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WORK at LIGHTSPEED™

Implementation of a Custom Time-Tracking Application in ServiceNow® with a Fully Accessible Custom UI

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servicenow

Agenda

- Introductions
- Session Overview
- Background on development of application
- Overview of Time-tracking application
- Custom UI features, design tradeoffs, etc.
- Accessibility deep dive
- Q&A

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Speaker Introduction



NAME: Jon Budoff

TITLE: Program Manager – ITSM Tools

FUNCTION: Management and Program development

COMPANY: University of Colorado, Boulder

EXPERIENCE: 18+ years managing enterprise IT; 11+ years managing teams; 4+ years managing ServiceNow®

EXPERTISE: Business Analysis, Team Building and Management

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Speaker Introduction



NAME: Craig Talbert

TITLE: Senior Software Engineer

FUNCTION: Design, Development, Deployment

COMPANY: University of Colorado, Boulder

EXPERIENCE: 9 years ITSM development; 5 years ServiceNow® development

EXPERTISE: Integrations and extensions

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Be Boulder.

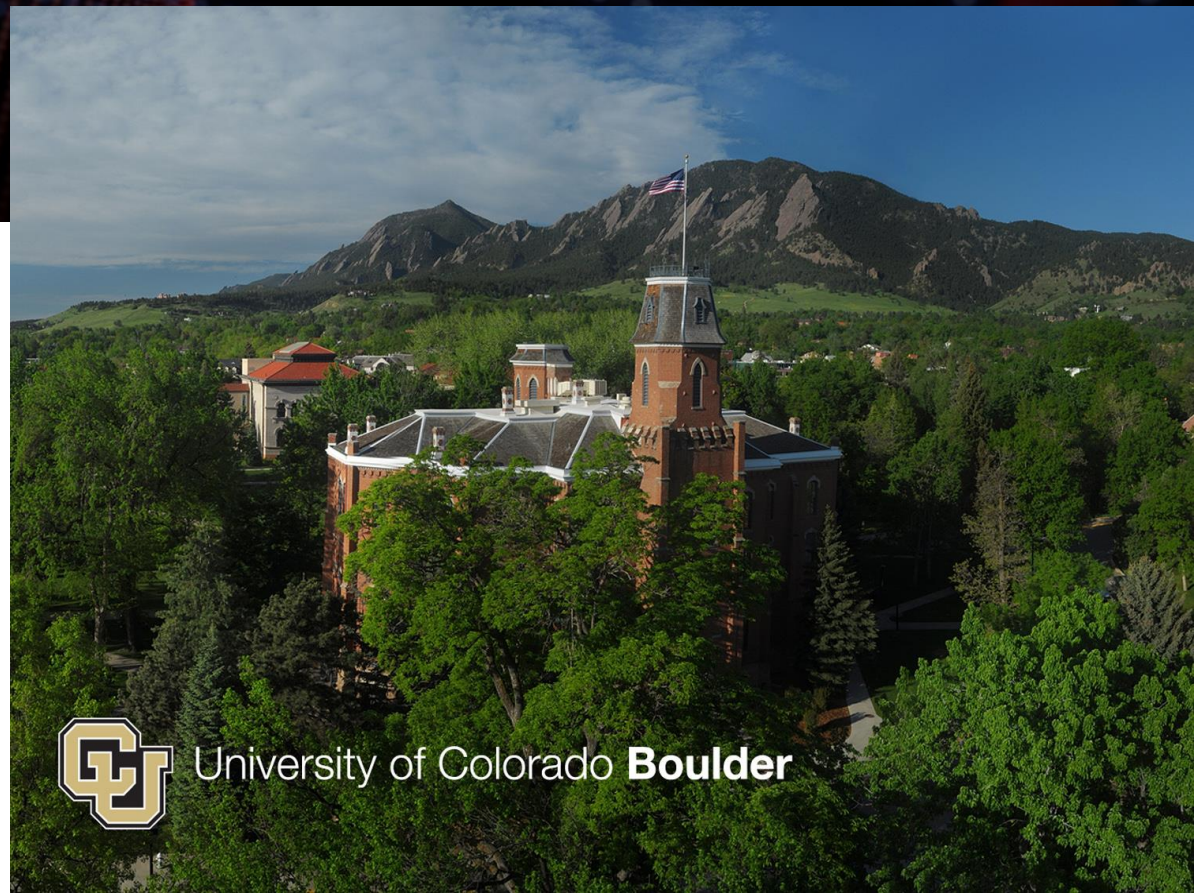
University of Colorado **Boulder**

30,000+ undergraduate and graduate students.
2,166 academic faculty and 1,984 research faculty.
3,600+ staff members

One of 34 U.S. public research institutions belonging to the prestigious Association of American Universities (AAU)

#18 most entrepreneurial university in the nation (*Forbes*, 2015)

Top 10 national rankings in physics (#1), geosciences (#2) and ceramics graduate program (#3)



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Session Overview



Objectives

- Share our experience in building a custom time-tracking application in ServiceNow® with a custom UI that is fully accessible for sight-impaired users



What You Will Learn

- See an example of a unique highly customized application built on the ServiceNow® platform
- Learn more about the benefits and challenges of designing to meet Accessibility standards

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Why are We Doing This?

