HEALTH INFORMATION AND QUALITY AUTHORITY
Online Catalogue of National Health and Social Care Data Collections

March 2014

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DECLARATION

I declare that the work described in this dissertation has been carried out in full compliance with the ethical research requirements of the School of Computer Science and Statistics.

Signed: __________________________

Niall Clarke
24th March 2014
ABSTRACT

The overall aim of this project is to improve the way in which the Health Information and Quality Authority’s Catalogue of National Health and Social Care Data Collections can be accessed online. The project seeks to achieve this through the development of an online prototype facility that is intuitive, easy to use and has a good aesthetic design. Such a system will allow various types of users of health information to find and retrieve the information they require in as efficiently as possible.
This project was undertaken for the Health Information and Quality Authority (HIQA).

The Catalogue of National and Health and Social Care Data Collections provides information on Irish health and social care services in a single location.

The client was seeking a facility that would make this information easily available to potential users online.

There were problems in terms of how the facility could be developed to fit in with the client’s existing website. The client’s website is based on a content management system, Drupal, that was unfamiliar prior to starting this project. As a result, there was a change in initial expectations of the project.

I would like to use this as an opportunity to further thank all those whom I worked with on this project. Within HIQA, the enthusiasm and encouragement of Tracy O’Carroll provided direction and clarity on the project. Orla McManus provided great information about HIQA’s existing web system and made many great suggestions that I managed to include in my final output. The staff in the Cork office also provided fantastic feedback that was of great benefit.

Within TCD, I would like to thank Cathal Walsh for the guidance he offered throughout the project.
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REFERENCES
1. INTRODUCTION AND SUMMARY

This chapter introduces the client, the background to the project and the terms of reference upon which it is based. It also outlines the structure of future chapters and provides an overview of information contained therein.

1.1 Client Background

The Health Information and Quality Authority (HIQA) is an independent statutory authority whose responsibility it is "to promote safety and quality in the provision of health and personal social services for the benefit of the health and welfare of the public." The Health Act 2007 establishes their responsibilities:

- Setting Standards for Health and Social Services
- Supporting Healthcare Improvement
- Social Services Inspectorate
- Monitoring Healthcare Quality and Safety
- Health Technology Assessment
- Health Information

During this project, I worked with the Health Information directorate, who are tasked primarily with the collection, evaluation and sharing of information across health and social care services and on the implementation of information technologies.

1.2 Project Background

Information systems have potential to offer many benefits to those working within the healthcare area such as improving the storage of medical records, the communication between medical practitioners and patients and the sharing and access to best-practice information (Bodenheimer & Grumback, 2003).

In 2005, a Princeton Survey Research Associates study published by the Pew Internet and American Life Project (a non-profit organisation that examines the social impact of the internet and does not advocate policy outcomes), found that 80 percent of American internet users looked for health information online. Searching for health information online at the time was the second most popular activity of non-business internet users after email. (Smith, 2006)

The internet and information technology has a critical role in ensuring that information to drive quality and safety in health and social care settings is available when and where it is required. The Catalogue of National Health and Social Care Data Collections is an excellent resource for various stakeholders in the health information field. However, as a physical document, it is not readily searchable and shareable.
The existing implementation of the Online Catalogue has limited search and filtering facilities. A revamp of these facilities was deemed necessary to allow users quick and efficient access to the information that they’re looking for. The current system requires users to have large degree of knowledge on what they are looking for. New users may have to look through a number of different collections before finding the information they require.

1.3 Project Objectives

During initial consultations with the client, a set of project objectives were decided on. These were:

- The new system should considerably improve the search experience. Information required by users should be provided in as efficient a manner as possible by utilising this search facility.
- The system needed to have considerable input from members of the Health Information team.
- Comprehensive help files needed to be developed for both using the system and also integrating the system into the current web infrastructure.
- The project should be completed by the end of February.

These objectives were quite vague, as it was acknowledged that things would change when a technical introduction to the existing website was given. These initial project objectives formed the basis for the Terms of Reference and Project Initiation Document.

The user experience, based on a strong search experience, was identified as a key performance indicator. The necessity of having considerable input from members of the Health Information team led to the weekly on-site work that dictated the flow of the project. Setting the project end the for a number of weeks before the official end date provided some space for time overrun, without inhibiting the performance of the finished project or compromising the ability to produce a detailed report with comprehensive documentation on system usage and integration.

1.4 Terms of Reference

Scope

In Scope: The building of a prototype system using information contained in the Catalogue of National Data Collections that will be able to integrate with the existing infrastructure used on the HIQA website.

