed Meetings

Prerequisites: Deliver Internet access to all desktops
Goals: Research software solutions,
Must be secure, private, easy to use, and keep logs of conversations
Install software
Train users
Can be used for meetings with workers, management committee, etc.
Implementation: Research software, buy, install, train
Resources: Time for research, installation, training of administrators and users, monetary cost of software
Successors: External Intranet access

Item 8 –External Intranet Access

Prerequisites: Deploy chat rooms for distributed meetings
Goals: allow secure access to Intranet via Internet
Access to file server
Access to newsgroups
Access to email
Access to chat rooms
Can be used for meetings with workers, management committee, etc.
Implementation: Custom solution thorough external IT consultants
Resources: Cost of consultants and solutions
Successors: none

Section 3 – Email and Newsgroups



Item 1 – Upgrade or replace Eudora

Prerequisites: None
Goals: offer employees a combined email and news software package
Software package that is simple to use
Variety of features
Customisable interface (fonts, word wrap, general appearance)
Reliability of the software
Must have unified or similar interface for email and news
Implementation: research software packages, buy, install, train, and deploy
Resources: Time for research, installation, training, monetary cost of software
Successors: Email training, including attachments

Item 2 – Email training, including attachments

Prerequisites: Upgrade or replace Eudora
Goals: offer employees more knowledge of the email software package and how email works
Enable employees to use email more efficiently
Give employees a good understanding of how to use attachments
Encourage employees to utilise email to its full capabilities
Should also include training on managing contacts and filtering messages
Implementation: multiple in-house short training sessions
Resources: Employee time, time to set up training
Successors: Develop email policy

Item 3 – Develop email policy

Prerequisites: Email training, including attachments
Goals:
Policy should address:
The content of the email
Address the junk email issue – what is junk email
Address the issue of excessive use of email
What the purpose of email is – the scope of the channel
Create draft policy based on employee opinions from interviews, focus groups, prerequisite items, and training sessions
Submit policy to workers meeting for revisions and approval
Implementation: Research data from interviews, focus groups, prerequisite items, and training sessions; write.
Resources: Time for research and writing, time for employee review and approval

Successors: Deploy newsgroups

Item 4 – Deploy newsgroups

Prerequisites: Develop email policy
Goals: allow employees to have online discussions via a NNTP server and newsreaders
Allow employees to have discussions over the network
Allow employees to pick out the messages that concern them quickly
Allow employees to have a discussion when they are not all present in a room
Reduce overall amount of email by relegating discussion items to newsgroups
NNTP server should:
Be cost-effective
Stable, require low maintenance
Allow for simple administration of newsgroups and users
Implementation: Research server software, set up news server, train administrators, train users
Resources: Time for research and set up newsgroup, cost of software, cost of hardware
Successors: None

Section 4 - Printing

Item 1 – Deploy printing access to all printers

Prerequisites: None
Goals: Allow employees to sent print jobs to every network printer
Offer more printer variety to employees
Eliminate the problem causes when a printer is jammed
Improve the efficiency of printing by allowing employees to select an available printer in the right location
Implementation: install printer driver to every computer and train users
Resources: Time for installation and training
Successors: Deploy laser printer

Item 2 – Deploy laser printers

Prerequisites: Deploy printing access to all printers
Goals: Improve the cost-effectiveness of printing
Improve the quality of the printing
Improve the speed of printing
Offers multiple trays (manual feed as a tray)
Black and White printers where needed, save money
All printers must be within line-of-sight of users
All Printers must be letterhead – capable (multiple trays may do this for certain printers)
Implementation: research on laser printers, buy and install printers and drivers; train users on letterhead / multiple trays; install existing laser printer
Resources: Time for research, training, and installation; Cost of purchase laser printers
Successors: None