How much do our services really cost to deliver?



Full-cost Accounting System

Budget Unit
Activity
Customer Type
Customer
…

Collect Data



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Why did we do this as a custom app in ServiceNow?



- Lack of support for Accessibility
- Couldn't customize UI as desired

- Too much customization needed
- Challenge to meet key design goals

YEA!

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Evolution of Project Requirements

- Original project requirements defined by Business Office
- After initial project scrapped, expanded scope and requirements to provide more value to whole organization
  - Allow managers to enter ‘local’ Activities and Projects
  - Reporting to provide value to employees and managers
  - Ability to identify work associated with Grants, Visas
- Project in ‘alpha’ testing

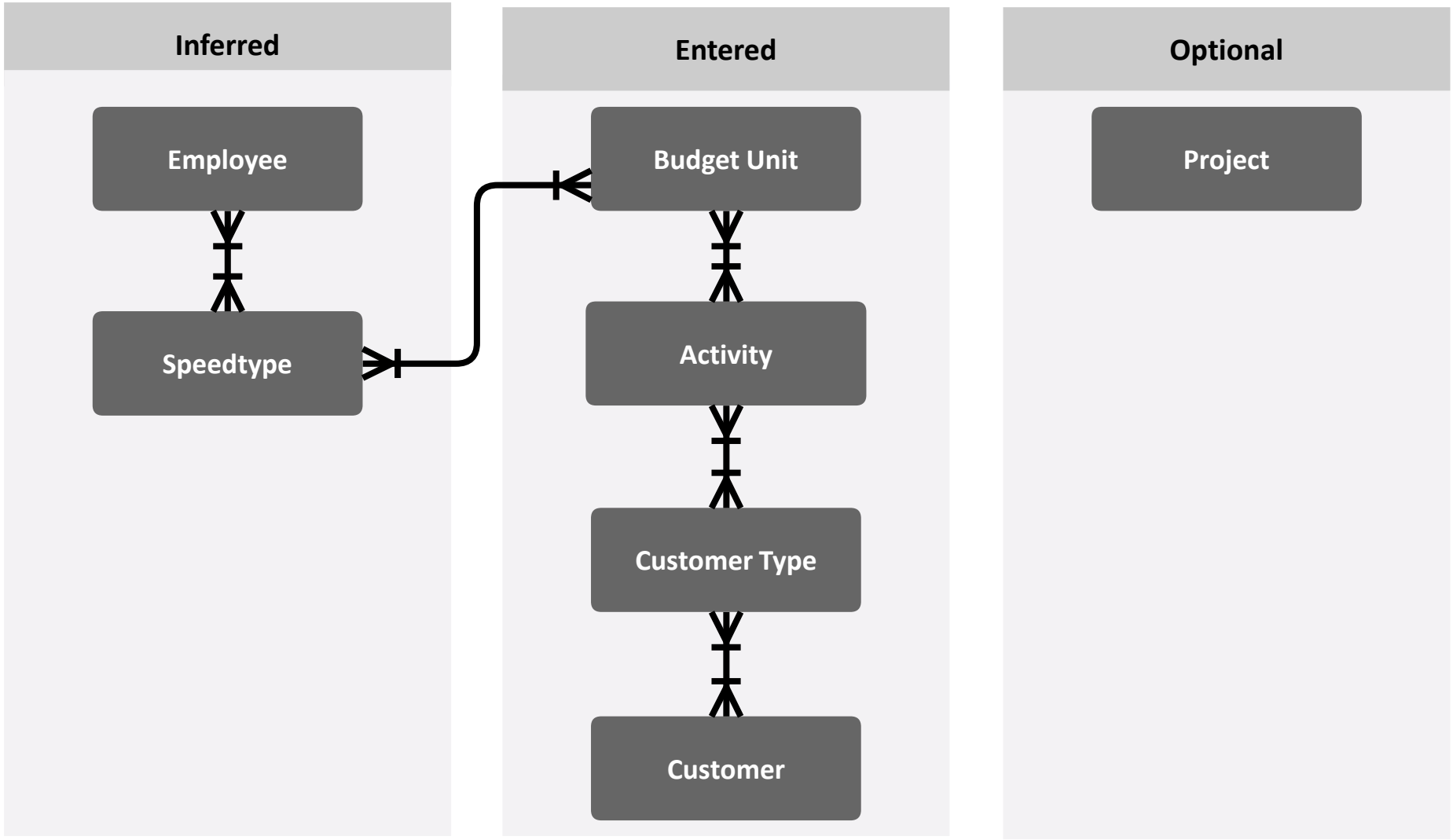
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Overview of Time-Tracking Application

