

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

Cloud Computing Benefits:

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

Software Engineering & Cloud Computing Usage

Software Engineering Principles:

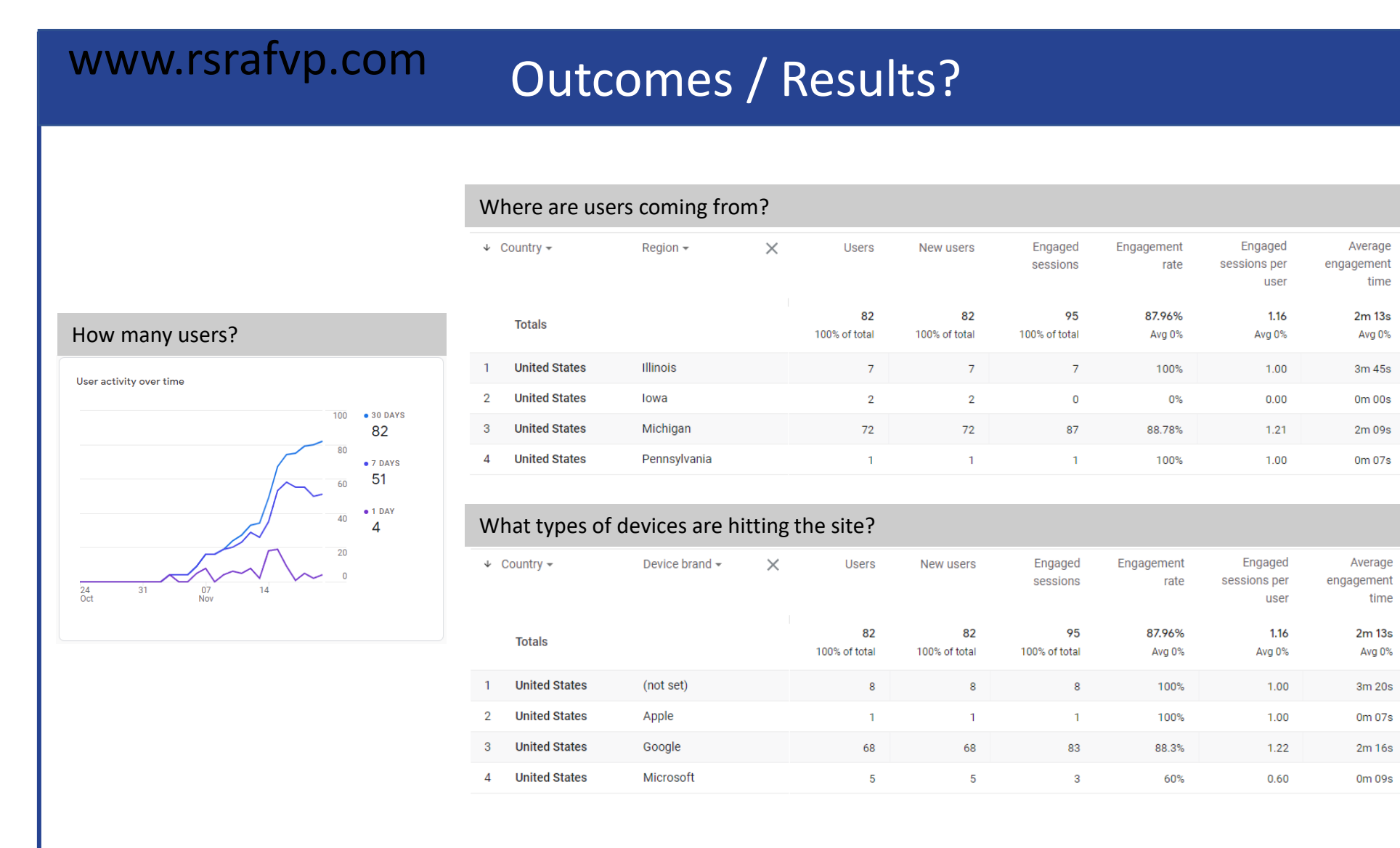
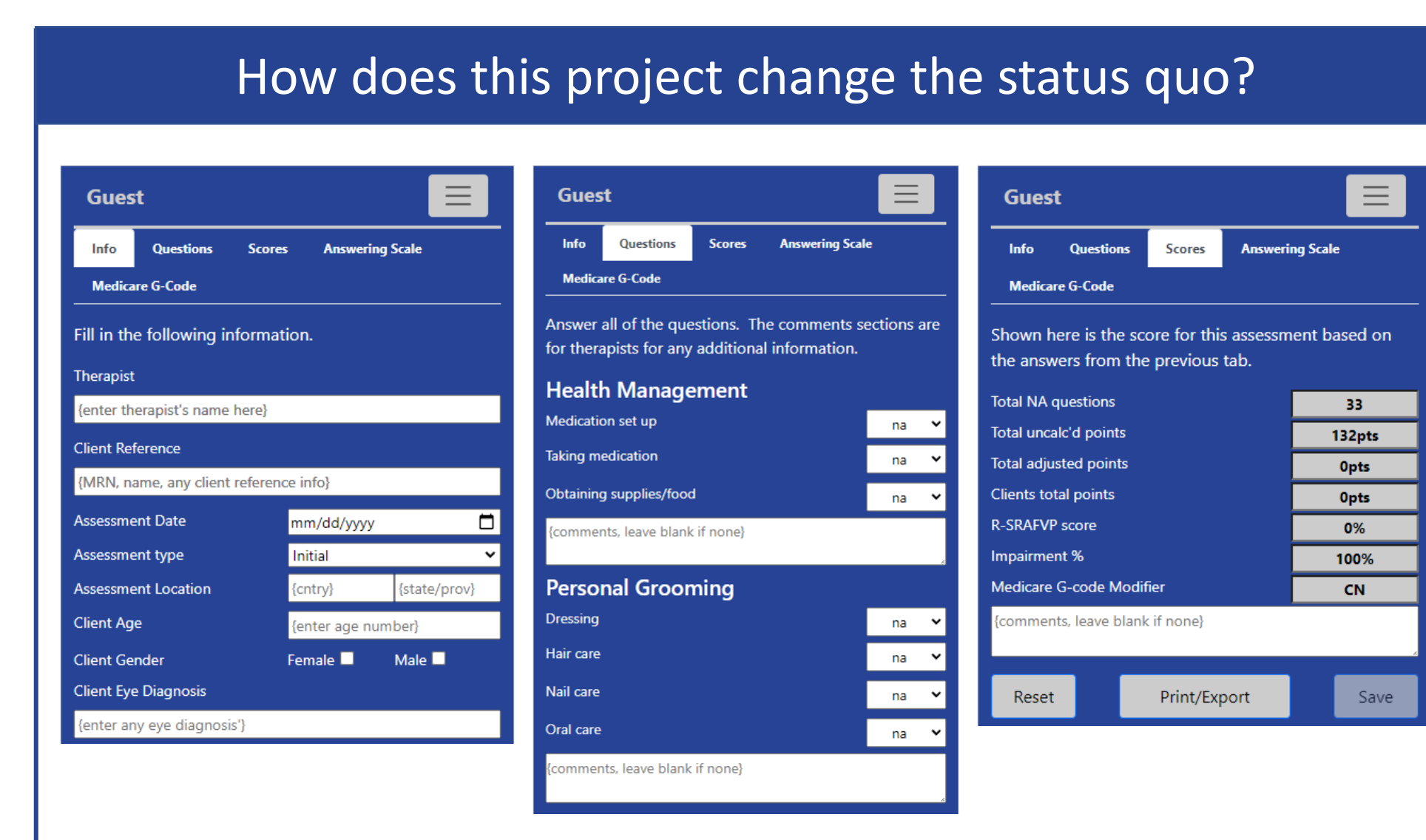
