SOFTWARE REQUIREMENTS SPECIFICATION

Guyana Police Force Electronic Certificate of Character (GPF-ECC)

Prepared for

The Guyana Police Force

Prepared by

592 Logistics

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592 Logistics members:

Shauna Lindo USI# 1039625

David Constantine USI#1009684

Oumotia Morris USI# 1039661

Kelvin Daly USI# 1040123

Tyrese Deleon USI#1039899

Khushal Lam USI#1041006

Ronaicia Stephens USI#1041912

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0.1 Introduction

0.1.1 Purpose

The purpose of this Software Requirements Specification is to detail the requirements for the Guyana Police Force Electronic Certificate of Character (GPF-ECC). This software will digitize all aspects that are being done by the current paper-based system while adding capabilities that other law enforcement or government institutions may benefit from. However, our solution is expected to meet very specific objectives and goals that will ensure a structured solution to store and organize the information needed for a certificate of character. We intend to create an efficient service by cutting the waiting time down by 50%, reducing the manpower needed to facilitate the process, and raising the standard of security and accuracy of the entire process.

To realistically reach our mandate of a fast, reliable, secure, and accurate system, a web-based platform was selected to accommodate our project. Since it can easily work on a client-server model to share the application, which is the Guyana Police Force Electronic Certificate of Character (GPFECC).

The goals and objectives outlined below guided the team to propose an information system that is based on a client-server model facilitated by the internet. Physically, there will be a central server set up to handle all the data that will be collected by the application (GPF–ECC) which can be accessed by at least twelve (12) clients set up at the regional divisional headquarters established throughout Guyana. These clients will be outfitted with all the necessary hardware and software needed to ensure a reliable system; the contents of this document will go into detail on what they are and what performance they will offer. At the culmination of this project, the developed web-based application, along with prerequisite hardware, will see a complete restructuring of how the

Criminal Records Office (CRO) functions and will reduce the hassle associated with the current process of acquiring a certificate of character, regardless of the reason.

0.1.2 Intended Audience and Reading Suggestions

This document is intended for the following groups of individuals as outlined below:

Developers

This document will give the developers a huge advantage since they're able to quickly understand the functional and non-functional requirements, as well as the methodology of the software engineering process, thereby minimizing the time and effort needed to complete the project.

Project Managers

This document will give project managers a general understanding of the scope of the software as well as the various requirements of the system and what the final product should look like.

Members of the Guyana Police Force

All the members employed by the Guyana Police Force Criminal Records Office will have a clear understanding of the software requirements.

Vital information about Non-Functional requirements, for example, Performance and Security is contained in this document. The Members of The Guyana Police Force would be able to attain knowledge of the system and ensure that the software is designed to meet their requirements. It can also help the developers and project managers to foresee what qualities the system should possess.

0.1.3 Acronyms and Abbreviations

(GPF-ECC) Guyana Police Force-Electronic Certificate of Character

(CRO) Criminal Records Office

0.2 Overall Description

The proposed solution will be referred to as the "Guyana Police Force Electronic Certificate of Character". It is an integrated digital version of the current manual and paper-based processes being carried out as part of the application and issuing of a Certificate of Character. It is a web-based system that will use a client-server model. It offers users a simple digital mechanism to conduct the steps involved in the application and issuance of a Certificate of Character. The information system is made up of the subsystems that will replace the processes listed below as described:

Process	Description
Application	1. The information system will include an online web interface and mobile application that citizens can access from any location to commence the initial application process for Certification of Character. 2. Photographs and Fingerprints of the applicant after their initial application will be collected through a separate interface of the information system that interconnects with standardized law enforcement digital photography and digital fingerprint-scanning hardware.
Payment	The information system will provide an interface to record payments made by the applicant through one of the following payment methods: 1. Third-Party Payment Services (Mobile Money, SurePay, Western Union) 2. Bank Transfer