Out of Scope: It was acknowledged that the developed system should take the form of a prototype. It was necessary to develop it outside the existing web framework, but in the way that would allow it to be integrated into their current system when required.
Deliverables

A working prototype that provides:

- An intuitive and aesthetically pleasing display.
- Powerful search facilities.
- Internal and external linking that promote ease of use.
- The ability to retrieve and transfer information in a user-friendly manner.

Key Assumptions

The project will be developed as a flexible prototype that can be changed according to stakeholder requirements. It will be provided in a modulated way that will allow particular parts of the system to be used as necessary.

Stakeholders will have a continuous input on the direction of the project, allowing it to be progressed in an agile rather than a waterfall manner.

Constraints

- There's very little scope for deadline extensions.
- The project must be developed in a test environment outside of the existing Drupal web infrastructure.
- Contact time with stakeholders is limited to one day per week, which is quite limited.

Dependencies

The nature of the project necessitates continuous contact with a number of stakeholders in the organisation. There will be on-site contact every Monday, as well as some off-site contact as required by project deadlines.

1.5 Summary

- Chapter 2 presents an overview of the current infrastructure, the current system and provides a description of the role and functionality of the new system.
- Chapter 3 contains a detailed description of the work done over the course of the project.
- Chapter 4 outlines the conclusions arrived at during the system's development as well as recommendations for the system's future.
2. CONCLUSIONS AND RECOMMENDATIONS

This chapter concludes what has previously been discussed and makes some recommendations for the future.

2.1 Conclusions

The completed prototype fulfils the client requirements (detailed in the terms of reference in section 1.4). The existing web version of the Catalogue of National Health and Social Care Data Collections lacks a thorough search system and isn’t as user-friendly as the client required. The new system improves in both of these areas by providing user-defined searching ability as well as an easy to use navigation system.

Each of the requirements was met as follows:

Search

The existing search feature worked by an alphabet filter system. It is required that the user know the exact name of the data source that they are searching for, and essentially served as a replacement for scrolling. The new search system allows the user to search based on the following fields:

- Title of data collection
- Managing organisation
- Keyword

This will allow new users, as well as those familiar with the data collections, to find the information they require in a much more efficient manner.

Display

The current landing page for the National Health and Social Care Data collections relies on text based hyperlinks for navigation. The new system minimises the text on the landing screen, by providing a short preamble and using images for navigating to the different sections.

Linking

The developed prototype devotes an entire section to ‘Related Documents/Useful Resources’, that helps users navigate to other areas of the existing site that might be of use to them. There is also a prominent visual link on the home screen that allows users familiar with the catalogue to download it in its entirety as a PDF. Each data collection has a link to the relevant content in a prominent position that allows users to navigate quickly between the metadata and content they require.
Sharing

After looking into different methods of sharing sections of the catalogue via email and PDF, the most straightforward and efficient option proved to be integrating the ShareThis Drupal module that was already in place on other areas of the site. As a result, each data collection can be shared by email using the client’s server, and won’t require the user to use their own mail program.

The process of developing this system was an unfamiliar one and proved quite challenging. The system was built in its entirety within the Drupal system, though knowledge of other technologies and programming languages was required throughout the process. During the planning and development stage, I worked with Drupal CMS, PHP, MySQL, HTML, Apache, Windows OS, JavaScript/JQuery and photo imaging software. Much of this was familiar from previous college work, but a lot of extra learning was required. The opportunity to combine knowledge I’d acquired across various different college modules with new learning and utilise it on an interesting and engaging project was very enjoyable.

2.2 Recommendations

As this project was completed in an agile environment, with continuous feedback from the client, its workings should be known to them. Assisted by the documentation, its maintenance and any necessary amendments should be relatively straightforward.

There will be a challenge in merging this new prototype onto the existing website. Consideration has been given to the fact that the client intends to overhaul their website in the not too distant future, and as such the system is built in a way that should migrate well to both the existing and any future platform.

In addition to this report, the client will be provided with all the files I’ve worked with on the project. Some of these files may be loaded onto the existing file base, though that may be inappropriate in some cases and some aspects of the system may need to be manually recreated. The documentation in the appendices outlines this process in detail and should minimise any problems associated with migration.

It is recommended that the client use some of their available resources to augment the core systems as previously discussed. For example, any images in the system at present are free and open-source and can be replaced from the client’s own more extensive repository of stock images to improve the visual appearance of the system.

In terms of system maintenance, there are no additional steps that need to be taken on top of normal routine for the existing website.

This system is fully extendable using Drupal. There are a number of different modules that can be added to the existing install that would add extra features to the existing installation. These were outside the core objectives of the system, but can be added at the client’s discretion. As a result, I’ve included some suggestions in this area in the appendices.
3. SYSTEM OVERVIEW

This chapter details the client’s existing web infrastructure, the current online representation of the Catalogue of National Health and Social Care Data Collections.

