
COM3610: Dissertation

Survey And Analysis Report

Managing The Extenuating Circumstances Process



The University Of Sheffield

This report is submitted in partial fulfilment of the requirement for the degree of
Computer Science by Rushil Shah.

Date: 03/12/2018

Name: Rushil Shah

Supervisor: Dr. Siobhán North

Declaration

All sentences or passages quoted in this report from other people's work have been specifically acknowledged by clear cross-referencing to author, work and page(s). Any illustrations that are not the work of the author of this report have been used with the explicit permission of the originator and are specifically acknowledged. I understand that failure to do this amounts to plagiarism and will be considered grounds for failure in this project and the degree examination as a whole.

Rushil Shah

Abstract

Background

Students who suffer from personal problems usually fill out the Extenuating Circumstances Form (ECF) which are then processed by various departments, some with higher clearance than others. This project is based on creating a system which can achieve confidentiality, ease of access and increase efficiency by reducing paperwork. Data has to remain confidential not only with different levels of hierarchy but also from outsiders trying to gain access.

Project Aims

The system should achieve confidentiality, allow the stakeholders to toggle around quickly and efficiently allowing feedback and communication at all times and should reduce the paperwork pile.

Achievements to date

Comparison between potential systems; Web based system or a mobile phone application. Information processing with a lot of data would not be readily accessible on an application and so a web based system is a potential project.

Acknowledgements

Contents

Title Page	i
Declaration	ii
Abstract	iii
Acknowledgements	iv
1 Introduction	1
1.1 Background	1
1.2 Problem	1
1.3 Aims And Objectives	1
1.4 Report Summary	2
2 Literature Review	3
2.1 Introduction	3
2.2 Web-Based, Smart Application Or Blockchain?	3
2.3 Web Based System	4
2.4 Django	5

List of Figures

2.1	Most widely used languages for Web Systems - WhiteHatSec[1] . . .	4
2.2	Security Vulnerabilites in ASP, PHP, Perl, Java, .NET and ColdFusion - WhiteHatSec[1]	4

Chapter 1. Introduction

1.1 Background

Students who suffer from personal problems usually fill out the Extenuating Circumstances Form (ECF) which then allows the examination board (the scrutiny committee) to consider their problems. The process usually begins with the student submitting the form and being reviewed. In situations where there is not enough evidence, the committee asks the student to provide more evidence and then processes the information accordingly, for example the committee may ask the student to present a death certificate. The form at this point has detailed information about the personal problem but from here on, only the general problem (without including details of the specific problem the student is facing) is taken ahead to the other departments and also added to the Students Record to allow leniency in terms of examinations and other assignments. Information regarding the ECFs can be found on the University Of Sheffield's page.[2]

1.2 Problem

Students sometimes fill out the form with less detail and so they need to be re-filled or the students have to provide more feedback/evidence. This leads to multiple documents being created and a lot of paperwork explaining the scenario. The forms are then accessed and duplicated by other departments and also added to the system for the Student Report. Multiple departments with different hieratic allowances creates a lot of confusion which then leads to improper book keeping and a reduction in information confidentiality. These forms may also be up for appeal and with multiple and mixed up forms the whole process tends to be biased.

1.3 Aims And Objectives

The system has to reduce paperwork, be secure enough to allow different levels of confidentiality and access and also be an easy but efficient to use system. A system which can be accessed by students, the examination board and can also be integrated into the student report. The forms contain important information in terms of text and so using a device such as a smart phone would not be efficient and could bring up accessibility issues. On the other hand a web based system with the correct levels of security and encryption can be access by anyone as long as they have a device connected to the Internet. All University buildings have access to computers making browsing easy. A big screen would allow accessibility and information can be processed swiftly.

Django[3], a high-level Web Framework based on Python allows the design of the system we are looking for. Its built-in features allows the coder to avoid and prevent

security threats such as SQL injection, cross-site scripting, cross-site request forgery and clickjacking[3]. It also data to be stored and encrypted in a database,

1.4 Report Summary

The report consists of five different chapters including this one. Chapter Two - Literature Review which expands on the use of web systems for solving the problem as well as other possible techniques that could be used but were not because of limiting factors. This chapter contains a broad variety of information and research. Chapter Three - Requirements And Analysis, contains specific information building on the previous chapter and contains evaluation of the project. Chapter Four - Progress will talk about the the testing and results that have taken place with all achievements to date. Lastly Chapter Five - Conclusion And Project Plan will summarise and end the report on the projects plan.

Chapter 2. Literature Review

2.1 Introduction

Digitalising the Extenuating Circumstances Forms would have different platforms to choose from. Technology has advanced to different levels. Web based Systems, Smart Phone Applications, Virtual Reality, Augmented Reality, Artificial Intelligence[4] and recently introduced Blockchain Technology. However, for a system allowing users to fill forms it would be difficult to use Virtual Reality and Augmented Reality as these are used for altering the perception of the world[5]. Same goes for Artificial Intelligence as this would be costly to implement and not very useful when it comes to Extenuating Circumstances. In this section we will look at Web Based Systems, Mobile Phone Applications and the Blockchain Technology. Further ahead we will eliminate Mobile Applications and Blockchain and focus more on the Web Based Systems.

2.2 Web-Based, Smart Application Or Blockchain?

Blockchain is built on transparency. It will allow the storage of forms and data to be secure and encrypted with no central database holding everything. However, Blockchain is more useful when a digital property is involved as it works efficiently with trading and not storage for single entries. It still is a new technology and there is not enough detail on how exactly it can be helpful[6].

