V2V Design & Deployment

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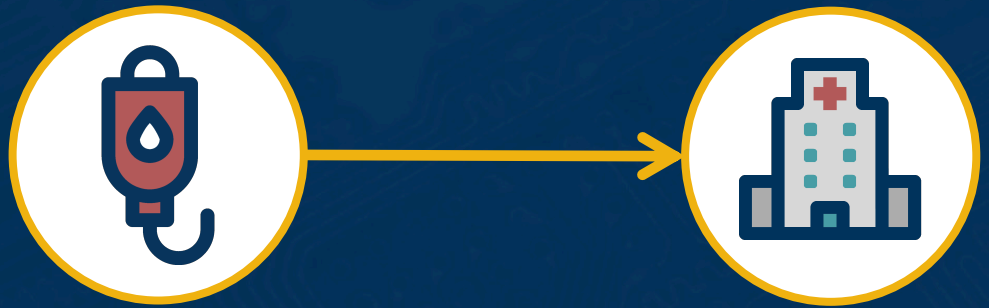
Vein-to-Vein (V2V) Goals

Blood Safety Information System

Rohit Banga
Primary Developer

The **goal** of the project is developing a **software system** to manage **blood related information**:



Donation

Transfusion

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Vein-to-Vein (V2V) Goals

No dependence on **internet connectivity**

Flexibility for meeting needs of different labs

Ease of **setup & administration**

Ease of **adoption & adjustment** to current practice

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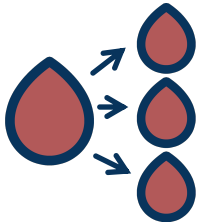
Donors
Track infected blood to donor & find donors when needed

Collections
Donation should be recorded in the system



Products
Multiple products prepared from a single collection

Test Results
Test results for blood samples

What to Store?

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Requests

- Requests received from different sites
- Reason for request: disease tracking
- Demand forecasting by area, age, product type

Product Issue

- Product was issued for what request

Usage

- End point of the chain
- Was it actually used or thrown away?
- Why was it not used?

What to Store?

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Reports:

- Use the data to solve problems
- Analyze the data
- Visualize trends
- Collections done by site, over time
- Disease prevalence by region, over time
- Inventory status
- Requests by location

Critical for Logistical Decisions

Used to Plan Blood Collection Drives

What to Store?

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Design Principles

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Blood Collection at Mobile Site

Sent to Collection Center

Blood Testing Lab

Unsafe Blood Discarded

Safe Blood Stored

Sent to hospital

Blood Transfused

The Life Cycle of Donated Blood

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No dependence on internet availability

Easy installation

- Installer as **small as possible**
- Install **all dependencies** automatically

Easy maintenance

- Easy to apply **upgrades**
- **Size** of update **small**
- **Backup** should be easy
- Easy **error reporting**