3.1 System Objectives

The system’s objectives were determined through continued interaction within the client and were amended as necessary during the course of the project. In initial consultations with the client, a basic outline of requirements was determined. These initial requirements were that:

- The system was to have an intelligent search facility
- The system was to be visually impressive
- The system was to provide various methods for sharing information
- The system was to be well linked to other information

After further meetings with technical personnel at the client, it was decided that the system would need to integrate into the current web environment at HIQA.ie, and consequently that the prototype would need to be built on an independent platform using the same content management system. These latter requirements did somewhat limit the system’s ability to excel in all of the previous requirements.

Each of these requirements was met in the final version of the system:

- The system has basic and advanced search facilities that allow users to find the information they need.
- The system features a design built with Drupal user interface tools and modelled on other health information websites.
- The system uses the ShareThis module to allow users to share parts of the catalogue via email and social media.
- The metadata page of each data collection places the URL of the data source in a prominent position, allowing the user to easily navigate to other websites.

3.2 Technical Environment

The client’s current website is built using Drupal, an open-source content management framework. It is used as a back-end framework on 2-3% of all website on the Internet. Drupal, like many content management systems, offers administrators abilities to manage their websites using a central interface.

As it was necessary that the system be able to integrate into the client’s current web infrastructure, it was agreed that the prototype system would have to be developed in a similar environment. Due to the nature of the Drupal system, the system would have to be built independent of the current system using a completely separate installation of Drupal. Furthermore, the system would have to replicate all necessary elements of the existing site.

The initial work in building a replication of the current website was done on a local WAMP environment. WAMP stands for Windows, Apache, MySQL and PHP.
- Windows is the operating system upon which the local implementation runs.
- Apache is a web server application that is used on the majority of websites worldwide.
- MySQL is a relational database management system.
- PHP is a server-side scripting language.

Each of these four components is necessary for running a Drupal installation at a local environment.

After the website had been replicated and the initial system shell had been developed, a live version of the system was necessary to demonstrate progress and ensure continuous feedback. To accomplish this, a web hosting package and domain was purchased from Register365, and the work from the WAMP environment was moved to this location.

This hosting environment runs on a Linux server running Apache and MySQL, which is necessary for the Drupal environment. This live hosting will remain in place for a period after the project’s completion for the client’s use.
3.3 System Overview Diagram

![System Overview Diagram](image)

FIGURE 2.3.1: System Overview
3.4 System Walkthrough

The automatic landing page for the developed system will be the dashboard. This can currently be visited at www.technicalspace.eu/drupal.

From the dashboard, there are four navigation options within the system (as shown in Figure 2.4.1):

![Figure 2.4.1](image-url)
Search

This is via a search box that is consistent across all pages on the system. In the prototype system, this box appears at the bottom of the content but when integrated will be places in a block on the client’s custom template that is positioned above the content.

This search box is part of the basic search functionality and searches all records by keyword. As a result, this box can be used to search for any parameters that are available in the metadata. It is envisaged that this search functionality will satisfy the requirements of most users. After entering a search term (or leaving the field blank), the user will be redirected to an index of the data collections that contain their desired search term (a blank field will display all the data collections). A demonstration of this can be seen in Figure E.4. From here, the user can select the data collection that they require.

If the basic search feature isn’t comprehensive enough, the user can navigated to the advanced search area, available via a link below the page’s title. Currently the only additional search field available is Source type (shown in Figure E.5). However, this can be easily added to when integrating the system.

Whether via basic or advanced search, the user will navigate to the data collection that they require. The data collection reproduces the content from the physical catalogue, though does move the web link to a more prominent position to improve the user experience.

About Page

This link directs the user to a page that gives a basic overview of the catalogue (without reproducing the extensive information contained within). There are options on this page for downloading the entire catalogue (via a hyperlink and a linked image) as well as email details for requesting further information. The consistent search box is still present here, to allow users to make a search of the catalogue without having to return to the home page.

Related Documents

The Related Documents/Useful Resources link takes the user to an index of links to other pages on the client’s existing site that they may find useful while using the system. Currently, there are links to ‘Health Information Governance’, ‘Guiding Principles for National Health and Social Care Data Collections’ and ‘What you should know about Data Quality: A guide for health and social care staff’. These can be added to as necessary by the client.

Download As PDF

This link simply downloads the catalogue in its entirety as a PDF file. This will be useful for users who are familiar with the catalogue and don’t require the search tool to find the information that they’re looking for.
4. **DESCRIPTION OF WORK DONE**

This chapter describes the entirety of the work done throughout the project.