Smart Phone Applications on the other hand are used almost daily. There are officially more Mobile Phones than people in the world[7]. Students all use smart phones and it would be easy for them to use a simple application to fill in all the questions and feedbacks for the form. However, the same brings an issue for data processing and readability for the examination board and student report. The scrutiny committee would want the data to be readily available, not having to download a new application where they can barely read the large amounts of data and attachments uploaded by the student. Using mobile applications would allow instant communication as the system can use notifications for constant feedback and review processes.

Web Based Systems have been in the market for quite a while now and they still are the most used compared to any other digital technology[8]. Being accessible from any internet connected device this makes it usable from Mobile Phones, Desktops/Personal Computers and other devices. Web system would also allow the scrutiny committee to access the system and view it on a big screen.

2.3 Web Based System

Web based systems are spread into various different languages with both positives and negatives. Java, .NET, PHP, ASP, Python, Ruby, ColdFusion are just a few of the most used language examples for web systems[9].

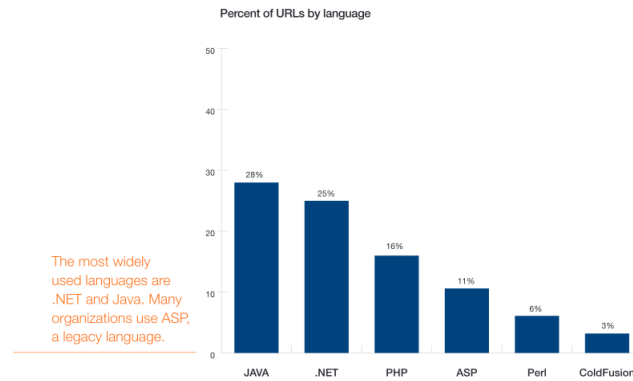


Figure 2.1: Most widely used languages for Web Systems - WhiteHatSec[1]

With all these languages, the highest priority would be to find a language which has Cyber Security as one of its strong points. .NET, Java, ASP, PHP all come with a high number of vulnerabilities as they are highly used[9].

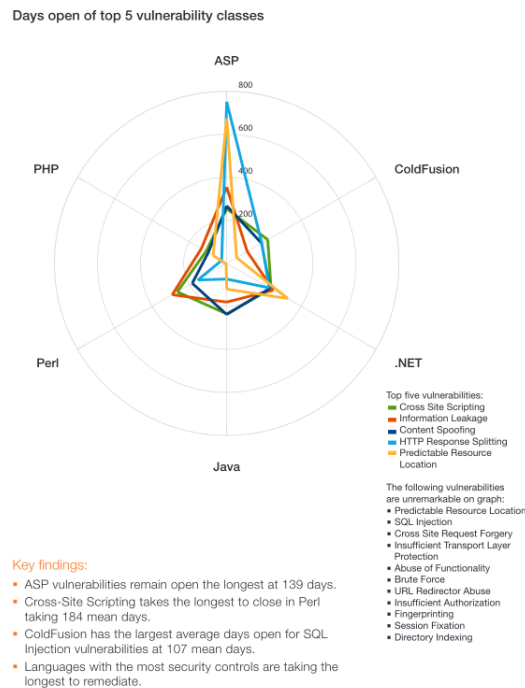


Figure 2.2: Security Vulnerabilites in ASP, PHP, Perl, Java, .NET and ColdFusion - WhiteHatSec[1]

This would then leave us with Python and Ruby which are both easy to code with and used widely. Using a web framework of the languages, Django(Python) or Ruby On Rails(Ruby) would be a smart idea because frameworks allow increased security as they are built for this and increase the efficiency and are cost effective[10].

2.4 Django

References

- [1] W. Security, “2014 website security statistics report.” <http://info.whitehatsec.com/rs/whitehatsecurity/images/statsreport2014-20140410.pdf>, 2014. Accessed: 06.11.2018.
- [2] U. Sheffield, “Extenuating circumstances form: Explanatory notes - forms - ssid - the university of sheffield.” <https://www.sheffield.ac.uk/ssid/forms/circsnotes>, 2018. Accessed: 01.10.2018.
- [3] Django, “The web framework for perfectionists.” <https://www.djangoproject.com/>, 2018. Accessed: 01.11.2018.
- [4] F. J. DeMers, “7 technology trends that will dominate 2018.” <https://www.forbes.com/sites/jaysondemers/2017/12/30/7-technology-trends-that-will-dominate-2018/#7e4e30157d76>, 2017. Accessed: 01.11.2018.
- [5] J. Ronzio, “7 technology trends that will dominate 2018.” <https://cramer.com/story/the-difference-between-ar-and-vr/>, 2018. Accessed: 03.11.2018.
- [6] A. Castro, “Blockchain’ is meaningless.” <https://www.theverge.com/2018/3/7/17091766/blockchain-bitcoin-ethereum-cryptocurrency-meaning>, 2018. Accessed: 06.11.2018.
- [7] Z. D. Boren, “There are officially more mobile devices than people in the world.” <https://www.independent.co.uk/life-style/gadgets-and-tech/news/there-are-officially-more-mobile-devices-than-people-in-the-world-9780518.html>, 2014. Accessed: 06.11.2018.
- [8] A. Larson, “How many websites are there?.” <https://www.independent.co.uk/life-style/gadgets-and-tech/news/there-are-officially-more-mobile-devices-than-people-in-the-world-9780518.html>, 2018. Accessed: 08.11.2018.
- [9] Upguard, “Which web programming language is the most secure?.” <https://www.upguard.com/blog/which-web-programming-language-is-the-most-secure>, 2018. Accessed: 01.10.2018.
- [10] Cabotsolutions, “Django vs laravel: A comparison of web application frameworks.” <https://www.cabotsolutions.com/django-vs-laravel-a-comparison-of-web-application-frameworks>, 2018. Accessed: 01.10.2018.