Section 5 – Internal Training

Item 1 – Internal training in short sessions

Prerequisites: None
Goals: Enable employees to obtain more knowledge on computer usage
Improve employees' confidence in technology
Establish procedure for:
Employees offering training in areas of skill
Employees requesting training in areas of need
Implementation: offer some training session to employees and write up training procedure.
Resources: Time for training, and time for Solon's employees to review and approve upon the procedure
Successors: None

Section 6 – Document Centre

Item 1 – Deploy document centre

Prerequisites: None
Goals: Bring efficiency and convenience to work place copying and printing
Allow employees to utilise all features such as printing, copying, collating, and binding in one electronic machine.
Implementation: Research on document centre, buy and install document centre
Resources: Time for research, cost of document centre
Successor: None

Section 7 – Intranet User Manual

Item 1 – Develop user manual for Solon's Intranet

Prerequisites: None
Goals: Provide simple reference to Intranet questions
Classify Intranet information in an easily accessible document.
Should be available in print version and online
Online version could take the form of internal web page or moderated newsgroup
Implementation: Research on Solon's Intranet, write manual
Resources: Time for research and writing
Successor: None

Section 8 – External Communications with Contractors

Item 1 – External communication with contractors

Prerequisites: None
Goals: Improve upon the efficiency and simplicity of external communication.
Provide a secure system for contractors to submit and receive work orders and payments online
Implementation: IT Consultant, custom solution
Resources: Cost of Consultants, software and hardware; training of users
Successor: None

Section 9 – Server Space Usage

Item 1 – Analyse server space usage

Prerequisites: None
Goals: Enable Solon to improve upon managing server space.
Allow server administers to monitor employee server space usage
Provide a better backup system
Clear out unused server space to secure media
Implementation: Research the software and install preferred software
Resources: Time for research, cost of server analysis software
Successor: None

Section 10 – Software Upgrades

Item 1 – Upgrade Workstation Software to Uniform Versions

Prerequisites: None
Goals:

- Provide uniform software versions to all workstations
- Reduce potential document version conflicts that may occur with increased electronic document sharing

Implementation: Determine current software versions; upgrade software (in evening, possibly concurrently with Eudora / newsreader upgrade)
Resources: Software, licences, time to install
Successor: None

Appendix F – Specific Recommendations

This section outlines the improvements that we recommended to Solon. They consist of hardware and software packages, drafts of policy, and training strategies.

Introduction of Internet Access

An organisation must introduce the Internet as a controlled process. The organisation must analyse the existing network, from the hardware set-up to the installed software. This analysis provides an understanding of what technologies are currently being used, and what technologies can introduce the Internet. Two concerns exist whenever the Internet is being introduced into a network: security and safety. An organisation wants to ensure that the information stored within their network remains secure, and that the information transfers will not be affected by the introduction of the Internet. Information Technology professionals have many different solutions for organisations that wish to protect their network. We focused on two different methods. These methods are utilised by many other organisations, and have a history of reliability.

Because of concerns about safety and security, many organisations decide to dedicate one computer to routing all of the Internet traffic. This computer is termed the Internet router, and serves as the gateway to the Internet in the organisation. The computer of any user wishing to utilise the Internet must make a request to this machine for the information. This restricts incoming Internet traffic to just this computer. In order to ensure that all the information being transferred is safe and secure, the router software will analyse the incoming information. This software is referred to as a firewall, which is best described as the network security guard. The guard will only allow safe information onto the network.

Direct Connection offers an Internet access package, which consists of an Internet Router/Firewall computer that will monitor incoming information, circuit level gateways, and

application proxies. The administrator can monitor the types of information being transferred and restrict access through the circuit level gateways. By having application proxies, the Internet traffic will be restricted to the gateway computer alone. This package will work seamlessly with the current server software. The specifics for prices and cost projections are in the Table below.

