02D125I

Information Gateway Feasibility Study

THE NATIONAL ART LIBRARY/PRINTS, DRAWINGS, AND PAINTINGS

DEPARTMENT OF

THE VICTORIA AND ALBERT MUSEUM

An Interactive Qualifying Project Report

submitted to the Faculty

of the

WORCESTER POLYTECHNIC INSTITUTE

In partial fulfilment of the requirements for the

Degree of Bachelor of Science

by

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Date: April 24, 2002

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1. **feasibility**
2. **gateway**
3. **enquiry**

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Abstract

This project, conducted at London's Victoria and Albert Museum's National Art Library/ Prints, Drawings, and Paintings Department (NAL/PDP)*, analysed the feasibility of implementing an Information Gateway. At present the NAL's enquiry desk cannot handle all its numerous phone enquiries. We conducted research, interviews, case studies, and surveys on the technology of the phone and database systems as well as on the human reaction to organisational change. Taking these into account, we recommended specific options for implementation of the Information Gateway.

* It was brought to our attention on 22 April, 2002 that the NAL/PDP is now "The Word and Image Department".

Executive Summary

The purpose of our Interactive Qualifying Project, conducted at the Victoria and Albert Museum (V&A) in London during D-term 2002, was to investigate the possibility of implementing an Information Gateway at the National Art Library/ Prints, Drawings, and Paintings Department (NAL/PDP). The problem we addressed for the NAL/PDP was that their enquiry desk receives numerous phone, letter, fax and electronic mail enquiries, and presently too many phone enquiries come into the enquiry desk for the present operation to handle.

The NAL/PDP's proposed Information Gateway would act as a single point of contact for enquirers seeking information on the Museum's and Library's subject areas. This Gateway would manage the enquiries and distribute them to the appropriate department or expert for an effective and accurate response. This proposed Information Gateway would be made up of two technological components: a telephone system and an enquiry tracking system.

Our group's specific objectives were:

- To interview V&A/NAL/PDP staff, other London museum and library staff, and those who operate at the Telephone Exchange (the main switchboard for the South Kensington Museums).
- To survey phone enquirers to find patterns and trends of enquirers' experiences.
- To research specific technological options for an information gateway that would comply with the UK Freedom of Information Act, which will go into effect in 2005.

- To analyse the interviews, surveys, case studies, research and options and to make recommendations on the feasibility of an information gateway.

We researched various aspects of the proposed Information Gateway. These included conceptual aspects, such as customer relationship management, knowledge management and human resource management, legal aspects, such as the United Kingdom Freedom of Information Act of 2000, as well as technological aspects, such as telephone systems and database technology.

The conceptual area included customer relationship management, knowledge management and human resource management. Researching these concepts guided us to understand the organisational and personal component of an information gateway, such as employee knowledge sharing, providing public services, and managing staff operations.

The legal area focuses on the United Kingdom Freedom of Information Act of 2000. The major focus of this Act states that public authorities like the NAL/PDP must answer all written enquiries within twenty days.

The technological area included researching general information on the technology of an information gateway and the resources needed to operate a gateway. Those resources are staff, training and existing technology. After researching this technology we researched specific companies that develop or sell telephone systems and database technology.

We used different methods to obtain information about the feasibility of the proposed Information Gateway. We interviewed sixteen professionals from the NAL/PDP, Victoria and Albert Museum, the Telephone Exchange and other London

museums, libraries and institutions to find opinions, concerns, and suggestions for the implementation and the technology needed for the proposed Information Gateway, and to see how other museums manage and track their enquiries. We carried out cases studies with companies, libraries, museums, and institutions in the United States and in London to observe how their telephone enquiry systems operate.

We also created Phone Surveys that were conducted by the NAL operators at the NAL enquiry desk to find information about the enquirers' experiences when enquiring to the NAL. We received telephone records for the NAL enquiry desk from the Telephone Exchange, which showed the enquirers' telephone numbers, the length of their call, and the type of response they received. We also received the enquiry desk statistics on the type of enquiries received, which were Procedural Telephone enquiries or Bibliographic Telephone enquiries. We used these to find various phone call statistics and to recommend options for a system that would handle the phone call appropriately.

Analysis of these data allowed us to conclude that the proposed Information Gateway is feasible. Though it is feasible, there are many different options of how to go about implementing it. There are multiple technology options that could be chosen in the areas of phone systems, enquiry tracking systems, database software, interface design and developers. There are also many organisational options for the proposed Information Gateway, such as communication, implementation, staffing, and training. We analysed each option to find its advantages and disadvantages.

Through our analysis of interviews we found that the majority of the staff at the NAL/PDP thought implementing the proposed Information Gateway would be beneficial. There were small numbers of people who had concerns with the proposed Information

Gateway. The opinions of the staff guided us in making our specific recommendations. When analysing our case studies of phone systems at other institutions, we found that we received better responses to our enquiries when we are connected directly to a human operator instead of going through a series of telephone push-button options. This finding influenced our final recommendation about the phone system portion of the proposed Information Gateway.

While analysing our surveys and phone records we found trends of enquirers' experiences in contacting the NAL enquiry desk. According to the telephone records, we noticed that only about fifty percent of the calls that come to the enquiry desk are answered. The other fifty percent either receive a busy signal or are asked to phone later by the Telephone Exchange operator. The NAL receives most of its calls in the morning and in the earlier days of the week. Since many enquirers have a hard time reaching the NAL desk we believe that filtering the Procedural Telephone enquiries would leave more time for the Bibliographic Telephone enquiries.

We believe that our recommendations for the proposed Information Gateway would enable it to handle the large number of phone calls that are received, especially those received during morning hours and at the beginning of the week. During these busy periods, if an enquiry could not be answered directly, it will be saved and forwarded to the enquiry desk for response when the desk is not too busy. This solution would overcome the NAL/PDP's current phone enquiry problem, including unanswered phone calls, poor tracking of enquiries and complying with the United Kingdom Freedom of Information Act 2000.

We realise that there was more to this project than completing our initial goals and helping the NAL/PDP determine the feasibility of implementations of an Information Gateway. We learned that when introducing a new idea to an organisation, there are many barriers to overcome, specifically human aspects. We helped to overcome some of these barriers by conducting interviews and showing enthusiasm for the project, and thus by increasing awareness of the proposed Information Gateway. According to our liaison, our activities lessened many of the concerns that staff members initially had and interested them in giving suggestions about implementation of the proposed Information Gateway. We believe we accomplished a task outside of our original goal and that is helping the proposed Information Gateway gain acceptance.

Acknowledgments

We would like to thank our liaisons, John Meriton and Vicky Stott, for their assistance and support throughout this project. We would also like to thank John and Vicky for their hospitality at the Victoria and Albert Museum and the National Art Library.

We would like to thank our advisors, Professor Laura Menides and Professor Stephen Weininger, for their guidance and patience throughout this project. We would like to especially thank Professor Laura Menides, who would always take time out of her schedule to meet with us whenever we needed her assistance.

We would like to thank Jennie Hawks for setting up this project and for her dedication as an international liaison.

We would like to thank all of the administrators and staff members of the Victoria and Albert Museum, especially those in the National Art Library/Prints, Drawings, and Paintings Department.

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1.0 Introduction

The National Art Library (NAL)/ Prints, Drawings and Paintings (PDP) Department, which is located in the Victoria and Albert Museum, receives numerous phone, letter, fax and electronic mail enquiries every day. All letter, fax, and electronic mail enquiries are answered generally within two weeks. However, too many phone enquiries come in during the day for the current phone system to handle. Through the phone records we found about 50% of phone calls received during the day are unanswered. All these phone calls are forwarded from the Telephone Exchange, which is located in the Natural History Museum and is the main switchboard for the Victoria Albert Museum (V&A), the Natural History Museum and the Science Museum.

Our project is a feasibility study of creating an Information Gateway that would solve the problem of unanswered phone enquiries and would unify the system of answering all enquiries. This proposed Information Gateway has two major technical components: a phone system and an enquiry tracking database. The proposed Information Gateway would help the museums comply with the United Kingdom Freedom of Information Act of 2000 which will go into effect in 2005.

The NAL/PDP proposed to merge their services and the information they provide into an effective, seamless and monitored Information Gateway. The proposed Information Gateway would act as a single point of contact for enquirers seeking information on the collections and subject areas of the Museum and Library. Other closely integrated information points would co-exist to handle information such as Museum activities and bookings. The proposed Information Gateway would manage the enquiries and distribute them to the appropriate department or expert for an effective and

accurate response. The Information Gateway would provide benefits for the public, the NAL/PDP and the Victoria and Albert Museum (Prints, 13).

Our group's specific objectives are:

- To interview V&A/NAL/PDP staff, other London museum and library staff, and those who operate at the Telephone Exchange.
- To survey phone enquirers to find patterns and trends of their experiences.
- To research specific technological options for an information gateway that would comply with the UK Freedom of Information Act, which will go into effect in 2005.
- To analyse the interviews, surveys, case studies, research and options to make recommendations on the feasibility of an information gateway.

The expected findings of this project are general and specific requirements from those who are involved, such as the employees and administrators we interviewed. From the interviews we found the majority of those interviewed saw a need for the Information Gateway but a minority did not see a need for a change in their current operations. The findings from the surveys showed us that phone enquirers were having difficulties during most mornings and that the busiest day is Tuesday. Our research allowed us to find the most appropriate options for the proposed Information Gateway.

Those interested in our findings are other museums, institutions, libraries and organisations that have similar problems with the overflow of enquiries, specifically those enquiries that are not answered. For example, the Victoria and Albert Museum and the Courtauld Institute may be interested in using a similar information gateway.

To achieve our objectives we used three methods. To find the type of phone system that would benefit the NAL, we conducted interviews and case studies with other museums and institutions in the United States and London. Also, we created a survey that was

given by NAL/PDP staff to every enquirer, for the week of March 22nd to March 28th, in order to obtain data about the success or lack of success and having the enquiry answered. As a final step we researched UK Freedom of Information Act 2000, concepts of knowledge and human resource management, phone systems and database technology.

The Interactive Qualifying Project (IQP) is a program which students undertake usually in the junior year at WPI. It challenges students to investigate and report on a topic dealing with the connection between technology and society. This project will help students understand how our careers will influence and impact society. Many of the projects are very in depth in science and technology. These can include studying new technologies, making databases, and working on information gateways like the subject of our project. These projects impact society because many times the projects are done for the general public's welfare. For example, our project is making the Victoria and Albert Museum and its Library more accessible to the public by giving recommendations for a proposed Information Gateway.

2.0 Background and Literature Review

Organisations that implement information gateways, run by staff, realise the importance of technology in their work place. They create a strategy, plan for the best solution, and then implement the solution that is most beneficial and cost efficient. This solution includes concepts of knowledge and human resource management, phone systems, and database technology. The concepts and the technology will provide relevant information to create an information gateway.

2.1 Overview of Customer Relationship Management

Aki Laine, author of "CRM (Customer Relationship Management)" defined Customer Relationship Management as "an information industry term for methodologies, software, and usually Internet capabilities that help an enterprise manage customer relationships in an organized way" (Laine, 2002). CRM is used by organisations to provide more efficient and effective service for their customers. As Laine explains, "CRM is as a process that will help bring together lots of pieces of information about customers, sales, marketing effectiveness, responsiveness, and market trends" (Bass, 2002). CRM concepts were applied to the Museum's and Library's current operations.

Laine outlines specific guidelines for customer relationship management:

- establish a strategy for determining the value of various types of your firm's customers and if possible, increase the value of your customers;
- provide direct information that is essential for a phone operator to know about an enquirer in any given interaction and integrate different channels of communication within your organization; and
- involve people who interact and communicate with enquirers so that they can act on the information they receive (Laine, 2002).

Customer relationship management can be developed into specialised software that can be managed by a computerized system. The software will be able to manage information flow and to process and store the data entered into the system by the users. Due to the improvement of technology, data can be shared and used within the internal organisation faster and more efficiently. The CRM can be arranged and developed so that each department has access to the most pertinent data that it needs to function (Laine, 2002).

Implementing CRM

The Woodburn Group has conducted a study concluding that an organisation requires a large commitment of time and resources to implement a CRM. First, the organisation needs to know what kind of information it needs to gather. The second step is to understand how customer information is collected and stored. Also, an organisation needs to be able to allocate resources such as money and time to execute its plan to supporting a CRM system (Bass, 2002).

An organisation should break down its CRM project into manageable pieces so it can be handled as a temporary program. The programs can be run through testing in different departments (Bass, 2002).

Call Centres and CRM

Call centres are the phone system component of an information gateway where information is received and routed to its proper location. When a phone call is received the voice or data need to go somewhere to be processed by another human or a machine. The enquirer is bringing information to this call centre in the form of enquiries and if the

enquirer and organisation do not connect, the information could be lost. People placing phone calls can be enquiring about the organisation's operational hours, researching a product, or simply needing to communicate with a specific employee. The call centre will make sure that the information coming from the phone caller is handled properly and will reach the appropriate person within the organisation.

A recent study performed by the Incoming Calls Management Institute or ICMI in April 2001, found that currently, phone/live-agent (99%), fax (85%), mail (84%) and email (83%) are the most common customer access methods being used in call centres. Most companies are working towards an Internet enabled system (Montgomery 2002). Chris Adams of CGK Technologies Group explains that those involved will benefit from the great value of access to real-time data, anytime, and anywhere. Consequently, much more communicating with enquirers can be done electronically (Adams, 1).

Planning a call centre depends on the organisation's daily operations. Montgomery highlights several factors to consider when creating a call centre:

- Planning, staffing and execution. Allocating the proper resources to a specific call centre will help improve customer relations. Having a resourceful person at the call centre at key points in the day: during peak and off-peak hours.
- Analysing the information. A call centre can produce reports that are set as standards and that can be customised for an organisation. Those organisations need to have company employees that will take the time to interpret what those reports are saying. If they are unclear on the reports, employees should discuss it with their IT or telecommunication department.
- Call centre agents and their abilities. It is not always information technology's fault for losing callers. It is often times the call centre agents. Examining the quality of the agents and their ability to perform their tasks is important in making an organisation much more effective.

- Planning for call centres to become Internet based. More and more organisations are working towards getting better customer relations by getting their organisation on the internet.
- Forecasting calls. Depending how large the organisation is, the call centre manager has to predict how many calls it can have in various times of the day. With the right tracking system, companies can see when these calls are coming in and how long it takes for an average call (Montgomery, 2002).

Call centres today use the most up to date software and hardware in voice and data applications. Anton writes that enquirers want their information as fast as possible at anytime, from anywhere, in any form, and for free. Enquirers want no constraints on receiving the information they deserve, but it is up to the organisation to allow the information to be provided to the enquirer (Anton, 122).

Some have claimed that there has been, and will be, a spectacular growth in the number of call centres on both sides of the Atlantic (Feinberg, 131). Feinberg believes that the number of call centres being used in European countries will increase. This is a trend that has happened already here in the United States according to Feinberg. He sees Europeans demanding more from organisations to receive better relationship satisfaction.

There are numerous factors to measure the success of handling phone enquiries (Feinberg 133). Success is defined broadly in terms of customer satisfaction. Those factors are shown in Table 1.

Table 1: Factors measured and tracked for call centres

- Average speed of answer
- Amount of time caller is in the line for answer
- Percentage of callers who have satisfactory resolution on the first call
- The percentage of callers who hang up or disconnect prior to answer

- Total time caller was connected to telephone service representative
- Time needed to finish paper work, do research after the call itself has been completed.
- Percentage of callers who receive a busy signal and could not even get in to the queue.
- Inbound calls per telephone service representative (TSR) per shift
- Total calls (Feinberg, 133)

Call centres are usually seen as automated systems, but there may be personal sides to the centres. A person or agent, called a call centre representative (CCR), will often be the contact that a customer will receive when calling to enquire about something. The CCR connects the organisation with the enquirer. Burgers states that for consumers, the evaluation of a service often depends on the evaluation of the "service encounter" or the time the enquirer interacts with the firm (Burgers, 142). A customer wants to hear an actual voice, not a recording.

Enquirer satisfaction has much to do with the environment and relationship set-up by the organisation. A study conducted by La Trobe University in Asia Pacific Call Centre News in August of 2000, stated that callers ranked the lack of service personnel as the most frustrating experience they had when calling organisations. After the lack of personnel, other items were: waiting on the phone, uncaring communication, getting the run-around, phone system too complex, receiving unreliable information and service (Montgomery, 2002).

There are other disadvantages of the technology that make up call centres. Touch-tone menus are difficult and irritating to users when the systems are implemented in a confusing way (Business, 2001). When the menus for these systems are made, they should be for the basic and repetitious calls that are frequently made (Business, 2001).

Also, these systems can malfunction and this should be monitored closely. Many students and parents in a Seattle school received incorrect grades when an automated phone system reported that every child had failed a certain class (Automated, 1999).

2.2 Overview of Knowledge Management

Knowledge management (KM) is the process of managing an organisation's intellectual and knowledge-based assets. It's important to understand that knowledge management is defined without involving technology. "KM is often facilitated by IT, technology by itself is not KM" (Santosus, 2002).

Intellectual or Knowledge-Based Assets

All information is not valuable. It is up to an organisation to understand what knowledge is needed to perform its operations. There are two categories into which intellectual and knowledge-based assets are classified: explicit and tacit. Explicit assets are patents, trademarks, business plans, marketing research and customer lists. In order to determine if an organisation's assets are explicit, that an organisation can follow a simple rule. The rule is if the asset consists of anything that can be documented and archived often with the help of IT, it is explicit (Santosus, 2002). In a library, an example of explicit knowledge assets could be electronic lists of the books, periodicals, and other publications that have been catalogued. The books, periodicals, and other publications that the library has are physical assets. Tacit knowledge is the "know-how" that resides in an organisation's staff member's head. Trying to figure out how to recognize, generate, share, and manage tacit knowledge is a challenge when dealing with this form of intellectual assets.

Benefits of KM

An organisation that uses KM can benefit in different ways. Depending on the type of industry an organisation is in can use the knowledge it gains from its operations for a strong value. These values of KM can result in efficiency and productivity improvements. KM should help an organisation:

- promote innovation by encouraging the sharing of ideas;
- improve customer service by reforming response time;
- get services to its customers more quickly; and
- enhance employee retention rates by recognizing the value of employees' knowledge and providing incentives for it (Santosus, 2002).

Challenges of Knowledge Management

Managing knowledge, specifically tacit knowledge, is often looked upon negatively by staff of an organisation. An organisation should create an environment in which it is rewarding for individuals to share their knowledge and abilities. The organisation should encourage an individual to share and should provide an incentive. Incentives need to be provided while not conflicting with the work to be done by the staff. KM should make life easier for employees (Santosus, 2002).

Knowledge Management within an Organisation

Many times, groups of employees or departments that share information will be able to work together to understand all operations of the organisation's overall vision. If two departments share their goals with each other, staff from both sides can potentially share knowledge that may help achieve those goals. Departments of a large organisation working together should not be competing, but should work together in parallel to

achieve the overall goal of the large organisation. In order to accomplish this, an organisation needs to do more than some simple restructuring within its internal operations. "It's about transforming the way business captures, manages, distributes, and interacts with its critical information" (Ringle, 2000). A community of knowledge can be designed and managed after an organisation fully assesses the way in which it shares information and practices. An organisation needs to understand the obstacles and opportunities it may have with its knowledge and information sharing.

Restructuring of an Organisation

When changes occur in a department's programs, staffing patterns, or resources, department management should examine a possible reorganisation. An organisation that implements a technology change also needs to re-evaluate its needs and look into reorganising its resources.

An organisation needs to examine various steps in reorganising human resources for a technology change. The Office of Human Resources at the University of California, Berkeley recommends defined steps for reorganisation; those steps are in Table 2.

Table 2: University of California, Berkeley's steps for reorganising human resources.

- Define the problem;
- Determine what departments are meeting goals;
- Consider what factors and attributes contribute to effectiveness of jobs and structure;
- Identify a new model that will support your goals;
- Develop a reorganisation proposal;
- Assess skills and training needs;
- Determine skills needed for each position;
- Compare current skills with what is needed;

- Determine training needs and resources;
- Review, reassess, and gather input during implementation
- Include systems that will provide regular feedback from management, staff, and client groups;
- Build an effective team;
- Schedule regular staff meetings;
- Facilitate communication by remaining open to suggestions and concerns;
- Encourage all team members to share information; and
- Support brainstorming and consensus decision-making where appropriate. (UC Berkeley, 2001)

These steps address issues that may arise in a reorganisation. Planning the reorganisation with proper goals and receiving constant feedback from staff will allow for an easier reorganisation process. Communication between management and staff is vital. The staff needs to be informed and trained on the new aspects or systems that will be implemented. There can be resistance from staff for these reasons of non-communication or the restructuring of the staff's job functions.

2.3 UK Freedom of Information Act 2000

The UK Freedom of Information Act 2000 goes into effect on January 2005 after receiving Royal Assent on 30 November 2000 (Freedom, "Explanatory Notes" 2001). The Act requires all public authorities (i.e. organisations funded by the Government) to reply to any written enquiries within twenty working days (Freedom, 2000). The twenty day time limit will affect the NAL/PDP in the way the department will answer enquiries. Before January 2005, public authorities, such as the V&A Museum must produce "publication schemes" or lists of the information they hold. Production of publication schemes will be at various times for different organisations; the local government needs publication schemes done by February 2003 (Museum, 2002). The production of publication schemes for the archives of the V&A's needs to be in place by the end of 2002. There are certain exemptions to this Act, such as, if the information enquirer about is not in records from the previous thirty years, then the authority is not mandated to respond to the enquiry. This means that if the V&A Archives receives an enquiry about a subject that is not in records from the past thirty years, it is not exempt from answering the enquiry.

In Section Eight of this Act, it is stipulated that a public authority must provide everyone with information that they request, only if the request is put forth in the proper manner. This manner includes the enquirer having to state his or her name and other "personal" information. In this Section, the Act also explains what constitutes "personal" information (see Appendix C). "Personal" information is "exempt from disclosure". This protects private information from becoming public knowledge. If this "personal"

information were to be given out, then it would infringe on the Data Protection Act 1998 which protects such information (Freedom, 2000).

Section 14 gives some leeway to authorities. It states that the authority does not have to comply with irritated enquirers' requests, unless they are valid question where the enquirer vents some frustration, nor repetitive requests of similar nature by the same person (Freedom, 2000). These Sections are just examples of the stipulations that the British Government has stated in the Freedom of Information Act 2000.

There are many different Acts that the Freedom of Information Act 2000 amends or rewrites. One of these Acts is the Data Protection Act 1998. The Data Protection Act replaces the Data Protection Act of 1984 which needed rewording. According to the Data Protection Act of 1998, organisations processing personal data must comply with the data protection principles. Public authorities should use the Freedom of Information Act 2000 and the Data Protection Act 1998 as guidelines to check and restructure their current enquiry scheme. These require organisations to keep confidential the records of individuals' enquiries. The only individuals who can access these records are the individuals themselves or law authorities with proper legal documents (Lord, 2000).

2.4 Call Centres

Each of the following solutions is taken from its company's web site and may have biased wording in its product information.

Great Plains Siebel Call Centre

This business-minded call centre is organized to have a closed-loop flow of information between sales, marketing and customer relations. This system can work in any organization because it is a very flexible system and is focused toward a company

with one or more operators. The system on-screen "pops-up" to display the customer's history when that customer calls so the operator can better serve the caller. A big plus for this system is that Great Plains offers 24 hour training over the internet, which will save time for an organisation and allow the operators to train during free time throughout the day. This system includes:

- Opportunity Management and Pipeline Analysis
- Account and Contact Management
- Shared Calendar and Activity Management
- Connected and Remote Support
- Charts, Reports and Expense Reporting
- Correspondents and Fulfilment
- Integration with Microsoft Outlook
- Multiple- Organization Enabled
- Data Integration Manager
- Correspondence and Fulfilment
- Service Request and Solution Management
- 24 Hour Internet Training (Microsoft, "Great", 2002)

Avaya IP Agent

This system is a Microsoft Windows® software based call centre that runs on Windows 98/2000/XP/NT® 4.0 software. This allows an operator to use the system on any computer in the network. The IP agent has an interface that can access existing database information through a Lightweight Directory Access Protocol, and an integrated call history allowing the operator to see calls made and received. The system also has pop-ups that appear on the computer screen when they are triggered by such things as a Dialled Number Identification Service and an Automated Number Identification service.