Reliability

Intuitive, zero-training User interface

Customizable to the extent possible

Design Principles

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Deployment

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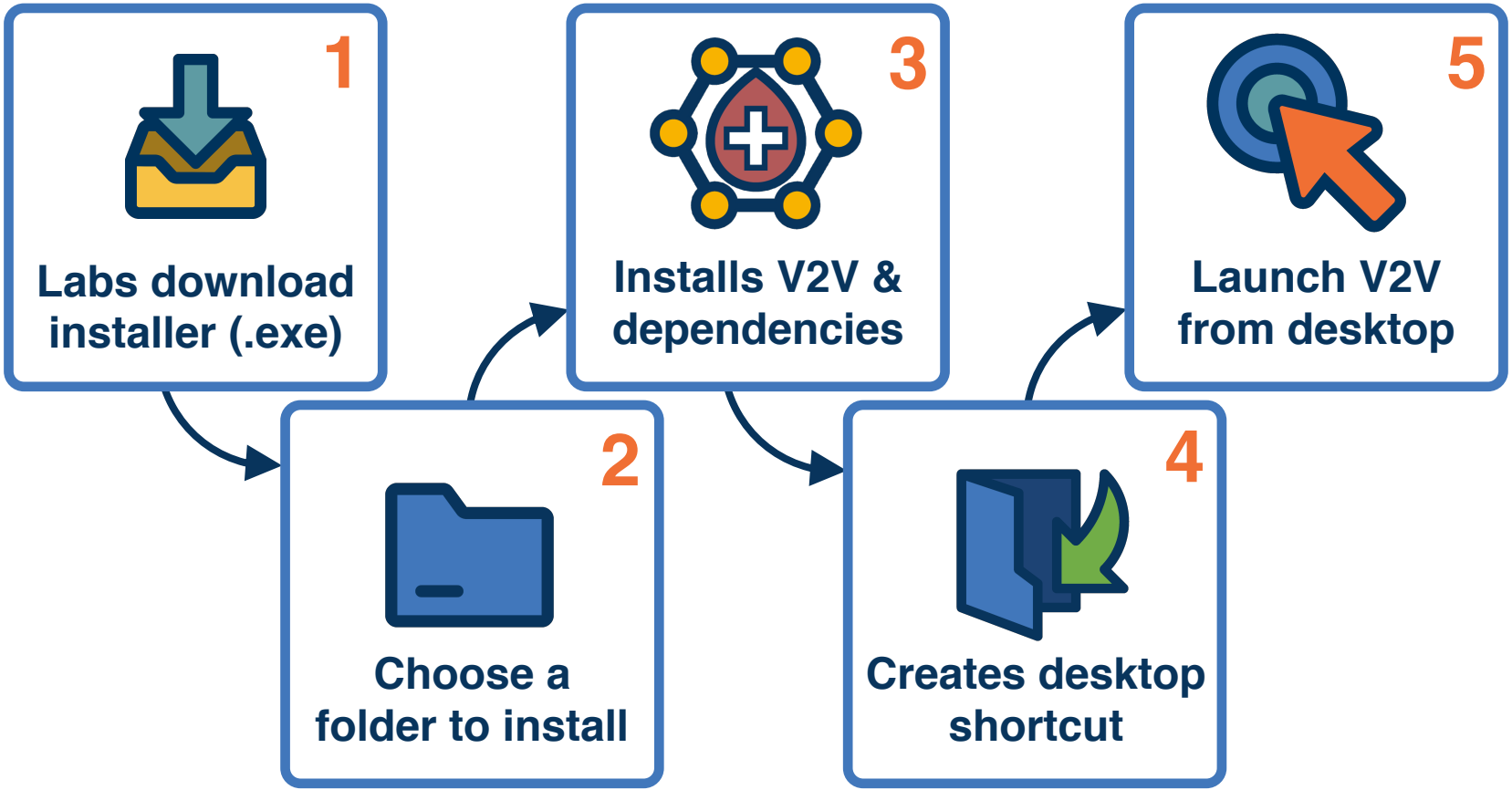