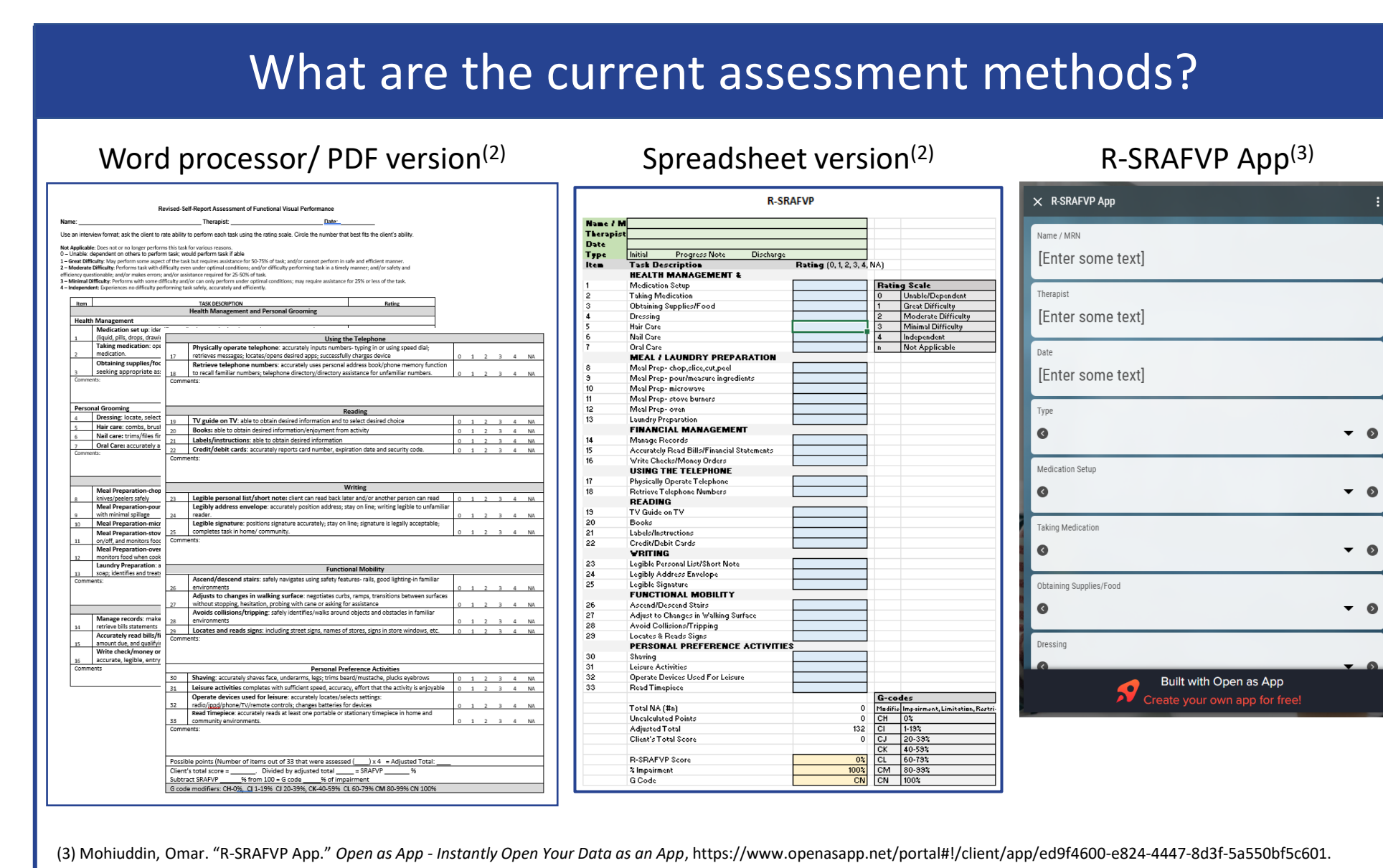
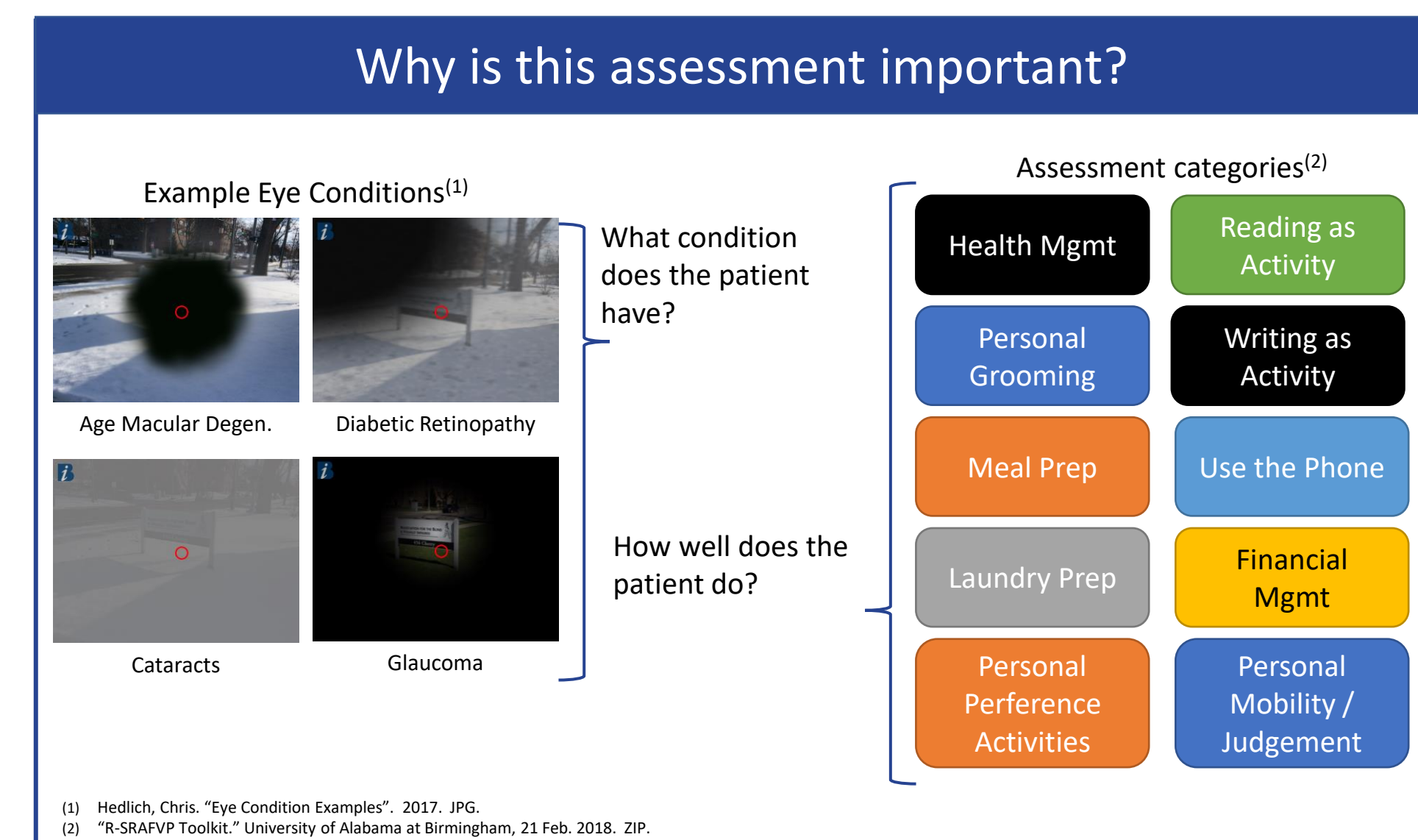
- Use Cases (w/ Reviews)
- Requirements (w/ Reviews)
- Requirements Traceability
- UI / UX Design (w/ Reviews)
- Development (w/ Review)
- Testing (functional, non-functional)
- Deployment
- Feedback / Analysis