Since this system is made to use standard Microsoft Windows software, training a new operator is easy if the operator knows how to use Windows. Here are some key features of the IP agent:

- **Customisable Interface**:
  - "drag and drop" interface
  - floatable toolbar with tips
  - easy-to-use interface makes conference calls and transfers simple for the operator
- **Integrated Call History**:
  - incoming, missed incoming and outgoing calls
  - Redial from "Recent Call List"
  - Add notes to names listed in directory.
- **Agent Greetings**:
  - Uses appropriate greeting for the operator logged in.
- **Screen Pop-ups:**
  - Displays information related to the caller when they call that pops up onto the screen.
- **Public Directory Search:**
  - access existing database information
- **Other Standard Features:**
  - Auto-answer support
  - Hold, transfer, conference call
  - Call timer
  - Missed call indication and waiting lamp
  - Multiple Call appearance

There are three basic configurations of this product. They are as follows:

1. **Telecommuter Mode:** This has a two-line configuration. One carries Voice Data and one maintains and delivers feature, or access, control and signalling across the IP network.

2. **Road Warrior Mode:** This offers flexibility by transmitting voice or audio over the IP network. Ideal for remote agent with only one line available.
3. **Callmaster VI Mode:** This uses a small, 8-button, digital voice terminal with two headset jacks. This is controlled through a serial port connection. This can still be used to a minor extent when experiencing computer problems or the computer is off. This does not require IP endpoints (Avaya, "IP", 2002).

Veramark Reporter

This system's software is designed to give the insight that an organisation needs to enhance call handling and improve customer service. It also has useful reports at an "economical price". The Reporter will show the organisation:

- when lines are the busiest,
- amount of time callers are on-hold,
- employees or groups making the most calls,
- average call length,
- incoming call activity by area code,
- and number of calls abandoned by a customer and their call-back information (Veramark, 2002).

This program is designed to run with Avaya's MERLIN MAGIX ™, MERLIN LEGEND ®, Partner® Advanced Communication System or Partner II®. These are phones with many different models that fit different kinds of businesses and organizations. They have such options as:

- one or two line models
- Navigation keys
- Digital displays for caller identification
- Everyday features such as Hold, Transfer, Conference, Volume control, etc. (Avaya, "MERLIN", 2002)

Talkswitch Phone System's Automated Attendant

This fully configurable system answers all incoming phone lines and routes calls to the proper extensions. The system allows for the operators to record greeting messages that guide the caller through touch tone menus. The system is capable of screening incoming phone calls by using its Name Directory. When someone is sending a fax to the business or enquiry line it will automatically route the fax call to the proper extension. It is also possible for a caller to reach the desired person by dialling the first three digits of their last name when instructed to by the Automated Attendant.

There are two different models of the automated attendant. They are:

- **TalkSwitch:**
  - Route calls to appropriate extension
  - Record up to nine greetings
  - Play different messages for different times and dates
  - Create up to nine levels of custom menus with three touchtone choices per menu
- **Switchboard:**
  - Record one greeting then guide caller to proper extension
  - Basic Model (Centrepoint, 2002)

Nortel Networks: Meridian 1 Automatic Call Distribution (ACD)

This Nortel Networks' call centre solution helps handle things such as customer enquiries, services and message taking. The system can run on different requirements. It can be operated on a first come first serve basis. This means that the person waiting in the queue for the longest will be the next person to be attended to. It can also be configured for different priorities such as long distance calls. Recorded announcements are also available to deliver messages to the caller while they are waiting in the queue.

Meridian1 ACD can be broken down into three basic components:

1. **Call Processing Features:** These allow an organization to customize the ACD to meet its needs such as handling a large amount of calls or proper distribution.
2. **Agent Features:** These provide agents with productivity tools so enquirers can receive the proper service.
3. **Supervisor Features:** These allow administrative staff to monitor the operators through current displays and those in the history of the system

   (Nortel, 2002).

Siemens: Call Centre Solutions ACD

This queuing system is very similar to the other systems in this research. It has the same basic structure and the following details:

- Incoming calls are queued and answered in order
- The system can be programmed to feed calls to the proper staff members

This system also includes a number of voice processing options that can enhance call response. These include:

- informative messages,
- voice mail for unavailable staff members,
- Automated Attendant which answers calls and transfers them automatically,
- and Integrated Voice Response system which answers callers automatically and takes details without staff intervention

  (Siemens, 2002).

Mitel Automatic Call Distribution (ACD)

An ACD system is essential in any business centre where there is a high volume of incoming calls. It offers benefits to the caller, the operators and the business. The Mitel ACD integrates with Mitel's IP and PBX platforms. This allows the managers of the organization to make sure that:

- Incoming callers are routed to skilled agents armed with answers;
- Callers are placed in a queue if all agents are busy;
- The longest waiting caller is directed to the first available agent;
- Callers are directed to the agent whose skills best match the call or who has been idle longest.

The ACD integrates with Mitel Networks' line of call centres, help desks and voice platforms to make a better interaction with the customer. The software directs the incoming call to the operators at desk. If the operator is busy then the caller is placed into a queue where a recorded message can be placed. The longest waiting caller is directed to the operator once they are finished with their last phone call. The system uses basic rules to direct calls to the best operator for each call. There are other advanced options that can be included in this system. The price is not an issue for this system since the Telephone Exchange already has bought this system. (Mitel, 2002)

2.5 Tracking Systems

After an automated system has been implemented, an organisation should evaluate the system to determine whether it is serving its customers properly. When call centres are still overloaded, an organisation should look into a tracking system. Tracking systems are used to assess:

- clients' requests for added features
- products that generate the most calls
- statistics on number of calls received
- statistics on number of calls answered
- statistics on abandoned calls
- statistics on average duration of call (Help Desk, 2002).

Nairm points out that an organisation needs to research these topics as well as their special needs. A custom system is appropriate for an organisation with heavy call volumes (Nairm, 2000).

Klein also states there are disadvantages to customizing a tracking system. First, a customised tracking system can take a month or two to be fully implemented versus a common product from a company that could be set up in less than a week. Secondly, the designer of the customized system may use methods in the database that are common knowledge for the designer but may confuse the average user (Klein, 2000).

Touch-Tone Menu Design Study

In a study conducted by BBN Technologies which is a Verizon Company, researches found long menus with clearly defined categories performed better than short menus with broad categories. Bernhard Suhm, Barbara Freeman and David Getty, the research team who conducted the study, studied the design strategies of touch tone phone

systems. They investigated whether short or long menus route callers more efficiently. In their research, the team found that previous research argued that there should be no more than four choices, while others argued it should have a maximum of nine options. The study was performed using live calls to a commercial call centre. The researchers did not interrupt any operations of the call centre while conducting their study. Using more concise options, the phone system directed the call to the proper expert or system to handle the caller's enquiry. The long menu reduced the rate of callers choosing the "other" option, by expanding what options are covered under "other". The study proves that there are problems with having a menu that only contains five or less options (Suhm, 2002).

2.6 Data Analysis Techniques and Technology

Data Mining

Data mining is sorting through data to identify patterns and relationships. Data mining parameters include:

- Association – finding patterns where one event is connected to another event;
- Sequence or path analysis – finding patterns where one event lead to another later event;
- Classification – finding new patterns
- Clustering – visually documenting groups of facts not previously known;
- Forecasting – finding patterns in data that can lead to reasonable predictions about the future (Data Mining, 2002).

Predictive modelling is a technique used to predict future behaviour and consequences of change. Research groups often use extensible mark-up language (XML) to enable the definition and sharing of predictive models between applications. Database technology often uses a computer processing technique called online analytical processing (OLAP). OLAP enables a user to selectively mine and view data from multi-dimensional databases in different views. Multi-dimensional databases have various attributes; OLAP software can intersect dimensions and display them. A standard relational database can be seen as a two-dimensional database. (XML, 2002)

Data Warehousing

Organisations that collect data or use data to perform daily operations can potentially have various systems they use to gather, store and/or retrieve data. Data warehousing techniques allow an organisation to connect all of the databases and use OLAP technology to analyse data from all of these databases. Data warehousing allows for data analysis across various database platforms and computer systems. "A data warehouse is virtually any database containing data from more than one source, collected for the purpose of providing management information" (Manning, 2002).

2.7 Networking Technology

Client/Server Networking

The Client/Server relationship in computer networking is a simple model in recording, transferring, using and storing data between two computers. The client is simply a workstation that an employee or staff member may use to enter, manipulate, or

store data on a server. The server is a computer that contains data or applications that are used by a client computer. For example, a library may have a computer which has an application that it uses to electronically catalogue its books; this computer would serve as a server. The client would be a staff member or a member of the public who connects into the server via a workstation, which is networked to the server; the client would use the data off the server to perform a job or task (Client/Server, 2002).

Enterprise Servers

An enterprise server is a computer containing applications that collectively serve the needs of an enterprise rather than a single user or department. Servers are often seen as large super-computers but recently servers have come down in size and have increased in performance technology. Personal computers can be set-up as a server from which someone can access data. Personal computers can serve as web servers. Those web servers usually can handle a small number of clients connecting to it. Servers' abilities have increased in speed and performance to provide enterprise-wide application management capabilities. This definition of an enterprise server includes both hardware and its operating system. Operating systems (OS) can range in performance depending on the server hardware on which it resides. Sun Microsystems' computers work well using its Solaris OS while Microsoft Windows Server OS works well on IBM based computers. Server hardware and operating systems truly depend on how the technology will be used (Enterprise Server, 2002).

The Database Planning Process

When planning to create a database it is important to understand the steps to get to a final product. It is important to understand the goals of the planning process and identify the following:

- The information the organisation currently track
- The information the organisation wants or needs to track in the future
- The reports the organisation needs to produce
- Where information runs through the agency (who gathers it, who enters it, etc.)
- Which database product most closely matches the organisation's needs
- Whether to buy an off-the-shelf database or build a custom database (Duffy, "Avoiding Disaster", 2000).

The final Database Plan will have set components, such as an executive summary, implementation plan, purchasing plans, and staffing and training recommendations that vary with content depending on the organisation's needs (Duffy, "Avoiding Disaster", 2000).

2.8 Training Human Resources for a Technology Change

Plan for Training

The management of an organisation needs to plan training into its technology plan. "The general rule of thumb is that only 30% of technology spending should go to hardware and software, and a full 70% should go to training and support" ("Plan, 2000). An organisation could buy the most sophisticated technology, but the technology needs to be managed and run by an effective staff. The staff must know how to use and troubleshoot the technology that is being newly implemented. Staffs that are experienced

on the new system will be able to cut down on problems with the system. The value from this will be improvements in staff satisfaction as well as customer satisfaction.

Management needs to plan for staff training appropriately. The staff should have the ability work in training with their regular work schedule. Training should not cut into work time, but management needs to assess when the best time to train staff members. Staff skills should also be assessed for what type of training would be proper. Skills and job functions may determine which classes or seminars the staff member will attend. Staff and management need to be "in harmony", convinced that training is a priority and proper resources should be allocated. (Duffy, "Integrating Training", 2000)

Types of Training

There are three types of training for staff when an organisation implements a new technology system. Those three types are training classes, customised training, and do-it-yourself training. Training classes for charities can range from sessions that last two hours to a regular college course. Most technology providers will provide training classes to charities. Often training courses can be part of a service agreement that the charity may make with a technology provider. The second type of training is customised training. It is easier to train an entire staff if training sessions can be tailored or customised to a specific need for the organisation. An organisation may need to explain a new software application and may want to cover it all with the staff. An outside trainer may come in to teach or an in-house IT administrator may teach the class. The last type is do-it-yourself training. Depending on the application, staff members may learn on their own using books, CD-ROMs or videos that have been produced to teach the application or system. (Advocate, 2000)

2.9 Database Technology

Databases

A database is a collection of data that is organised so that its contents can easily be accessed, managed, and updated. Databases can contain data such as inventory records and customer profiles. There are various types of databases; those types are relational, distributed and an object-oriented programming database. A relational database is a commonly used type; data in these types of databases can be reorganised and accessed in multiple ways. Those who manage the databases can allow certain permissions be granted to those who access the database server. The database manager can permit someone to have read/write capabilities, report generation, and the ability to analyse data. In some cases, organisations may not allow staff members to change information that has been inputted into the database server. Allowing data to be widely accessed could cause a staff member to incorrectly manipulate data that could hurt analysis or report generation. (Database, 2002)

Oracle Database Technology

Oracle is a software company that provides sophisticated relational database products. Currently, Oracle 9i is the newest version of Oracle's database application software. Many of the Fortune 1000 companies use Oracle9i to run their Web sites; though Oracle's software is not designed just for web site technology. The Victoria and Albert Museum currently have a site license which allows them to install Oracle on any computer in the Museum. Oracle database software was the first to support the Structured Query Language (SQL), which is an industry standard to query data and produce reports from those queries. There are many benefits to using an Oracle Database. Oracle9i, according to the company's web site, includes:

- Support for more types of data than any other database;
- The most advanced SQL, Java, XML, Web Services, and more;
- Efficient management of terabytes of data with parallel processing of all operations;
- Continuous availability despite system failures, data failures and disasters, human errors, and planned maintenance;
- High performance business intelligence services such as data warehousing, online analytical processing (OLAP), and data mining;
- Support for thousands of application available from Oracle and its partners. (Oracle Corporation, 2002)

Microsoft SQL Server 2000

Microsoft Corporation creates SQL Server 2000 software. Microsoft states that SQL Server 2000 provides extensive database programming capabilities built on Web

standards. SQL Server 2000 has the ability to store and retrieve data in XML format. SQL Server allows users to achieve unparalleled scalability and reliability with SQL Server 2000. SQL Server's ability to expand will be beneficial when an organisation increases in number of users and workstations. SQL Server also allows users to debug queries so the queries can be tailored and customised to business need. Various companies and organisations around the world use SQL Server 2000 to manage all types of data, queries and reports (SQL Server, 2001).

Microsoft Access Databases

Microsoft Access is a database creation software application created by the Microsoft Corporation. Access is a popular database tool, because it is bundled with the Microsoft Office Suite which provides various office applications such as word processing (Microsoft Word) and a spreadsheet program (Microsoft Excel). Access allows organisations to create applications rapidly and they can be customisable to the organisation's need. Microsoft has created Access to be able to link itself to Oracle database and use current web page languages such as extensible mark-up language (XML) (Microsoft Corporation, 2002).

We investigated and researched various relational database products. We focused on two major market leaders in relational database technology. Oracle database software is currently used on the Museum's servers to perform daily operations in the Accounting Department, building management and for the Museum's intranet.

Computer World conducted a telephone survey in 2001 titled "Report Card for Database Vendors" that surveyed IT Professionals on major database software products and the products' vendors. The five database vendors that were evaluated in the survey were Oracle, IBM, Informix, Microsoft and Sybase. The IT professionals or respondents answered questions about specific database software they use. Some IT professionals answered questions on two products. The IT professionals were asked to rank their experiences from 1 to 7 where 7 is high.

The first part of the survey shows that the best database vendor for "Product Average" is IBM and in a close second is Oracle (see Table 3). Oracle is very strong in "Features", "Performance", and "Scalability", but low on costs. IBM has a strong reliability but its cost is relatively high according to the survey. Informix, according to the survey, is a relatively an average product it has no maximum (bold text) or minimum (italicised text) response. Microsoft was low in scalability and reliability. Microsoft also had a high of "Cost to Operate". Sybase had low numbers in features and performance. Sybase was also low in 'Overall experience with the product".

Table 3: Computer World Survey Result on Database Products

User Ratings of the Product	**Oracle**	**IBM**	**Informix**	**Microsoft**	**Sybase**
Features	**5.86**	5.67	5.21	5.52	***5.15***
Performance	**5.73**	5.69	5.36	5.43	***5.17***
Scalability	**5.93**	5.88	5.14	***5.08***	5.13
Reliability	5.94	**6.27**	5.65	***5.29***	5.45
Cost to purchase or license	***4.27***	**5.67**	4.73	5.36	4.63
Cost to operate or maintain	***4.51***	5.18	5.09	**5.43**	5.30
Overall experience with the product	5.49	**5.73**	5.43	5.39	***5.22***
Product Average	5.68	**5.70**	***5.30***	5.33	5.40

IT professionals ranked the organisations from 1 to 7, where 7 is high.

The survey had a second part to it which evaluated the IT professional experiences on the vendor of the products (see Table 4). Oracle was average in licensing structure but low in flexibility in pricing. IBM had the highest value within each category. Informix tied with Microsoft in "Licensing Structure". Microsoft was the lowest in every category but "Flexibility in pricing". Sybase's vendors services were average compared to the other database vendors. IBM was both the highest rated within their product and with their vendors services (Report Card, 2001). Comparing revenue growth of Microsoft versus Oracle shows Microsoft at a 45% increase while Oracle has a 19% and IBM a 17% increase. Revenue growth comparisons help to understand the increase of each vendors products being purchased and used within companies and organisations (Microsoft Corporation 2002).

Table 4: Computer World Survey Results on Database Vendors

User Ratings of the Vendor	**Oracle**	**IBM**	**Informix**	**Microsoft**	**Sybase**
Licensing structure	4.96	**5.42**	***4.92***	***4.92***	5.06
Flexibility in pricing	***4.24***	**4.78**	4.59	4.71	4.74
Technical Support	5.15	**5.37**	4.94	***4.67***	5.06
Customer Support	5.03	**5.30**	4.83	***4.56***	4.92
Overall experience with the vendor	5.09	**5.45**	4.91	***4.85***	5.06
Vendor Average	4.90	**5.27**	4.82	***4.72***	4.95

Extensible Markup Language (XML)

Extensible Markup Language (XML) is a way to develop flexible and common information formats and share both the format and the data on the Internet or intranets. For example, libraries may agree on a standard or common way to describe the information about a book (author, date of publication, subject and so forth) and then describe the book information format with XML. This would allow a user to send out an intelligent agent (a program) to each library, gather data, and then produce reports on a specific book at each library. XML can be used by an individual, groups, or departments that want to share information in a consistent way. XML is like Hypertext Markup Language (HTML) but there are differences in its usage. HTML is used to describe the content of the web page, mainly how information needs to be displayed. XML describes the content in terms of what data is being described. XQL (XML Query Language) is a way to locate and filter the data fields and text in an Extensible Markup Language (XML) document. XQL provides a tool for finding and/or selecting out specific items in the data collection in an XML file or set of files. (XML, 2002)

Java

Java is a computer programming language developed for the Internet which is a distributed environment. Java is easier to use than the C++ programming language used to create computer applications. Java can be used to create complete applications that may run on a single computer or distributed among servers and clients on a network. Java technology also allows the programmer the ability to create single modules that can

run a small application on a web site. The single modules or applets allow users of the web site to interact with the web site.

There are various benefits to using Java technology. Java is portable, strong, fast, easy to learn, and has the ability to be a cross-platform technology. Java programs are portable in a network. Java's code that is written by programmers can be compiled into bytecode, which can be run from anywhere on the network on a server or client that has a Java virtual machine. A Java virtual machine creates the Java code written by the programmer into bytecode or an executable program. Java code is so strong that it will not crash the operating system on the server or client. The Java virtual machine checks for the integrity of the code before producing the final Java application. Java applications are run at the client level and can perform at a fast rate. Java is easier to learn than the C++ programming language. Another value to Java is its ability to be a cross platform technology; it can run on any operating system and computer hardware. (Java, 2002)

Common Gateway Interface

The Common Gateway Interface (CGI) is a standard way for a server to pass a user's request to an application program and to receive data back to forward to the user. Common gateway interfaces are used on a web based level. CGI pages are created to develop interactive web pages that users may find on the Internet or within an intranet. Developers find CGI to be very flexible because it can be run on any operating system the server uses (PC, Macintosh, UNIZ, OS/290, or others). The CGI is consistent and it allows programmers and developers the ability to write CGI in different languages such as C++, Java, and Perl. (CGI 2002)

3.0 Methodology

The methods we used to gather information on the Victoria and Albert Museum, the NAL/PDP department and other organisations were interviews, surveys, case studies, research on the World Wide Web and other sources. We performed case studies over the phone with various organisations based in the United States. Face-to-face interviews were held with appropriate employees of the Victoria and Albert Museum, the NAL/PDP department and other organisations. Our sponsors arranged these interviews. Phone surveys that we created were conducted by NAL staff who were answering enquiries. We analysed the survey data using Microsoft Access and Microsoft Excel. We obtained phone records from the Telephone Exchange and NAL Enquiry Statistics from the NAL which we analysed using Microsoft Excel. We also researched database technology, phone systems, concepts on knowledge and human resource management and government policies that are pertinent to our sponsor's proposed Information Gateway. We created and piloted a database using Microsoft Access to show possibilities of an Enquiry Tracking System. These methods are described in the following sections.

3.1 Interviews

Face-to-face Interviews

We conducted sixteen interviews with staff and administration of the Victoria and Albert Museum, The National Art Library/Prints, Drawings and Paintings Department, the Telephone Exchange and other London museums, libraries and institutions. Our liaisons arranged interviews with V&A/NAL/PDP and other institutions' staff. The

people chosen were those with knowledge of the proposed Information Gateway or the subjects that pertain to the gateway. We made customised interview guides for each interview. The questions we asked varied depending on each staff member's expertise and knowledge of the gateway.

We performed interviews with our liaisons to discuss basic information such as their job function, NAL/PDP operations, and goals for the proposed Information Gateway. We asked questions pertaining to what is expected of the proposed Information Gateway (See Appendix D.1).

We interviewed the NAL staff who deal with information services and cataloguing about their job functions and the expected impact of the proposed Information Gateway on their department. The questions that we asked were directed towards their opinions on the IG as well as their understanding of the technical knowledge on creating the IG. We asked for recommendations they had for the IG and any contacts that they felt would be necessary to interview (See Appendix D.2).

We interviewed the PDP and Archives staff separately, but used the same interview guide for both. We asked questions about their job functions and their opinions on the proposed Information Gateway and the impact of the Freedom of Information Act. We discussed with each staff member their methods for answering and tracking their enquiries (See Appendix D.3).

We conducted interviews with V&A and NAL/PDP staff members who have knowledge about technical areas within the Museum. We specifically asked questions on the hardware and software systems that currently operate at the Museum. We also asked

for recommendations on the kind of technology necessary for the proposed Information Gateway (See Appendix D.4).

We conducted an interview with a Telephone Exchange administrator about the current telephone systems used in the Museums and specifically for the National Art Library. We asked questions about telephone technology and the phone technology capabilities (See Appendix D.6).

We conducted interviews with administrators at The Natural History Museum, The British Library and a leading professional body. We asked questions pertaining to their enquiry management and the technology used to manage these enquiries (See Appendix D.5).

3.2 Case Studies

We conducted phone interviews with organisations in the United States. The interviews we carried out were to test the various organisations' phone systems. We tested the system by phoning with a sample enquiry in order to discover how well their systems work. We analysed how long it took to be connected properly, how long the call took, and how many times the call was transferred within the organisation. A member of our team would follow up with a second phone call to find the specific system that the organisation used to handle enquiries. The organisations we phoned for these case studies were British Airways Headquarters in New York City, The Metropolitan Museum of Art in New York City, Museum of Fine Arts in Boston, and The Library of Congress in Washington D.C.

3.3 Phone Surveys

We created a survey for NAL phone operators to use while conducting phone enquiries. We first proposed a survey that would evaluate the experience that enquirer had when while phoning the National Art Library (see Appendix E). The survey was then piloted by John Meriton, the Deputy Keeper of the NAL/PDP. Mr. Meriton discussed the survey and recommended suggestions for revised questions. We redesigned the survey to analyse the enquirer's experience on their phone enquiry (see Appendix F). We used Microsoft Access and Microsoft Excel to input and analyse the survey data. The survey was approved and was conducted by the staff at the enquiry desk on 22nd of March, 26th to 28th of March and the 2nd of April. There were fifty-nine respondents to the survey.

We analysed the data collected from the surveys to find patterns and trends about the enquirers' experiences. We created a Microsoft Access database to organise and input our survey data. We then queried the data using queries programmed in Structured Query Language (SQL). We then used Microsoft Excel to analyse the queries and create plots using this data. We examined the enquirers' ability to reach the enquiry desk at the NAL. We focused on rates of "Immediate Success", the time length to reach the enquiry desk, and the number of attempts to reach the enquiry desk. We studied the possible outcomes the enquirer may have encountered during their enquiry such as busy signal, no answer, transferred incorrectly, and/or disconnected. The survey allowed us to observe what other types of enquiries enquirers use such as electronic mail, letter and/or fax. Our

last question on the survey was to track where each enquirer was phoning from such as nearest town or county.

3.4 Literature Research

When we met with our liaisons we discovered that further research was needed on the United Kingdom Freedom of Information Act, and on concepts of knowledge and human resource management, phone systems, and database technology for the proposed Information Gateway.

