

# Utilizing Software Engineering and Cloud Computing Principles to Develop the Revised Self-Report Assessment of Functional Visual Performance (R-SRAFVP) Application

Kirk Hedlich, advisor Byron DeVries (PhD)

School of Computing, Grand Valley State University, Allendale, MI 49508

### Abstract

Can principles from software engineering and concepts from cloud computing be applied to and aid in the development of a small project, specifically improving the use of the Revised Self-Report Assessment of Functional Visual Performance (R-SRAFVP)?

#### Goals:

- Improve on existing attempts
- Move the R-SRAFVP assessment to a PWA
- Provide ease of use, simplicity, greater access

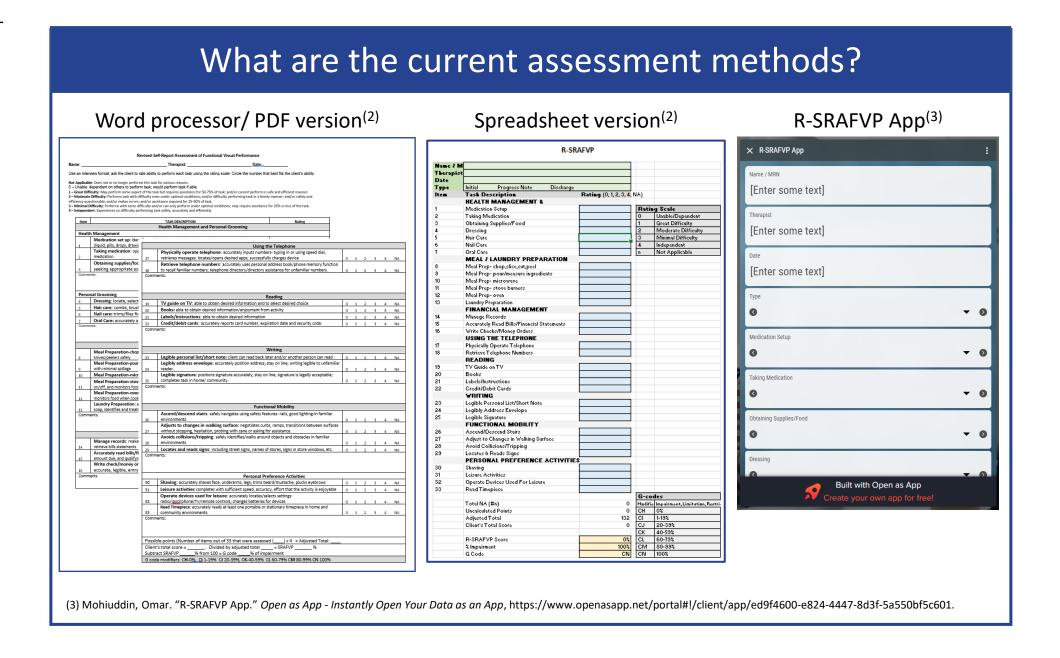
# Software Eng. Benefits:

- Engage stakeholders,
- Confirm requirements,
- Review design,
- Code last not first
- Test! Test! Test!
- Reduce development rework,
- Mitigate surprises

# Benefits: Cloud Computing Benefits:

- Reduce costs
- Scalable resources
- Reduced complexity
- Cross-platform flexibility
- Reuse instead of redevelop services
- Gauge usage

# Example Eye Conditions(1) What condition does the patient have? Assessment categories(2) Health Mgmt Activity Personal Grooming Writing as Activity Meal Prep Use the Phone Laundry Prep Mgmt Perference Activities 1 Hedlich, Chris. "Eye Condition Examples". 2017. JPG. 2 "\*\*SSRAPP Toolkit." University of Alabama at Birmingham, 21 Feb. 2018. 2IP.



# Software Engineering & Cloud Computing Usage

# Software Engineering Principles:

- Use Cases (w/ Reviews)
- Requirements (w/ Reviews)
- Requirements Traceability
- UI / UX Design (w/ Reviews)
- Development (w/ Review)
- Testing (functional, non-functional)
- Deployment
- Feedback / Analysis

### **Cloud Computing Services:**

- On-demand services
- Internet accessibility
- Measured services
- Managed services