How a User Sees It

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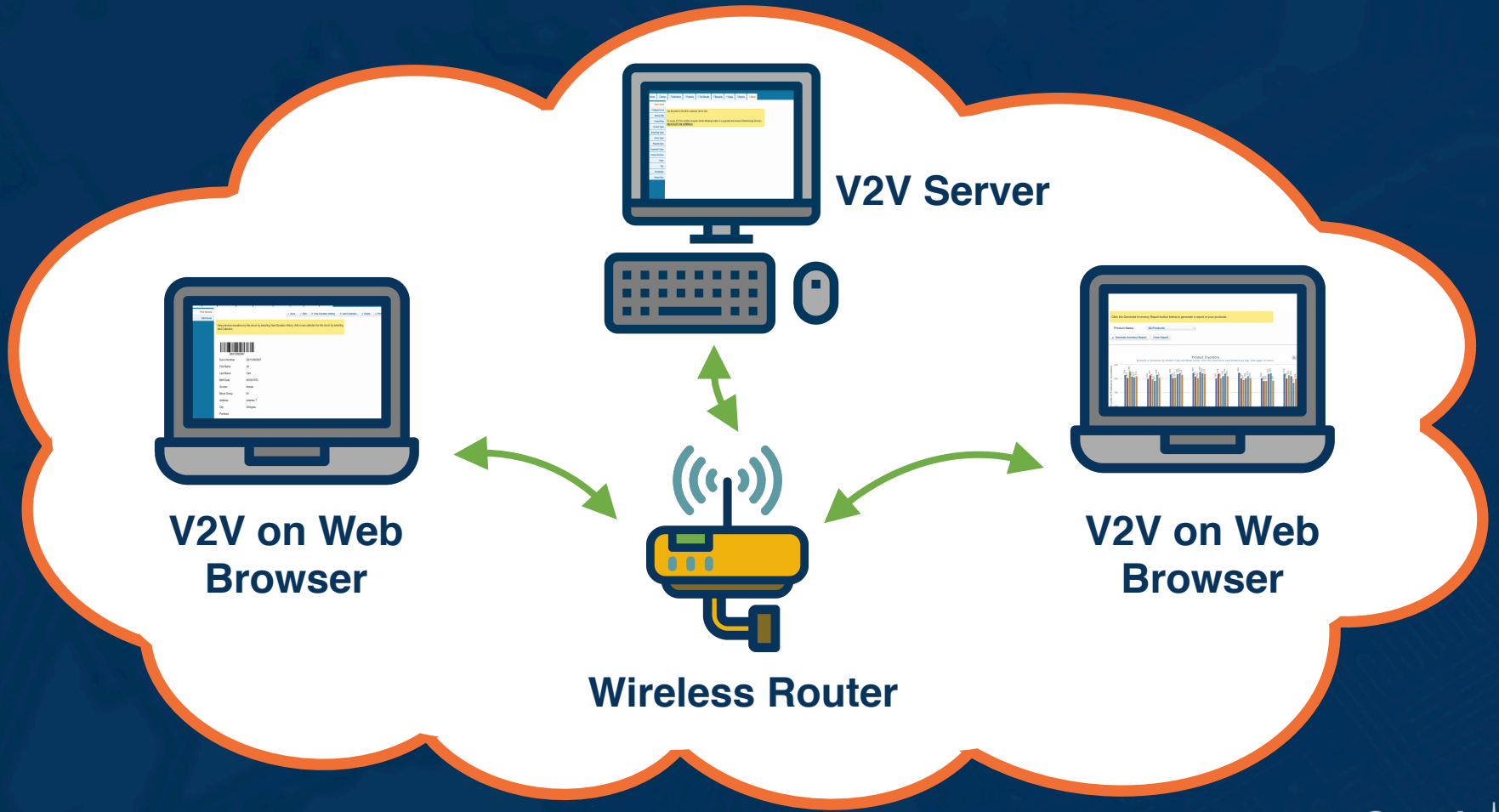