Table F.1 – Firewall Solution Cost Analysis

	Hardware				
	Router/Firewall Computer	Cost			
	SOHO Firebox	£600.00			
	Netopia R3100	£349.00			
	Connection				
	Direct-LAN Connection Solutions				
	Dircon LAN-ISDN Service	£529.00	per year		
	Dircon Setup Fee	£100.00			
	Totals			1st Year	2nd Year
Option 1	Dircon Connection + SOHO Firebox			£1,129.00	£529.00
Option 2	Dircon Connection + Netopia R3100			£978.00	£529.00
				These exclude phone line charges incurred	
	Phone Charges				
	Phone Line Local Line	£0.02	per minute		
	Constant Use (10am-7pm)	£12.00	per day		
	Monthly Usage (30 days)	£360.00	per month		
	Yearly Usage (12 months)	£4,320.00	per year		
	Phone Line Local Line	£0.02	per minute		
	Assume Some Use (10am-7pm) 4 hours	£4.80	per day		
	Monthly Usage (30 days)	£144.00	per month		
	Yearly Usage (12 months)	£1,728.00	per year		

Table F1 shows two options for hardware set-ups, the SOHO Firebox and Netopia's R3100. Both use the same type of Internet connection. Since the Netopia router costs less, it is clearly the more cost-effective of the two. The first and second year cost projections appear to the right of the two options. These charges do not include the cost of per minute / ISDN access to British Telecom. We estimated the cost of the line charge through

the year if the Internet was used constantly from 10:00 until 19:00 and if the Internet was only utilised for four hours through the day.

Digital Subscriber Line (DSL) connections to the Internet will be available in April of 2000 to the city of London through British Telecom. We recommend that Solon wait for this option before having a constant connection to the Internet, as dial-up ISDN service is not cost-effective at their current stage of Internet usage.

Printer Upgrade

Currently Solon has six inkjets located in different departments, one colour laser printer in reception, and one laser printer not in use. From our research of printers we concluded that inkjet printers are not as efficient and reliable as laser printers. Although laser printers have a higher purchase price, they are more cost-effective because the cost of printing per page is lower. Laser printers also have multiple feed trays that allow for easier printing of different paper letterhead. In addition, each laser printer tray can hold more paper than an inkjet tray. This saves the user time from adding additional paper, and prevents delays that come from running out of paper in the middle of a print job.

We recommend that Solon should consider supplementing the six inkjet printers with three black and white laser printers. Black and white laser printers are far cheaper than colour laser printers and are sufficient for most of the tasks at Solon. Whenever employees need to print colour documents they can send the documents to the colour laser. One of the ideas that we received in the focus groups was that all of the employees support the idea of moving to printers that are more efficient and prefer a printer to be within line-of-sight. Because of the physical layout of the office, we have concluded that printers in the following locations will be reasonable: between design and development, between finance and maintenance, in the housing management area, and near the administration area.

Table F.2: Comparison between laser printers and an inkjet printer

Printer Model	Cost (Pounds)	Page Per Minute	Cost Per Page (Pence)	Pages to break even
HP 2100xi	472	10 B/W	1.1	94400
NEC Technology SuperScript 1800	750	17 B/W	1.33	277777
Xerox DocuPrint P1202	365	12 B/W	1.33	135185
Xerox DocuPrint N17	659	17 B/W	1.33	244074
DeskJet 970Cxi Pro	205	12 B/W 2.9 Colour	1.6	Baseline

The last column of the table shows the number of pages each printer has to print in order to break even with the inkjet printer. We calculated these numbers by taking the total cost of each laser printer divided by the difference in cost per page of each laser printer and inkjet printer (Total cost / [inkjet printer cost per page - laser printer cost per page]). This allowed us to take into account the difference in price between each laser printer and inkjet printer.

The HP LaserJet 2100xi has many good features and is a reasonably priced printer. It is the cheapest HP LaserJet printer for business use. The 2100xi has a production rate of ten pages per minute (ppm), which is fairly fast. The HP printer's cost per page is significantly lower than other laser printers and inkjet printers. HP LaserJet 2100xi is a very attractive bargain.