We researched the various Sections of the Freedom of Information Act (FIA) that were pertinent to the Museum, Library and the proposed Information Gateway. We focused on "Access to Information Held by Public Authorities" and "Exempt Information" of the FIA.

We studied knowledge and human resource management to understand how organisations share tacit and explicit information between departments and within an organisation. We also looked at benefits and concerns of training staff on new implemented technology in the work place. We evaluated the different knowledge management and training methods and gave the best recommendations for the proposed Information Gateway.

We researched various phone systems and call centre solutions (refer to Background and Literature Review Chapter). We listed the technology and specific companies that could provide an IG system for the NAL/PDP. We analysed all of the options and made recommendations.

We evaluated database technology that was relevant for the enquiry tracking system, i.e. Oracle and Microsoft software. We also looked into Common Gateway

Interfaces (CGI), the Java programming language and Extensible Markup Language (XML) for managing the data for NAL/PDP. We researched recommendations about the best solution for a database and made our recommendation.

3.5 Telephone and Enquiry Documentation

Telephone Exchange Records

In order to analyse the number of telephone calls, we asked the Telephone Exchange for the National Art Library enquiry desk records (extension 2400). These reports are in chronological order starting from 1st of March to the 28th of March.

The first elimination of phone numbers we did was eliminating days when the desk was not open. The enquiry desk is not open on every Saturday, Sunday and Monday. Since people did call in and were dealt with by a pre-recorded message, their numbers were on the sheet. We therefore did not count these.

We also had to make another type of elimination. Because the Exchange will continue to ring for a caller when the line is busy at the NAL Enquiry desk we had to sort the information. To do this we looked for calls that were from the same number in a short period of time that were continuously busy or unanswered. Because they were being sent back by the Exchange, we considered it the same enquiry. If the call was finally answered at the end of the series we would consider this one call that was answered. If it remained busy until the end, we considered it one busy call.

After sorting the information we then totalled each response and total calls for the month, the week of the 22nd to the 28th (when the desk was open), and each day of this week separately. We then made charts to present our data better.

National Art Library Enquiry Desk Statistics

We also obtained Enquiry Desk statistics which are tally sheets kept by the enquiry desk operators. We inputted the data into a Microsoft Excel spreadsheet and created plots that showed trends in the types and totals of calls per time shift and day.

3.6 Pilot Database

We also created and piloted a database using Microsoft Access merely for presentation purposes. This shows possibilities of an Enquiry Tracking System that could be used for the proposed Information Gateway.

4.0 Data and Analysis

We collected and analysed information from interviews, surveys, case studies and other documents obtained through our methods. We analysed sixteen interviews, fifty-nine respondents to our survey, six case studies conducted by our group, and numerous telephone and enquiry desk statistics.

4.1 Interviews

We conducted sixteen interviews with staff and administration of the Victoria and Albert Museum, The National Art Library/Prints, Drawings and Paintings Department, the Telephone Exchange and other London museums, libraries and institutions. The people we chose to interview come from various backgrounds, such as information sciences, art and design, and technical backgrounds. The questions that we prepared for each interview varied depending upon the different expertise of the interviewee. We analysed the interviewees' statements and opinions on the proposed Information Gateway.

Interviews at the National Art Library

We discovered, from interviews with NAL staff, the way in which The National Art Library receives and manages phone, electronic mail, letter and fax enquiries. There are different types of enquiries that are answered by the NAL staff members, ranging from general to subject enquiries. Phone enquiries are directed to the NAL enquiry desk from the Telephone Exchange, which is located in The Natural History Museum. The NAL enquiry desk has one phone line to receive incoming enquiries, which are answered on a rotating schedule by NAL staff members. When a phone enquiry is received, the

staff member at the desk is expected to spend no more than five minutes on researching and answering the enquiry. If the research is taking over five minutes, the NAL staff member will ask the enquirer to ring back at a later time or the staff member will return their phone call later. Since there is only one phone line, often enquirers will have difficulties connecting with the enquiry desk and will get either a no-answer or a busy signal.

The NAL staff members who answer phone enquiries currently track the number of enquiries the staff answers, the type of enquiry and how many phone calls were transferred. It's important to note, when we analysed statistics sheets we only analysed the days that the NAL phone operators were conducting our survey.

We examined the data and found that the greatest number of enquiries for both types of enquiries, Bibliographic Telephone enquiries (BT) and Procedural Telephone enquiries (PT) came on Tuesday the 26th of March. See Figure 1 for the analysis of this data. Bibliographic enquiries are subject matter enquiries, while Procedural enquiries represent general enquiries such as the Library's hours of operations or directions to the Library. It's important to separate these two types of enquiries because we believe the proposed Information Gateway will filter out the PT enquiries leaving more time for BT enquiries. The procedural enquiries will be answered using a filtering system such as a recorded message or push-button options to answer general information. As the week progressed to Thursday the 28th of March, BT enquiries decreased and PT enquiries increased. It is possible that a phone enquirer could ask two questions during one phone call, which would result in both a bibliographic and procedural enquiry. Such enquiries are labelled as "Both". Tuesdays are a large day for enquiries. By examining data on the

22nd of March and the 2nd of April, are found that BT enquiries are once again more than PT enquiries.

Figure 1:Total Phone Enquiries by Type per Day

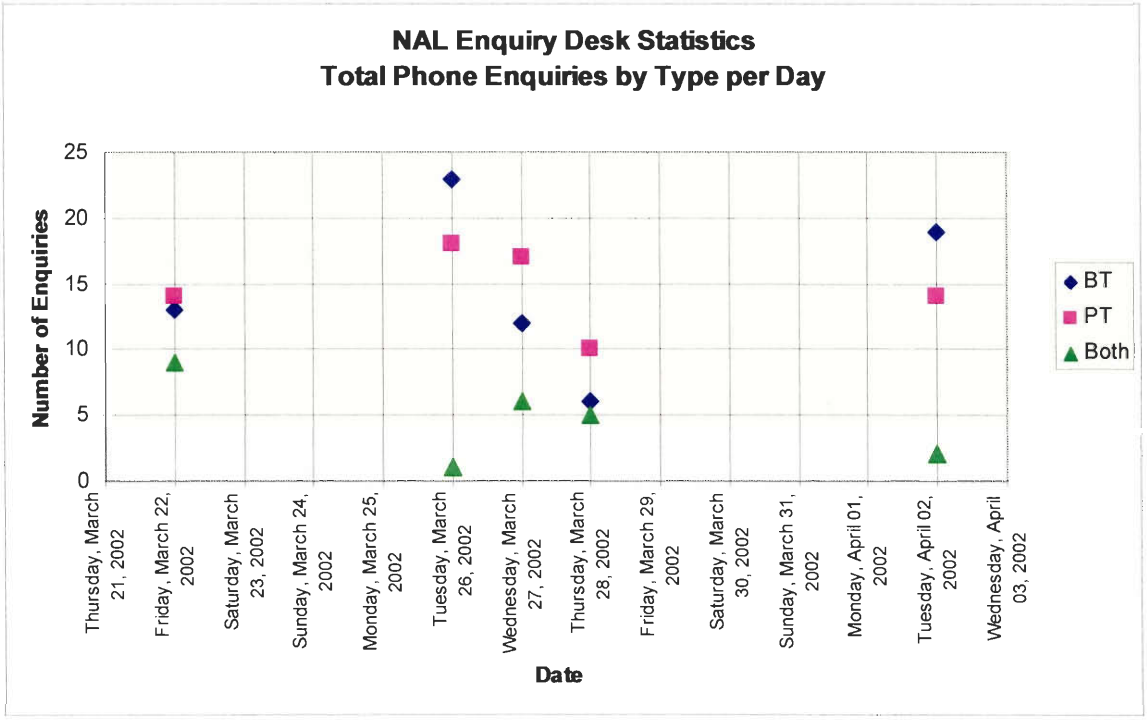
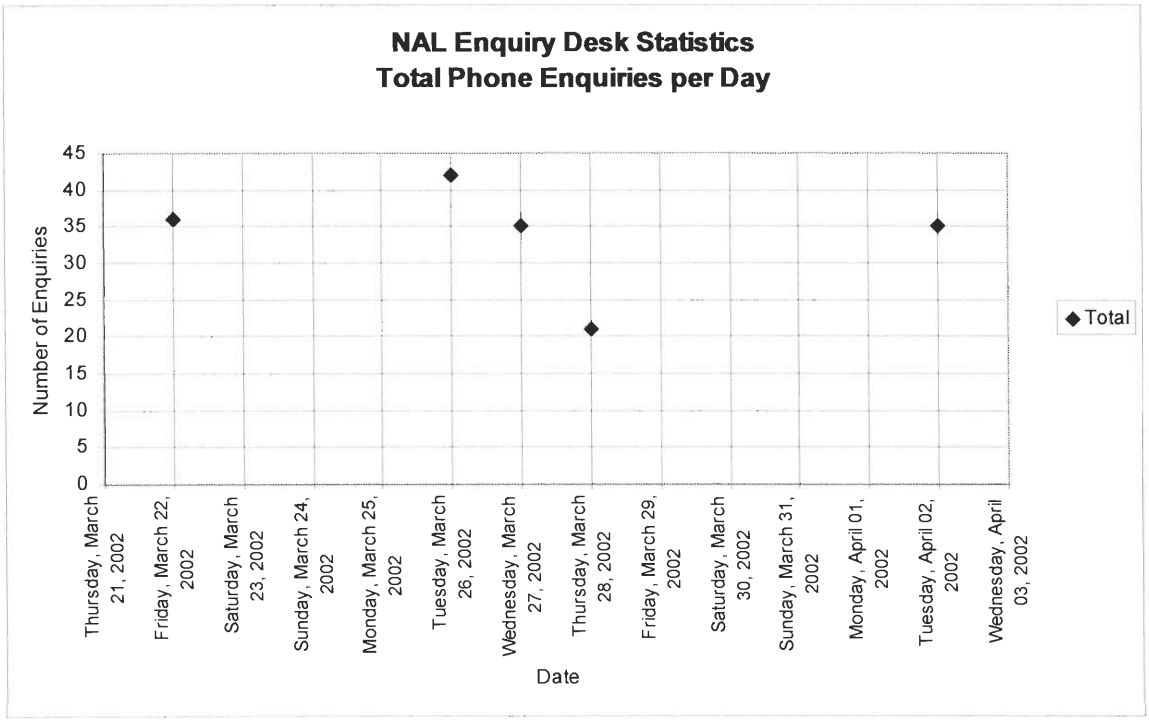


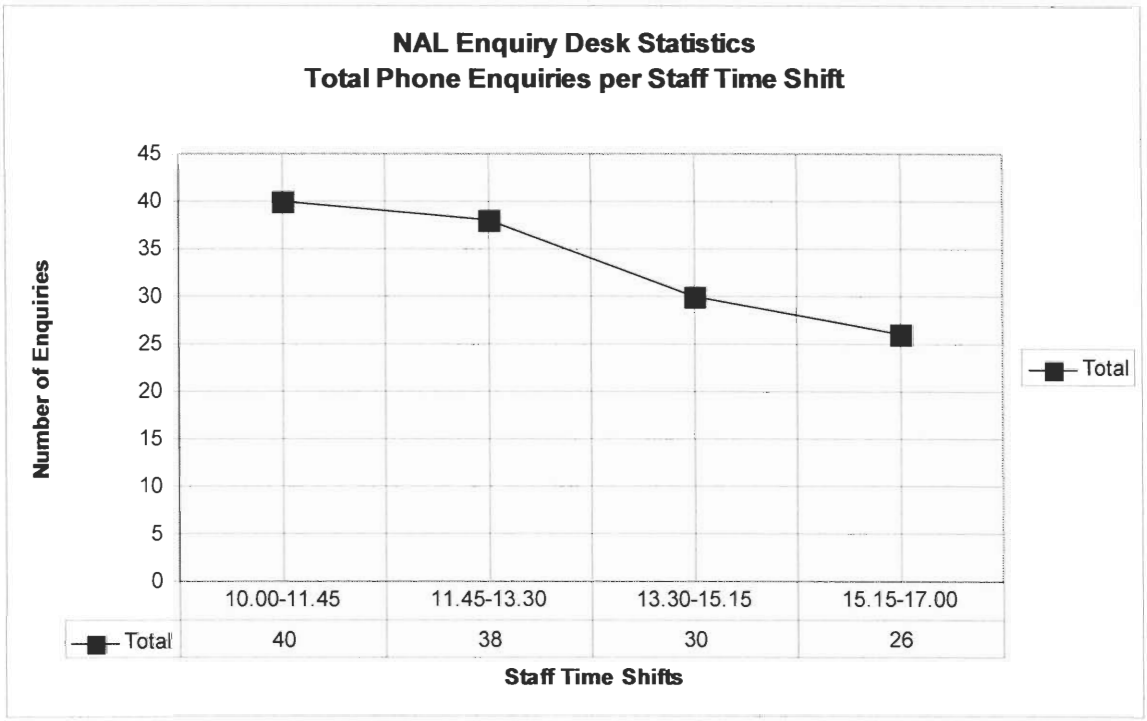
Figure 2 shows the total number of enquiries per day for the days that we surveyed. We noticed that the 22nd and 27th of March and the 2nd of April had similar totals. The greatest number of enquiries were received on the 26th of March which was a Tuesday.

Figure 2: Total Phone Enquiries per Day



We noticed that the total number of telephone enquiries (Bibliographic, Procedural and Both) were at its highest in the morning and would decrease as the day continued. From the data we collected, we discovered that most people would try to contact the NAL enquiry desk before one o'clock in the afternoon. (See Figure 3)

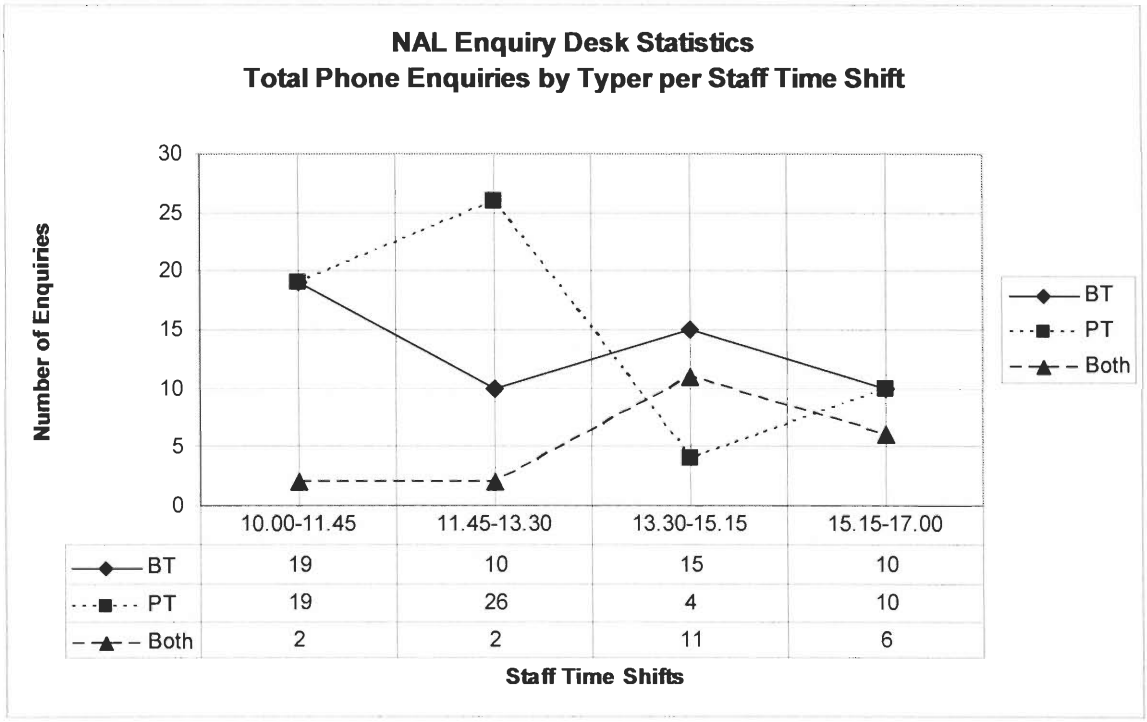
Figure 3: Total Phone Enquiries per Staff Time Shift



We also conducted an analysis of the number of telephone enquiries per type during the time shifts of the NAL operators. We examined these numbers because we wanted to know when the greatest number of enquiries are received at the NAL enquiry desk. We noticed that both BT and PT enquiries were close in totals during the period 10.00 to 11.45am. Procedural enquiries decreased, while bibliographical enquiries increased during the 11.45 to 13.30 shift. During the 13.30 to 15.15 shift there were more BT enquiries than PT enquiries. Also during this shift, the number of enquiries that

were both bibliographic and procedural was close to the procedural enquiry total for that time shift. (See Figure 4)

Figure 4: Total Phone Enquiries by Type per Staff Time Shift



NAL staff members also receive letter, electronic mail and fax enquiries. Currently, staff members use a Microsoft Excel spreadsheet to log these types of enquiries. The staff gathers and stores information such as enquirer contact information, subject of enquiry and who was assigned to answer it. The NAL currently responds to or transfers all of these enquiries to the appropriate expert.

The NAL staff members have a positive consensus on the proposed Information Gateway. Our interviews with them reveal that they believe that the new proposed Information Gateway will help increase efficiency and productivity within the department and the Museum, that staff members will be more proficient in answering enquiries properly, and that the proposed Information Gateway will improve accessibility to the

public and in turn will attract new audiences to the NAL/PDP department and Museum. NAL administrators and staff believe that they would use the knowledge obtained from the proposed Information Gateway to provide better services for the public. For example, one administrator proposed the idea of creating pre-packaged content on frequently requested subjects.

Some NAL administrators and staff have concerns about the proposed Information Gateway. The main concerns are the proposed Information Gateway's compliance with the Freedom of Information Act, phone enquiry filtering system, and resource constraints, for example, on staffing and budgetary issues.

Interviews at the Prints, Drawings, and Paintings Department/ Archives of Art and Design

The PDP has two main areas where they answer enquiries: the Prints Room and the PDP Central Office. The Prints Room has an enquiry desk, much like the NAL enquiry desk, where people can enquire by phone or in person.

The PDP Central Office receives and manages phone, electronic mail, letter and fax enquiries. The Central Office staff like the NAL, use a Microsoft Excel spreadsheet to manage information about letter, electronic mail and fax enquiries. The Central Office will disperse those enquiries within the correct department's sections. The PDP staff gathers and stores information from the enquiry such as how the enquiry was received, the subject, date, and where it was forwarded to in the department or Museum. Letter, electronic mail, and fax are stored in a paper file to be used for future reference.

We met with an administrator and a curator from the PDP and we spoke to both about the proposed Information Gateway. The administrator spoke in favour of having a single point of information such as the gateway. This person believes that the enquiries would be handled more effectively, especially when the right curator or expert could answer it. This administrator did have concerns on the current knowledge sharing between the NAL and the PDP staff. NAL staff members have studied library science and have a better understanding of information management, though many have degrees in Art or Design History. PDP staff members have studied in specific areas of Art and Design. The administrator stated that there have been workshops to allow NAL and PDP staff members to learn about each other's sections of the departments. NAL staff members were more likely to take advantage of learning about the PDP, but there was

less PDP staff visiting the NAL. This administrator also would like to see where enquirers are calling from and hopes to build larger audiences using this information.

A curator from the PDP had some concerns on the reasons why enquirer information needs to be collected. The PDP curator stated that there was a previous method that was used to track enquirers. The curator thought the previous methods were tedious and found no real good reason for keeping the information. This curator noticed there was a lack of improvement of PDP technology and hoped funds would be used to improve the Collections Information Systems (CIS). The CIS was stopped for financial reasons and constraints.

We met with four staff members of the Archives and Special Collections departments of the Victoria and Albert Museum. These people stated that they receive more electronic mail than phone calls. Most enquiries come from V&A and the V&A departments' staff, but there are still a number of enquiries from the public. We discussed the Freedom of Information Act with the staff members, who said that they realise the importance of the need to answer enquiries in the twenty days. We believe all three of the departments would need to keep track of the enquiries forwarded to them. The Archives and Special Collections staff would like to see a filter system before general phone enquiries reach the proposed Information Gateway. Such a system would help in reaching those who have specific subject questions and these enquirers would get the appropriate information on one phone call. The V&A staff member said that the proposed Information Gateway would be a positive asset to building better relations with the public and making them aware of the services the Museum and its departments offer.

An administrator from the Archives had one concern with the development of the new Information Gateway. The administrator's concern is there may not be sufficient involvement from every area of the Museum to give input on the proposed Information Gateway.

Interview with the V&A Information Systems Services Department (ISSD)

We conducted two interviews with administrators of the Victoria and Albert Museum's Information Systems Services Department (ISSD). The ISSD handles all computing, web and database development, and the networking technology for the Museum. According to one administrator the main objective of the ISSD is to maintain and look after the Information Technology strategy for the Museum. We realised the various technology options that could be recommended after speaking to the ISSD administrators. The two administrators did acknowledge that the Information Gateway would be an asset to the Museum.

Both administrators accept the idea, but have concerns with the gateway that need to be cleared up. One administrator, who was informed by NAL staff of the proposed Information Gateway before our interview, said that the objective of the Information Gateway is unclear and should be more specific. There was confusion, the administration said, about whether the proposed Information Gateway would become a "one-stop shop" or merely a "channel for information". A "one-stop shop" is when enquiries are answered at one single location. A "channel for information" is a method of distribution to have the enquiry answered best.

The two administrators discussed the various constraints that would affect the development of the enquiry tracking system. One of them spoke about the basic resource

constraints of the Museum such as budgetary needs, time, and staff, and explain that the Museum, as a public authority, has a lack of funds to finance proposed projects. Currently, the ISSD is working on fourteen projects for the Museum. The projects have various priority levels. Table 5 lists the names of the projects with a brief description. The administrator did not state the priority levels, but the projects will be completed depending on funds, time, staff and technological resources.

Table 5: 2002 Development Section Projects

Project Name	**Description**
Project Management Framework	Defining how IT projects will be run
Registry System	Replace current FMPro application & prove Java technology
Events Diary	Part 1 – for the web site Part 2 – for the intranet
People Play NOF/Theatre Museum	Part 1 – Data capture Part 2 – web site
Personnel System Upgrade	Upgrade to 32-bit software Web-enable personnel system
Data Warehouse	Create a corporate or operational data model linking CIS, NAL, Picture Library, Archibus, RIBA & more
Images on Web	Web-enable the Museum's digital image collection
FMPro Survey	Long term goal is to remove FMPro & (selectively) replace it with something else
Architecture for All	Parts of the RIBA project
Intranet	Phase 3
Oracle Portal	Web interface to Oracle databases
Loans System	Urgently needs replacing
British Galleries Database	Decommission it & develop a Museum-wide asset management system
Concise	Conservation assist management system
Friends Database	Needs to be replaced
ISSD Asset Management	Hardware & software asset management
Contacts Database	Museum wide contact management system
Purchase Grant Fund Database	Needs replacing (currently DOS based)

One administrator works directly with systems development and has concerns about staffing constraints of developers, as well as about identifying ownership and

maintenance of the proposed Information Gateway's data, the computer literacy within the Museum, and staff training issues.

The ISSD administrations reported that there is a small team that works on IT related projects. Those projects go through various phases of design, development, testing and implementation. If a project needs to be done in a specific amount of time and ISSD staff cannot accomplish it, the V&A has to outsource the project to a contractor. One administrator stated that contractors are relatively inexpensive due to the current economy; current contractor charges could range from £20,000 to £30,000 on a ten week project. Prices vary depending on project complexity and completion time.

The administrator had concerns over who would have access and control of the information being inputted into the database, and asked whether other departments would have access to the data if they found a use for it or whether the data would have set purposes. This administrator said that computer literacy within the V&A staff was very low, and training staff members could become an issue on this new proposed system.

The two ISSD administrators, interviewed separately by the IQP team, had both agreements and disagreements about the technology to be used for the proposed Information Gateway. Both administrators recommended using an Oracle database as the back-end platform for running the enquiry tracking system. The front-end, which is the "user-friendly" interface, could be developed using web-based languages such as Common Gateway Interfaces (CGI), Java, and XML technology. The Victoria and Albert Museum owns a site license from Oracle Corporation to install Oracle Database software on any machine in the Museum for no extra cost. Oracle databases are currently

being used at the V&A in the accounting department, building management operations and the management of the British Galleries.