Inside a Blood Center

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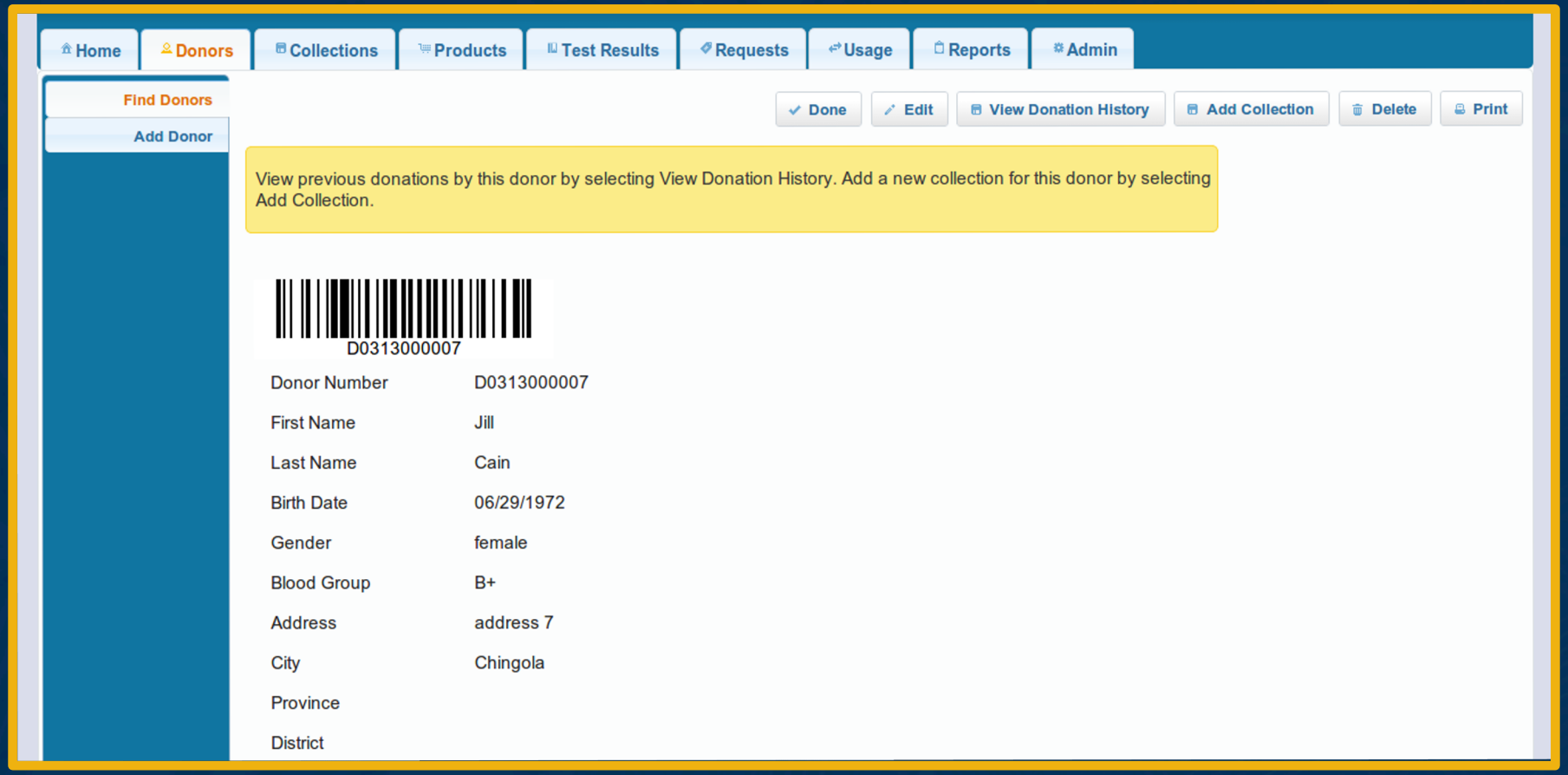

Screenshot

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V2V Webapp

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Web Application
written in **Java**

Installed locally on computers **in the lab**

Spring Framework:

- Model, View, Controller architecture
- MySQL for storing all data, using v5.5

Hibernate

- Java Persistence API
- Abstraction layer between code and database

UI

- HTML, Javascript
- HTML generated using JSP templating language
- Jquery and jquery plugins to give better UI

V2V Webapp

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Why Browser Based?

- Browser provides a **good boilerplate UI framework**
- **Easy to interconnect** several computers within a single center
- In the future when we need to **interface between centers and sites via Internet** it will be easier
- **Supported Browsers: Firefox, Google Chrome**
- Cross Browser Compatibility is **not a concern** right now
- We package a **supported version of Firefox** in our installer