The NEC Technology SuperScript 1800 has a fast printing speed. However, its purchase price is high. Its cost per page is not as low as the HP 2100xi; therefore, it requires more pages printed to break even. On the other hand, its printer speed is much faster than the HP 2100 series.

The Xerox DocuPrint P1202 is the cheapest laser printer we investigated. Its printing speed is good with the capacity to print twelve ppm. Its cost per page is lower than the HP

inkjet printers. This printer performs well with 135,185 pages to break even, which is not quite as good as the HP printers. Our overall assessment is that the DocuPrint P1202 printer offers attractive features at a low price.

Xerox DocuPrint N17 has many good features, but its price is high compared to other laser printers. Its printing speed is one of the fastest at 17 ppm. Its cost per page is also low in comparison to the inkjet printer. However, the pages to break even for the Xerox DocuPrint N17 are the highest of the laser printers in Table F.2. Based on a cost-effective analysis, this printer is the worst choice for Solon.

The main benefit of inkjets is that employees can print their documents in colour with a low purchase price. However, most employees do not print many of their documents in colour. In addition, whenever employees need to print colour they could send their print jobs to the colour laser in the reception. In contrast, there are many disadvantages to the inkjet printer. Inkjet printers are not as reliable as laser printer. The cost per page of inkjet printers is also higher than laser printers; therefore in the long run a laser printer is a more cost-effective. To determine exactly how much money laser printers will save, Solon should run a long-term print audit. A print audit will determine the amount that specific users print on specific printers.

Based on our research of laser printers and inkjet printers we conclude that Solon should supplement or replace all inkjet printers with laser printers in the future. We also believe that the HP 2100xi and the NEC Technology SuperScript 1800 are the best values at this time. With a good combination of both speed and cost-effectiveness, these two printers stand out as the two best printers. Since Solon has had excellent performance with their current HP printers, the HP 2100xi is the better choice.

File Server Storage Analysis Software

Currently Solon is running low on server storage space. Solon is currently using Backup Exec to back up frequently all the files on the file server. However, this software does not delete the files after it has backed them up, leaving many old unused files on the server. In order to manage the server space more efficiently Solon should install utility software that will analyse the files on the server and determine which have not been accessed for a set amount of time. Currently, Solon is using Novell 4.11 as the operating system on the file server, and there are many shareware utilities that can monitor the server space usage on a Novell system. The software can be found at http://www.novellshareware.com. This website has many programs on server management, file management, backup, and other utilities that can be useful to Solon for administrating their file server. We researched server management and file management utilities and would like to recommend Space Watch Pro 3. This program allows network users to search quickly and easily and analyse the disk space. It pinpoints unexpected and unwanted files and directories as well as important changes over time. It allows ownership search and analysis with Netware. This program has built-in reports such as unused space by user, and contains graphs of space distribution by user over time. The software costs 26 pounds per licence.

Document Centre

When we introduced the idea of a document centre, Solon's employees instantly supported the idea of purchasing one. A document centre is one complete system that allows the user to print, copy, scan, and staple documents. A document centre is a useful machine for Solon, but it is very expensive. Currently, Solon has two copy machines and six inkjet printers; therefore, at the moment Solon should not replace or supplement the copy machines with a document centre. We found Xerox to be the main manufacturer that produces

document centres. The table below contains information on document centres and their specifications. Solon should consider replacing their copy machines with a document centre only when the machines are in need of replacement.