Cloud Computing Services:

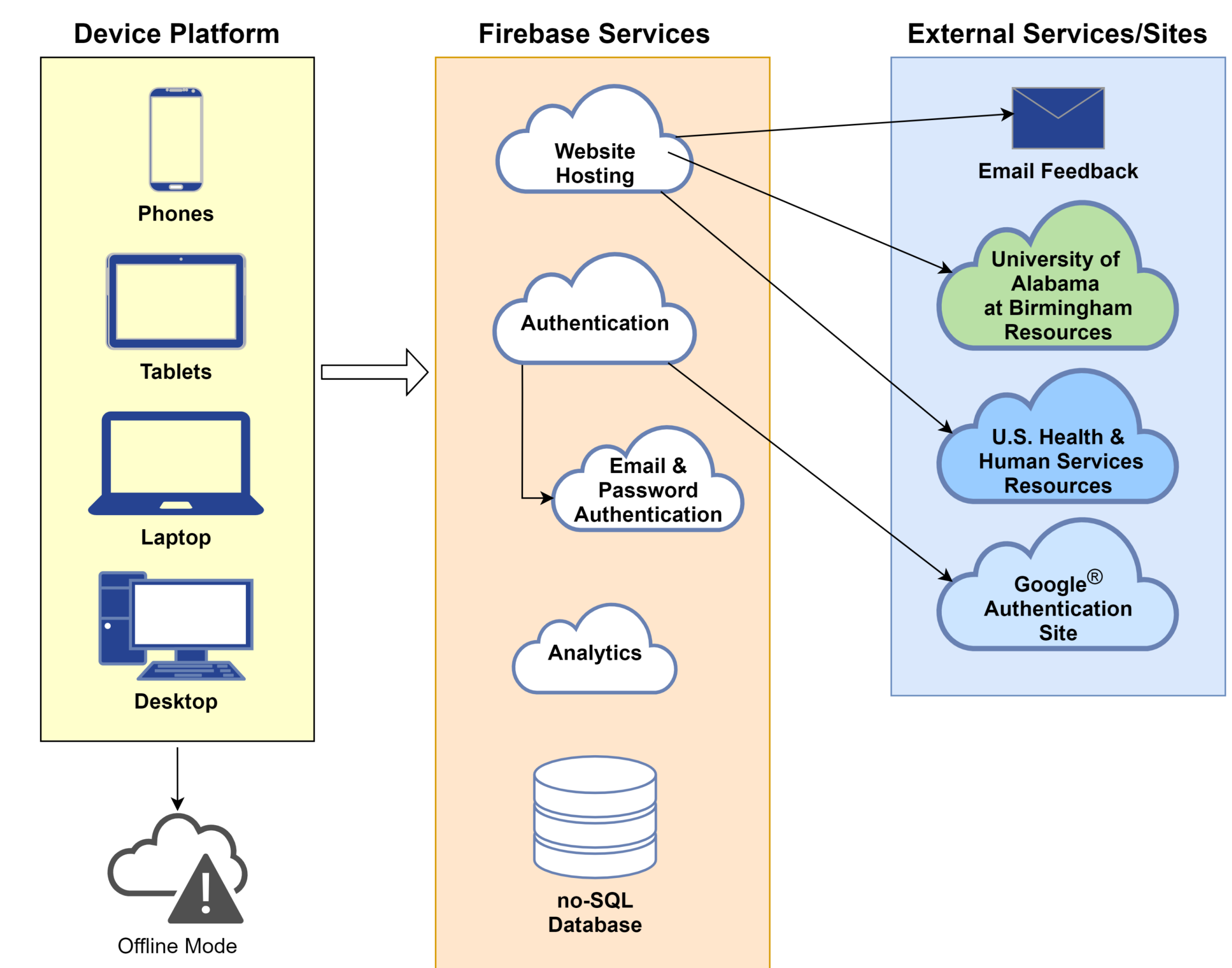
- On-demand services
- Internet accessibility
- Measured services
- Managed services

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)



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® 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