Applicant Verification (internal)	The information system will facilitate the functionality of cross-checking previous applications of an applicant to avoid duplication
Applicant Verification (external)	1. The information system will facilitate the functionality of crosschecking external digital databases such as those used by the courts to determine the applicant's criminal history. 2. The information system will provide an interface to allow the input and storage of results from other manual processes used by the police force to verify an applicant's criminal history.
Certificate Issuance	The information system will facilitate an electronic sign-off review and approval by the required sections and members of the Guyana Police Force before a certificate is generated and issued.
Certificate Delivery and Retrieval	1. The information system will facilitate the digital delivery and retrieval of an issued certificate by the applicant, via an online interface accessible from anywhere. 2. The information system will facilitate the issuance of certificates to persons who are unable to access the online application. Officers at the various outposts can access the system and complete the application for the individual applying.
FAQs section:	The information system will facilitate a frequently asked section that will contain the answer to the problem which users frequently faced when applying online for a Certificate of Character

0.2.1 Product Functions

1. A system should facilitate applicants to register using different device types.
2. The system must be able to accurately record digitally and store applicants' fingerprints.
3. Tracking of payment methods used by the applicant.
4. Staff must be able to view and assist applicants who register using the online application.
5. The information system will facilitate the digital delivery and retrieval of an issued certificate by the applicant, via an online interface accessible from anywhere.
6. The system should be able to process various payment methods.
7. The system must be able to automatically compile weekly reports.
8. The system should be able to recover smoothly in cases of downtime.
9. The system's security alerts should be able to detect possible attacks and block them.

0.2.2 User Classes and Characteristics

The following describes the user's classes of the information system and their characteristics:

1. **Applicants:** These are individuals who will access the system to apply for a Certificate of Character and retrieve the certificate after it has been issued.
2. **Police Personnel:** These are individuals employed by the Guyana Police Force that will utilize the information system, to monitor the incoming applications and capture the digital

fingerprint and digital photograph of applicants using the software interface and connected hardware.

3. **Verification Officers:** These are individuals employed by the Guyana Police Force that will utilize the information system to perform records verification tasks that determine if the applicant can be issued a Certificate of Character.
4. **Certifying Officers:** These are individuals employed by the Guyana Police Force that will utilize the information system to provide a final approval that the certificate can be issued, with this approval the applicant will be allowed to retrieve the Certificate of Character from the system.
5. **Systems Administrators:** These are individuals employed by the Guyana Police Force that will utilize the information system to maintain user accounts and access privileges, generate reports and troubleshoot general issues related to the use of the software.

0.2.3 Design and Implementation Constraints

This project is of an extensive scale and will be processing high-level information so there may be a need to outsource developers with this level of experience. These persons may be requesting a salary that does not meet the budget allocated for system development. There is also the possibility of delays due to the shipment of the required tools and materials since they are produced outside of Guyana. Next, the possibility of the developers underestimating the project can affect the project completion timeline. Since the application process can also be done online there may be some issues with security and ensuring that the information being entered is authentic. The system will be used at different regional police stations and will be linked to a criminal records database that can bring forth the issue of unauthorized access. With some officer's conduct

searches on an individual's criminal history for their reason. The money needed for some hardware components is rather costly and needed in substantial quantities. Henceforth, the ability to purchase these devices in their needed amount is not completely guaranteed.

0.2.4 Assumptions and Dependencies

- **Compatibility with Third-party Systems:** Our new web-based application software must first be linked to the sub-systems utilized by the Courts across Guyana to verify criminal records. The system must also integrate with standardized law enforcement digital photography and digital fingerprint-scanning hardware that will be installed at various police stations.
- **Network**: Network issues such as a slow connection or loss of connection can affect the usage of the software, the software is dependent on good internet connectivity.
- **Security Breaches**: It is assumed that the Guyana police have in their internal network infrastructure firewalls and virus protection systems to prevent attacks that can affect the performance and availability of the software systems.
- **Skills and Experience:** It is assumed that human resources with the required skills and knowledge will be available and can be acquired to design and implement the required functions of the software system.
- **Uninterrupted Power supply**: The information system relies on an uninterrupted supply of Power
- **Location of Applicant**: It is assumed that the applicant for the certificate of character will be present in the country during the stage where the fingerprint and photograph have to be captured by the Criminal Records Office.