Table F.3 – Document Centre 240 Digital Copier

Feature	240 Digital Copier	230 Laser Printer	332 ST
Price	17950 Pounds	9450 pounds	15100 Pounds
Copy Speed	40 ppm	30 ppm	32 ppm
Max. Paper Size	12 X 18	11 X 17	11 X 17
Auto Duplex	Included	Included	Included
Collation	Offset	Optional	Included
Monthly Volume	200,000	N / A	N / A
Stacker	Included	Optional	Not Included
Stapler	Included	Included	Optional
Scanner	N / A	Bundled software	32 ppm
Highest B/W print speed	40 ppm	30 ppm	32 ppm
Fax	N / A	Optional	Included
Standard memory	32 MB	64 MB	64 MB
Networkable	Optional	Included	Included

News Server Recommendations

Solon has three options for a news server: DNews, Netscape Server, or InterNet News (INN). We recommended and installed DNews.

Issue 1- Operating system

All three systems run on Linux. However, Netscape Server and DNews also run on Windows NT, and only DNews runs on Windows 95. This is an advantage for DNews, since the current mail server runs Windows 95 and this option did not require an additional computer.

Issue 2- Cost

Netscape Server and DNews are both commercial products, have reasonable prices, and include technical support with the product. INN is open source software, and is

completely free. The downside of this is that there is no company that provides technical support. However, there are many Usenet newsgroups about INN administration, and most questions can be answered rapidly. DNews also allows a free trial period to test the server software before purchasing. This option combined with the relatively low cost and included technical support made DNews the best option in this category.

Issue 3- Ease of Administration

Netscape Server and DNews both have a graphical user interface. INN is run from text based configuration files, which are confusing for administrators with little UNIX experience. Because of this, Netscape Server and DNews are better choices than INN. After we conferred with Solon's IT working party, the working party selected DNews as their news server software, and we installed it and set up functional newsgroups. The software is easy to administrate, cost effective, and does not require a separate computer. It is for these reasons that we deployed DNews as Solon's news server.

Newsreader Recommendations

Having a news server is only useful if all users have software clients, called newsreaders. We recommended two newsreaders, Microsoft Outlook Express and Netscape Messenger, because they have friendly user interfaces and combine news and email into one interface.

Both newsreaders have large, simple, well-labelled buttons that perform all of the basic tasks, such as getting new messages, replying, forwarding, and writing new messages. Setup is simple, and all one window contains shows all configuration settings. Also, both clients are completely free. Outlook Express has a slightly nicer and easier interface, which is the biggest difference between the two. Messenger does not require that Solon be locked into

a Microsoft solution. This last factor led Solon to choose Messenger as their email and news client.

Solon Wandsworth Housing Electronic Mail and Internet Policy (Draft)

Introduction

This document sets forth the Policy for use of Electronic Mail, referred to as Email, and the Internet use at Solon Wandsworth Housing Association (SHWA). The policy applies to all Email sent both internally and externally. The Policy also states how Email and Internet will be monitored to prevent abuse.

Email

Explanation

Email is defined as messages sent and received electronically via telecommunications links, as between computers or terminals. Email facilities such as electronic bulletin boards, list-servers, and newsgroups allow user to create, send, forward, reply-to, transmit, store, hold, copy, blind copy, download, display, view, read, or print computer messages, files, graphics, and/or executable files across computer network systems between or among individuals or groups. A user can send an Email to one person or to multiple people at the same time. There are additional electronic devices that can send/receive Email other than desktop computers.

Access

Email is available to all employees of SHWA. Upon creation of an account on the file server, the network administrators from the IT working party create a subsequent account on the mail server for Email.

Security

Built-in security exists which restricts a user to access only his/her own email through a login/password system that is verified each time the user retrieves mail from the mail server. The same system is in place for access to newsgroups.

Email users must be aware of harmful computer "viruses" that can infect their workstation and create file damage. Such viruses can exist as attachments to Email messages. For this reason all workstations have virus protection software. However, the best preventative measure is for Email users to open only reliable attachments.

Usage

Email is a very useful communication tool for an organisation, and can be very effective if used properly. The following guidelines pertain to both internal and external Email. They are designed to promote use and protect both SHWA and the user.

