Software Requirements Specification

for

The Coronavirus Pandemic System Integrated Control (CPSIC)

Version 2.0 approved

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Revision History

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| **Name** | **Date** | **Reason for Changes** | **Version** |
| Adam Adkins | 4-25-20 | Progression of System Design | 2 |
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# Introduction

## Purpose

This document is intended for The Kent State University Health System managers, physicians, councilors, and other various executives of Kent State University which may be involved in the KSUHS system. This document explores functional and non-functional requirements in detail and describes how this software fulfills each one of these requirements. It also describes the various constraints and standards if the software system in this domain. It includes descriptions of all software/hardware and third-party dependencies in the development of this software.

## Document Conventions

Various abbreviations to clarify:

* KSUHS – Kent State University Health System
* KSU – Kent State University
* DB – database
* CSPIC – The Coronavirus Pandemic System Integrated Control

## Intended Audience and Reading Suggestions

This project is a prototype for the KSUHS case management system and is restricted within the University premises. This project is useful for the physicians and councilors of the KSUHS as well as any other affiliated executives of KSU.

## Product Scope

The purpose of the Coronavirus Pandemic System Integrated Control is to Schedule a visit for patients. Alert patients of appointments. Keep track of patient history (test results, payment). Prepare a schedule of the booked visits. Rescheduling appointments for Personnel “absences”. Restrict random patients and allow only KSU patients. Compute the total amount of money earned per semester. Differentiate between counseling’s money earned and the money earned from medical services. Integrate an automated data visualization showing the number of corona virus cases in US, Ohio, and at KSU. Provide the total number of patients who sought medical attention at KSU. Calculate the percentage of patients who exhibited flu related conditions, the percentage who contracted the corona virus and the number of people who sought mental counseling for issues related to corona virus. Send an alert and prints info on KSU website when virus is detected.

## References

Documents like use case diagrams, class diagrams, scope statement in generic UML format

<http://w3schools.com/>.

# Overall Description

## Product Perspective

The product is a web based Single Page application which could be used to augment or replace the KSUHS system as it relates to the corona virus. The software system can be used for scheduling personnel, scheduling patients, notifying patient and personnel of scheduled appointments, ordering tests, and receiving test results. It should be able to create and distribute visit invoices, process and save payment status, and calculate semester earnings for both medical and counselor services. It should be able to compare the amount of patient visits to positive cases, correlate positive cases to counselor services. It will be able to alert personnel and appropriate authorities of a positive corona cases. The software is intended for the KSUHS and any other HS in need of a similar system.

## Product Functions

The major features of the software include a secure log- in which provides privacy and confirms KSU authentication. A menu with easy to choose options. An interactive schedular that takes personnel availability and divides them into appointment slots which can be accessed by patients to choose. A test portal for which tests can be ordered and received. An invoice creator which will save and provide payment status, calculate total semester earnings differentiate between counselor and medical earnings. A record creator. An automated Corona virus counter for world state and university. A statistics portal which will keep track of positive cases and the number of those cases who sought councilor services A notification system to notify both patients and personnel of appointments.

## User Classes and Characteristics

This system will support two types of user privileges Customer and Personnel. Customer will have access to scheduling management functions. Employees will have access to scheduling management functions, billing management functions and Patient management functions.

**Patients should have access to the following functions:**

* **Authenticate** KSU student/staff
* **Schedule:** Patient Visit
  + **Schedule** medical services
  + **Schedule** councilor services
  + **Reschedule** appointment
* **Invoice:** Patient Invoice
  + **Invoice** payment status
* **Record:**
  + **Record** test results

**Personnel should have access to the following functions:**

* **Record** patient visit
  + **Order** test
  + **Store** lab/test result
  + **Store** diagnosis
* **Invoice** visit payment
  + **Process** payment

**Confirm** payment status

* **Generate** scheduled visit reports
  + **Print** full schedule of appointments
  + **Print** per doctor/counselor schedule
* **Reschedule** appointment
* **Record** doctor absence
* **Authenticate** KSU personnel
* **Generate** Earnings Reports
  + **Generate** total semester earning report.
  + **Generate** reports for medical attention.
  + **Generate** reports for counseling.
* **Generate** visit reports
  + **Generate** Coronavirus reports
    - **Generate** flu-symptoms report
    - **Generate** counseling reports
  + **Generate** Data visualization
    - Total patients
    - Coronavirus patients
    - Flu-like symptoms patients
* **Send** alerts
  + **Send** FlashAlert message
  + **Print** message on KSU website

## Operating Environment

CSPIC has some software requirements you need a web browser that has HTML 5 and JavaScript capabilities. It also has some hardware requirements such as any mobile device that has internet capabilities and a touch screen or a monitor with mouse and keyboard.