- **Operation issues:** It is assumed that the users of the system are familiar with an internet browser ,and familiar with handling the keyboard and mouse.

0.3 System Features

0.3.1 Description and Priority

System Feature	Priority Level
Online Application Portal - an online web interface and mobile application that citizens can access from any location to commence the initial application process for Certification of Character. This feature is of high priority because it initiates the process that involves the other subsystems to produce a Certificate of Character.	High
Photograph and Fingerprint capture system - The aspect of the software that manages the process to digitally record an applicant's photography and fingerprint. A high-priority feature as this data is required to produce an accurate Certificate of Character.	High
Payments - Tracking - A high-priority feature it enables the application to progress to the next step. The system confirms that the applicant has made a payment.	High
Automated Criminal records cross-checking - The system performs comparisons against other database systems to determine the criminal status of the applicant. A high-priority feature as this data is required to produce an accurate Certificate of Character.	High

Application Status Tracking - The system can inform the applicant of the status of their application. This is not a requirement to produce a Certificate of Character however it is still a key feature to keep the user updated as such it is assigned a medium priority.	Medium
Digital Certificate of Character - The system generates a digital certificate of character for the applicant. This is a high-priority feature of the system as it achieves one of the primary requirements of the system.	High

0.3.2 Functional Requirements

1. Authorized employees should be able to review reports produced weekly.
2. An executive employee should be able to see which employees are signed into the system.
3. Online applicants should receive a receipt of payment within five minutes after the transaction.
4. The system must encrypt all personal data that is inputted by an applicant.
5. The system must be able to notify users when information is inputted in the wrong field.
6. The system should allow users to pause the application process.
7. The system should allow users to return to an application within one hour after being paused.
8. The system must be able to produce an applicant's criminal record within six minutes.

0.4 Non-functional Requirements

1. Accessibility
2. Performance
3. Usability
4. Security
5. Maintainability
6. Portability
7. Reliability

0.4.1 Performance Requirements

- The application should not take more than 10 seconds to load and be usable on the client side to facilitate a swift interaction process.
- In cases where client systems are in outlying regions of Guyana, an independent satellite uplink will be needed to provide internet to those locations to enable connectivity to the main server.
- The application should be able to cross-check conviction records within 8 – 10 minutes since the heavy load will be on the high-end hardware and software on the server side of the operation.

- Normalization of the database is recommended to avoid redundant data and to enhance performance.
- The database should be securely and regularly backed up to ensure little or no loss of data in the case of a hardware failure.

0.4.2 Safety Requirements

The following safety requirements have been identified:

1. **Uninterrupted Power Supply:** The information system is expected to be available 24hrs to persons applying for a certificate of character, continuous read and write operations to the database are expected as such the supply of power to the system is a critical requirement and required to be always uninterrupted.
2. **Data Accuracy:** Inaccurate data in the information system will have legal implications that affect various stakeholders. The information system is expected to validate and ensure there is data accuracy.
3. **Data Recovery-** Data stored in the information system must be protected from any form of accidental or intentional loss. All data should be backedup continuously so it can be easily recovered at any given moment.
4. **Cybersecurity-** Due to the personal and identifiable nature of the data collected by the system. It is required that data is safe and secured within the system, and cybersecurity protocols are required to prevent any tampering with data.

0.4.3 Security Requirements

1. **Account creation:** Systems will require staff to create accounts using their correct badge number (ID) and a password to gain access to the system.
2. **ID and password generation**: The application will not grant access until the user(staff) inputs an ID listed in the system and a strong password containing at least eight (8) characters, including a capital letter, a number, and a symbol.
3. **Account locking:** After three (3) failed login attempts, the user's (staff) account will be locked. To unlock their account, a user(staff) will seek assistance from the (supervisor) to verify their identity and set a new password.