- Be clear and precise in stating your point - an electronic mail message should not be used as a discussion document. Newsgroups are for this purpose.
- Avoid being personal or confrontational in an Email. If a subject is better handled in a face-to-face meeting, then arrange one.
- Enhance the text of your message where necessary by using asterisks before and after selected words, to highlight them. Don't type words in capitals for emphasis, as this is interpreted as "shouting."
- Don't say something in a mail message that may be regarded as libellous. It is not possible to give a list of all the things that could fall into this category, so you will need to think about what you say in Email, and ask yourself if you would say the same in a signed letter.

- Don't say something in a mail message which may be regarded as constituting racial or sexual harassment, or which could be taken as being racially, sexually, religiously or politically offensive.
- Don't use Email for situations where a letter is appropriate. These will include formal communications with both the public and colleagues.
- Don't use Email to send large attachments to many people if it can be avoided, as this can affect other network users. Instead, place the files into a shared directory on the network.

Internet

Explanation

The Internet is a worldwide network of joined computers and networks operated by businesses, universities, military organisations, governments and their agencies, and other institutions. The World Wide Web is a graphical interface to the Internet, and is the primary facility of access for the employees at Solon. The Web is also an emerging source of many technologies that are rapidly changing, so this policy will pertain to all abilities or technologies considered a part of the World Wide Web.

Access

Access to the Internet will be available to any employee with a network login and password. He or she will subsequently login to their workstation and receive a connection to the Internet. This connection will not be constant, but only utilised when a user on the network requests a piece of information from the Internet.

Security

Due to the danger of computer viruses from content downloaded from the Internet, all machines will have the latest virus protection software installed on their workstations, with the latest virus definitions. These virus definitions will be automatically updated as per the software manufacturer's instructions.

In order to protect the information on the Internal Solon network, a firewall will be installed to act as security guard to the Internet. This will protect the internal network from users on the Internet. It will also regulate the Internet requests made by Solon users.

Usage

The Internet is a very useful communication tool for an organisation, and can be very effective if used properly. The following guidelines are designed to promote use and protect both Solon Wandsworth Housing Association and the user.

- Before accessing the Internet, undergo training on its usage to understand better the resources available.
- Spending time learning the Web is encouraged, but SHWA will not tolerate excessive time spent in this medium, especially if the use is not directly related to the user's current projects.
- Some limited personal use will be acceptable (like the telephone) but it should be kept to a minimum. Since the usage logs will be available for peer review, it is highly recommended that each user monitor their own usage.

Monitoring

The Email and Internet access facilities are provided for business use. Within the above guidelines, however, the Email and Internet facilities may be used for personal use, if sufficient capacity remains on the network. Email attachments should not be sent internally,

due to the impact on the network. Instead, the user should save the file on the file server, and distribute its network path via Email.

Email messages will be monitored as necessary by the IT working party to ensure that the policies are being complied with. This should not be regarded as an invasion of privacy, as Email facilities are clearly provided solely for business, not private, use. It will, however, help to protect the organisation in the event that an action for libel arises from statements made in Email messages.

The logs from the Internet router will be routinely placed on the network and made available to all employees. These logs will contain information on each user, the site(s) he or she connected to, and the length of time they were connected to the individual site.

Guidelines for Email and News

This section describes:

The intended use of email and news, and the differences between the two

Some points of etiquette for using email and news

News is like a bulletin board; email is like sending a letter.

- When you go to send a message, first decide who you want to receive it. If you only intend for one or two people to read it, use email. If multiple people should see it, use news.
- If the message contains private or personal information, use email. Public information, such as memos, announcements, and FYI messages should be transmitted via news.
- When you send someone an email, it is brought to the user's attention, and he or she has to choose to ignore it. Newsgroups require people to seek out the information by going and looking at the board. Email is a higher-priority method, and should be used for urgent communications.
- Email is primarily for the important information you need in your day-to-day job. News is for conversations and other less important discussions.