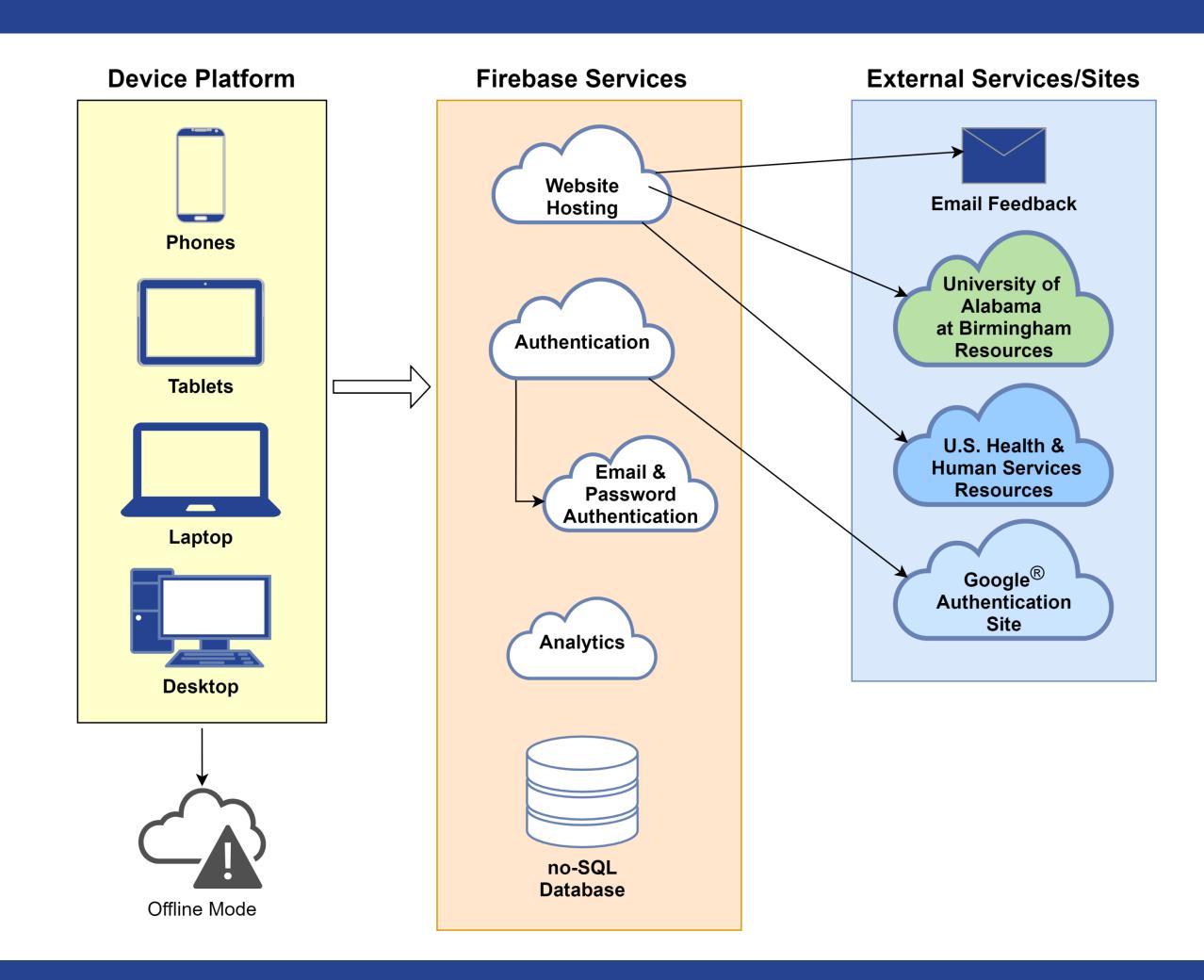
# Cloud Computing Technical Usage:

- Web hosting
- Progressive Web Application (PWA)
- Online/offline use via service workers
- Cloud Security
- Application security (authentication)
- Reuse of existing accounts (ex: Google)
- Cloud Database (no-SQL)
- Cloud Metrics (analysis)

# How does this project change the status quo? Guest Info Questions Scores Answering Scale Medicare G Code Fill in the following information. Therapist (enter therapist's name here) Client Reference [MRN, name, any client reference info] Assessment Date mm/dd/yyyy Assessment Deate [Client Age [center age number] Client Age [center age number] Client Sender Female Male Male Client Syp Diagnosis [center any eye diagnosis'] Guest Guest Info Questions Scores Answering Scale Medicare G Code Answer all of the questions. The comments sections are for their assessment based on the answers from the previous tab. Info Questions Scores Answering Scale Medicare G Code Shown here is the score for this assessment based on the answers from the previous tab. Info Questions Scores Answering Scale Info Questions S

# 

# Architecture



# Deliverables

#### **Software Engineering:**

- Use Case Specification
- Requirements Specification
- Requirements Traceability Matrix
- UI / UX Design
- UI / UX Wireframe & Workflows
- System Architecture Design
- Source code
- Functional Tests
- Production Deployment

# **Cloud Computing:**

- Google® Website
- Scalable resourcing
- PWA with service workers
- Firestore® Authentication
  - Authentication using Email/Password
- Authentication using Google Accounts
- Firebase® Firestore DB (no-SQL)
- Firebase<sup>®</sup> Analytics

# Challenges

- Healthcare compliance (U.S. HHS Security & Privacy Rules)
- Development languages (HTML, CSS, Javascript)
- Implementing cloud services/functionality (first time)
- Platform testing (ex: Apple Mobile iOS vs anything else)
- Testing at all levels (ex: unit, functional, acceptance)
- Challenge of time vs. doing it right