4.1 **Requirements Phase**

The first phase of the project involved meeting the client, setting out some broad goals and objectives and developing a timeline for the project. This phase involved the drafting of terms of reference, a project initiation document as required by the client and a review of existing systems from similar organisations that could be used as a basis for design choices.

This was followed by brainstorming about potential ideas, drawing sketches and running them by the client. These first steps were carried out before any introduction to the current technical environment of the site. As a result, this idea generation phase was quite ranging and drew largely upon similar experiences for the Management Science and Information Systems course – software engineering concepts, relational databases, web development and others.

Following the first meeting with the web administrator, it was clear that a change of focus was needed before beginning the design phase. It was apparent that the system would need to be developed in the Drupal content management system, which was quite different to initial expectations. As a result, a number of weeks were spent working purely on learning the Drupal system before we could re-visit the drafting of requirements. As Drupal was a new environment for me, this side-learning became a continuous activity throughout the project.

After work had been done researching the Drupal system, more meetings were arranged to finalise the client requirements.

4.2 **Design Phase**

This phase identified the technical methods that would be involved in building the system as well as the mechanisms by which the previously agreed upon requirements would be achieved.

Based on previous project work in MSISS, a local web development environment seemed like the best place to carry out early the early parts of the design phase. This allowed the determination of the feasibility of some early ideas. The WAMP environment allowed work from home outside of the regular Mondays of work in the client’s offices.

During the design phase, we selected an appropriate interface via an informal survey of people involved with the physical catalogue. For this, a selected of designs were drawn from other sites and some rough templates were distributed via email to various stakeholders.
In developing ideas for a search system, I met with some staff members of Trinity Library who explained some features of their search system as well as some other search technologies available. The main options that stemmed from this were:

- A simple database search system
- Implementation of third-party search software such as Apache Solr
- Building an advanced search system that attempted to replicate the features of commonly used search systems.

As a result of the timeline of the project as well as the fact that search system would be run on a relatively small dataset, the simple database search system was chosen. Implementing a database search system in Drupal requires the installation of additional modules to the core installation. The popular Views model adequately served this purpose as well as several others.

4.3 Development Phase

After most design decisions were made, development of the prototype system began on the WAMP environment throughout late December and early January.

The first stage of this phase involved the creation of a basic shell of a site upon which all the information would later be placed. In technical terms, this involved the creation of a number of nodes in Drupal that would effectively act as dynamic web pages. Also created during this stage were a number of content types that would determine the structure of each page.

The second stage involved the loading of some test information onto the site that would be used in developing the search system. To do this, a selection of 20 data collections were loaded onto the site. The search system was then built in Drupal’s Views module based on this initial sample.

There was an option of using web space provided by TCD to host the site. However, based on previous experience, a better option was to purchase a premium hosting service for the duration of the project. It was necessary to be able to access the website at all times and from all locations, so an external host made sense for this purpose.

4.4 Implementation and Testing

As per the agile development methodology that was adapted, continuous testing took place throughout the development process. During the early stages of the project, it was necessary to complete quite large portions of development at the time before the system took shape. As a result, testing at an early stage was done independent of the client.

Once the basic system was in place, the development model switched to a weekly development cycle, along the following lines:
Monday
Testing and demonstration of the previous week’s work. Identify features for the next development cycle.

Tuesday-Friday
Development of proposed features.

Saturday-Sunday
Independent testing of new features.

This system took place in the form of weekly meetings in person with staff at the client’s Dublin office as well as video conferencing meetings with staff involved in building the catalogue in the client’s Cork office. These regular meetings were crucial in ensuring the project remained on track and to specification, and the client’s input was a major part in its success.

4.5 Problems Encountered

The nature of the initial project outline and early client consultations meant that planning for the system began before receiving a technical overview of the client’s web infrastructure. As a result, a number of weeks were spent creating conceptual models of a system that would work under a MySQL/PHP/HTML framework. Quite a bit of work was done in designing broad database relationship diagrams as well as PHP workflows. After it became clear that there was a Drupal content management system in place, there was a big shift in focus.

Previous college experience had given an introduction to what content management systems are and how they work. However, I had little in the way of practical experience in using them. A solid basis in relational databases, scripting and front-end web design helped a lot in becoming familiar with how Drupal works, but there was still a significant learning curve in gaining a level of ability that allowed the project to progress. The time spent conceptualising a more traditional web framework and then studying Drupal took up a significant amount of time that could have been utilised in improving the system.

