BRD

"doctor consultant"

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Introduction

Executive Summary

symptoms checker is an online Service offer you the ability to check your health and Diagnoses your condition for some types of disease based on some Questions, you can even search for advice from doctors you already know or we can recommend you a doctor for your status, you can also create your own profile that contains your body description and your history with any previous disease if you want or you can use our Service without Creating a profile.

Document overview

This document introduce Exam Cloud product study plan. It introduce general description, technical description, development plan, operation plan, cost analysis and marketing study.

Business objectives

- **Offer easy and effective online medical Service**
- **Offer quick help for patients to know the main causes of the chief complain**
- **Offer online Service to save both money and time**
- **Offer recommendations for the best doctors**
- **Offer effective advice to keep your body healthy**

Background

Introduction

YOU WAKE UP IN THE MIDDLE OF THE NIGHT with stomach pain, fever and sweats. Was it the questionable sushi from the gas station? Or the coughing kids you sat next to on your public transit adventure yesterday? You can't call the doctor's office at 3am, so you reach for your trusty smartphone and check in with Dr. Internet. We've all done this, and the results can often be more than intimidating, it's either definitely cancer, you're pregnant, or just a rash.

Using computerized algorithms, symptom checkers ask users a series of questions about their symptoms or require users to input details about their symptoms themselves. The algorithms vary and may use branching logic, Bayesian inference, or other methods. Private companies and other organizations, including the National Health Service, the American Academy of Pediatrics, and the Mayo Clinic, have launched their own symptom checkers. One symptom checker, iTriage, reports 50 million uses each year. Typically, symptom checkers are accessed through websites, but some are also available as apps for smart phones or tablets.

Symptom checkers serve two main functions: to facilitate self-diagnosis and to assist with triage. The self-diagnosis function provides a list of diagnoses,

usually rank ordered by likelihood. The diagnosis function is typically framed as helping educate patients on the range of diagnoses that might fit their symptoms. The triage function informs patients whether they should seek care at all and, if so, where (that is, emergency department, general practitioner's clinic) and with what urgency (that is, emergently or within a few days). Symptom checkers may supplement or replace telephone triage lines, which are common in primary care. To ensure the safety of medical mobile apps, the US Congress is considering the regulation of apps that "provide a list of possible medical conditions and advice on when to consult a health care provider."

Search strategy for symptom checkers

Between June 2014 and November 2014 we searched for symptoms checkers that were in English, were free, were publicly available, were for humans (compared with veterinary use), and did not focus on a single type of condition (for example, only orthopedic problems). To find symptom checkers that were available as apps in the Apple app store and Google Play, we used two search phrases ("symptom checker", "medical diagnosis") used in a recent study on symptom checkers and examined the first 240 search results by hand. We

chose 240 because this cut-off has been used in previous studies that have searched smartphone app stores. To find online symptom checkers, we entered the same two search phrases in Google and Google Scholar and examined the first 300 results. In previous research, the probability of relevant search results identified using Google declines substantially after the first 300 results. We supplemented our searches by asking the developers of two symptom checkers if they knew of other competing products.
In total we identified 143 symptom checkers. We excluded 102 that used the same medical content and logic as another tool (and therefore would have identical performance) (see list in supplementary appendix). We excluded a further 25 that only focused on a single class of illness (for example, orthopedic problems), 14 that only provided medical advice (for example, what symptoms are typically associated with a certain condition) and did not provide diagnosis or triage advice, and two that were not working. After these exclusions, we evaluated 23 symptom checkers.

Benefits of Symptom Checker:

Symptom checkers have several potential benefits. They can encourage patients with a life threatening problem such as stroke or heart attack to seek emergency care. For patients with a non-emergent problem that does not require a medical visit, these programs can reassure people and recommend they stay home. For approximately a quarter of visits for acute respiratory illness such as viral upper respiratory tract infection, patients do not receive any intervention beyond over the counter treatment, and over half of patients receive unnecessary antibiotics. Reducing the number of visits saves patients' time and money, deters overprescribing of antibiotics, and may decrease demand on primary care providers—a critical problem

given that the workload for general practitioners in the United Kingdom increased by 62% from 1995 to 2008.17 However, there are several key concerns. If patients with a life threatening problem are misdiagnosed and not told to seek care, their health could worsen, increasing morbidity and mortality. Alternatively, if patients with minor illnesses are told to seek care, in particular in an emergency department, such programs could increase unnecessary visits and therefore result in increased time and costs for patients and society.

The impact of symptom checkers will depend to a large degree on their clinical performance. To measure the accuracy of diagnosis and triage advice provided by symptom checkers, we used 45 standardized patient vignettes to audit 23 symptom checkers. The vignettes reflected a range of conditions from common to less common and low acuity to life threatening.