We also discussed with the two ISSD administrators the hardware needed for the proposed Information Gateway. The first administrator we spoke to stated that there may be a need to purchase a medium-sized Sun Microsystems' server at a cost of around £15,000. The second administrator explained that the current servers that are running the Museum's intranet would be capable of running the enquiry tracking system. This enquiry tracking system could be an extension of the current intranet used in the Museum. The intranet, the Museum's internal web site, has applications such as staff directory and an electronic bulletin board for staff members to obtain Museum notices and press releases. The public cannot access this internal web site because there is private information about the Museum's operations. For security reasons, the intranet is password protected. We also realised that there would be no need to purchase a separate server to run the enquiry tracking system.

Interviews with Telephone Exchange Staff

After an interview with Telephone Exchange staff, we learned various details on the phone technicalities, calls answered within the Telephone Exchange and possible solutions to the phone aspect of the proposed Information Gateway. The Telephone Exchange is a call centre based in the Natural History Museum that works for The Natural History Museum, V&A, the NAL/PDP, and The Science Museum. Currently there are three or four different "telephonists" answering calls at the same time and their job is to forward the calls to the correct location unless they can answer the enquiry. The Exchange estimates that ninety percent of the enquiries called into the Exchange are

answered directly by the "telephonists". When an enquiry cannot be answered, the Exchange or the enquirer asks directly for a specific department. The Exchange will then transfer the phone call to the correct institution and department such as the NAL enquiry desk. If the caller does not get through to the enquiry desk, the Exchange will continue to phone the desk for the enquirer until someone at the desk answers or the enquirer disconnects.

The Exchange staff had many recommendations for a phone solution for the gateway. They have various solutions that could be implemented. One solution that they have been waiting to implement is the Automatic Call Distributor (ACD) that the Exchange has already bought. The ACD and some other equipment in the Exchange are made by Mitel, a Canadian-based company. The ACD is a telephone system that could put callers in a queue. While in this queue the ACD could make it possible for the enquirer to have push button options that would allow his/her call to be directed properly instead of waiting on the queue. There is a minimal cost for this solution since the ACD has already been purchased. The NAL has given the Telephone Exchange staff a script already for the ACD.

Another technological solution is buying telephones with multiple lines for each office. This would allow an employee in his/her office to answer the enquiry line if the current desk operator is busy. There is a cost to this solution, consisting of what each individual phone costs, but it is minimal. Also it is possible for the NAL to get more than one line if they were to ask the Telephone Exchange for it. This is a simple process and there is no extra cost.

The major concern of any system working in the NAL is that they must have people at the desks when the calls are forwarded from the Exchange. That is if the Information Gateway is set up to allow phone calls to be forwarded to experts on subjects, then the experts must be at their desk so they could answer these enquiries. If they are not, immediate response would not be achieved and the enquirers would have to leave a message in the expert's voice mail.

The staff members at the Exchange are very willing to help and would like to meet with representatives from the NAL/PDP to discuss exactly what they want the proposed Information Gateway to accomplish. The Exchange could give NAL/PDP representatives options to evaluate. When the NAL/PDP decides on specifications, they should meet once more with the Exchange to work on the appropriate system for the NAL/PDP.

Telephone Exchange Records

During our interview with the Telephone Exchange we received the telephone records for the NAL enquiry desk. These phone records include every call to the NAL enquiry desk, the date and time, the number of the caller, the duration of the call, the time length of the ring, and the response to the call. The response of the call is coded using A (Answered), B (Busy), and U (Unanswered).

Our data for the week of 22 March to the 28 March, shows that just under half of the calls that came in were actually answered. This can be seen in Table 6.

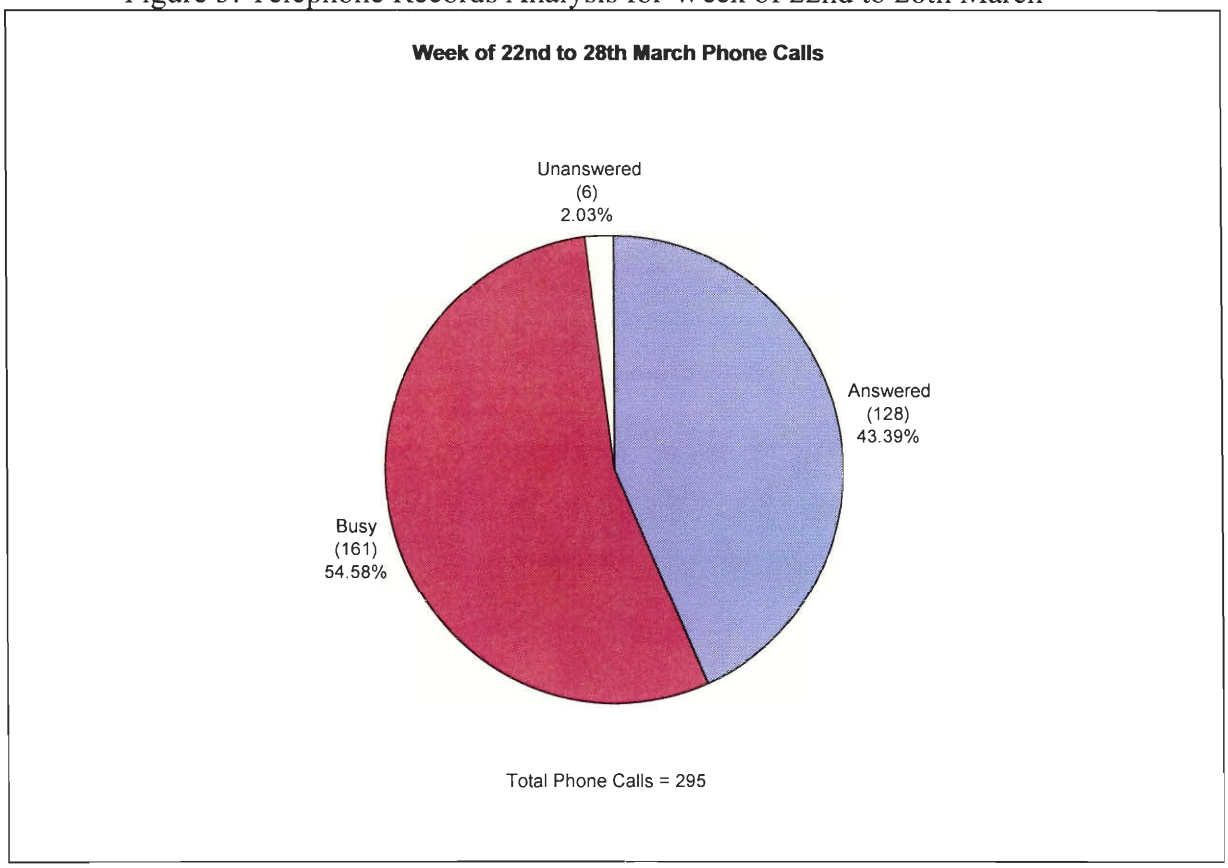
Table 6: Telephone Records for NAL Enquiry Desk (Extension 2400)

	Answered	Busy	Unanswered	Total Calls
March	422	358	15	795
	53.08%	45.03%	1.89%	
March 22nd	24	9	0	33
	72.73%	27.27%	0.00%	
March 26th	42	101	5	148
	28.38%	68.24%	3.38%	
March 27th	36	21	1	58
	62.07%	36.21%	1.72%	
March 28th	26	30	0	56
	46.43%	53.57%	0.00%	
22 March to	128	161	6	295
28 March*	43.39%	54.58%	2.03%	

*Week includes Friday, Tuesday, Wednesday, and Thursday

The analysis of the data in Table 6 is shown in Figure 5.

Figure 5: Telephone Records Analysis for Week of 22nd to 28th March



There are many more busy calls than unanswered because it is much more common that the line is occupied than that no one is at the desk to answer it. We were able to compare these data with the data for the entire month. We found there was a similar percentage of all three categories of phone calls for the month, which is shown in Figure 6.

Figure 6: Telephone Records Analysis of March

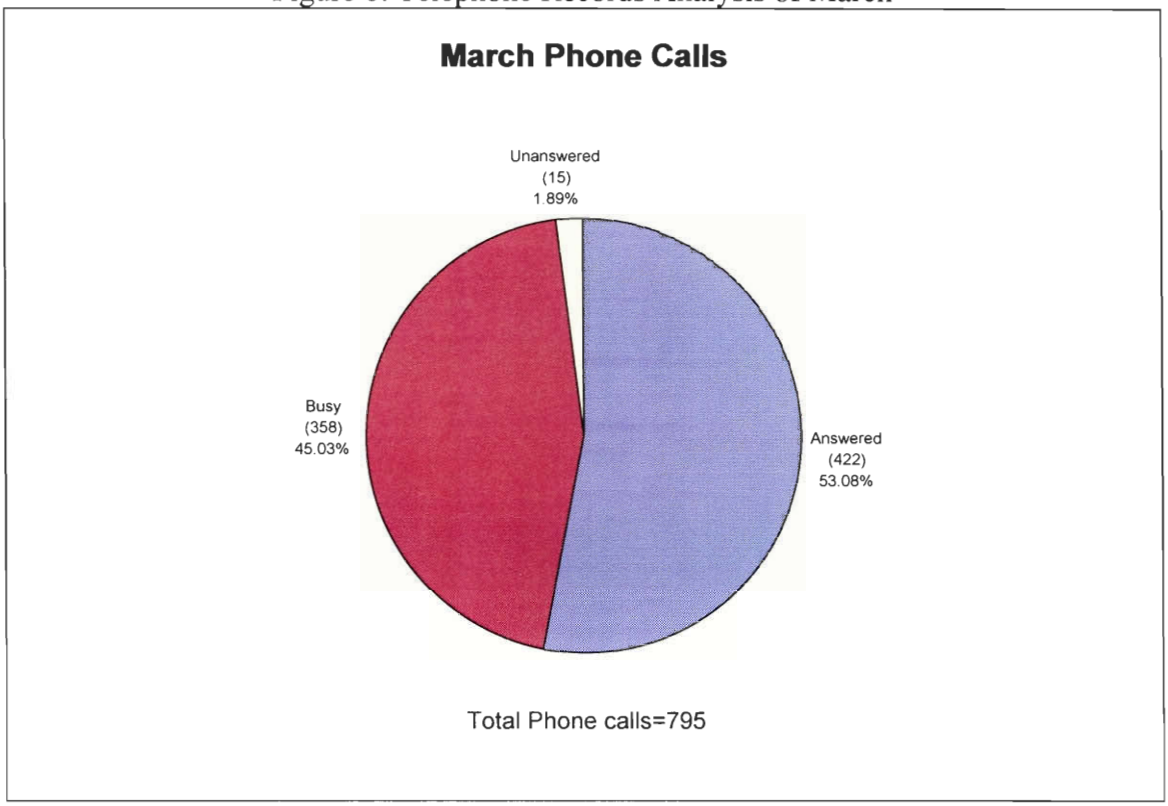


Figure 5 and Figure 6 show that about half of the enquiries called into the desk are actually answered while many callers are turned away by either a busy signal or an answering machine message after there was no person who answered.

Interviews at the British Library

During our interview with the enquiry manager of the call centre at the British Library we learned the operations of their call centre. The current system used by the British Library involves a queue system, a call scan system and an electronic mail archive. This system has a group of three operators answering phone calls in the call centre. These operators are not expected to carry out other tasks like operators at the NAL/PDP. When answering enquiries, the British Library does not use a script system because it has a wide range of enquiries that can be asked, similar to the NAL/PDP. This administrator explained that a script system is a method of answering enquiries using a text-driven script which has various routes to lead the enquirer to the appropriate information or contact.

The queue system that the British Library uses is similar to the Mitel system that the Telephone Exchange has already purchased. It has the capacity of holding six enquirers on the queue and while the enquirer waits, the email and internet address is provided so the enquirer may use these methods of contact if that is preferred. The British Library does not use a filtering system such as push-button options. This is because a survey the British Library carried out, stated by a British Library administrator, showed that the majority of people had negative feelings towards a push-button system.

The call scan system the British Library uses is made by Siemens and is called the HiPath ProCenter eVolution. This system provides a various range of reports that can be customized to the needs of each organization, such as average call length, number of calls unanswered and average wait in queue. These reports are very helpful when tracking the success of their call centre.

The British Library's electronic mail archive is in three different categories for easier sorting. When an electronic mail enquiry is received, it is sent to the enquiry call centre. The call centre staff will answer the enquiry and will then print out the enquiry for future reference and archive the paper copy for three months.

Interview at The Natural History Museum

During an interview with the manager of the Natural History Museum, we learned their basic enquiry operations. Since their museum is split into many different groups it is difficult to get the enquiry to the correct location. Thus they are very interested in our results.

The basic process the NHM Archive staff uses is Request Forms that track when the enquiry was started and finished, who answered the enquiry and other information such as the subject of the enquiry and whether it was transferred. The manager had many questions about what we are looking into and requested that we send her a copy of our final paper.

Interview at "A Leading Professional Body"

We interviewed a program engineer of a professional body, from whom we learned about the way that enquiries are handled. We also learned of a CRM package, created by Siebel, and its capabilities. Some of the function capabilities of Siebel are storing the history of members in such a way that it is possible to change and capture public details in an easy-to-access easy-to-read way. We also learned that outsourcing to a firm would be extremely expensive.

The website of the professional body is being revamped to include answers to Frequently Asked Questions (FAQ) and to make it easier for enquirers to find needed

information. This will save the professional body personnel time since they will not have to answer general repeated questions.

We learned that a queuing system would be useful for the professional body's contact centre as well as for the NAL's proposed Information Gateway. The program engineer stated that the queuing system may need to include a filtering system.

4.2 Case Studies

We conducted case studies with other London museums, libraries and institutions. We analysed how each organisation managed phone enquiries.

British Museum Case Study

We phoned the British Museum and, to test their phone system, enquired about their watercolour exhibit. When we dialled the first time at 11:23 AM on 8 April 2002, the phone rang six times and then their push-button system came on and gave five options. After those options were given, it gave general information about the museum's location and times of operations of the museum and reading rooms. After we waited on the phone line for 2 minutes and 23 seconds, the voice recording said "goodbye". We phoned the museum back at 2:07 PM on the same day. This time, we pushed the button for option number three: Special Exhibitions. There were two exhibits on the recording, neither of which were the one we were enquiring about. Each of these exhibits was announced and then a description and a phone number to dial for advanced reservations. After we waited on the line for 2 minutes and 52 seconds, the voice recording said "goodbye".

British Library Case Study

We phoned the British Library and, to test their phone system, enquired about their map exhibit. When we dialled at 12:16 PM on 8 April 2002, we were connected immediately. We were informed that the exhibit was over as of yesterday and that the next exhibit would be "Trading Places: East India Company and Asia" and it would be displayed from 24 May to 22 September 2002. This phone enquiry lasted 47 seconds and was thoroughly answered.

A Leading Professional Body Case Study

We phoned a professional body and asked them about what they did at their organisation. When we dialled at 12:49 PM on 8 April 2002, we got an immediate response. We asked the person what they did at the organisation and she told us that we had reached the Meetings and Research Department and asked if we wanted to be transferred to the information desk. We were transferred and the person at the information desk gave us a satisfactory response to our enquiry. The total time for the enquiry was 1 minute 43 seconds.

The Natural History Museum Case Study

We phoned The Natural History Museum and, to test their phone system, enquired about their predator exhibit. When we dialled at 1:46 PM on 8 April 2002, we got an immediate response from an NHM operator. Our enquiry was very quickly answered and then transferred to the information desk for verification. We were informed that the exhibit would be on display until 6 May. The total time for the enquiry was 27 seconds.

The National Art Library Case Study

We called the National Art Library to test their current enquiry system on 9 April. We were testing to see how the system acts when it is busy and when there is no answer at the desk around noon.

We called through the Telephone Exchange first while the NAL phone was known to be busy. The Telephone Exchange operator attempted to get through a few times and was unable because the operator received a busy signal. Instead of hearing a busy signal we heard silence as though we were being transferred or put on hold. The Exchange operator then asked if we wanted to hold or be given the direct number. We received the direct number and ended the phone call.

We later called at approximately 1p.m. to the direct number of the NAL at a time when they were known to be busy. Instead of being transferred and hearing nothing we got a busy signal. Because we didn't use the Exchange we did not have the convenience of having them retry a few times for us.

We then called again later when there was no one at the desk to answer our call. We called and after three rings we received the following answering message:

> This is the National Art Library. We are open from Tuesday to Saturdays from 10am to 5pm. If you call between these times and get through to this answerphone message it is because we are busy with a reader. Please call again later. Please note that although we are open to readers we do not provide a telephone enquiry service on Saturdays. Please do not leave enquiries on this answer phone. If you would like an information pack about the Library and its services, please leave your name and full postal address after the tone. Please spell out any unusual words. Thank you. (Albu, 2002)

As you can tell this message also plays during hours and days when the Library is not open.

After performing all these case studies, we received a better idea as to how the proposed Information Gateway should act. The British Museum Case Study showed us

that there should always be an individual near the phone to pick it up. It also showed push-button options are really annoying since rarely do any of the options have anything to do with your enquiry. From the British Library Case Study, we learned that a quick response to a simple enquiry is necessary when dealing with an enquirer.

From the Case Study with "a leading professional body" we learned that when transferring a phone call to its appropriate department, so that it is better answered, it is vital to have the transfer take place as quickly as possible so the enquirer is not on hold for too long. The Natural History Museum Case Study showed that it is vital to have a quick response to a simple enquiry. It also showed that operators should be certain of the information that they give so they do not have to transfer it for verification. Transferring makes the enquirer's phone call take longer than he or she would like. These Case Studies gave us specifications of the proposed phone system and how it needs to be handled for the proposed Information Gateway.

4.3 Surveys

We analysed the surveys that were conducted, 22 March to 28 March and 2 April, by NAL staff at the NAL enquiry desk. The surveys were conducted by asking enquirers who phoned in if they would participate in a survey after their enquiry was answered. The NAL staff members collected fifty-nine responses from those who enquired by telephone.

Figure 7 shows sixty-one percent of those who phoned the NAL had "Immediate Success" in reaching the NAL enquiry desk and in having their enquiry answered. Thirty-nine percent of those who phoned the NAL enquiry desk had some type of difficulty in reaching the enquiry desk on their first phone call.

Figure 7: Success Rate of Enquiries

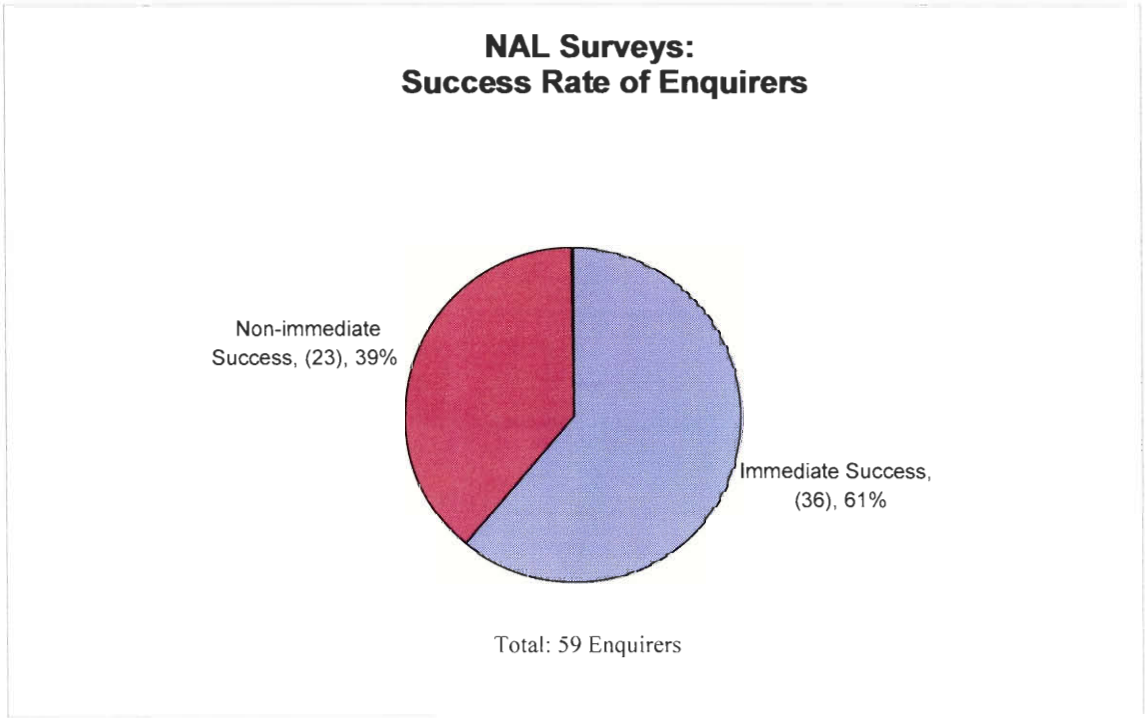


Figure 8 shows how many minutes it took phone enquirers to reach the NAL--that is, the amount of time an enquirer may have waited on the line to be directed to the enquiry desk or the time it took for them to make multiple attempts to phone the enquiry desk. Of the thirty-nine percent that did not have "Immediate Success", twenty-six percent took only one to five minutes to reach the enquiry desk, while for seventeen percent, it took fifteen to twenty minutes. There were two respondents who said they took ninety minutes or more to try to reach the enquiry desk. Forty-eight percent of those who did not have immediate success could not give a time length, but gave the number of attempts it took to reach the enquiry desk.

Figure 8: Number of Minutes to reach NAL Enquiry Desk

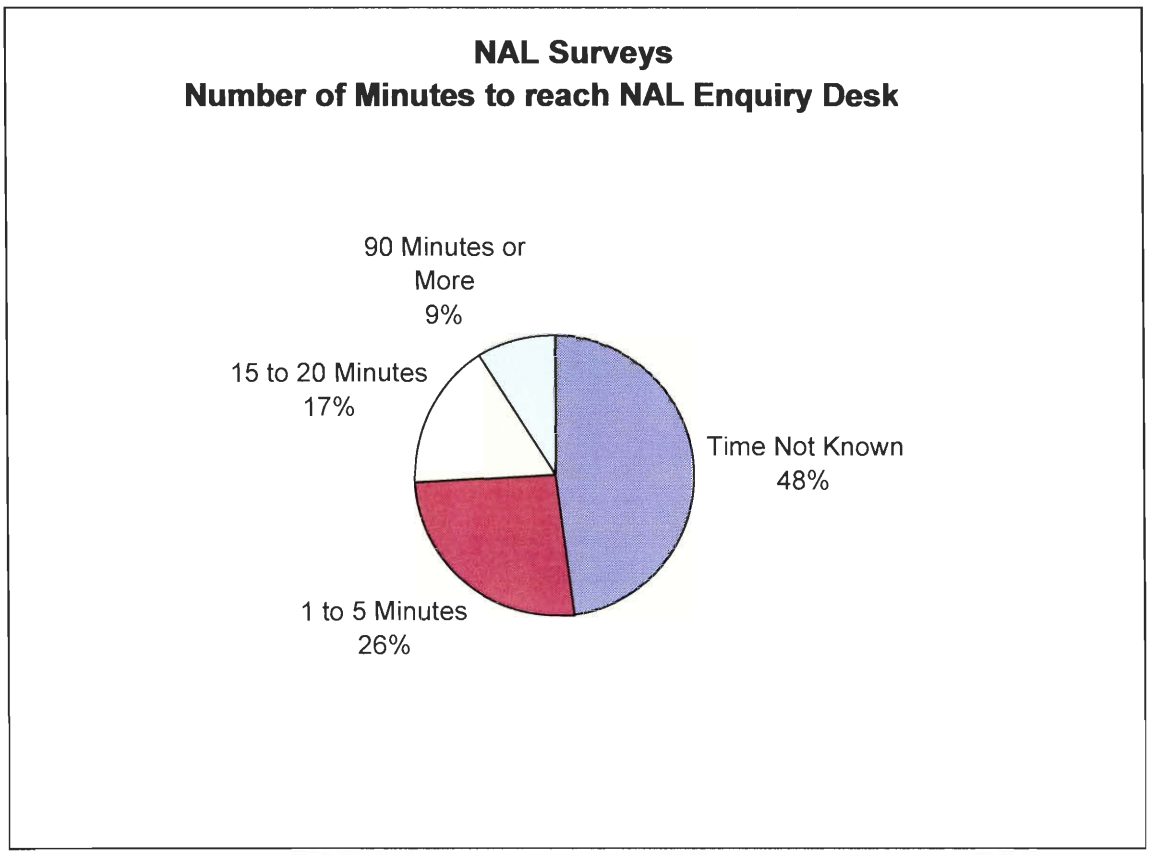


Figure 9 shows the number of attempts it took for an enquirer to reach the NAL enquiry desk. The number of attempts does not include the successful phone call. For example, the nine enquirers who took two attempts to reach the enquiry desk actually made three phone calls to the enquiry desk. From the fifty-nine respondents to the survey, sixty-eight percent had made one phone call to reach the enquiry desk. There was only one respondent who phoned twice to achieve success. Fifteen percent of the respondents made three phone calls, while another fifteen percent made four or more phone calls to reach the NAL enquiry desk.