Drupal and content management systems in general offer some great benefits to users, simplifying what would otherwise be unwieldy websites. During this project, using Drupal had some positive and negative effects. Some tasks were completed quicker, such as creating content-type templates and implementing a simple ad-hoc search system. At other stages, the systems proved to be limited and inflexible when trying to fulfil objectives that could quite easily be solved using code. A standout example of this was in building an advanced search system modelled on a library website that would offer a complex filtering system. Previous projects had involved building similar systems using code without issue. There was no intuitive way of doing something similar in Drupal though.
As an open-source system, Drupal features many user-contributed modifications and add-ons, some of which were already used on the client’s existing system. A limitation to the project was that there needed to be some thought given to what sort of new modules that could be added because of the new system that this project was building. Consensus was reached on:

- Using a minimum of modules to minimise the memory impact from the system.
- Using only modules that were actively maintained
- Using only modules that were under active development

As the system was only forming a minor part of the client’s overall site, it made sense to minimise the amount of space that it would take up. The other two considerations were necessary to ensure reliability and consistency. A further limitation on the modules was that the current site was built using Drupal 6, not the more recent and more developed Drupal 7.

It was important at all stages that the work being done was in-line with current site standards. The finished prototype had to be designed so that it would seamlessly fit into the current site. Ideally, this would mean building the system on a live test environment of the existing site. The drawback to this was that the entirety of the system building would have to be done on-site at the client’s offices. There was consideration given to this at the project outset but it was deemed infeasible due to time constraints. As a result, the next best option of mimicking the existing template was selected. This allowed the system to be built within the parameters of the existing site, which was the most important consideration. Unfortunately though, it didn’t allow a completely true picture of how the system would look when integrated. Hence, the design currently displayed on the test site, isn’t the same as it will be when moved onto the client’s site.

### 4.6 Measuring System Success

![Diagram](image)

**FIGURE 3.6.1**

The DeLone and McLean IS success model was first introduced in 1992 to “synthesise previous research involving IS success into a more coherent body of knowledge and to provide guidance to future researchers” (DeLone & McLean, 2003). It is the most widely cited IS success model, and has been used as the basis for much research in the area of IS
success measurement (Gable et al, 2008). The model uses three inputs; ‘Information Quality’, ‘System Quality’ and ‘Service Quality’. Each of these inputs is an effective measure of system performance in a certain area of an information system (Dickson). Maximising all of these should promote intention to use and user satisfaction with the system.

‘Information Quality’ in the model describes the desirable characteristics of outputs from the system. A clear distinction can and should be drawn between this and ‘System Quality’, this characteristic focuses on information output, while the ‘System Quality’ characteristic focuses on the system’s performance in a technical and design sense. The ‘Information Quality’ of the system built during this project is largely dependent on the physical version of the Catalogue of National Health and Social Care Data Collections.

‘System Quality’ focuses on the system’s performance in a technical and design sense. In certain systems, good ‘System Quality’ can be a prerequisite for any success, as both ‘Information Quality’ and ‘Service Quality’ can be dependent on it. Maximising the system quality was the main goal of this project. The project has been a success under this measure as the developed system is able to handle each client requirement as well as each use-case that was identified in an efficient and intelligent manner.

To ensure good levels of ‘Service Quality’, the system needed to provide information on the catalogue as well as links to valuable resources that would be of interest to potential users. As a result, prominent links to an ‘About’ section and ‘Related Documents’ were placed on the navigation page.
A. ORIGINAL PROJECT OUTLINE

Client: Health Information and Quality Authority (Government agency)
Project: Developing a prototype that allows online access to a directory of national data collections
Location: Smithfield, George’s Court, George’s Lane, Dublin 7
Client Contact: Tracy O’Carroll, (01) 8147684
Dept. Contact: Myra O’Regan

Client Background:

Health Information and Quality Authority (HIQA) has national responsibility for improving the quality and safety of healthcare, through the development of standards, monitoring compliance and investigations. The health information directorate is one of the five directorates within HIQA, this directorate is responsible for supporting the improvement of health information, by developing standards, guidelines and setting out recommendations.

Health is information-intensive, generating huge volumes of data every day. It is estimated that up to 30% of the total health budget may be spent one way or another on handling information, collecting it, looking for it, storing it. It is therefore imperative that information is managed in the most effective way possible in order to ensure a high quality, safe service.

In order to facilitate and inform the public about sources of health information, HIQA developed a Catalogue of national data collections in 2010, and is currently in the process of updating the catalogue. In order to help maximise the benefit of this data, and facilitate ease of user access, HIQA want to develop a web-based, user-friendly searchable version of the Catalogue.