What is the difference between a symptom and a sign?

A symptom is any subjective evidence of disease, while a sign is any objective evidence of disease. Therefore, a symptom is a phenomenon that is experienced by the individual affected by the disease, while a sign is a phenomenon that can be detected by someone other than the individual affected by the disease. For examples, anxiety, pain, and fatigue are all symptoms. In contrast, a bloody nose is a sign of injured blood vessels in the nose that can be detected by a doctor, a nurse, or another observer.

Health-care professionals use symptoms and signs as clues that can help determine the most likely diagnosis when illness is present. Symptoms and signs are also used to compose a listing of the possible diagnoses. This listing is referred to as the differential diagnosis. The differential diagnosis is the

basis from which initial tests are ordered to narrow the possible diagnostic options and choose initial treatments.

Our Symptom Checker for children, men, and women, can be used to handily review a number of possible causes of symptoms that you, friends, or family members may be experiencing. There are many causes for any particular symptom, and the causes revealed in the symptom checker are not exhaustive. That is, they are not intended to be a listing of all possible causes for each symptom but are representative of some of the causes that can be underlying various symptoms.

How Comfortable Are We with Symptom Checkers?

According to survey conducted by Phillips North America, 40 percent of Americans are comfortable using websites and apps to check their own symptoms. In addition, one in 10 Americans feel that web-based health information has saved their lives. With accuracy improving quickly, even doctors are incorporating them into their websites and electronic medical records. By encouraging patients to learn more about their symptoms and possible causes prior to the office visit, this saves everyone time & money, significantly improving efficiency all around. Aside from decreasing demand on primary care providers, symptom checkers also deter the overuse of prescribing antibiotics.

A study published by BMJ in 2015 titled Evaluation of Symptom Checkers for Self-Diagnosis and Triage, took an in-depth look at symptom checker

accuracy and use by testing 23 commonly used symptom checkers. Researchers found that of the 23 symptom checkers analyzed, 34 percent provided the correct initial diagnosis in standardized patient evaluations, 54 percent provided the correct diagnosis out of the first 20 potential diagnosis given, and 57 percent provided the appropriate triage advice (triage advice included recommendations on when to seek emergent care, non-emergent care or self-care).

As you can see, symptom checkers have both benefits and drawbacks in diagnosis and triage advice, as they are not always correct. Researchers of the BMJ study found that symptom checkers can encourage patients with a life-threatening problem, such as a stroke or heart attack, to seek emergency care. For patients with non-emergent problems, symptom checkers can offer reassurance and recommend self-care techniques to avoid unnecessary hospital visits and treatments at home. Researchers found, however, that these tools are generally risk adverse, meaning patients are urged to seek care more often than not, even when self-care is realistic. It is important to note that symptom checkers have also been found to do the opposite, misdiagnosing patients with a life-threatening problem, worsening their illness.

System Description

Symptom Checker

what if you don’t feel ok ,and you can’t see a doctor Now ,with our service we can offer you the ability to check your health by choosing from many choices how do you feel.

You can even search for advice from a certain doctor you know , Or we can recommend you a doctor for your status we can also Diagnosis your condition for some types of disease based on some questions we will ask, you can also create a profile that contains your body description ,and your history with any previous disease , you can also use our service without creating a profile.

Diagnosis your condition:

you can check if you have a disease by answering some of our carefully chosen MCQ questions .

Doctor recommendation (as a secondary feature):

we can recommend you a doctor for your condition based on your answer on our questions , or you can ask a certain available doctor about your health.

Creating a profile:

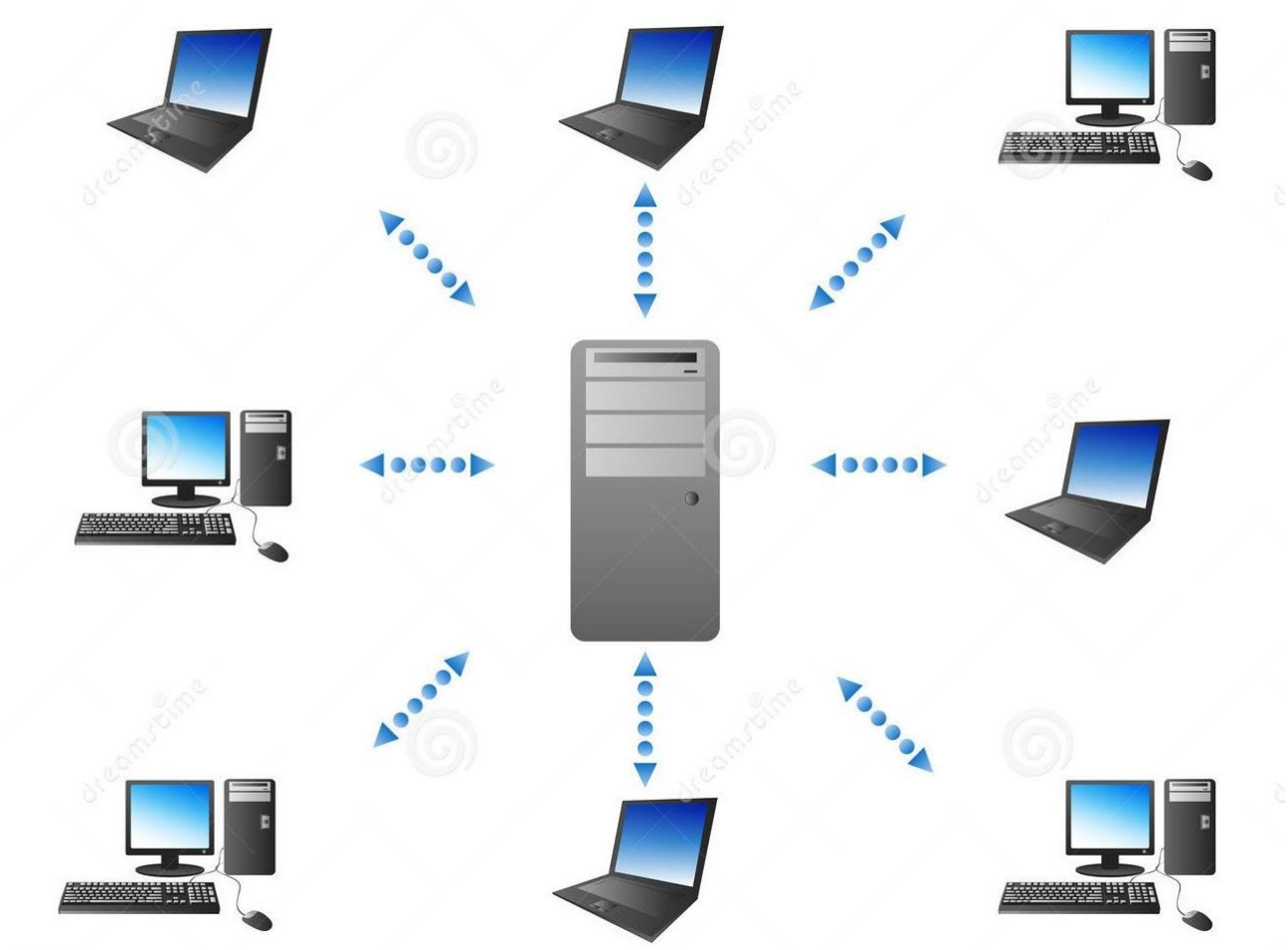
you can create your own profile that contains your health condition, previous injuries or illnesses , and if you have a history with allergic.

System Architecture

Pharmacy system introduces huge amount of services contents. The system offers the contents and service to both mobile and desktop users via web-based or dedicated mobile software.

The system consists of following modules: (1) Storage, (2) Data Processing, (3) Indexing, (4) General User Area, (5) System Administration Area, (6) Security, (7) Reporting, (8) Cloud Service, (9) General Mobile Application.

Storage:



Pharmacy system uses different types of storage:

- **Core storage for inquiry material and user interaction**
- **Archive storage for historical changes, deleted contents and old logs**
- **System storage for system configuration, users' information and fresh logs**
- **Indexing storage to support full text search engines**
- **Analytics storage(s) to store the medicine selection.**

Core storage uses NOSQL unstructured database installed over distributed infrastructure. Unstructured scheme allows flexible data definition and allow future extension of medicine types. NOSQL database speed up the queries compared with raw data storage format. Cloud infrastructure offer high availability and instant recovery of data. Archive storage uses JSON data format stored directly over distributed storage. JSON allow flexible access of data attributes. Distributed storage allows fast access of data items and offer expandable storage.

Data Processing:

Data processing module is responsible on providing all data related services like data transformation, data modeling, data classifier and multimedia processing. The system supports common data formats supported by

common data processors applications. Multimedia processing is required to enhance the quality of multimedia contents like images, audio and video. It converts multimedia contents to unified format. Also, this service is required to detect some features required by data classifier service. Data classifier is required to classify the contents which is important to avoid non-appropriate material. The classifier uses information retrieved by data modeling and image and video processing services.

Indexing:

This module is responsible on indexing textual contents to allow internal full text search queries. Full text search is used by final users to find certain contents. Also, it used by other modules like data processing to locate contents in a fixed time regardless the overall contents size.