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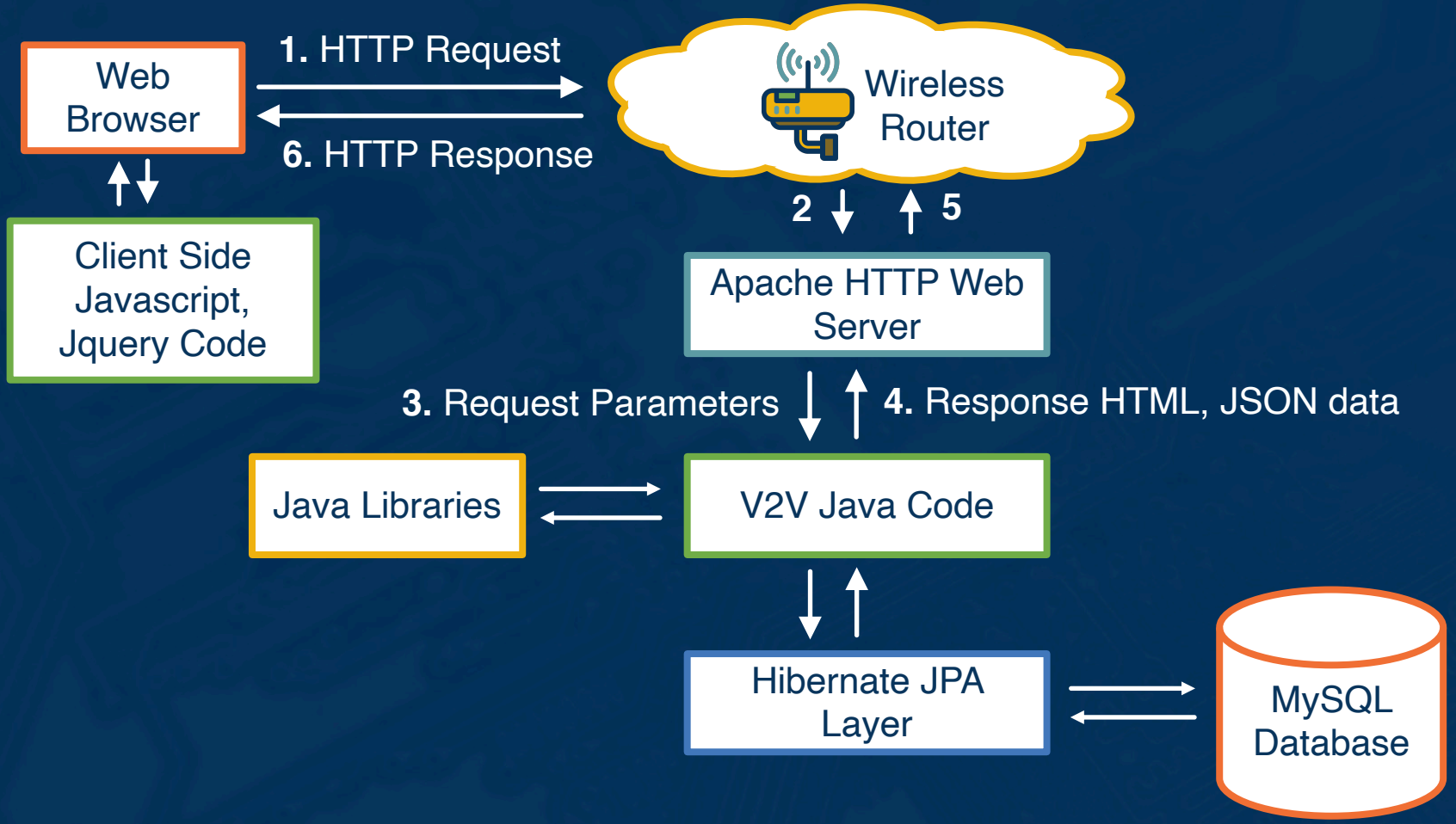

System Layout

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Java

- Installer automatically installs Java if it is not already installed
- At least Java 6 required. Installer installs Java 7.

Apache Tomcat

- V2V runs as a Java Web Application locally within Apache Tomcat container

MySQL Database

- MySQL for storing all data
- Using v5.5

Required Java libraries

- All packaged with the webapp

Dependencies

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Feedback & Progress Made

Feedback Process

Committed Partners

- Most feedback from **Zambia**
- **Cameroon** started using V2V at **University of Yaounde**
- Several **meetings with CDC**

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MS Access version in use **at ZNBTS:**

Bright Mulenga, IT Manager at ZNBTS sent a part of the **Access database**

Zambia wants to transition from MS Access to **V2V**

Added features by studying what they are **already using**

Several meetings & demos with CDC

Extensive feedback & suggestions from Pete Zach (SBFA), Rob Wilkinson during March visit

Feedback Sources

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Version 1.1:

- Print Worksheets
- Enter test results in worksheet
- Many features migrated from MS Access database
- Much more stable product than last release
- More customization options
- Several performance improvements

Version 1.2 in April after feedback from Pete, Rob, CDC

- Significant change in the way test results are recorded
- Recording individual test results instead of final outcomes
- Inferring test outcome from multiple test results
- Inference rules configurable
- Creating new tests
- Grouping collections into batches
- Worksheets more customizable
- Capturing more information
- More configuration Options
- UI improvements