Project background:

HIQA published the ‘Catalogue of National Health Information Sources in Ireland’ in 2010. The text version of the catalogue can be found at http://www.hiqa.ie/resource-centre/professionals/health-information, and an online database can be found at http://www.hiqa.ie/resource-centre/professionals/health-information-sources. HIQA are currently in the process of updating the national data collections, both the actual listing and the information relating to each data collection. HIQA plan to completely re-design the online facility, it is envisioned that it will be user-friendly and allow several methods for users to search for data collections for example by theme, area of speciality, organisation that manages the data collection and so forth. The end user should be able to retrieve data for one or several data collections. There will also be a requirement that allows the retrieved data to be manipulated and downloaded according to the end-users needs, for example, canned reports should be available, in addition the end user should have the ability to develop ad-hoc reports, that is
extract the data elements that they require. There should be an ability to print, email or
download the report(s) to a number of formats for example excel, word, xml, pdf etc.

Client Requirement:

The aim of this project is to develop a prototype of a web-based, user-friendly searchable
version of the Catalogue, enabling a large number of users to readily access data on national
data collections. This project will involve developing a specification, liaising with stakeholders as
appropriate, with the final output of a workable prototype.

What is involved for the student?

The main technical emphasis in this project will be on an ability to develop and populate a web-
based portal for the Catalogue. Some knowledge of data mining techniques, programming
ability and developing specifications is assumed, but an imaginative approach to data mining/
website design will be essential. There is significant scope for the student to shape the project
to facilitate learning new methods and approaches.
B. INTERIM REPORT

Project: **Online Catalogue of National Health and Social Care Data Collections**
Client: Health Information and Quality Authority (HIQA)
Student: Niall Clarke
Supervisor: Cathal Walsh

Review of Background and Work to Date

Thus far I’ve focussed on developing a comprehensive terms of reference and project schedule in consultation with my client and supervisor. This involved in-person meetings with the client in Dublin as well as follow up meetings with staff based in Cork via video conferencing.

After a terms of reference had been completed and a Project Initiation Document submitted (client requirement), I began familiarising myself with the web architecture into which my prototype system would fit. This involved meeting with the client’s webmaster to discuss the website’s underlying Drupal content management system. During this period, I reviewed some similar systems of interest across the web as well as meeting with technical staff in the TCD library to form an idea of what the project could be modelled on.

I’ve since presented a collection of 6 sample dashboard layouts that I sketched out to the client that it is intended will replace the current catalogue introduction page on the website. This collection of 6 will be narrowed down to 2 via informal surveying within HIQA. There is scope to select a single layout via some more formal surveying in future if consensus isn’t found.

Terms of Reference

The project stems from a desire to improve the way in which the Catalogue of National Health and Social Care Data Collections can be accessed online.

The goal is to develop a system that is intuitive, easy to use with good aesthetic design. Such a system will allow various types of users of health information to find and retrieve the information they require in as efficient a way as possible. It was decided that the system should meet certain key deliverables in design, search, linking and reporting.

The developed system will be a prototype, developed outside the existing web infrastructure. It will be delivered in an iterative manner, allowing continuous input from relevant stakeholders.

Further Work

A provisional deadline of December 30th has been set for a basic alpha release that will demonstrate basic functionality of the system, particularly back end search and information retrieval.
A further deadline of February 3rd has been decided on for the first beta release of the system. It is intended that this beta release will have complete backend functionality in terms of searching, linking and reporting.

After February 3rd, a complete front-end will be added and necessary amendments made to the back-end with a view to providing a full release on February 28th.

Conclusions

A complete terms of reference and project schedule has been decided upon between me and the client. I’ve received all necessary information I need to begin work on the system, and will continue working on-site in HIQA until the end of February.

Three deadlines have been set for alpha, beta and full release. Extra deadlines for more specific goals can be added on an ad-hoc basis after work has fully begun on the system.
C. DESIGN DOCUMENTATION

This section of the appendix details the software development methodologies that were selected for the project and how they were employed throughout.

C.1. Software Development Process

As with most software projects, this one was broken down into three distinct stages of activity:

1. Planning
2. Implementation and Testing
3. Deployment

During each of these three stages, an agile software methodology was employed. Work on choosing software methodologies had features heavily in previous college modules, and so this played a large part in choosing Agile as the methodology to follow.

![Agile Design Model](image)

Figure C.1.1: Agile Design Model

Agile development is a continuous process were the software being developed undergoes ongoing feedback and testing from different stakeholders in the project. As illustrated by Figure...
C.1.1, the agile development process is made up of various “iterations” in which relatively small functionalities are added to the software. Each iteration during this project lasted approximately one week. While iterations on most software projects last two to three weeks (Highsmith & Cockburn), one week seemed a more appropriate choice in this project due to the very limited and definite timespan.

This methodology was the most suitable for this project because of the importance in front-end features. The client’s extensive knowledge of the information being presented as well as their user-base meant that their input on various features was critical. The first basic principle of agile development is that you can show project sponsors working code as soon as possible, code that can be changed as necessary after feedback. The second is that people are used effectively, an area that this project performed extremely well in.