Etiquette for using email and news

- When replying to a news message, either:

1) Just send email to the original poster if you have a private response or one that does not involve the entire group.

2) Reply only to the newsgroup.

Sending email to the original poster and replying to the newsgroup with the same message is rude; the sender does not need to receive the message twice.

- Attachments with mail and news:
  - News: never use attachments with news. Due to the underlying way the news protocol works, this seriously slows down the network. Instead, place the file on the file server and give the path in your message.
  - Email: Avoid attachments wherever possible, especially large attachments. Small attachments to external addresses are OK, since this is the easiest way to send files to people over the Internet. However, this should be avoided for internal messages; the easiest way to send files is to save them on the file server and give the file's path in the message. [Note: discuss attaching links]
- Security of news and email:
  - News: internal newsgroups are secure, since no outside computers can access the news server.
  - Email: sending email over the Internet is like sending a postcard through the post. This is not to say that other people read every email; interception is a deliberate attempt to read an email. Because it is a deliberate attempt, attackers tend to go after sensitive information, such as contract or financial data, and most communications are safe. Also, it is a violation of the UK Data Protection Act to transmit personal information such as financial, personnel, or medical information in an unsecured manner. These data should be transmitted through traditional methods, such as post mail or fax. This section is not intended to discourage the use of email for business, but to warn users of potential dangers.
- Viruses: email attachments can carry viruses. If you receive an attachment from someone you don't know, don't open it, don't save it. Just delete it, and inform the IT working party.

Guidelines for using the World Wide Web

The web is a new medium, and brings with it advantages and disadvantages. Like any other communication method, it also has the potential for misuse. This section describes:

What misuse of the web is, and how to avoid it

Etiquette and proper use of the web

Misuse of the Web

One of the biggest worries about the Internet is the potential for misuse. However, the phone system offers the same kinds of misuse, but is widely accepted as an essential business tool.

Misuse of the web is what happens when an employee excessively uses the web for non-business purposes. Like the phone, there is nothing stopping an employee from wasting the organisation's money and time. However, the organisation has ways of knowing if an employee is misusing the phone. The organisation receives an itemised phone bill, showing each call, the number called, and the length of the call. For Internet access, the organisation has a server log that lists every web site an employee connects to and the time spent there. These logs will be posted on the network file server so all employees can view them.

Etiquette and Proper use of the Web

- Avoid downloading large files. Everyone shares the same Internet connection, and your large file downloads slow down the overall connection speed.
- Don't download files from sources you don't trust; they might contain viruses. Also, scan all files you download. In the Windows Explorer, right click the file, and select 'scan for viruses.'

Appendix G – History of Solon Wandsworth Housing

The following history is the text from Roger Armstrong's *Solon Wandsworth – A Brief History.*

Solon Housing Association was set up in April 1970, and was the brainchild of Robin and Jessica Sutcliffe who were architects with a keen interest in low cost rented housing. They were working at the time for Circle 33 H.A.

The name Solon was a contraction of South London, because the intention was to work in Southwark, Wandsworth, and Lambeth. A committee was set up to steer the new association and agree how it would run. It was intended to operate in a very different way to most associations.

The impetus for setting up Solon came from the Sutcliffes frustration with the paternalistic way that rented housing was provided by councils and H.A.s at the time. They had a determination to involve tenants by giving them full access to the design of their housing, and participation in the management of the association. They also wanted the actual association to be run in a similar democratic manner.

It was intended that the association would be run as a collective, with all workers participating in decision making at worker meetings. It was envisaged that the association would remain fairly small, so that it did not become impersonal.

The new association was initially run on an un-salaried basis from the Sutcliffes rented flat at 381 Clapham Road Stockwell. Eventually a semi-derelict four storey house in Stockwell Road Brixton was acquired with G.L.C. finance as Solons first conversion scheme but it was some eight months before development income allowed any wages to be paid to the several unpaid workers.