Figure 9: Number of Attempts for Enquirers to Connect to the Enquiry Desk

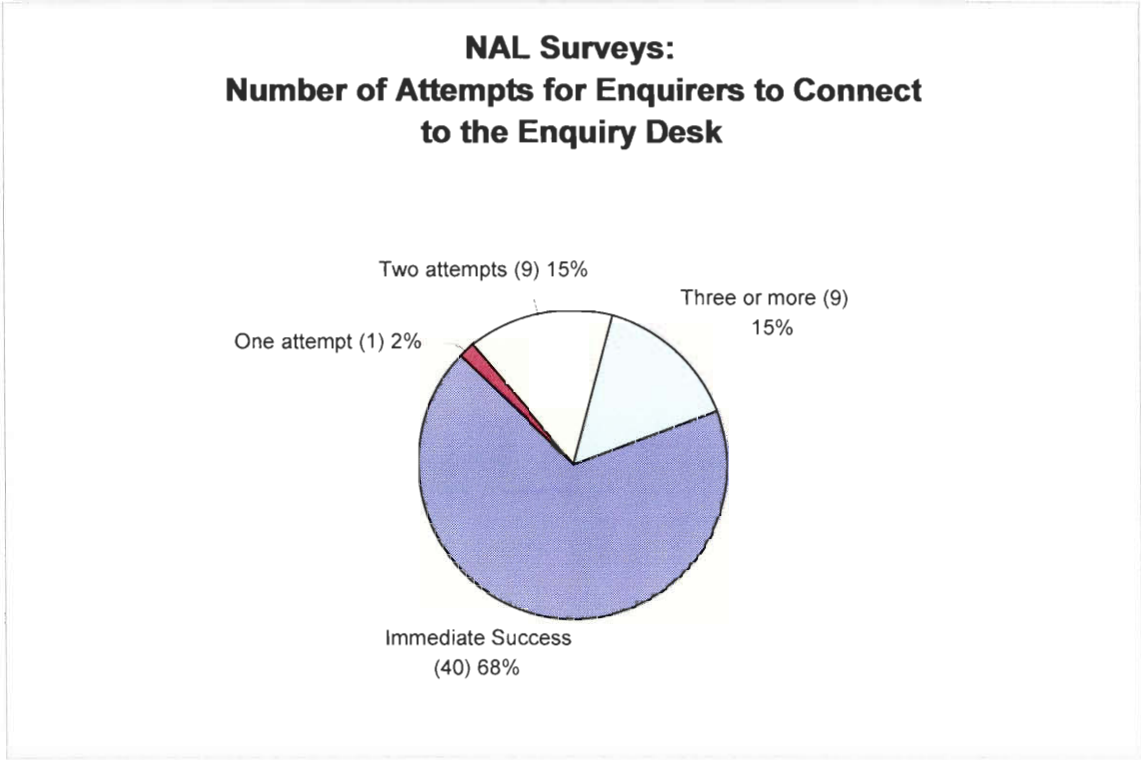


Figure 10 shows twenty-one of fifty-nine respondents who have experienced a type of difficulty when trying to reach the NAL enquiry desk. Fourteen enquirers experienced a busy signal, six enquirers experienced no one answering the phone at the desk and one enquirer was transferred incorrectly.

Figure 10: Types of Difficulties with Phone Enquirers who Experienced Difficulties

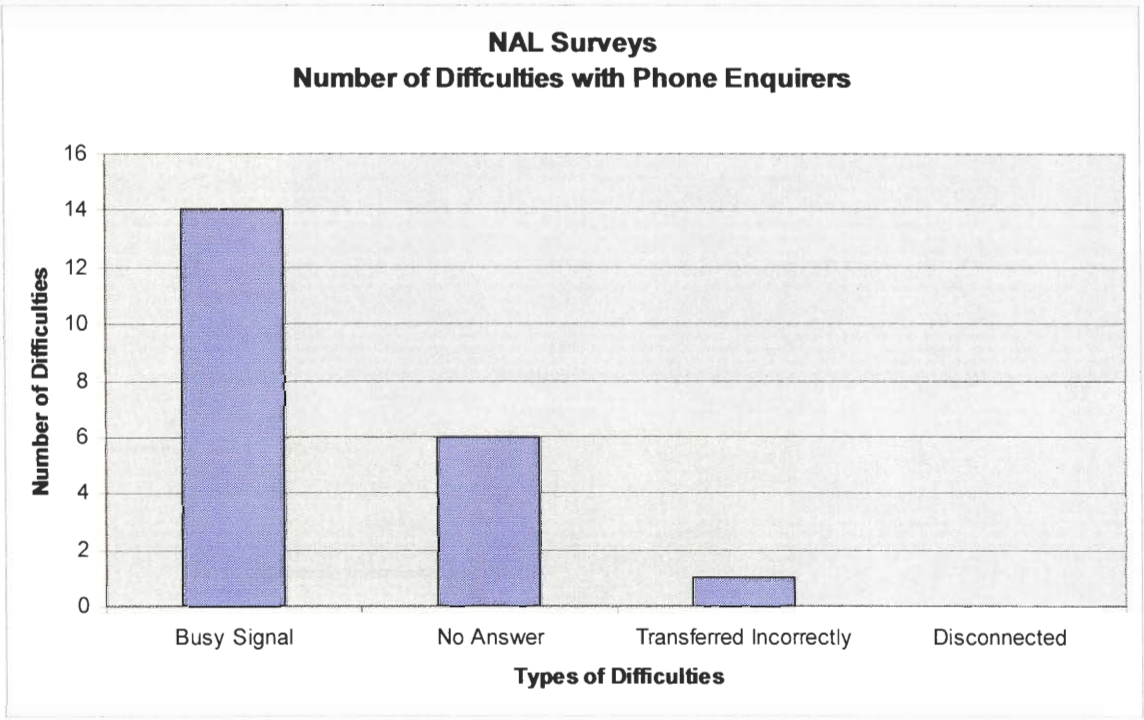


Figure 11 shows that out of the fifty-nine enquirers only four had sent an electronic mail and two had previously written a letter. It is important to know that the enquiries sent by electronic mail and letter could be the same or a different enquiry than the one being phoned in during the time of the survey. No one surveyed had faxed the NAL enquiry desk on a previous enquiry.

Figure 11: Other Types of Enquiring used by Enquirers

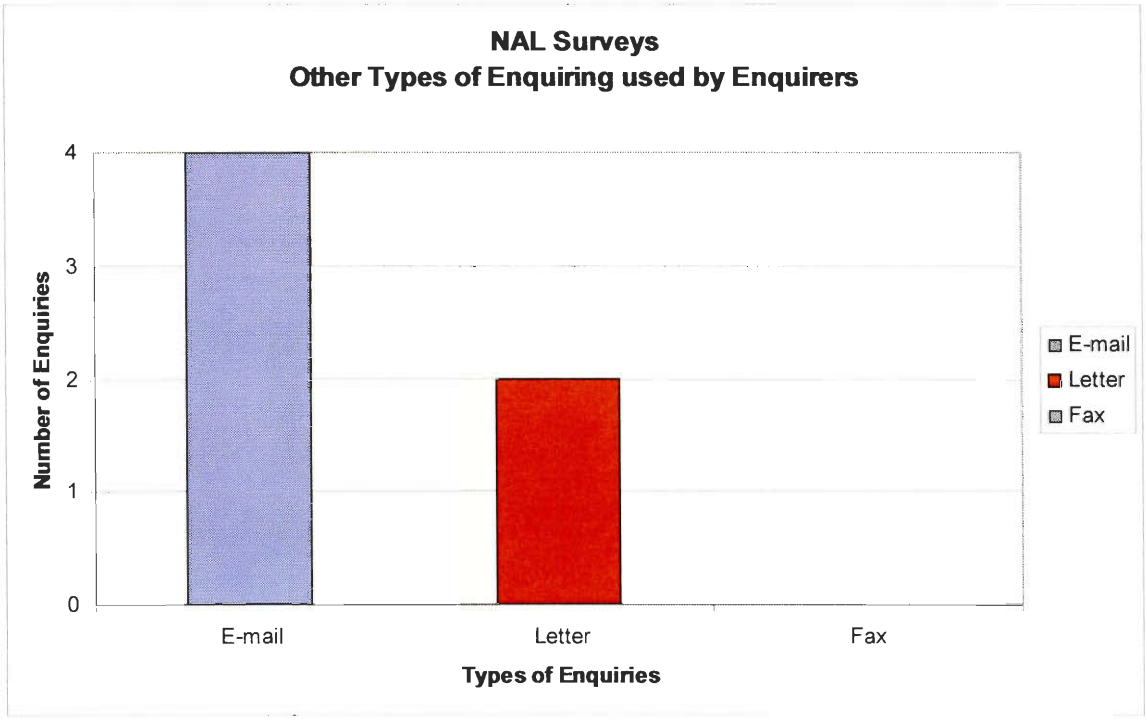
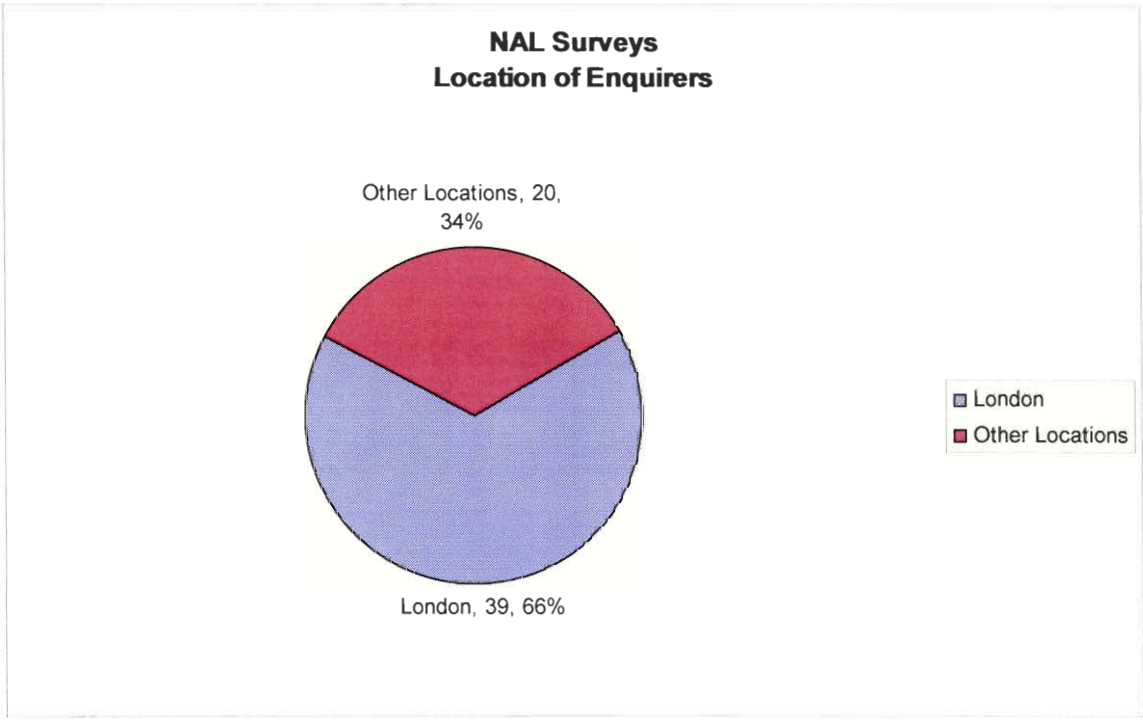


Figure 12 shows sixty-six percent of those surveyed were from London. The other respondents were from various parts of England such as Bristol and Nottingham. There was only one respondent to the survey who was from New York in the United States of America.

Figure 12: Location of Enquirers



From these surveys we were able to find trends in the experiences of those who enquire to the NAL enquiry desk. We observed that most enquiries were received during the morning and early in the week. The survey analysis shows that over fifty-percent of those who enquired reached the enquiry desk with immediate success. Most phone call enquirers only took one to five minutes to reach the enquiry desk. Enquirers would attempt to contact the enquiry desk at various times, often experiencing difficulties. From this analysis, we conclude the proposed Information Gateway would need an

improved method to answer phone enquiries. See section 5.1 for the options and 6.0 for our recommendations.

4.4 Technology Research

Telephone System Solutions

In Table 7 we examine the aspects that are needed in the proposed Information Gateway: a queuing option, a recorded message, a phone call filter/push-button option, reports and cost. The table also examines the companies that offer each aspect.

Table 7: Telephone Solutions Comparisons

System	Queue Option	Recorded Message	Call Filter	Reports	Cost
Mitel ACD	X	X	X	X	Little or No cost
Meridian1 ACD	X	X			Very High
Call Centre ACD	X	X	X		*
Great Plains Call Centre				X	£1-2K
Avaya IP Agent		X	X		*
Veramark Reporter				X	*
TalkSwitch Auto Attendant		X	X		£450

*These Companies would not submit a price range

Our first system, Mitel's Automatic Call Distributor (ACD), which was recommended by the Telephone Exchange, has all the options we are considering. It is already paid for by all the museums and libraries that use the Exchange's Telephone service. Therefore, there is only a small cost for the set-up fee for the system.

Meridian 1's ACD has two of the four options we are looking at. These are the queuing option and an option for a recorded message. It lacks a call filter and ability to make reports. Another problem is that this Nortel system is only compatible with other

Nortel products, meaning that in order to install this system, the Exchange would need to restructure its entire operation. This would make the cost extremely high.

Call Centre Solutions' ACD has three of the four options we are considering. It is only lacking the ability to make reports for tracking performance. The company would not provide us with the cost over email.

The Great Plains Siebel Call Centre and the Veramark Reporter has the ability to make reports but lacks the queuing system, recorded message and call filter. Veramark was unable to provide us with a price range but Great Plains estimated a price range between one to two thousand pounds.

The Avaya IP Agent and TalkSwitch Automated Attendant both lacked a queuing option and ability to make reports but did have a recorded message and call filter. Avaya could not provide us with a price but TalkSwitch estimated the price at 450 pounds.

Database Analysis

We evaluated two major competing products that provide database solutions for the enquiry tracking component of the proposed Information Gateway. We focused our evaluation on products created by Microsoft Corporation and Oracle Corporation. In the Background and Literature Review chapter, we evaluated a survey that was conducted by Computer World. Some of the survey data from that research were included in our database product analysis.

The data are shown in Table 8 and the numbers are based on a scale of 1 to 7 (7 being the highest).

Table 8: Computer World Survey Comparisons on Oracle and Microsoft Products

	Oracle	**Microsoft**
Features	5.86	5.52
Performance	5.73	5.43
Scalability	5.93	5.08
Product Average	5.68	5.33

The Computer World survey indicates that Oracle out-performs Microsoft in features, performance and scalability. Both products have the ability to manage large amounts of data and use different data formats.

Table 9: Oracle and Microsoft Database Software Comparison

	Oracle	**Microsoft**
Online Analytical Processing (OLAP)	X	X
Data Mining	X	X
Web based	X	X
Development Tools	Oracle Development Tools	Microsoft Visual Studio
Best Hardware Platform	Sun Microsystems	Wintel Systems (Microsoft Windows and Intel Technology)
Price	No additional cost to NAL	£13,000* * based on a purchase for 1 central processing unit (cpu)

Oracle and Microsoft database products serve as a back-end, where the front-end are interfaces with development tools such as CGI, Java, XML and/or Microsoft Access. Both products are able to be used on intranet and internet sites for staff (users) to input and manipulate data.

During our interview, ISSD personnel stated that Microsoft products are great for creating simple applications, but Oracle handles more complex operations. Both

products can handle online analytical processing (OLAP) and data mining applications for large scale applications and querying.

As stated earlier, the ISSD purchased a site license to install Oracle software on any server in the Museum with no extra cost. Microsoft SQL Server 2000 Enterprise Edition would cost a little more than £13,000 to purchase for one central processing unit (cpu) (SQL Server, 2002).

We found that there are advantages and disadvantages to use either Oracle or Microsoft products. We researched these products, analysed survey data from Computer World, and interviewed administrators/developers who use these products. We considered all advantages and disadvantages and we have concluded that a database would be needed to track enquiries for the proposed Information Gateway.

Analysis Summary

Our analysis revealed that the proposed Information Gateway is not only feasible but it also should be implemented. NAL/PDP staff think that it is a good idea to develop the proposed Information Gateway so that enquiries would be more efficiently answered and tracked. We realise that there are also concerns for the staff that needed to be considered when creating options. These concerns include filtering Procedural Telephone Enquiries, appropriate Museum and Library administration involvement, why the tracking of enquiries is actually necessary, how the NAL would monitor the success of the Gateway when implemented and the compliance with the United Kingdom Freedom of Information Act 2000. There are also the usual concerns of lack of time, money and staff to operate the proposed Information Gateway.

Our analysis of enquirers' experiences showed that there is a need for an Information Gateway. This was shown through their difficulties when attempting to contact the NAL enquiry desk with their enquiries. Problems such as busy signals and unanswered phone calls arose. These can be attributed to busy calling times such as mornings and the beginning days of the week.

When contacting other organisations' telephone systems in London we were able to find advantages and disadvantages of using their current systems. We had particular problems with the push-button option and, when using it, we could not find an answer to our enquiry in some cases. Our enquiries were answered most effectively when talking to human operators.

We analysed the technology needed for the proposed Information Gateway. We found a wide range of options and specific companies that could provide the NAL/PDP with the service they need. The following chapter outlines these options.

5.0 Conclusions and Options

We conclude from our analysis of the interviews, case studies, research, surveys and phone records that the proposed Information Gateway is feasible for the National Art Library/Prints, Drawings and Paintings Department. We achieved our project's initial goals by showing the proposed Information Gateway's feasibility. In this chapter of the report we outline the best options to make the gateway operate satisfactorily. The options we offer are from two basic categories: Technological and Organisational. These categories are divided into many other recommended options for the proposed Information Gateway.

We realise that there is more to our project than finding its feasibility and making technological recommendations. We learned that the project also included overcoming barriers of implementation, specifically that of the human aspect. It seemed that because there was not much awareness of the proposed Information Gateway, that the employees of the NAL/PDP and the V&A had some resistance to implementing a system that would change their work habits. We learned that there are psychological barriers that must be overcome so that the proposed Information Gateway may gain acceptance.

We were able to help the proposed Information Gateway gain acceptance through our interviewing process and by showing enthusiasm in our project. Many people we interviewed had not heard of the proposed Information Gateway or had misinterpreted the proposal. By explaining what our task was and what the NAL intends to do with this Gateway, we were able to get useful suggestions from staff members and we also sparked interest in some of their minds. Many staff members, such as those in the ISSD

department and Telephone Exchange were ready to give immediate suggestions after hearing of the proposed Information Gateway for the first time.

We learned that in organisations there is often resistance to new proposals and ideas. Proposed changes could cause hesitation or displeasure in staff members. For this reason we believe we accomplished a task outside of our original goal and that is helping the proposed Information Gateway gain acceptance.

5.1 Technology Options for the Proposed Information Gateway

In the sections that follow, we provide The National Art Library/Prints, Drawings, and Paintings Department various options to implement their proposed Information Gateway. Each option includes an explanation of its benefits, concerns, and constraints.

Phone System Options

OPTION 1: Queuing System

The first option is to use a phone system involving a queuing system. We believe a queuing system is important because it would allow phone calls to be put into a queue instead of receiving a busy signal when the phone is in use. Most of these systems allow for six enquirers in the queue. If there are six enquirers waiting, a seventh caller would receive a busy signal. Many queue systems have recorded messages that could allow an organisation to leave information for enquirers in the queue such as electronic mail address, web address, open hours and location. By leaving this information in the queue, some callers' enquiries could be answered and they do not need to wait any longer.

Many of these systems also have the ability to make reports such as number of calls missed, average wait on the queue and average call length for particular time periods.

This option would allow for enquiries to be answered effectively as long as the queue does not run out of room and enquirers do not hang up early. A queuing system could work well when the right amount of staff is used. When the desk is short-staffed it could cause large numbers or even a maximum number of callers in the queue meaning some people could still get a busy signal.

OPTION 2: Queuing System and Push-Button Filter

This option includes everything from the OPTION 1. The Push-button filter makes it slightly different. This addition acts as a filter for more general and frequent enquiries. When the enquirer first calls he or she could go through a series of push button options, which could lead to an appropriate expert who could address the enquiry. If the enquiry could not be directed correctly the filter could include an option so that the caller could enter the queue. The recorded message could still be in the queue to answer the more general questions, advertise special exhibits, or give directions. By including this option the queue system could still be effective.

While the filtering system could direct enquirers to the best expert first or even answer phone calls without the caller waiting in the queue, there could still be problems. First of all, these systems could only give a maximum number of choices, so the choices would be very general. So for most enquirers seeking specific information it is going to be a waste of time because these are the people who want to go directly to the queue.

Also, some people still do not have touch-tone phones, which means their phone would be useless in this system and again add more time onto their call.

OPTION 3: Queuing System and Script

With this system the operations would be the same as OPTION 1, only when the operator first picks up the phone, there would be a script on his or her computer screen. By clicking on the appropriate script on the screen, the operator could try to find the answer to the caller's enquiry. If the answer is not catalogued on the system then the operator would forward the enquiry to the proper expert who could answer it.

While the script could lead the enquirer to useful information without getting transferred, it could also cause problems. The information that is provided on the catalogue of the operator's computer may not always be in depth enough for the enquirer. Also when an enquirer goes through this long process of the script and if the information is not found, he or she is simply transferred along. Time has been wasted, when the enquirer could have been transferred in the first place.

OPTION 4: Queuing System, Call Filter and Script

This option simply includes all three elements: queuing system, call filter and script. It would allow the filter to answer general enquiries or direct the call to its proper place first. If this does not work then the enquirer would wait in the queue system where a recording of general information is playing. Finally, once the call is answered the enquirer would go through the script that would either answer the enquiry or have it directed.

Outside of all the negative aspects of each individual system described in the first three options, the three systems working together could also cause a problem. To start the process by going through a push-button filter, then to wait in a queue, only to have to go through a script process and possibly be transferred could be a long wait to finally get to the correct expert. These three systems cause a problem because the process seems to be overkill of filtering and sorting.

Enquiry Tracking System Options

The following options are presented for developing an enquiry tracking system. This second component to the proposed Information Gateway contains a server, database software, and a user interface.

Hardware Purchase

OPTION 1: Purchase a Server

The NAL/PDP could purchase a server from manufacturers such as Dell or IBM. All of these companies have a wide range of server sizes and capabilities. Purchasing a server that would be dedicated to the proposed Information Gateway would be a benefit. Using a non-Sun Microsystems Server may be a problem down the road with maintenance and configuration. The Victoria and Albert Museum use Sun Servers and for integrations and configuration purposes there may be configuration difficulties. The purchase of these servers brings about other costs, specifically maintenance and configuration costs.

OPTION 2: Purchase a Sun Microsystems Server

The NAL/PDP could purchase their own server which would be dedicated to the proposed Information Gateway. All operations would be processed on this one server and other non-information gateway operations (other departmental uses) would not be able to use this server. The server was estimated by an IT administrator to cost around £15,000.

The purchase a server has one main benefit. The benefit would be that it is a computer server dedicated to the Information Gateway. All the operations of inputting, accessing, manipulating, and storing data about enquirers would be run through this server. No other department would run its business operations on this server without proper set-up and permissions. The only drawback is the cost of the server. The server would also incur other costs such as set-up and maintenance of the hardware.

OPTION 3: Use the Current Sun Microsystems Server

The Victoria and Albert Museum currently own many Sun Microsystems Servers. An administrator explained that the servers running other department operations could handle the proposed Information Gateway's operations as well.

The proposed Information Gateway could run on technology that has already been purchased and could run its operations with effective computer processing. The server is already set-up and maintained by the IT staff, so the cost of running the Information Gateway operations would be nothing extra.