## Design and Implementation Constraints

CSPIC is a web-based application so for data transfer internet access is necessary. Appointments are designed to lock so that only one patient/personnel can access at a time so that double booking cannot occur. Software is designed to only allow those with a Valid KSU ID to access features. There are two different set of privileges those specifically for the patient such as choosing appointment, changing appointment, viewing payment invoice and status, and viewing test result.

## User Documentation

CSPIC provides a PowerPoint Presentation for better understanding of use and features of software.

## Assumptions and Dependencies

CSPIC requires internet connection for data transfer. Device that can access a web browser. SMS capability for appt alert.

# External Interface Requirements

## User Interfaces

Frist interface includes a login option for the user, and it asks the user about username and password. If first time user register link is available which will show the register page system will ask for first, last name, username, password and KSU ID. If already registered user will progress with username and password. If not, a valid user system prompts displaying message the “Username or password incorrect”.

**Patient User** If he/she is a valid user, then the main CSPIC menu page will show with list of feature options. This will include the features view available appointment slots, reschedule appointment, view invoice and view test result. When the view available slot option is chosen the available appointments page displays a list of available appointments and a prompt to choose an appointment when chosen a confirmation will display chosen appointment time and return to main menu. If the reschedule appointment option is chosen, then available appointment slot page will display as before, and process will repeat. If view invoice option is chosen invoice page will display will billing information and payment status. If view test result page is selected test result page will display with test result.

**Personnel User** If he/she is a valid user, then the main CSPIC menu page will show with list of feature options. This will include the features such as schedule available time, View reports, View invoice, view scheduled appointments, reschedule appointment, order test and view test result. When schedule appointment feature is selected schedule page with show prompting user to input date and time and hours available. If view scheduled appointments feature is chosen appointments page shows a list of all scheduled appointments and their times. If order test is chosen prompt to input pt. ID is shown after ID placed test page shows test ordering options. If view test results feature is chosen prompt to input pt. ID is shown after ID placed test results page displays test result. If reschedule appointment feature is chosen prompt to input pt. ID is shown after ID placed and available appts page will show remaining appt slots. When appt slot chosen appt time confirmation will display if view invoice option is chosen prompt to input pt. ID is shown after ID placed Invoice and payment status will display. If view reports feature chosen reports page will show semester earnings for both medical and councilor services. the amount of patient visits the amount of positive cases and the amount of councilor visits related to corona.

## Hardware Interfaces

The mobile device is used to view software and touch screen will be used to interact with application features. The monitor is used to view software and the mouse and keyboard will be used to interact with features.

## Software Interfaces

Application is web based so web browser with java script and HTML capabilities

## Communications Interfaces

Uses the internet to store and transfer data.

# System Features

## Record

**4.1.1 Description and Priority**

This feature is minor in the CSPIC system and is used by the system personnel so see a report of how many patient visits occurred and how many positive corona cases were recorded. It also shows the semester earnings and a division of those earnings between into the medical earnings and councilor earnings. It also provides the number of counselor visits related to corona.

**4.1.2 Stimulus/Response Sequences**

When a patient arrives for their visit this function records which type of service the patient utilized the medical services or the counselor services creating a running tally. It takes the tally and multiplies the cost of services creating a medical earning and a counselor earnings and then adds those together to ger total earnings.

**4.1.3 Functional Requirements**

**REQ-1: Visit confirmation**

For this function to work there must be a confirmed patient visit.

**REQ-2:** **Earnings**

This format accepts the earnings data a float for dollars and cents

## Login

**4.2.1 Description and Priority**

This feature is one of the main features of CSPIC and has a High priority without it none of the other features are available. it asks the user about username and password it also includes a register link. this feature is a security measure that only allows users with a KSU ID to register and access the rest of the features.