4. **Data Encryption:** Data that is inputted by the end user will be encrypted and stored to maintain data security and privacy.

0.4.4 Software Quality Attribute

This system for the Guyana Police Force would need to meet some quality attributes. The most important quality attribute of this system would be security to reduce the occurrences of network attacks and unauthorized access. We will be incorporating different techniques to protect the information that our system will be storing. Testability is another quality that goes along with security. Our system needs to allow developers to conduct testing for different criteria. Next, functionality and Usability are important because the software should meet the user's requirements and they should be able to operate the system free of difficulties. The software should have amazing performance with thirty users as it would with eighteen users because this software would be used across the ten administrative regions in Guyana.

0.4.5 Business Rules

1. Applicants are the users of the software who are nine (9) years of age or older as the laws of Guyana restricts persons below this age from applying for a police clearance.

2. Only executive managers would be able to view the employees that are currently logged into the system.
3. Weekly and monthly reports can only be accessed by executive managers.

Bibliography

(n.d.). Afiswitch Automated Electronic Criminal Record Checks South Africa. Retrieved November 16, 2022, from https://www.afiswitch.com/

Bandakkanavar, R. (2021, June 10). Software Requirements Specification document with an example - Krazytech. Krazytech -. Retrieved November 16, 2022, from https://krazytech.com/projects/samplesoftware-requirements-specificationsrs-report-airline-database

Conley, S., & Kelly, M. (n.d.). VCE IT Theory Slideshows By Mark Kelly McKinnon Secondary College

Vceit.com Software Requirements specifications (SRS) - ppt download. SlidePlayer. Retrieved November 16, 2022, from https://slideplayer.com/slide/8000692/

Murthy, K. (n.d.). Electronic Criminal Vetting and Management System (eCVMS) By WELLINGTON SIBANDA (R125832V). Retrieved November 16, 2022, from http://ir.msu.ac.zw:8080/jspui/bitstream/11408/3208/1/sibanda.pdf

Requirements Specification. (n.d.). Chair of Software Engineering. Retrieved November 16, 2022, from https://se.inf.ethz.ch/courses/2011a_spring/soft_arch/exercises/02/Requirements_Specification.pdf

Group Participation Report

Section 0.1.1 was completed by David; Section 0.1.2 was completed by Khushal and Tyrese; Section 0.1.3 was completed by Everyone. Section 0.2 was completed by Kelvin and Oumotia; Section 0.2.1 was completed by Ronaicia and Shauna; Section 0.2.2 was completed by Khushal, David, and Kelvin; Section 0.2.3 was completed by Shauna and Tyrese; Section 0.2.4 was completed by Ronaicia and Kelvin. Section 0.3.1 was completed by Kelvin; Section 0.3.2 was completed by Shauna; Section 0.4 was completed by Shauna and Tyrese; Section 0.4.1 was completed by Ronaicia and David; Section 0.4.2 was completed by Kelvin and Tyrese; Section 0.4.3 was completed by Oumotia; Section 0.4.4 was completed by Shauna; Section 0.4.5 was completed by Kelvin and Shauna. Originally each group member was assigned three tasks each and the other sections were to be completed as a group. Unfortunately, constraints such as internet access and work commitments caused other group members to complete those sections that were previously assigned to other members. The strategies that were used by the group to collaborate were WhatsApp, Google Documents, and Zoom. Strengths of online communication are it facilitates easy methods for collaboration, and members can edit the same document at the same time. The weakness of online collaboration is that members do not give group feedback promptly and this causes a delay in the progress of the project. Also, some members would lose internet connection during meetings and their reconnection is not always guaranteed. To combat these issues the meetings were recorded for absent members, task was reassigned to members that were available to complete them, and the completion dates were extended.