General User Area

This module provides user with main system activities like asking for medicine or booking appointment with his favorite doctor. For asking for medicine, user can get

suitable medicine for his disease. Users can view medicines history that were taken before. In additions, users can browse and find topics. Also, users can edit their profiles. General system support martial are published to help users. However, users can communication with system operators to report issues or to get a direct support.

System Administration Area:

This module is dedicated for system administrators. System administrators responsible on system management, configuration, backup and solving technical issues. System administrator can view system status, data status, logs and other system status and measures.

Security:

Security module is responsible on user authentication and communications security. User can register/login using internal accounts or via their phones or common social accounts. The portal access is made using https protocol in order to secure the communication. Security module also, responsible on managing the permissions and roles. Users are either guests, logged users, examination authority owners and examiners. Security module also, responsible on detecting the threats and preventing data theft. The system is tested against common attacks using known penetration testing tools. Data theft is prevented using various data protection techniques as described in "Examination Process Security" feature.

Reporting:

This module is responsible on providing many business and technical reports like following:

- **Technical reports:**
  - **Resources usage, it shows the usage of storage, CPU and bandwidth.**
  - **Users, contents and logs statistics.**
  - **Administrators and operators activities statistics.**
  - **…**
- **Business reports:**
  - **Available scientific topics and supported languages.**
  - **Statistical report on user contribution per region, age segment, authority and more.**
  - **Usability report offer information about user behavior inside the system**

Cloud Service:

This module provides all system feature through set of APIs. APIs are required by mobile applications and other software interfaces. External developers with permissions can use those APIs to build additional applications with different flavors. Pharmacy system encourages developers to build dependent software systems. For example, developers may build software applications for special user segments based on their region or age or scientific topics. Developers may build software applications for Mobile, Web and Desktop.

General Mobile Application:

Mobile application provides most of the web-based system features using Mobile graphical user

interface. Mobile application is offered to normal users like patient. Activities like administration, reporting and authority management are supported only by the web- based system. Mobile applications support major mobile platforms like Android, Windows-Mobile and iOS.

System features:

User Profile: -

Users Can register to the system before they can use the website, in urgent cases user can skip making profile.

The profile will contain user's personal information such as: name, age, number, …. etc. Also, the profile will contain user's medical information.

Users profile show all the activities, as user can review all the related illness.

Choose symptom: -

"doctor consultant" will supply all kinds of symptoms, which will appear in the front page. User must choose the exact symptom of the illness & answer any question related to it, to get the right treatment.

Choosing symptoms will be made by three phases, first "website" will show options of symptoms and user must choose the main symptom.

second," website" will supply questions about the basic detailed of the symptoms, third, "website" will support Detailed questions

User must answer carefully and honestly the questions, to get the right treatment.

After these three phases the right medicine will show immediately to user.

If User's Condition is critical or need an extra radiology and medical analysis, the "website" will automatically show the link of doctors' contacts page.

Doctors' Contacts: -

"website" will supply doctors' contacts of each medical field.

In Case user have an emergency or want to meet doctors we will make it easy for him by gathering doctor's contact of each symptom.

"website" will supply all doctors' contacts in all medical fields which will be in categories and user should choose the right field for his condition, then the user will find doctor's contacts in this field in different places.

User Feedback: -

"website" will supply feedback form, so user's can tell their opinion about everything in "website" as we will improve it continuously to make it more friendly and helpful for the users.

Multi Language Support: -

"website" system interface allows two language, the main language is Arabic, and it also support English as well.

System Development and Operation

Overview

The system development is performed using Agile methodology. Initial R&D activity should be applied to experiments tools and techniques. Later continuous R&D activity will run beside the system development activities. the system should take twelve weeks.

	1	2	3	4	5	6	7	8	9	10	11	12
Study requirements												
Preparation												
Test Planning												
Implementation												
Research												
System Testing												
Final Release												

Tools

Exam cloud will be developed using open source tools, development online tools will be used for management, tracking, testing and source control. This will increase the collaboration between team members even they are not located at the same place. Also, this will allow external teams and members to participate.

operation	tool
Source Control and Versioning	GitHub/Git
Structured Database	MySQL
Programming Languages	PHP
Host Management	cPanel

Assumptions

- **The system completely depends on answers of patients.**
- **The patient know exactly what he feels and where the matter is.**
- **Users should approve to give the copyright of their material to the system.**
- **The system does not provide any medicine directly. It can only provide your illness and external links to other systems.**

References

1. URL: symptom checker website

https://www.mayoclinic.org/symp…/select-symptom/itt-20009075