**4.2.2 Stimulus/Response Sequences**

The user will place username and password into the related boxes. The function will confirm username and ID, and if valid and is a patient, the function will allow user into patient portal. If they are personnel, the function will allow user into personnel portal. If invalid function will block user from accessing any aspect of the system.

**4.2.3 Functional Requirements**

**REQ-1: Registration**

User will have to have registered with first/last name and KSU ID and created a username.

**REQ-2: KSU ID**

User will have to have received a KSU ID from the university.

## Invoice

**4.3.1 Description and Priority**

This is a minor feature and is of moderate priority as it is what processes the cost of the patient visit and other features do not rely on its data. This feature calculates the cost of the patient visit and has a flag that records the patents payment status. Both the patient and personnel can view it

**4.3.2 Stimulus/Response Sequences**

After choosing the invoice feature a prompt will appear asking for patient ID. Once the ID in inserted into the system will display the billing information of that patient and the status of payment.

**4.3.3 Functional Requirements**

**REQ-1: Patient ID**

To access this function, you must have the patient ID

**REQ-2: Patient visit**

To view the invoice a patient visit has had to take place

## Test

**4.4.1 Description and Priority**

This is a major feature of the CSPIC system and is of high priority. This feature allows the medical services to order a COVID-19 test and receive the test results with an alert if result is positive. This alert is of extreme importance.

**4.4.2 Stimulus/Response Sequences**

Once the test feature is selected a test portal is shown with the option of which test to choose this feature will then remain idle until the test results return. If the test is negative result will post patient result page, if test is positive alert will be sent to patient medical services and to any other authority given privilege

**4.4.3 Functional Requirements**

**REQ-1: Privileges**

To access the function and to receive the alert you must have the appropriate privileges

**REQ-2: Patient ID**

To use the function, you must have a patient ID to keep the sensitive data secure.

## Appointment

**4.5.1 Description and Priority**

The feature gives the personnel the ability to report availability and will parse that time into appointment slots. Feature is of high priority because for other features to function they rely on its data

**4.5.2 Stimulus/Response Sequences**

The personnel will choose the schedule option and the date in which they are available to work the system will then prompt user to input time available for selected date. The system will then parse that block of time into hour increments known as appointment slots.

**4.5.3 Functional Requirements**

**REQ-1: Personnel Privileges**

To access this function, you must be KSU-HS personnel and have received the appropriate privileges

**REQ-2: Date and Time**

This format will be date mm/dd/yyyy and military time hh: mm.

## Schedule

**4.6.1 Description and Priority**

The feature gives the personnel the ability to report availability and will parse that time into appointment slots. Feature is of high priority because for other features to function they rely on its data

**4.6.2 Stimulus/Response Sequences**

The personnel will choose the schedule option the system will prompt them to place the date and the times in which they are available to work. It will then take that time block and parse it into 1-hour increment which we refer to as appointment slots

**4.6.3 Functional Requirements**

**REQ-1: Personnel Privileges**

To access this function, you must be KSU-HS personnel and received the appropriate privileges

**REQ-2: Date and Time**

This format will be date mm/dd/yyyy and military time hh: mm.

# Requirements

## Performance Requirements

The CSPIC system requires that every user do simple manipulations of appointment slots and text files. Also, the system is web based so internet access is necessary for data transfer and performance depends solely on the number of user’s and the internet capabilities of the internet service provider.

## Safety Requirements

In the system we can upload a file in a computer system which contains the information that will be uploaded to a DB. So, we can take the backup of the user information from the DB files after making any changes which can be used in case the system were to crash. This protects the user information from becoming lost.

## Security Requirements

The CSPIC provides a login option for each user and it asks for a username and password. Every user is provided with a fixed set of user privileges which are different for patient users and personnel users. Every user must also register with first name last name and KSUID which will distinguish each user so that data will not be viewed by those who do not have privilege.

## Software Quality Attributes

This system is adaptable any file containing information can be inserted to the DB. It is highly available it depends only on the maximum number of internet users allowed. Its correctness is high the system provides accurate routinely updated information for appointment scheduling and test results

Appendix A: Glossary  Appendix B: Analysis Models





A close up of a logo

Description automatically generated

A close up of a map

Description automatically generated