Other projects followed but a major change in January 1972 with the acquisition (after a heroic struggle) of a whole portfolio of fifty six run down houses in a street in Balham. The existing tenants were fully consulted in the acquisition process, and the phased decanting and improvement programme set new standards for tenants involvement and consultation, and was featured in The Architects Journal.

In 1972 also, the association was able to begin buying in Wandsworth working jointly with Wandsworth Council for Community Relations to provide housing for Asian refugees from Uganda. Solon was among the first associations to make use of computers with an IBM terminal installed early in 1972 to carry out the complex HAG scheme feasibilities. The collective grew in size, but more work meant slower decision making at longer workers meetings. Other pressures for change came from the workers desire for a review of the way the collective was structured.

In the summer of 1973, a conference was held at Swanage in Dorset to map out the future of Solon. The conference decided that the Sutcliffes had to go, because they were being relied on too much for leadership. Only then could Solon become a true collective. A further major decision to come from the Swanage conference was the breaking down of the association into smaller area based groups.

Decentralisation took place within two years with the Wandsworth office being set up in 1974 in a small terrace house awaiting demolition at 63 Alma Road SW18.

The 1973 conference also mapped out a system of tenant control, with tenants now enabled to acquire shares in the association. From May 1975, elected tenants began to serve on the associations management committee.

The area offices eventually acquired proper premises and became autonomous locally based collectives with their own committees. Solon Wandsworth achieved separate registration in 1981, and now has grown to become a medium sized association.

There have been many changes to the associations systems of working since 1981 but it is still a collective. The changes brought about by the 1988 Housing Act have proved a challenge to the associations structure and ethos but it has survived so far by proving flexible enough to adapt to new challenges and finding new kinds of work in housing.

The desire to involve tenants in the design of their housing is still strong within Solon Wandsworth but we are having to explore new ways of doing this in the cash strapped 90's. Innovation is extremely important to deliver the best standard of housing achievable from available funding.

Glossary of Terms

Communication Channel: a particular mode of communication. Examples include face to face talking, telephone, email, voice mail, and leaving notes.

Document Centre: a networked copier which also prints, collates, scans, faxes and staples.

Exoteric Knowledge: Knowledge obtained at no social risk to the person giving it; common knowledge.

Firewall: A system designed to prevent unauthorised access to or from a private network.

Inkjet: A type of printer that works by spraying ionised ink at a sheet of paper.

Information Technology: the broad subject concerned with all aspects of managing and processing information, especially within a large organisation or company. Because computers are central to information management, computer departments within companies and universities are often called *IT departments.* Some companies refer to this department as *IS (Information Services)* or *MIS (Management Information Services).*

Internet: A global network connecting millions of computers. As of 1999, the Internet has more than 200 million users worldwide, and that number is growing rapidly.

Intranet: A network based on the Internet, belonging to an organisation, usually a corporation, accessible only by the organisation's members, employees, or others with authorisation. An intranet's Web sites look and act just like any other Web sites, but the *firewall* surrounding an intranet fends off unauthorised access.

Laser Printer: A type of printer that utilises a laser beam to produce an image on a drum, similar to a copy machine. The light of the laser alters the electrical charge on the drum wherever it hits. The drum is then rolled through a reservoir of toner, which is picked up by the charged portions of the drum. Finally, the toner is transferred to the paper through a combination of heat and pressure.

Network: A group of two or more computer systems linked together. There are many types of computer networks, including:

Local-area networks (LANs): The computers are geographically close together (that is, in the same building).

Wide-area networks (WANs): The computers are farther apart and are connected by telephone lines or radio waves.

Network News Transfer Protocol (NNTP): The protocol defined in Request For Comments (RFC) 977 that defines how news messages are transferred between a news server and a news client.

Newsgroup: an on-line discussion group accessed via a newsreader.

Router: A device that directs the information transmitted from computers on a network to their destination.

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