C.2. System Design

In the planning stage of the project, a basic idea for what the system would look like was devised. The system would have a central dashboard that would act as a navigation platform for users of health information. There were certain limitations for the dashboard because of the existing site. All features had to be contained within the top and left sidebars. A sample of five different mock-up designs were created to form the basis for future design decisions. Each of these designs were based on other health information sites.

None of the designs were final candidates, but they would serve as models for the Drupal Implementation. The result of the design consultations was that a more minimalist version of Figure C.2.3 would be the best design to focus on.
Catalogue of Health and Social Care Information Sources in Ireland

What are national health information sources?

A considerable amount of information is collected on a daily basis about our health and social care services in Ireland. This information is used for many important purposes such as examining how frequently certain diseases occur, measuring performance of health organisations, looking at how resources are used in the health system, and developing healthcare policies. Examples of major national health information sources in Ireland include the National Cancer Registry Ireland and the Hospital In-patient Enquiry Scheme.

FIGURE C.2.1
Catalogue of Health and Social Care Information Sources in Ireland

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About The Catalogue

Browse

Download

FIGURE C.2.2
Catalogue of Health and Social Care Information Sources in Ireland

What are national health information sources?

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Data we collect
- View information about the data we collect, how we collect it and the data sources available to us.

Cancer factsheets
- Factsheets provide a frequently updated one-page summary of statistics for a particular cancer.

Online cancer incidence
- Design customised tables of rates and numbers using location, cancers, years or areas in webpage or CSV format.

Survival statistics
- Access relative survival statistics for selected cancers, years or areas in webpage or CSV format.

Data set download
- Download our dataset directly. It is available in CSV or DBF formats and is classified both by ICD-10 and ICD-03.

Cancer rates mapped
- Maps depict annual average cancer rates at county level for various cancers from 1994-2010.
What are national health information sources?

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What are national health information sources?

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D. USER MANUAL

This user manual section of the appendix describes how to navigate and use the developed system.

D.1. Navigation

The automatic landing page for the developed system will be the dashboard. This can currently be visited at www.technicalspace.eu/drupal.

From the dashboard, there are four navigation options within the system (as shown in Figure E.1):

Search

This is via a search box that is consistent across all pages on the system. In the prototype system, this box appears at the bottom of the content but when integrated will be places in a block on the client's custom template that is positioned above the content.

This search box is part of the basic search functionality and searches all records by keyword. As a result, this box can be used to search for any parameters that are available in the metadata. It is envisaged that this search functionality will satisfy the requirements of most users. After entering a search term (or leaving the field blank), the user will be redirected to an index of the data collections that contain their desired search term (a blank field will display all the data collections). A demonstration of this can be seen in Figure E.4. From here, the user can select the data collection that they require.

If the basic search feature isn't comprehensive enough, the user can navigated to the advanced search area, available via a link below the page’s title. Currently the only additional search field available is Source type (shown in Figure E.5). However, this can be easily added to when integrating the system.

Whether via basic or advanced search, the user will navigate to the data collection that they require. The data collection reproduces the content from the physical catalogue, though does move the web link to a more prominent position to improve the user experience.

About Page

This link directs the user to a page that gives a basic overview of the catalogue (without reproducing the extensive information contained within). There are options on this page for downloading the entire catalogue (via a hyperlink and a linked image) as well as email details for requesting further information. The consistent search box is still present here, to allow users to make a search of the catalogue without having to return to the home page.
Related Documents

The Related Documents/Useful Resources link takes the user to an index of links to other pages on the client’s existing site that they may find useful while using the system. Currently, there are links to ‘Health Information Governance’, ‘Guiding Principles for National Health and Social Care Data Collections’ and ‘What you should know about Data Quality: A guide for health and social care staff’. These can be added to as necessary by the client.

Download As PDF

This link simply downloads the catalogue in its entirety as a PDF file. This will be useful for users who are familiar with the catalogue and don’t require the search tool to find the information that they’re looking for.

D.2. Integration

As this is a prototype system developed outside the existing site, the client will have to integrate it during their planned future website updates. To aid with this process, the test website at www.technicalspace.eu/drupal will remain online for a number of months. Also, included with this report is a CD containing all source code files from that site, many of which can be copied directly into the client’s existing web directory.