Database Software

OPTION 1: Microsoft SQL Server 2000

The NAL/PDP has the option to purchase Microsoft SQL Server 2000 to run its enquiry tracking system. Using Microsoft applications to retrieve data from a Microsoft SQL Server is beneficial. One administrator stated that Microsoft products are great for many processes, but could be unreliable with complex processes. Microsoft SQL Server 2000 runs better on servers that have Intel Processors made by Intel Corporation. The cost of one license of Microsoft SQL Server 2000 would be around £13,000. Microsoft SQL Server 2000 also works well when using Microsoft applications to input, access, and manipulate data. Those applications would be created using Microsoft Visual Studio. Depending on the ISSD's proficiency with these development tools, the project may need to be outsourced.

OPTION 2: Oracle Databases

The NAL/PDP has the option to use Oracle database software. The Victoria and Albert Museum ISSD has purchased a site-license to install Oracle database software on any server within the Museum. Oracle databases became the main database software three years ago at the Museum.

There are two major benefits to using Oracle database software. First, the Museum currently owns a copy, so there would no cost in purchasing the software. Second, the ISSD is familiar with designing Oracle database applications and implementing them into the Museum's operations.

Interface Design

OPTION 1: Microsoft Access and other Microsoft Development Tools

The NAL/PDP has the option to create applications using Microsoft Access or using other Microsoft Development Tools such as Microsoft Visual Studio. Microsoft applications could be easily linked to use data from a Microsoft SQL Server or from an Oracle database. The applications could be easily created and its "Windows-like" interfaces are common to staff members and users.

There are many negative issues with designing an interface using Microsoft Access and other applications developed by Microsoft tools. Often there are some compatibility issues with linking Microsoft applications to an Oracle database. Also, the Museum prefers not to use Microsoft development tools; The ISSD uses them for simple applications but not with large, complex applications.

OPTION 2: The V&A Intranet Interface

The NAL/PDP has the option to use the Victoria and Albert Museum's intranet to input, access, manipulate, query and create reports on data from the Information Gateway. The V&A's intranet is secure and allows for permissions to be set for each department and staff member. The intranet was created using web-based technology such as common gateway interfaces and java technology. This would allow staff members to log on to the proposed Information Gateway and retrieve information they need for an enquiry. The intranet was developed by the V&A's ISSD and currently runs on an Oracle database.

OPTION 3: Oracle Development Tools

The NAL/PDP has the option to have the ISSD create customised applications using Oracle development tools. It would create interfaces that could be used by staff at the proposed Information Gateway. The ISSD would create these applications, but technology accessibility, time and staffing expertise are important matter to consider.

Developers

OPTION 1: The Victoria and Albert Museum's Information Systems Services Department

The NAL/PDP has the option to have the V&A's ISSD design and develop the enquiry tracking system component of the proposed Information Gateway. The benefits of having the ISSD create this system are that it would incur no additional costs and it would be developed by "in-house" developers. There are two major constraints of using the ISSD: ISSD's current projects and staff. The ISSD is working on fourteen IT projects at the V&A with various priority levels. The staff is relatively small and have various technology specialties needed to complete these projects. ISSD is understaffed and overworked.

OPTION 2: Outsource Development

The NAL/PDP has the option to outsource the development of the enquiry tracking system. Once the requirements are specified the NAL/PDP would need to create a proposal and submit the proposal for bidding. Those with the best bid would receive the job. The benefit of having the project outsourced is the dedicated team to accomplishing the specified project.

There are few negative issues of outsourcing development: cost, management difficulties and constant programming maintenance. Costs of outsourcing would range depending on specifications such as technology platforms to be used and time to be completed. A project being developed at the V&A is a ten-week project costing around £25,000. When a project is outsourced there is management within the NAL/PDP that would need to look over the progress of the system development. It may be difficult to manage NAL/PDP operations at the Museum and also to oversee the system development company. The final issue is with maintaining the system, working out software failure, and improving system features. There could be add-on costs and timing issues again with system maintenance.

5.2 Organisation Options for the Proposed Information Gateway

Communication

When approaching the specifics of how this proposed Information Gateway would be implemented, the V&A's ISSD staff and the Telephone Exchange must arrange a series of meetings. A meeting with the Telephone Exchange and ISSD should be held immediately and separately to discuss the NAL's specific options. The NAL should have specific questions ready for these meetings.

We suggest the NAL use the following guideline for the meeting with Telephone Exchange staff:

I. Purpose

II. Current Problems or Issues
   a. Phone calls not being answered (50% of phone calls are unanswered)
   b. General enquiries (time/date) take up operator's time in answering more complex enquiries (subject).

III. Feasible Technology Options
   a. Filtering or push-button systems
      i. Push-button categories
      ii. Number of push-button categories
   b. Queuing System
      i. How many enquirers in the queue?
      ii. Recorded message (general information)
   c. Script

IV. Constraints
   a. Time
   b. Cost
   c. Staffing
   d. Training

We suggest the NAL use the following guideline for its meeting with the ISSD:

I. Purpose

II. Current Problems or Issues
   a. Enquiries are tracked manually (by hand)
   b. Enquiries need to be answered in a specific amount of time
   c. Enquiries are transferred from department to department (enquiry needs a proper answer)

III. Specific Information to be captured
   a. Enquirer's specific information
      i. Enquirer contact information stored
      ii. Enquiry information to be stored

IV. Feasible Technology Options
   a. Server
   b. Database software
   c. User Interfaces

V. Constraints
   a. Time
   b. Cost
   c. Staffing
   d. Training

After these items are discussed, the NAL should go over their options, given by both departments, and decide on the final plan. After the NAL administrators make their decision they should approach both the ISSD and Telephone Exchange in a combined meeting and explain their decision.

Implementation

The NAL/PDP has two options in implementing their proposed Information Gateway into their department. Before implementing, the NAL/PDP has to understand the effect on the staff members and the amount of time needed for implementation.

OPTION 1: The "Big-Bang" Method

The "Big-Bang" method brings the information gateway technology and reorganisation with an all-at-once method. The implementation would be within a one-day to one-week time frame. Everyone involved in the reorganisation and affected by the technology implementation would be prepared for the organisation's methods of change. The staff would be prepared with proper training and workshops before the implementation. The NAL/PDP staff would start their new job functions (if needed) and start using the new phone system and the new enquiry tracking system within a short amount of time. The important part is that each component would need to be ready to be implemented on a specific time frame. If one or two of the components are ready to be implemented before another, it could result in the project being held back.

OPTION 2: Gradually Implementation Method

In order to gradually implement the proposed Information Gateway's operations and technology components, the NAL/PDP would have to involve all staff members of the organisation. The first component, staff functions, may change and the old functions, which have been deemed as not needed, would need to be reassigned. For example, the NAL/PDP, depending on the choices made, would change the manual tracking of

enquiries. The function of manual enquiry tracking would be eliminated, but the need to understand the technology to track enquiries would need to be understood. The second component of the proposed Information Gateway would have to be the phone system. The NAL/PDP staff or phone operators would need to practice and be comfortable with the new methods and process of answering phone enquiries. The last component would be the introduction of the enquiry tracking system. The NAL/PDP staff or phone operators would be comfortable with answering phone enquiries and the staff/operators would also gradually feel comfortable with asking enquirers for information to be tracked.

Staffing

OPTION 1: One Operator

This option suggests that the handling of enquiries remain the same. By this we mean the organisation keeps its current operation of having a rotating schedule of the current staff working the enquiry desk throughout the day. This option would keep only one line to the enquiry desk and all the answering would be in this central location.

While this keeps operations pretty much the same, the queue could only hold six people. When the queue reaches six phone calls, enquirers after that would get a busy signal and choose to hang up. This option also takes staff members away from their offices and from other tasks to be done in the library.

The operator would also need to be able to input, access, and manipulate enquiry data using the enquiry tracking system.

OPTION 2: "Back-Up Answering"

This option involves other staff members to be at their desks at certain hours. We would suggest that every phone in the NAL have the enquiry line accessible. We would then suggest, along with the rotating schedule of the operator at the desk, that the NAL also have a rotating schedule for staff to be at their desks at all times. With this schedule, if the person at the enquiry desk is busy or away from the desk, the person at his or her own desk could answer the call. The staff members at their own desks could be instructed to answer the phone after a certain number of rings if it is not picked up.

While this option gives a second hand to helping the desk when unoccupied, it could cause staff members to not completely concentrate on their work at their desk. They must always keep a close watch on when the line of the desk is ringing to be able to answer if the specified number of rings is reached. This schedule may also cause another staff member to be permanently at his or her desk for an amount of time, taking that person away from other tasks.

Each staff member would need access to the enquiry tracking system to input, access, and manipulate enquiry data in the enquiry tracking system. It is vital that each staff member who may answer an enquiry have the same access and permissions to the enquiry tracking system. The staff member's workstations (client) would need the ability to connect with the proposed Information Gateway's enquiry tracking system (server).

OPTION 3: Multiple Operators

This option would involve adding more lines to the enquiry desk allowing more than one person to answer enquiries from the phone system chosen. By doing this, the

number of missed calls could be cut down by having more operators to answer calls from the queue. A rotating schedule would need to be made for times the desk is open.

While this would make the enquiry desk more of a call centre and provide more operators to answer, it would take even more staff members away from their jobs in the busy Library. This would cause the library to seem somewhat understaffed.

The enquiry tracking system would be similar to Staffing Option 2. There would need to be two or more workstations for the staff to use during each enquiry. This would allow each staff member his or her own access to the enquiry tracking system.

OPTION 4: Outside Operators

This option would involve hiring outside operators to work the telephone system. It would allow the use of one or multiple lines while at the same time not making NAL staff work the desk. If they are not working the desk it could give the actual NAL staff more time to do more specific tasks.

This option creates a call centre that takes no members from the staff to answer the enquiries. The draw back is that the operators are coming from outside so their knowledge on where to find material the enquirer asks about is not as good as those who have worked here under the current system. There would have to be a long training session included to train these outside operators.

The enquiry tracking system would be similar to Staffing Option 3.

Training

Telephone System Training Options

While the process of answering enquiries at the enquiry desk would not be a drastic change, there would still be a need for a training/information session.

OPTION 1: Telephone Exchange

If the Telephone Exchange is the department implementing the new system, they could hold a session informing whoever works the desk on how the new system would work. They should include such detail as how to know how many people are in the queue, how long they have been waiting, how to prepare for the next call and how long they have to prepare between calls. They should also explain that the system is similar to the old system in the eyes of the operator at the enquiry desk.

OPTION 1A: One Big Session

This option is having every operator of the enquiry desk come in at one time. This could be on a day when the Library is closed for some reason. This option would allow the Telephone Exchange staff to get all of the training done in one day. It does not require missed work on the training day.

The disadvantage to this is that it requires operators come to a mandatory training session when they are supposed to be off. We would recommend some type of payment to the operators to come in on this scheduled day.

OPTION 1B: Train Department Heads

This option has the Telephone Exchange staff train only the department heads who could later train their operators during hours when they are not busy during working days. This would not require an extra day or extra payment.

The disadvantage here is taking a member of staff out for a period of time during the day, which could lead to the Library seeming understaffed for the entire training period.

OPTION 2: Outside Contactor Training

If the NAL decides to use an outside contractor then the outside contractor should hold a training session. Since it would be an outside company in most cases, they would have a training process which they normally follow. The Museum could request that they go about their training in two different ways. These options are very similar to the options above.

The same criteria for training in Option 1 would be used for training in Option 2, but the Telephone Exchange would be replaced by the outside contractor.

Enquiry Tracking System Training Options

OPTION 1: ISSD Training

If the ISSD is chosen to develop the enquiry tracking system for the proposed Information Gateway, the ISSD developers would need to train all the staff users of the Information Gateway or the department heads.

OPTION 1A: Train all staff users

In order to train all the staff users there would need to be specific time allocated for training. Training time would need to be evaluated based on the complexity of the new system and organised by ISSD and NAL/PDP administrators.

OPTION 1B: Train Department Heads

The ISSD developers may want to train the department heads on administrator user and staff-user functions of the enquiry tracking system. The department heads then later could train their staff members on the appropriate functions the staff users would need to perform their job. The ISSD would be able to train a small number of people (department heads) so the trained users could train their own staff.

OPTION 2: Outside Contractor Training

If the enquiry tracking system is developed by an outside contractor, proper training would be needed. The same criteria for training in Option 1 would be used for training in Option 2, but the ISSD would be replaced by the outside contractor.

Analysis Summary

We prepared possible options for the two technological components of the proposed Information Gateway. The options presented could be chosen in any combinations and work effectively. We have also presented organisational options which again could be used with the technological components of the proposed Information Gateway. The NAL/PDP administrators would need to evaluate the current status and resources of the NAL/PDP and choose the appropriate options. In the following chapter, we explain our choice of options and make our recommendations for the proposed Information Gateway.

6.0 Recommendations for Proposed Information Gateway

We concluded, after careful analysis of interviews, surveys, case studies and statistics, to recommend the following options for the National Art Library/Prints, Drawings and Paintings Department's proposed Information Gateway. The NAL/PDP department's proposed Information Gateway should have two main technology components: a telephone system and an enquiry tracking system. We also offer our recommendation on the department's issues on communication, implementation, staffing and training.

6.1 Telephone System

We recommend Option 1: Queuing System

We recommend using the Mitel Networks' Automatic Call Distributor which would act as a queuing system with a recorded message to provide general information. The queuing system should have the ability to support six enquirers at a time. This would help in cutting down on lost calls to the proposed Information Gateway. The recorded message would provide general information such as hours of operation, electronic mail address, web site address, and major exhibits. Using the recorded message would cut down on enquirers asking operators general enquiries. This message would be played while enquirers wait in the queue.

We chose not to recommend a push-button filtering system because from analysis interviews we found that some general public have negative feelings towards push-button systems. We also believe that the recorded message would filter out enough phone calls so that a push-button system would not be needed. We chose not to recommend a script

because of the lengthy process involved in answering enquiries. The NAL/PDP has such a wide range of topics and services it would be difficult to create set routes to obtain answers to enquiries.

6.2 Enquiry Tracking System

Hardware

We recommend Option 3: Use the Current Sun Microsystems Server

Database Software

We recommend Option 2: Oracle Database

Interfaces

We recommend Option 2: The V&A Intranet

Developers

We recommend Option 1: The Victoria and Albert Museum's Information Systems Services Department (ISSD)

We recommend that an enquiry tracking system be implemented as part of the proposed Information Gateway, and that it be developed by the V&A's ISSD staff, using a current Sun Microsystems' server with Oracle database software. The enquiry tracking system could be created as an extension to the Victoria and Albert Museum's intranet.

We decided on this recommendation on the basis of existing technology, low cost and recommendations from our interviews. The Sun Microsystems and Oracle database already exists and is owned by the V&A. The development could be done by the ISSD at low cost. The ISSD created the V&A's intranet and has recommended developing it as an extension.

We chose to use these technologies because the other options would have a high cost. The purchase of a new server would not be necessary since the current V&A servers could support the proposed Information Gateway's operations. Outsourcing the development would not be a high cost. Since we recommend the enquiry tracking system

be an extension of the intranet, the outside contractor would have a difficult time in programming within the Museum's intranet. The outside contractor would need to understand the intranet's current code and the Museum would need to allow special access to an outside contractor to develop within their secure intranet.

6.3 Organisation Recommendations

Communication

We recommend a meeting between NAL/PDP administrators and Telephone Exchange administrators to discuss the purpose and options for the Telephone System component of the proposed Information Gateway. Our specification guidelines should be used to evaluate options before the meeting takes place.

We also recommend a similar meeting between the NAL/PDP administrators and ISSD administrators. We recommend using our specification guidelines to prepare options for the meeting.

There should be a combined meeting with NAL/PDP, Telephone Exchange, and ISSD administrators to discuss as a group the technology components and other issues pertaining to the proposed Information Gateway such as development and implementation schedules.

We also recommend that all NAL/PDP staff be constantly updated on the changes that would be made to the organisation's structure and functions. Communication and knowledge management should be practised within the organisation so that everyone is prepared properly for the proposed Information Gateway.

Implementations

We recommend Option 2: Gradual Implementation Method

We recommend implementing the proposed Information Gateway on a gradual schedule. This would allow for NAL/PDP staff to become comfortable with job function changes and the new technology that is being implemented.

We chose not to recommend the "Big-Bang" method because introducing new technology into an organisation such as the NAL/PDP may interrupt operations and may have a negative effect on enquirers and staff members.

Staffing

We recommend Option 3: Multiple Operators

We recommend that the proposed Information Gateway be staffed by multiple operators. It is important to remember that the Information Gateway would manage more than phone enquiries. There would need to be someone who would answer electronic mail, letter and fax enquiries. The tasks of the phone enquiry operator and the non-phone enquiry operator would be rotated between the NAL/PDP staff.

We believe that one operator could not manage phone and non-phone enquiries all at once. It is important for the staff working at the Information Gateway to be working productively and not be overloaded with large numbers of enquiries.

Training

Telephone System Training

Option 1B: Train Department Heads

Enquiry Tracking System Training

Option 1B: Train Department Heads

We recommend that both technology components be taught by the Telephone Exchange and the ISSD. It would be the role of the department heads to train their staff on the new technology that pertains to their specific job functions.

Recommended Solution Conclusion

We believe that our recommendations for the proposed Information Gateway would enable it to handle the large number of phone calls that are received, especially those received during morning hours and at the beginning of the week. During these busy periods, if an enquiry could not be answered directly, it would be saved and forwarded to the enquiry desk for response when the desk is not too busy. This solution would overcome the NAL/PDP's current phone enquiry problem, including unanswered phone calls, poor tracking of enquiries and complying with the United Kingdom Freedom of Information Act 2000. The filtering system that we recommend would solve another problem: Procedural Telephone enquiries would be answered quickly, leaving more time for the staff to respond to Bibliographic Telephone enquiries.

Although we have provided the National Art Library/Prints, Drawings, and Paintings department our recommended solution, the final decision must come from the Victoria and Albert Museum. The Museum should set priorities for what they truly want to get out of the proposed Information Gateway and allocate proper resources, such as

funds and staff.

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Appendix A: Mission of the National Art Library/ Prints, Drawing, Paper Department of the Victoria and Albert Museum

The National Art Library is a major reference library and the Victoria and Albert Museum's curatorial department for the art, craft, and design of the book. The National Art Library (NAL) and the Prints, Drawings, and Paintings department (PDP) recently merged. The NAL and PDP now are one department (NAL/PDP) in the Victoria and Albert Museum with one common mission:

> The Department is an open and inclusive resource for art and design and a gateway to information on the Museum's collections and subject areas. It aims to stimulate creativity, encourage scholarship, and promote enjoyment and understanding of designed objects and how they help us interpret the world, past and present. (Prints, 4)

The NAL/PDP wants to build upon its current audiences and would like to create services that would make the public aware of the NAL/PDP and the Victoria and Albert Museum. The NAL/PDP hopes to share its knowledge and services with families, schools, children, students, academics, curators, conservators, critics, journalists, people working in the creative industries and art markets, interested adults, and adult groups.

Appendix B: Interviews

Appendix B.1: British Airways

We called the British Airways call system on Saturday January 26 at 5:41 PM. Their phone system has 6 options on their main menu and before any options are given, it tells the customer to visit their website. It took 35 seconds to get a response and we found out that a ticket from Boston to Heathrow would cost $657.27 with taxes included. We could not get a student discount because they no longer had an affiliation with Council Travel which is associated with Worcester Polytechnic Institute. The call took 4 minutes and 16 seconds and we got answers to all my questions.

We were told that there wouldn't be anyone to talk to about the phone system until Monday January 28, 2002. When we called back at 4:37 PM on Friday February 1, we talked with a representative at their Corporate Offices in New York. The representative told us that she couldn't tell us what their peak hours were because they have recently switched their phone system from a Roam System to a Nortel System. She also stated that this system made it easier to direct a customer's call to an answer (Henry, 2002).

Appendix B.2: Metropolitan Museum of Art, New York City, USA

We called the Metropolitan Art Museum in New York on Saturday January 26 at 5:30 PM to ask them a question about an exhibit and test out their phone system. Their system has 11 options on the main menu and before any options are given, the menu gives directions, the days of operation, and says that baby strollers are not allowed on Sunday. Our call took 4:04 before we hung up. Our question remained unanswered

because there was no one to pick up. There was no one there to answer questions about their phone system at that time so we called back on Friday February 1 at 2:30 PM and still there was no one there to answer questions such as their peak hours and who provides their phone system.

Appendix B.3: Museum of Fine Arts, Boston, USA

We called the Museum of Fine Arts in Boston at 10:47 AM on Thursday January 31 to ask them a question about their American Folk exhibit and to test out their phone system. Their system has 8 options and is easy to get through to talk to someone. The first time we called, we were transferred once and were directed to a voicemail. We hung up after the call took 2 minutes and 7 seconds. Then, we called back and again were transferred only once, and we spoke to a representative who was able to answer the question. This call took 2 minutes and 31 seconds. We felt that this system was easy to get though. Unfortunately, there was no one there to answer the questions about their phone system, how well it operates, and its peak hours. We called back on Friday February 1 at 2:46 PM and still there was no one available to answer the question (Quinn, 2002).

Appendix B.4: Library of Congress, Washington D.C., USA

We made a phone call to the Library of Congress in Washington DC to enquire about their phone system at 12:30 PM on Thursday February 14. We got in touch with an operator, who transferred us to the Reference Referral Service and an answering machine picked up so we hung up. We also had a question in mind to test their phone system to see how many times we would get transferred before we got an answer to our question.

So, we e-mailed the Library of Congress, specifically Malinda Hetrick, to get phone numbers for the appropriate Departments. On February 22, at 11:13 AM, we phoned back the main number to enquire about their phone system again. This time we were again transferred to the Reference Referral Service and an answering machine picked up and again we hung up. We decided not to leave a message. Then at 11:19 AM on the same day, we phoned the Manuscript Division of the Library of Congress to ask them our question. The phone number was received from the electronic mail from the Library. When I asked them the question, if they had a recording of Elizabeth Bishop's Poetry, they said that their Department didn't carry any recordings. They then transferred me to the Recording Sound Division, which could help us with our enquiry about recordings. After four rings, their answering machine said that all operators were busy at that time and to either wait on the line, call back, or send an electronic mail to an electronic mail address which was given. So, we waited on the line. After about a minute, four options were given:

- Press *H for help
- Press *W for system wait
- Hang up if you are done
- If nothing is pressed, you will be disconnected

So after about another 15 seconds of waiting, we were disconnected. Then, we called back again. This time, we pressed *W and waited for about 2 minutes. After that we hung up. We didn't get a response to either enquiry.

Appendix C: Freedom of Information Act 2000 Explanatory Notes

The Freedom of Information Act 2000, which received Royal Assent on 30 November 2000, amends the Data Protection Act 1998 and the Public Records Act 1958. It is intended to supersede the Code of Practice on Access to Government Information.

The Public Records Act 1958 reorganised the arrangements for the preservation of public records. It places a duty on the Keeper of the Public Record Office to provide reasonable facilities for inspecting and obtaining copies of such records. The statutory rights under the Act and the Information Commissioner's regulatory powers will be extended to information contained in these records.

The Act:

- provides a right of access to recorded information held by public authorities;
- creates exemptions from the duty to disclose information; and
- establishes the arrangements for enforcement and appeal.

It is divided into eight parts.

Part I: Access to information held by public authorities

This part provides for the general right of access to recorded information held by public authorities (i.e. Government funded organisations, as well as further learning and higher learning institutions) and specifies the conditions, such as the information that an individual is looking for must be in written form, which need to be fulfilled before an authority is obliged to comply with a request.

Part II: Exempt information

This sets out the circumstances in which information is "exempt information" for the purposes of the Act. Some of the exemptions apply to a class of information; others rely on the application of a prejudice test or other consequences of disclosure.

Part III: General functions of Secretary of State, Lord Chancellor and Information Commissioner

This requires the Secretary of State to issue a code of practice providing guidance to public authorities on various administrative matters, including the practices which authorities should follow when dealing with requests for information. It also requires the Lord Chancellor to issue a code of practice providing guidance to public authorities on the keeping, management and destruction of their records.

Part III places a duty on the Commissioner to promote good practice and public authorities' compliance with the Act, their publication schemes and codes of practice. The Commissioner is also obliged, where he considers it expedient, to disseminate information to the public about the Act. The Commissioner is permitted to charge fees with the consent of the Secretary of State for such services. Part III also enables the Commissioner to make practice recommendations specifying what a public authority should do to comply with the codes of practice and requires the Commissioner to lay annual reports before Parliament.