Editing Nodes

Existing pages in the system can be modified using the edit link beside the title (this should be removed when the site is published). Selecting the edit link will bring up the page displayed in Figure D.2.1. Here the client can input the information they require, as well as changing the settings on the content. The settings included that can be altered are:

- **Input Format**: This allows the selection between filtered HTML (for novice users) and full HTML (for advanced users who want to input code).
- **Revision Information, Comment Settings, Menu Settings and Authoring Information** will not be necessary for this system.
- **Publishing Options**: To make the current page public, the user should check the ‘Published’ checkbox. ‘Promoted to the front page’ should only be used for the homepage on this system.
National health and social care data collections were defined for the purpose of this project as national repositories of routinely collected health and social care data (including administrative data, censuses, national surveys, and patient registries) in the Republic of Ireland. An example of a national health data collection is the Hospital In-Patient Enquiry Scheme (HIPE), which collects information on discharges from acute hospitals nationally. In total, 108 data collections are included in this Catalogue.

To read more, please visit our "About The Catalogue" section below.

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Admin Section

To create nodes and fulfil various other administration tasks, the admin section of the site is required. The default layout of the admin section is displayed in FIGURE D.2.2.

In the admin section, users can create content (for new data collections), create content types (for new types of data collections e.g. National, Surveys – shown in FIGURE E.7), change search settings in ‘Views’ and define a variety of other settings. Most of these will already be optimised on the client’s existing system, so only the ones mentioned should be required.

---

**FIGURE D.2.2**
Search

The search features in the system are built in the Views module within Drupal. Views allows SQL type queries to be created without manually writing code. The current View for basic search is shown in FIGURE D.2.3.

To edit the existing search system, the user will be primarily concerned with the Fields and Filters areas. Fields will dictate what is shown in the search results – currently the title and the managing organisation (the description field is used to exclude null entries). Filters are what the search is based on – currently the keyword system, with National Data Source set as the node type to search through.

FIGURE D.2.3
D.3. Drupal Modules

The Drupal modules used in building this prototype that will be necessary for using this prototype are:

CCK (Content Creation Kit)

This module allows the creation of customised content types that can later be referenced in Views. This module is available at: https://drupal.org/project/cck

Views

The Views module allows the creation of displays via filters that are necessary for the search system. Views comes as a built in module in Drupal 7, but must be downloaded in Drupal 6. It is available at: https://drupal.org/project/views

ShareThis

This allows the sharing of Drupal nodes via email and social media. This module is already part of the client’s Drupal install and will automatically be included as a feature. It is available at: https://drupal.org/project/sharethis

Other modules that aren’t required but can be used to add functionality are:

- Chaos Tool Suite (ctools) – Adds a variety tools for improving the customisation of nodes. Available at: https://drupal.org/project/ctools
- Better Exposed Filters – Works with the Views module to create a more customisable search experience using check boxes and radio buttons. Available at: https://drupal.org/project/better_exposed_filters
E. SCREENSHOTS

This section of the appendix contains screenshots from different parts of the web system.

FIGURE E.1: Home Page
National health and social care data collections were defined for the purpose of this project as national repositories of routinely collected health and socialcare data (including administrative data, censuses, national surveys, and patient registries) in the Republic of Ireland. An example of a national health data collection is the Hospital In-Patient Enquiry Scheme (HIPE), which collects information on discharges from acute hospitals nationally. In total, 108 data collections are included in this Catalogue, sub-divided as follows:

- National data collections of health and social care information in Ireland (n=74)
- National censuses (n=3)
- Collections without national coverage/regional collections (n=7)
- Systems that collate data from a number of different data collections (n=15)
- National surveys (n=9).

This catalogue can be searched by keyword on the following data variables:

- Title
- Managing Organisation
- Contributor
- Subject
- Description / Summary
- Statement of Purpose
- Coverage
- Method of data collection
- Data Content
- Data dictionary
- Clinical coding scheme
- Accessing data

If you require additional information please email info@hiqa.ie

Download the full report here.

FIGURE E.2: About Page
FIGURE E.3: Related Documents Catalogue
FIGURE E.4: Basic Search Page
FIGURE E.5: Advanced Search Page
FIGURE E.6: National Data Source example
FIGURE E.7: Create New Data Source
F. SOURCE CODE

Due to the nature of working with Drupal, much of the coding work in this project took the form of editing existing PHP and CSS files. It would be impractical to include all the code from these files in this appendix, so I’ve only include code that I constructed in its entirety. The files that have been edited are available on the CD provided with this report.

Home Page

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This catalogue can be searched by keyword on the following data variables:
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Accessing data

If you require additional information please email info@hiqa.ie


Related Documents

Health Information Governance
Guiding Principles for National Health and Social Care Data Collections
What you should know about Data Quality: A guide for health and social care staff
SELECT node.nid AS nid, node_data_field_keywords.field_keywords_value AS node_data_field_keywords_field_keywords_value, node.type AS node_type, node.vid AS node_vid FROM dr_node node LEFT JOIN dr_content_type_data_source node_data_field_keywords ON node.vid = node_data_field_keywords.vid WHERE (node_data_field_keywords.field_keywords_value) = ('')
REFERENCES