Part IV: Enforcement

This enables an applicant who is not satisfied with the response by a public authority to a request for information to apply to the Commissioner for a decision on whether the authority has acted in accordance with the provisions of the Act. Subject to certain conditions, for example, the exhaustion of other means of complaint, the Commissioner is under a duty to reach a decision

This part of the Act also describes the investigative and enforcement powers of the Commissioner. The Commissioner's powers of entry and inspection are set out in Schedule 3. It confirms that the Act does not give rise to any right of action against public authorities for breach of statutory duty. This part also provides for the circumstances in which a certificate may be issued by an accountable person in respect of a decision notice or enforcement notice issued by the Commissioner in respect of the disclosure of exempt information. The effect of such a certificate is that a public authority need not comply with the Commissioner's notice.

Part V: Appeals

This states the circumstances in which an applicant or a public authority may appeal to the Tribunal when a decision notice, information notice, or enforcement notice has been served. It also states the circumstances in which a party to an appeal to the Tribunal can appeal to the courts on a point of law. It lays down the circumstances in which the Tribunal can hear appeals against the issue of a certificate in national security cases. It also provides for appeal procedures through amendments to the Data Protection Act 1998 as detailed in Schedule 4.

Part VI: Historical records and records in Public Record Office or Public Record Office of Northern Ireland

This effectively replaces the largely discretionary provision for access to public records under the Public Records Act 1958 with a new statutory regime; provides for the access to be enhanced in respect of information contained in records more than thirty years old by disapplying a number of the exemptions in Part II; regulates the relationship between the Lord Chancellor (or appropriate Minister in Northern Ireland) and public authorities in relation to certain information contained in historical records, and makes further provision in relation to decisions relating to certain transferred public records.

Part VII: Amendments of Data Protection Act 1998

With some exceptions and modifications this Part extends the Data Protection Act 1998 provisions about subject access and data accuracy to all personal information held by public authorities. Schedule 6 makes specific provision to extend the 1998 Act to include relevant personal information processed by or on behalf of both Houses of Parliament and makes other minor amendments to that Act.

Part VIII: Miscellaneous and supplemental

This Part:

- provides for a power to make provision relating to environmental information;

- provides for a power to repeal or amend existing statutory bars to disclosure;
- provides for disclosure of information between the Commissioner and specified ombudsmen.
- creates an offence of altering etc. records with intent to frustrate a right of access;
- saves existing powers of public authorities to disclose information;
- makes provision in respect of defamation;
- prevents the extension of the Act to the Scottish Parliament and certain devolved bodies;
- deals with the application of the Act to government departments and to Parliament and the Northern Ireland Assembly;
- defines the way in which orders or regulations can be made under the Act;
- defines various terms used in the Act; and
- gives effect to repeals of existing legislation in Schedule 8.

Part VIII also sets out the commencement provisions for the Act. Those provisions in the Act which do not come into effect on, or at the end of the period of two months following, Royal Assent must be brought into force within the following five years unless brought into effect earlier by order of the Secretary of State; meanwhile, the Secretary of State must make annual reports to Parliament on progress towards full commencement.

(Freedom, 2001)

Appendix D: Interview Guides

Appendix D.1: Liaisons' Interview Guide

1. What is your job function here at the NAL/PDP?

2. What is the current system that you use to track enquiries?

3. What are you looking for in the new system that will track enquiries?
    a. Specifications
    b. Role in the NAL
    c. Future function for the NAL

4. What is your overall goal for our project?

Appendix D.2: NAL Interview Guide

1. Can you explain how the NAL functions?
    a. Mission
    b. Staffing

2. Now that the NAL and PDP have merged how do you see the two departments integrating?
    - Technology
    - Information sharing
    - Enquiry Tracking
    - Staff

3. What is your job function here at the NAL?

4. What is the current system that you use to track enquiries?

5. How are you preparing to deal with the Freedom of Information Act?

6. Do you know about the proposed Information Gateway? What is your opinion about it?

7. How do you see the Information Gateway affecting the NAL?

8. What are you looking for in the new system that will track enquiries?

9. Do you know of any other technology that is used at the NAL? (For example, cataloguing technology)

Appendix D.3: PDP/Archives Interview Guide

1. Can you explain how the PDP (or Archives) functions?
    - Mission
    - Staffing

2. (PDP Only) Now that the NAL and PDP have merged how do you see the two departments integrating?
    a. Technology
    b. Information sharing
    c. Enquiry Tracking
    d. Staff

3. What is your job function here at the PDP (or Archives)?

4. How are you preparing to deal with the Freedom of Information Act?

5. What is the current system that you use to track enquiries?

6. Do you know about the proposed Information Gateway? What is your opinion about it?

7. How do you see the Information Gateway affecting the PDP (or Archives)?

8. What are you looking for in the new system that will track enquiries?

9. Do you know of any other technology that is used at the PDP (or Archives)? (For example, cataloguing technology)

Appendix D.4: Information Technology Interview Guide

1. What is your job function here at the Victoria and Albert Museum?

2. What is your opinion on the proposed Information Gateway?

3. Are there any specific constraints that you see as a problem in creating the gateway?

4. Can you specifically explain the current systems in place at the Museum?

5. Can you give us any information on the current specifications on the Museum's and Library's technology?

    a. Hardware (Servers, workstations)
    b. Software (Oracle, Cataloguing software)
    c. Networking Capabilities

6. Can you explain how Oracle works? Possible demonstration?

    a. What kind of data can be manipulated in this type of database?
    b. What are the specifications needed to run Oracle?

7. Would you advise us to set up a new database system using the technology that exists currently?

8. What kind of data storage is running currently at the V&A?

9. Do you work with any phone technology? If not, can you provide us with a contact?

10. Who else would you recommend us speaking to?

Appendix D.5: Natural History Museum, British Library and "A Leading Professional Body" Interview Guide

1. What is your job title and function here?

2. What are your current operations for tracking enquiries?
    a. Specific system types
    b. Methods

3. Have you researched, conducted surveys or received any other useful data for our proposed Information Gateway?

4. What are your operations for electronic mail, letters and fax enquiries?

5. Could you suggest anyone else we should meet with for further information?

Appendix D.6: Telephone Exchange Interview Guide

1. What is your job function here at the Telephone Exchange?

2. What is the current system and operations of the phone system for the NAL?

3. Are you aware of the proposed Information Gateway?

4. Are there any specific constraints/concerns that you see as a problem in creating the gateway?

5. Do you have any suggestions for a possible system for the phone aspect of the proposed Information Gateway?

6. Do you have any Reports for the current system?

Appendix E: Piloted Survey

PHONE SURVEY

THIS SURVEY SHOULD BE GIVEN AFTER EACH PHONE ENQUIRY

Current time: _____

"Before you go, would you mind participating in a brief three question survey to help improve our enquiry services?"

1. Within this past week have you tried to phone the NAL? (Yes/No)
2. If so, approximately what time did you have success, if any at all, with reaching the NAL?
3. What time of the day did you not reach the NAL? (busy signal etc.)
4. Would you mind telling us where you are calling from? (nearest town or county)

Appendix F: Final Survey

PHONE SURVEY

THIS SURVEY SHOULD BE GIVEN TO EVERY PHONE ENQUIRER

Today's Date: _____ **Current time:** _____

Beginning of Enquiry:

"We would like to improve our service here at the National Art Library, would you please participate in a brief survey at the end of this phone call?"

After Enquiry has been answered:

"Before you go, here is our brief survey."

1. How long have you been trying to phone the NAL today?

   □ Immediate Success

   □ Time length (How long has it taken to get through?): _____

   □ Number of attempts: _____

2. Did you experience any of the following when phoning today?

   □ Busy Signal

   □ No answer

   □ Transferred Incorrectly

   □ Disconnected

   □ Other: _____

3. What other types of enquiring have you used to try to contact the NAL?

   □ Electronic Mail

   □ Letter

   □ Fax

4. Where are you phoning the NAL from? (Nearest town or county)

   _____

Thank you for your time.

Appendix G: Interviews

Appendix G.1: Interview with NAL Information Services Manager

We interviewed the Information Services Manager of the National Art Library. She is in charge of managing the Reading Room, the staff that works in there, the remote enquiry service, and web editing. She explained to us how the library is split into five different sections and Public Services is one of them. She explained to us how enquiries are received and tracked at the National Art Library. She told us that all phone enquiries are answered at the Enquiry Desk located in the Reading Room of the NAL. The enquiry desk only has one phone line so everyone who phones in with an enquiry does not always reach the enquiry desk. There are four shifts taken during the day to handle enquiries at the desk, so the enquiry desk always has someone there to answer phone and face-to-face enquiries. Only the staff of public services answer the letters. Everyone else does enquiry desk duty. That includes answering enquiries by phone, answering face-to-face enquiries and working at the counter, which includes delivering the books.

The current system the NAL uses for tracking enquiries is an Excel spreadsheet. They just track written enquiries because that is the only correspondence that isn't dealt with immediately. They log when the enquiry was received, who in public services dealt with it, and when it was responded by. Once a month, a public services employee goes through the log and checks to see if there are any outstanding enquiries and then she will "chase" the person who is responsible for a certain enquiry to see what is happening.

What she is looking for in the new tracking system that we are investigating is for it to keep track of who has sent it, the information about the enquiry (time of enquiry, subject and nature of enquiry, sample categories would be: artists biographies, exhibitions and catalogues, sales/auctions), information about the enquirer (location of caller, how they heard about the NAL, what other sources have they tried using), who is dealing with it, and how long it has taken to deal with it.

Appendix G.2: Interview with the NAL/PDP Deputy Keeper

We interviewed the Deputy Keeper of the National Art Library/Prints, Drawings and Paintings Department. He is responsible for the NAL and all of its information provisions.

He sees short and long term goals for the information gateway. In the short term he hopes it is an attempt upgrade information provision. This will be for the NAL/PDP department in the beginning and he hopes to incorporate PDP and the Archives seamlessly into the gateway. He would like to see a pilot created to see how well it will work within the NAL. He hopes it will work out with the NAL/PDP so it can expand to the Victoria and Albert Museum as a whole.

The Deputy Keeper's long term goal is to explain to the Museum after the pilot that the "information gateway is working". He would like to better the services to the public and he expects it will in the future.

He also sees that the information gateway will make it more accessible to the public. It will be a focal point at the V&A and hopes to bring new audiences to the NAL. With creating this gateway, regular "museum goers" will have open access to books that will be available to the general public. He would like to create layering of services that the public can use for life long learning.

He has specific goals for the IQP team. His main goal is for us to recommend a solution that will monitor enquiries, find away to integrate phone, electronic mail, fax and letters into one tracking system. He expects from this solution the ability to build profiles of audiences, find interests within enquirers, to determine where who answered the enquiry and how long it took to answer the enquiry. Within our solution he hopes to receive technical specifications and possible costs of the solution. He would like the solution to become a major management tool. He would like for us to give him our best solution and advice for the feasibility of the information gateway.

Freedom of Information Act was also discussed with the Deputy Keeper of the NAL/PDP. He feels it is a bit limited and he is curious as to how much information the act will make the Museum give out.

Appendix G.3: Interview with the NAL Assistant Systems Librarian

We interviewed the Assistant Systems Librarian for the National Art Library. She works directly for the NAL Systems Librarian, and troubleshoots any problems that arise with access to the Library's technology. She handles users' problems for the staff and those who come to use the Library's computers in the NAL Reading Room. She also helps with the NAL's websites and helps to manage the catalogue and web servers. Those two servers are the NAL's and the V&A Museum does not have control over those servers. She hopes to give more access to the public so they may receive information remotely.

The NAL/PDP merger is still relatively new and so far the electronic information that is being shared is over a network drive in the Museum's internal network. She mentioned that most of the technology dealing with data storage and data warehousing can be discussed with the Information Systems Services Department (ISSD). The internal Victoria and Albert Museum website is driven by an Oracle database and parts of the website is done in Extensible Mark-up Language (XML).

Appendix G.4: Interview with the Head of Collections Management

We spoke the Head of Collections Management who is responsible for cataloguing books, transferring older records onto the Dynix computer system, and is in charge of automation systems. He also has worked on the web site in the areas of the catalogue.

He discussed the technology in the library. The museum is completely networked but the library has a specific catalogue which is the Dynix cataloguing system. The catalogue will be upgraded at the end of the summer to Epixtech made through horizon. This system will allow more integration of bibliographical information.

The museum also has a Sun Enterprise Server. They also use Java for the catalogues. He also told us the Exchange is shared with the other local museums.

He also pointed us in the directions of others who could help us with information such as the Systems Administrator, the Chief Cataloguer and the Telephone Exchange.

Appendix G.5: Interview with the PDP Access Manager

We interviewed the Access Manager of the PDP. She is Curator in charge of the Print Room, the Controller of enquiries, and in charge of loans of PDP objects within the UK and to the world. The Access Manager of the PDP explained the process of how enquiries come into PDP central office and then are dispersed to other sections of the department. The central office serves as a hub and handles loans of objects, staffing, and enquiries. Most of the enquiries that come in are in the form of letter and electronic mail and pertain to various subjects in the PDP department. If the enquiry does not pertain to the PDP it is transferred to whoever can answer it. The letters and electronic mail that come in are often from young students wanting answers for reports on art and design.

Enquiries are logged in a spreadsheet by a secretary in the central office of the PDP. The information gathered from enquiries are how the enquiry was taken, the subject, date and where it was forwarded to in the department or Museum. The letter, electronic mail and fax enquiries are filed away to be used for future references for enquiries. Departments often do not file these enquiries.

Currently the NAL and PDP provide interdepartmental training, but it is voluntary. There are more NAL staff members who have come to the PDP to learn about PDP operations and objects. The staff members of the PDP have twenty-six to twenty-eight members ranging from temporary to full time work. The budget for the PDP is based on staffing costs and acquisitions to the PDP archives.

She would also like to understand where enquirers are enquiring from. She feels that acquiring information on enquirers and enquiries will help in expanding audiences and increasing visitation to the Museum.

Appendix G.6: Interview with the PDP Head of Contemporary Section

We interviewed The Head of Contemporary Section of the PDP. One of her jobs is to research new media. She is also Head of Documentation in which she manages the PDP catalogues and sets targets of the number of items to be catalogued. She is also an expert in various collections such as War papers and Botanical Collections.

She explains that the PDP is currently back-logged with the number of objects to be catalogued. Within the five sections of the PDP, Prints, Paintings (Drawings are included with paintings), Photos, Designs, and Contemporary, only about one hundred thousand items are catalogued. That one hundred thousand is a tiny proportion of the millions of objects to be catalogued by the PDP staff. Not all of those one hundred thousand records have full records containing all the necessary information that an enquirer may want to receive.

According to The Head of Contemporary Section of the PDP, the enquiries that come into the PDP have a long range of subject areas. Currently enquiries come to the PDP's Central Office and enquiry desk in the Public Viewing Room. The enquiries that come into the PDP are in the form of phone calls, electronic mail, letters and fax and they are from a range of audiences. Those audiences are school children, academic and educational institutions and various levels of researchers.

The enquiry desk has one phone line in the print room which is able to take one call at a time. Central office staff also handles enquiries. The exchange which resides in the Natural History Museum will transfer calls directly to the PDP and Central office will then transfer them to the right curator in the PDP.

The standard for replying to enquiries for the V&A is fifteen working days. The PDP does not send out standard reply letters as the NAL does. When someone calls and reaches the PDP enquiry desk in the public viewing room each call's length will vary on the ability of the person answering the enquiry. Depending on the time of the staff member they may answer the enquiry right away or they may wait and have to reply later.

The Head of Contemporary Section of the PDP remembered at one time when enquiries were tracked and she said it was a tedious system. It was often difficult to organise and catalogue each enquiry into categories set-up by the PDP. The categories that the enquiries were organised by were general public, academic, education institutions, and the media. The number of enquiries and types were analysed at the end of each month. The NAL and PDP have been training each department's staff during the merger. The departments before becoming one used group visits and job shadowing.

The Head of Contemporary Section of the PDP, when questioned about resource constraints in staff, technology and funding, told us to speak with The Access Manager of the PDP in the central office. She discussed issues with high staff costs and the budget for the Collection Information System (CIS). The technology in the PDP needs to be increased for the public. She also hopes that the public can use computer terminals to search through the catalogues, but the catalogues still need to be retro-converted. The CIS that was being developed and used in the PDP had stopped for financial reasons. There also needs to be security on confidential information on each object in the PDP. The public should not have information pertaining to how much the object was acquired for by the Museum and who donated the object.

Appendix G.7: Interview with the Head of Museum Archives

We interviewed the Head of Museum Archives for the Victoria and Albert Museum. She chairs a committee that is looking into the Freedom of Information Act for the Museum.

She explained that the Freedom of Information Act focuses on all public bodies that answer enquiries. The Freedom of Information Act was suppose to start in 2002, but was postponed by the government to January 2005.

She explained the FIA group is doing well because it has a member from every department in the Museum. A Museum Archivist is looking into the exemptions of the FIA for the Museum and its Archives. Head of Museum Archives is preparing a proposal for the Museum's FIA policy; the policy is due in November of 2002.

She stated that the FIA has an appeal process that an enquirer can use if the enquirer is unsatisfied with the Museum's response. This process can potentially go to court.

She also suggested that the Information Gateway committee should include a representative from every department of the Museum.

Appendix G.8: Interview with the Museum Archivist

We spoke with the Museum Archivist that is in charge of the Victoria and Albert Museum Archives and the Registry of the Archives. There are four people and himself that work in his department. The department is in charge of file and record management. He also noted that very few enquiries come from the public; most enquiries come from V&A staff.

The Museum Archivist explained that most enquiries come in by electronic mail and there are not that many phone enquiries. He also stated that his staff may spend more time on enquiries that are from the V&A staff than from the general public. Museum staff may ask the archives to send them a certain file or record. The public often asks questions that cannot often be categorised. The staff at the archives will not spend more than thirty minutes on an enquiry from the public.

The Museum Archivist feels that the Freedom of Information Act "will be a nightmare".

The Museum Archivist feels that the Information Gateway is a great idea. He wants to make sure that when the enquiry comes in it gets to the proper expert.

Appendix G.9: Interview with the Archivist of Art and Design

We interviewed an Archivist of Art and Design at the Blythe House. He explained to the IQP team what the Museum Archive does. The V&A Museum Archives collect papers and records on Art and Design, British Design, Historic Records, the Beatrix Potter Collection. They also manage enquiry services and cataloguing of the Museum's archives.

The Archivist of Art and Design manages the Victoria and Albert Museum's Art and Design Archives. He makes sure that people have access to the collections in the Reading Room of the Archives. He is also in charge of displaying publications, arranging the enquiry services and managing staff and volunteers. There are two people that make up the staff in the Art and Design Archives.

The Archivist of Art and Design stated that electronic mail enquiries have increased and have surpassed phone enquiries. Most of the phone enquiries that come to the Archives are from V&A staff. Most of the time, most V&A staff enquiries will extend beyond the thirty minute limit set for answering public enquiries. The Archives staff will plan on researching an enquiry for a member of the public for only thirty minutes. Enquiries will come from various people, but mainly from those in academics. Examples of enquiries the archives may receive are enquiries on furniture, product, or family history.

The Archivist of Art and Design recommended to the IQP team to speak with the Head of Archives. The Head of Archives chairs a committee for the Museum that is focusing on the Freedom of Information Act. The Archivist of Art and Design also recommended that we look into the Data Protection Act.

The Archivist of Art and Design has heard of the Information Gateway. He feels that there needs to be proper filtering of calls before reaching the enquiry desk. He understands the concept of a one-stop service for enquiries to be answered for the Museum. Enquiries that reach the gateway should not be of general nature such as questions that ask for opening and closing time of the Museum or the procedure on how to register with the Library. The Archivist of Art and Design wants subject matter enquiries to be handled properly and not transferred back and forth between departments. He explains that the phone systems are a bit archaic at the Archives. He would like to see more of this information posted on the web and all documentation 'brought up to speed".

He later explained the current technologies that the Archives use to catalogue. There are three forms of methods to catalogue archives in libraries or museums; Catalogue Information Systems, Dynix, and Electronic Archive Documentation (EAD). EAD is an XML-based archival technology and can become web-based. EAD was created by another Museum Archivist. The EAD was created for the Archives. This Museum Archivist used XMetal a software tool that creates XML web pages. The XML web pages are uploaded to the Museum's shared network drives and put on the Library's

servers. The Archivist of Art and Design states that two-thirds of the items in the Art-Design Archives have been catalogued.

Appendix G.10: Interview with the Assistant Curator of Special Collections

We spoke with The Assistant Curator of Special Collections. The Special Collections Department handles items that are rare and fragile. The staff members at Special Collections log all the items that are considered to be unique.

The Assistant Curator of Special Collections explained that the area of Special Collections receive specific enquiries that need to be handled. He states that the staff's expertise in Special Collections is the proper place for enquiries to be answered properly. Enquiries arrive from inside the V&A and from the general public. Often times the general public do not even know about Special Collections and the enquirer may get transferred back and forth. Once the enquirer knows about Special Collections the enquirer will direct the correspondence right to Special Collections.

Special Collections receive enquiries by phone, letter, electronic mail and fax. Often enquiries are complex and complicated. Most of the enquiries will come through Public Services first and then if answered at Public Services it will move on to Special Collections.

The Assistant Curator of Special Collections also explained that Special Collections often transfers calls to other parts of the Museum such as the V&A Picture Library.

The Assistant Curator of Special Collections feels that the proposed Information Gateway would have a great benefit to Special Collections. He stated that the National Art Library is often seen as a separate entity from the Museum. He also likes the idea of a proper filtering system be implemented so pertinent and subject enquiries will be properly answered. He also likes that the information gateway will make answering enquiries more efficient and faster.

Appendix G.11: Interview with the Head of Information Systems Services Department

We interviewed the Head of Information Systems Services Department (ISSD). He explained what the ISSD does and what it handles for the Victoria and Albert Museum. The ISSD handles all computing, web and database development, and the networking of the building. The Head of ISSD states the main objective of the ISSD is to maintain and look after the Information Technology strategy for the Museum.

The Head of ISSD feels the proposed information gateway is "a very good idea". He feels that the information gateway is still unclear on its objective. He asks if the information gateway is a channel by which the IG will pass on enquiries or is a "one-stop shop" for information. He is worried that there may be concerns within the V&A learning and visitors services. He recommends that there are multiple channels of accessing information such as the web and terminals within the Museum.

He explained some of the constraints that will exist within the new proposed information gateway. First, he states there is a lack of money that can be budgeted and granted to proposed projects. The Museum has great information systems but the systems are scattered in types of information that is being handled. He explained that there are various cataloguing systems within the Museum and he hoped to make the databases one with one single format of data. He told the team that there are some departments what want to protect their data and not share it.

He told us about the use of Oracle database within the Museum. Oracle database software became the primary database software three years ago. Currently, Oracle databases are used to run the Accounting system, building management operations and the management of the British Galleries. The Oracle software can be put on any server within the V&A, the V&A purchased a site-license from Oracle. Oracle Interfaces can be designed with a series of Oracle development tools. The best way of creating a user interface is Java technology.

There are currently thirty servers within the V&A. There are mainly Sun Microsystems Servers. He recommends a medium-sized Sun Server for the information gateway, which could be about £15,000.

He also told us that the phone technology in the Museum is not run by the V&A. The telephone systems are not easily upgradeable and are on a dedicated telephone network.

The Head of ISSD recommended to us to speak to the Systems Developer of Information Systems Services who works with Oracle. He works in Systems Development Management. The Head of ISSD is looking into data-warehousing to bring together all the databases and data on a large storage network. This will help in maintaining data. His last recommendation was for us to create a pilot in Microsoft Access, though Access would not be the best way of creating an interface.

Appendix G.12: Interview with the Systems Development Manager

We interviewed the Systems Development Manager. He manages the Museum's software development of standard applications, the Museum's intranet, and the access to the Collection systems.

The IQP team explained to him the mission of the proposed information gateway. He recommended that the Enquiry Tracking System component of the Information Gateway becomes and extension of the Museum's intranet web site. He explained that the Museum's intranet web site runs on Oracle Database software on a Sun Microsystems' E450 Server. The intranet web site is used for internal operations at the Museum such as staff directory listings, Museum news postings and press releases. Every member of the Museum staff has access to the intranet and some employees have limitations on the access of specific information and applications.

The intranet was created by two members of the staff and has gone through three phases of completion. He spoke about the development phases over the last year and a half for the intranet. The first phase took three months to design the system, the second phase was six months to implement within the Museum and the third phase took nine months to create applications for the intranet.

The Systems Development Manager sees various constraints in the development of the information gateway. Currently, the ISSD (Information Systems Services Department) is working on fourteen projects with different levels of priority. The creation of the enquiry tracking system will need members of the ISSD staff or a contractor to develop this system. He stated that contract work right now is relatively cheap due to the current economy. A software development contractor for a ten week project could be in the range of twenty to thirty thousand pounds.

Another constraint is the sharing and ownership of the information being inputted into the Enquiry Tracking system. He also stated that it ownership of data and information is important and it is a major issue when allowing people to have permission to the system. He also mentioned that computer literacy relatively low through out the Museum. This could affect the training within the Museum. He mentioned he will not train all users of the system but will train specific department heads to then train their staff members.

Appendix G.13: Interview with the Manager of the Telephone Exchange

The manager of the Telephone Exchange explained many of the operations of their switchboard and also gave us an overview of their technology and some possible recommendations.

The Telephone Exchange transfers and answers phone calls for the Victoria and Albert Museum, the National Art Library/Prints, Drawing and Paintings Department, the Science Museum, and the Natural History Museum. Ninety percent of the calls that go to the Exchange are general enough for the Exchange to answer right there such as when the museums are open, parking, etc.

The Exchange had not been contacted by the National Art Library about the Information Gateway until our group discussed it with the manager. After having the system explained, the manager said she had a few different ways at solving the problem. She suggested the first step to be the Library to meet with her and collaborate on what is possible with the current systems. Once the Library knows their specific options they need and what they need to include they again need to meet with the Exchange and the Exchange can then get started.

The manager also pointed out that the museums had all paid for an Automatic Call Distributor made by Mitel that no one has used yet. This is a queuing system that can hold six people on the queue and give a recorded message as well as other options with help from the manager of the Exchange. This means the call options of the gateway have no money constraints except for the small set-up cost.

For the system to be truly successful the manager thinks that people must be at their desks when calls are forwarded. If an enquiry is forwarded to an expert and they are not at their desk, the system will not be as effective. She felt this was a major issue.

Appendix G.14: Interview with the Manger of Enquiries at the British Library

The manager of the enquiries at the British Library monitors the Library's call centre and also works as an operator on the call centre. She also tracks these enquiries using different programs to make different monthly and yearly reports.

The call centre operates with 3 operators at all times that have 6 to 8 people a day on a rotating schedule. The Library uses a queue system that allows up to 6 people to be in the queue and also reports to the operators exactly how many people are in the queue and how long they have been waiting. If there are 6 people waiting in the queue and another person calls they will get a busy signal. While callers are waiting in the queue the recorded message gives the email and website to the enquirers. The system does not use a filtering system such as a push button system because a survey this manager conducted showed that there was a negative response to push button systems.

The library also uses a call scan system made by Siemens that is called the HiPath ProCenter eVOLUTION. This gives comparisons dealing with the number of calls missed and their average wait in the queue and many other details of interest to a call centre.

All fax and electronic mail is sent to the main office where the operators can respond to these in there hours not on the phones. All electronic mail is printed and archived for 3 months for future reference when similar enquiries are sent in.

With this system the British Library answers eighty percent of its enquiries and forwards the other twenty percent. Their busiest times are normally 9:30 to 10 in the morning when the call centre first opens.

Appendix G.15: Interview with the Archivist at the Natural History Museum

An archivist at the Natural History Museum discussed the tracking system that the Museum uses briefly.

When logging information at the museum on those who enquire, the Museum asks for personal information such as name and address. They tell people that this information will only be used to log enquiries and not for any other reason. There is no specific enquiry point because of the many different sections of the museum. The only main point is in the General Library of the museum. This causes some overlap of the same enquiry when enquirers try going through different sections that all transfer that enquiry to the same point.

The standard for answering enquiries in the Natural History Museum is 2 to 3 days for internal enquiries and 14 days for all outside enquiries. Typically 40 percent of the enquiries are external and sixty percent are internal. If the expert of the enquiry is not available the museum will ask them if they want brief information on the subject or whether they would like to wait and have the enquiry answered as soon as the expert is back.

Logging is done by using Enquiry Request Forms that track information such as the time the enquiry came in, the time completed, if it was transferred, etc. There are typically 500 enquiries answered that did not have to be forwarded per year by this manager.

Appendix G.16: Interview with the Program Manager at a Leading Professional Organisation

We interviewed a program engineer at a leading professional organisation. He explained to us a lot of what the organisation does and their function. This organisation functions only for England and Wales. They have three offices, the main one in London and two in the Midlands. The organisation consists of a staff of 800 people. Their job is to answer legal enquiries and if people have complaints about a solicitor, people would contact this organisation. The members pay £500 a year and for that, they receive membership privileges. This organisation is not Government funded. They make their money from dues and through their monthly newsletter.

For answering Enquiries, this organisation has two switchboards, one in London and one to share for their Midlands offices. There are many ways to contact this organisation. Each department or section of the organisation has its own enquiry phone line. Some of those enquiry phone lines have quite sophisticated Automated Call Distribution (ACD) systems and others don't. Each Department or section keeps a record of the number of enquiries.

This leading professional organisation is in the midst of developing a Contact Centre. In developing this Contact Centre, they expect to give enquirer's the same level of service at all times of the day. To develop this Contact Centre, this organisation is using Siebel as their CRM package.

Before starting to develop this Contact Centre, they had a consulting firm come in and help them analyse what they needed and help in developing the necessary technology. This firm had to bid on this project. The firm finally chosen after the bidding was Aspective.

In Siebel, they have lists of members that constantly have changing information so the organisation is constantly updating the lawyers' information. Siebel can bring up the history of all its members and can capture public details. The organisation must decide on a reasonable level of detail so to be able to contact them back but not to bog the enquirer down with twenty questions.

The program engineer thought the queuing system would be a good idea and said he would take it under consideration when developing the Contact Centre.

The Contact Centre is being developed in such a way that when a phone call comes in to the organisation, if it is a general or frequently asked question, the operator will take care of it. If it is a detailed question that the operator cannot easily answer or is unsure about, the operator will pass it on to the correct person who can answer the enquiry. The operator will be able to search for the correct person using Siebel since the information that each person specialises in will be on Siebel. Currently, operators in the Contact Centre use a script to try answering an enquiry and/or better direct their enquiry.

In developing this Contact Centre, operators will record certain information from the enquirer so if the enquirer phones back, the operator can realise what questions they previously had and to hopefully be better equipped to help them with their current enquiry. Also, in developing this Contact Centre, there are six phases to go through. It is important that they go through these six phases as to develop this Contact Centre slowly. As the Contact Centre is being developed, staffing will increase from thirty people to eighty people.

This project of developing a Contact Centre started eighteen months ago. It should take three years for the phase approach. This whole project will have taken approximately five years to develop this Contact Centre. They should be able to start using the Contact Centre by the end of this year.

For training, they are planning to set aside one month. During this time, they will pull out people at different times from their job, as not to totally shut their business down. They will train fifty people at a time and then have those fifty people train others in their department.

Overall this project is quite expensive with all the consultants and program software. According to the program engineer, this project cost is in the multi-million pound range.

Appendix H.1: NAL Enquiry Desk Statistics Form

Enquiry Desk Statistics

Day..... Date.....

	Bibliographic		Procedural		Both	
	In Person	Telephone	In Person	Telephone	In Person	Telephone
10.00-11.45						
11.45-13.30						
13.30-15.15						
15.15-17.00						
Daily total:						

Number of forwarded calls:

Appendix H.2: NAL Enquiry Management Spreadsheet

Public Services Correspondence Logbook

Date Received	Surname	Forename	Code	E-M	P-C	Thanks	Assigned To	Date Assigned	Referred To	Date Referred	Invoice No.	Date Invoice Sent	Date Sent Out	Turn Around Times	MOR	MSO	Month of Referral

Appendix I: Telephone Exchange Records for the NAL Enquiry Desk

Report period 01/03/02 00:00:00 to 31/03/02 23:59:59.

Creation 08/04/02 17:00:57

H Downing - Ext Detail 2400

Site	Date	Time	From	To	Duration	Ring	Access	Digits	Place Name	Resp	Tr	Op	Cost
NHMSY1	01/03/02	09:56:00	T NHMSY1/1607	E NHMSY1/2400	00:00:00	00:00	CLI	02083749426	Unknown	B			0.00
NHMSY1	01/03/02	09:59:00	T NHMSY1/1614	E NHMSY1/2400	00:04:43	00:06	CLI	02077361762	Unknown	A			0.00
NHMSY1	01/03/02	10:06:00	T NHMSY1/1623	E NHMSY1/2400	00:00:00	00:00				B			0.00
NHMSY1	01/03/02	10:07:00	T NHMSY1/1611	E NHMSY1/2400	00:00:00	00:00				B			0.00
NHMSY1	01/03/02	10:07:00	T NHMSY1/1621	E NHMSY1/2400	00:00:00	00:00	CLI	02083403028	Unknown	B			0.00
NHMSY1	01/03/02	10:04:00	T NHMSY1/1614	E NHMSY1/2400	00:04:38	00:09	CLI	01789842017	Unknown	A			0.00
NHMSY1	01/03/02	10:12:00	T NHMSY1/1620	E NHMSY1/2400	00:00:00	00:00	CLI	02087412626	Unknown	B			0.00
NHMSY1	01/03/02	10:12:00	T NHMSY1/1625	E NHMSY1/2400	00:00:00	00:00				B			0.00
NHMSY1	01/03/02	10:11:00	T NHMSY1/1619	E NHMSY1/2400	00:01:11	00:07	CLI	02083403028	Unknown	A			0.00
NHMSY1	01/03/02	10:14:00	T NHMSY1/1608	E NHMSY1/2400	00:00:59	00:02	CLI	02087412626	Unknown	A			0.00
NHMSY1	01/03/02	10:23:00	T NHMSY1/1626	E NHMSY1/2400	00:00:00	00:00	CLI	02077361762	Unknown	B			0.00
NHMSY1	01/03/02	10:23:00	T NHMSY1/1620	E NHMSY1/2400	00:00:00	00:00	CLI	02077361762	Unknown	B			0.00
NHMSY1	01/03/02	10:19:00	T NHMSY1/1623	E NHMSY1/2400	00:04:23	00:03	CLI	02083749426	Unknown	A			0.00
NHMSY1	01/03/02	10:26:00	I NHMSY1/1488	E NHMSY1/2400	00:00:00	00:00				B			0.00
NHMSY1	01/03/02	10:24:00	T NHMSY1/1620	E NHMSY1/2400	00:05:08	00:05	CLI	02077361762	Unknown	A			0.00
NHMSY1	01/03/02	10:30:00	T NHMSY1/1629	E NHMSY1/2400	00:00:30	00:07				A			0.00
NHMSY1	01/03/02	10:35:00	T NHMSY1/1629	E NHMSY1/2400	00:00:40	00:04	CLI	01962666999	Unknown	A	T		0.00
NHMSY1	01/03/02	10:51:00	T NHMSY1/1619	E NHMSY1/2400	00:02:12	00:03	CLI	02077361762	Unknown	A			0.00
NHMSY1	01/03/02	10:57:00	I NHMSY1/1485	E NHMSY1/2400	00:00:52	00:03				A	T		0.00
NHMSY1	01/03/02	10:58:00	T NHMSY1/1621	E NHMSY1/2400	00:01:30	00:03	CLI	07811277587	Unknown	A			0.00
NHMSY1	01/03/02	11:03:00	T NHMSY1/1622	E NHMSY1/2400	00:02:48	00:04	CLI	02088703773	Unknown	A			0.00
NHMSY1	01/03/02	11:17:00	I NHMSY1/1483	E NHMSY1/2400	00:03:47	00:05	CLI	01973261856	Unknown	A			0.00
NHMSY1	01/03/02	11:26:00	I NHMSY1/1487	E NHMSY1/2400	00:00:53	00:03	CLI	02077941511	Unknown	A	T		0.00
NHMSY1	01/03/02	11:40:00	T NHMSY1/1608	E NHMSY1/2400	00:00:00	00:00	CLI	01634815217	Unknown	B			0.00
NHMSY1	01/03/02	11:39:00	I NHMSY1/1486	E NHMSY1/2400	00:06:48	00:11	CLI	01273685568	Unknown	A	T		0.00
NHMSY1	01/03/02	11:51:00	I NHMSY1/1485	E NHMSY1/2400	00:01:11	00:02	CLI	01273685568	Unknown	A			0.00
NHMSY1	01/03/02	11:54:00	T NHMSY1/1619	E NHMSY1/2400	00:01:19	00:02	CLI	02073517871	Unknown	A			0.00
NHMSY1	01/03/02	12:29:00	I NHMSY1/1486	E NHMSY1/2400	00:00:00	00:00				B			0.00
NHMSY1	01/03/02	13:04:00	I NHMSY1/1486	E NHMSY1/2400	00:00:12	00:04	CLI	07815294595	Unknown	A			0.00
NHMSY1	01/03/02	13:06:00	T NHMSY1/1606	E NHMSY1/2400	00:00:41	00:05	CLI	02087351831	Unknown	A			0.00
NHMSY1	01/03/02	13:09:00	I NHMSY1/1488	E NHMSY1/2400	00:00:37	00:13				A			0.00
NHMSY1	01/03/02	13:51:00	T NHMSY1/1613	E NHMSY1/2400	00:02:11	00:01	CLI	01329842240	Unknown	A			0.00
NHMSY1	01/03/02	13:58:00	I NHMSY1/1488	E NHMSY1/2400	00:00:43	00:02				A			0.00
NHMSY1	01/03/02	14:19:00	T NHMSY1/1610	E NHMSY1/2400	00:01:48	00:04	CLI	02077278278	Unknown	A			0.00
NHMSY1	01/03/02	14:22:00	T NHMSY1/1601	E NHMSY1/2400	00:00:00	00:00				B			0.00
NHMSY1	01/03/02	14:22:00	T NHMSY1/1603	E NHMSY1/2400	00:01:35	00:06				A			0.00
NHMSY1	01/03/02	14:30:00	T NHMSY1/1629	E NHMSY1/2400	00:00:00	00:00	CLI	01633267545	Unknown	B			0.00
NHMSY1	01/03/02	14:29:00	T NHMSY1/1606	E NHMSY1/2400	00:01:34	00:02	CLI	02077361762	Unknown	A			0.00

Appendix J.1: Example Survey Data Results

Survey Results

Date:	*Time:*	*Immediate Success:*	*Time Length:*	*# of Attempts:*
22-Mar-02	11:30 AM	☑	0	0
22-Mar-02	11:40 AM	☑	0	0
22-Mar-02	11:30 AM	☑	0	0
22-Mar-02	10:35 AM	☑	0	0
22-Mar-02	10:25 AM	☑	0	0
22-Mar-02	10:10 AM	☑	0	0
26-Mar-02	10:00 AM	☑	0	0
26-Mar-02	10:05 AM	☐	2	2
26-Mar-02	10:10 AM	☐	1	2
26-Mar-02	10:12 AM	☑	0	0
26-Mar-02	10:14 AM	☐	3	2
26-Mar-02	10:16 AM	☐	5	4
26-Mar-02	10:40 AM	☑	0	0
26-Mar-02	11:30 AM	☐	15	5
26-Mar-02	12:40 PM	☐	0	6
26-Mar-02	1:00 PM	☐	0	20
26-Mar-02	1:40 PM	☑	0	0
26-Mar-02	1:50 PM	☐	0	5
26-Mar-02	2:05 PM	☑	0	0
26-Mar-02	2:10 PM	☑	0	0
26-Mar-02	3:10 PM	☐	0	4
26-Mar-02	3:30 PM	☐	180	0
26-Mar-02	3:55 PM	☐	90	0
26-Mar-02	4:05 PM	☐	0	2
26-Mar-02	4:15 PM	☐	20	0
26-Mar-02	4:25 PM	☑	0	0
26-Mar-02	4:55 PM	☐	0	0
27-Mar-02	10:10 AM	☐	15	2

Appendix J.2: Example Survey Data Results

Survey Results

Date:	*Time:*	*E-mail:*	*Letter:*	*Fax:*
22-Mar-02	11:30 AM	☐	☐	☐
22-Mar-02	11:40 AM	☐	☑	☐
22-Mar-02	11:30 AM	☐	☐	☐
22-Mar-02	10:35 AM	☐	☐	☐
22-Mar-02	10:25 AM	☐	☐	☐
22-Mar-02	10:10 AM	☐	☐	☐
26-Mar-02	10:00 AM	☐	☐	☐
26-Mar-02	10:05 AM	☐	☐	☐
26-Mar-02	10:10 AM	☐	☐	☐
26-Mar-02	10:12 AM	☐	☐	☐
26-Mar-02	10:14 AM	☑	☐	☐
26-Mar-02	10:16 AM	☐	☐	☐
26-Mar-02	10:40 AM	☑	☐	☐
26-Mar-02	11:30 AM	☐	☐	☐
26-Mar-02	12:40 PM	☐	☐	☐
26-Mar-02	1:00 PM	☑	☐	☐
26-Mar-02	1:40 PM	☐	☐	☐
26-Mar-02	1:50 PM	☐	☐	☐
26-Mar-02	2:05 PM	☐	☑	☐
26-Mar-02	2:10 PM	☐	☐	☐
26-Mar-02	3:10 PM	☐	☐	☐
26-Mar-02	3:30 PM	☐	☐	☐
26-Mar-02	3:55 PM	☐	☐	☐
26-Mar-02	4:05 PM	☐	☐	☐
26-Mar-02	4:15 PM	☐	☐	☐
26-Mar-02	4:25 PM	☐	☐	☐
26-Mar-02	4:55 PM	☐	☐	☐
27-Mar-02	10:10 AM	☐	☐	☐

Appendix J.3: Example Survey Data Results

Survey Results

Date	*Time*	*Location*
22-Mar-02	10:10 AM	London
22-Mar-02	10:25 AM	London
22-Mar-02	10:35 AM	London
22-Mar-02	11:30 AM	London
22-Mar-02	11:30 AM	Gloucester
22-Mar-02	11:40 AM	Bristol
26-Mar-02	10:00 AM	Rouchester
26-Mar-02	10:05 AM	London
26-Mar-02	10:10 AM	Rouchester
26-Mar-02	10:12 AM	London
26-Mar-02	10:14 AM	London
26-Mar-02	10:16 AM	London
26-Mar-02	10:40 AM	Nottingham
26-Mar-02	11:30 AM	London
26-Mar-02	12:40 PM	Reading
26-Mar-02	1:00 PM	Buckinghamshire
26-Mar-02	1:40 PM	London
26-Mar-02	1:50 PM	Bristol
26-Mar-02	2:05 PM	London
26-Mar-02	2:10 PM	New York
26-Mar-02	3:10 PM	London
26-Mar-02	3:30 PM	London
26-Mar-02	3:55 PM	London
26-Mar-02	4:05 PM	London
26-Mar-02	4:15 PM	East Sussex
26-Mar-02	4:25 PM	Oxford
26-Mar-02	4:55 PM	London
27-Mar-02	10:10 AM	London

Appendix K: PDP/NAL Information Gateway

PDP/NAL Information Gateway

Context:
The purpose of the information gateway is to assist the Museum in meeting the information and learning needs of its target audience. The considerable information handling skills of the PDP/NAL Department make it well placed to provide this pivotal service to the public on behalf of the Museum.

This paper aims to define the added value that such a gateway can bring to Museum information provision.

Definition:
The information gateway would act as a single point of contact for Museum enquirers seeking information on the Museum collections and subject areas. Other closely integrated information points would co-exist to handle information on museum activities, bookings, &c.

The information gateway would manage the process whereby enquiries are distributed to wherever the information can be provided most effectively and efficiently, taking account of the availability of resources and curatorial expertise.

Benefits:
The user would benefit from an effective, seamless and monitored service measured against delivery and quality standards. The Museum would benefit from across the board application of professional information management: the gateway acting as a conduit for enquiries efficiently reaching the relevant subject specialist.

Using knowledge management principles a databank would be developed, allowing the information collected from previous enquiry work to be repackaged. This would enable a growing audience to have similar information needs satisfied immediately, while, in the long term, using fewer resources.

The information gateway would include the following delivery mechanisms:

1. **Telephone call centre**

   E.g.
   To answer calls to a direct line and re-directed from other hubs;
   To introduce the enquirer to the most appropriate information source or enquiry route (web, visit, written enquiry);
   To provide an advanced ordering service for Departmental items;
   To identify and locate objects using CIS, Catalogues, crib-sheets, &c.

2. Written enquiry handling

E.g.
To act as a single point of contact for subject and collections based enquiries by e-mail, letter, fax;
To answer enquiries using local reference resources and electronic reference tools
To forward enquiries requiring additional expertise to answer satisfactorily to appropriate department or expert in the Museum & beyond;
To maintain and monitor a database of enquiries and to fulfil the legal requirement under *Freedom of Information Act* to monitor all written requests for information by 2005;
To log enquiries, monitor efficiency standards, compile data record for assessing type, level and subject matter of enquiries.

3. Web

E.g.
Information provision:
Distance answering of basic level subject enquiries (FAQs) for Museum and Department. This would build on responses to previous enquiries;
Digitization of topic boxes and other appropriate collection materials;
On-line exhibitions (and archiving of previous Departmental displays).

Service delivery:
Photocopying requests;
Enquiry form;
Catalogue searching;
Remote document supply.

4. On-site

All study rooms should be made available to the widest possible audience and should also be accessible to the disabled. Additionally they should facilitate access to collection items across the Museum.

NAL reading rooms

Layered service delivered across three rooms:
West Room (chief public entrance; open reference and access); Centre Room (book delivery & information literacy training); Reading Room (study conditions, secure & invigilated issue)

Providing services such as:

- enquiry service
- access tools
- building of reference collections to enable individual and assisted information gathering on subject and collections based topics, including topic boxes
- packaged and educational resources (national curriculum and further education) layered for learning types, abilities and disabilities
- exhibition cases
- on-line resources
- reprographics
- item ordering
- reader registration (automated)
- invigilated delivery of reserved items
- space for tutorials/inductions/seminars/workshops

PDP study room

(study conditions, secure & invigilated issue)

Providing services such as:

- access tools
- packaged educational resources (national curriculum and further education; but increasingly based in the NAL West Room)
- on-line resources
- reprographics
- enquiry service
- item ordering
- reader registration (automated)
- invigilated delivery of reserved items

Archive reading room

(study conditions, secure & invigilated issue)

Providing services such as:

- access tools
- packaged educational resources (national curriculum and further education)
- on-line resources
- reprographics
- enquiry service
- item ordering
- reader registration (automated)
- invigilated delivery of reserved items

Recommendation:

Given the overall restriction on resources, there will have to be a redeployment of current departmental capacities. It follows that a phased introduction, centred on PDP/NAL Department, would enable procedures and standards to be established and the potential benefits for the Museum's overall information provision to be demonstrated.

Appendix L.1: March Project Schedule

March 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
	April 2002 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30				1	2
3	4	5	6	7	8	9
10 Week 1	11 10am Tour of V&A 1pm Final Rehearsal	12 10am Meet Liaison	13 10am Interview: Info. Services Manager of NAL 4pm Liaison and Advisor Meeting	14 6pm Final Draft of Methodology- Advisor	15 3pm Interview: Head of Collections Management	16
17 Week 2	18 11:30am Interview: Asst. Systems Librarian for NAL 2pm Interview: Head of Contemporary Section 2:30pm Interview: Access Manager of PDP	19 Pilot Survey 2pm Presentation King'sCollege 15-min. Presentation	20 9:30am Interviews: Archivist of Art and Design, Museum Archivist, and Head of Archives of Museum Archives 4pm Meeting	21 9:15am Deputy Keeper of NAL/PDP 2:30pm Head of ISSD	22 2pm Assistant Curator of Special Collections 6pm Final Drafts of Intro. and BR chapters	23
24 Week 3	25	26 Start Survey	27 4pm Meeting Passed in Revised Methodology	28 Revised Methodology Due	29	30
31 Week 4		Surveys			Library Closed: Easter	

Appendix L.2: April Project Schedule

April 2002

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Week 4	1 **Long Weekend No Work**	2 1:30pm Kings College- Presentation	3 10am Systems Developemnt of ISSD 11:30am Telephone Exchange Staff 4pm Meeting	4 6pm 3-5 pages summary of data and conclusions Revisions to Intro and BR chapters if needed.	5 11am Enquiry Manager of the British Library	6
Week 5	7 8	9 10am Archivist of NHM	10 4pm Meeting	11 11am Program Engineer at a leading professional body	12 6pm Data, Analysis, Conclusions and Recommnedations Chapter Due	13
Week 6	14 15	16	17	18 Noon- Paper Copy of Presentation also Rough Draft of IQP 6pm Copy to team critiquing paper	19	20
Week 7	21 22 9:30am, Final Presentation	23	24 4pm Final Paper due to Liaisons	25	26	27 Go Home
	28 29	30				