- How tracked time is categorized
- Data Feeds
- Roles & Permissions
- Reporting
- Time Entry UI

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Categorization Table Relationships



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Tying it Together

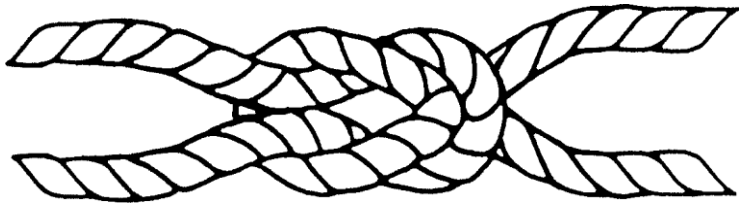
Employee -> Speedtype

Speedtype -> Budget Unit

Budget Unit -> Activities

Activities -> Customer Types

Customer Types -> Customers



Employees -> Supervisors

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Time Cards and Time Card Entries

Time Card
week of April 30 - May 6, 2017

Time Card Entry

Employee	Speedtype	Budget Unit	Activity	Customer Type	Customer	Project
Dan Jones	28064212	IT Security	Compliance Audit	Internal	IT Service Center	MyTime

Sun	Mon	Tue	Wed	Thu	Fri	Sat
0	1.5	0	2.25	0	0	3

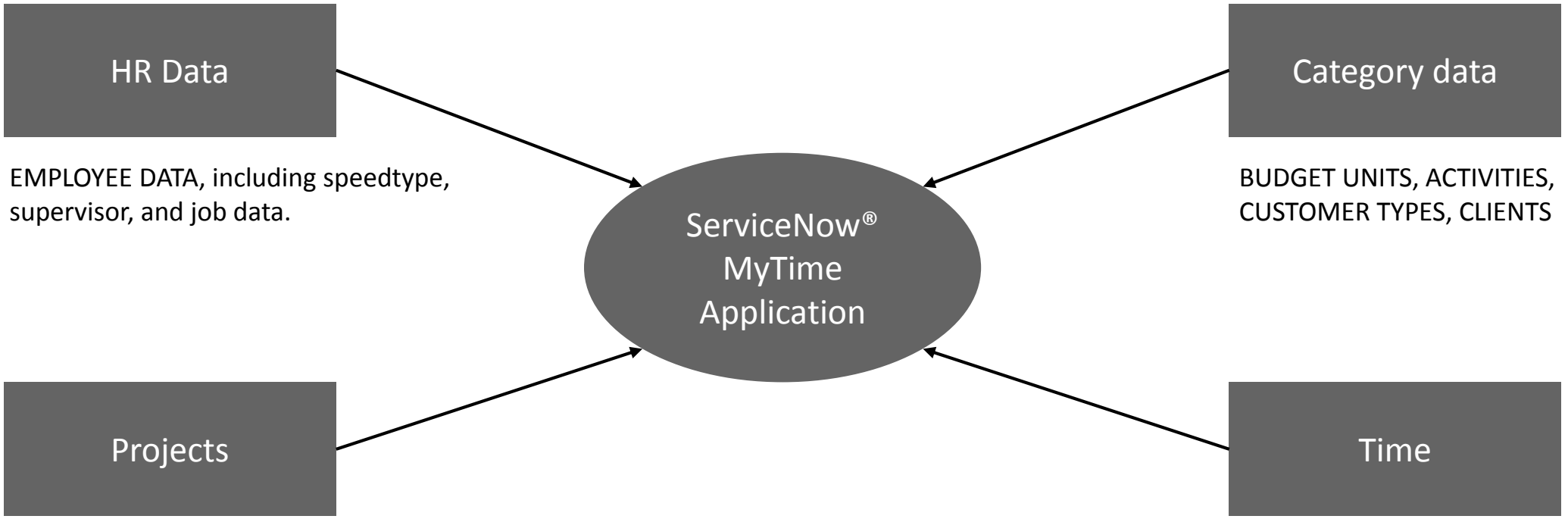
Time Card Entry

Employee	Speedtype	Budget Unit	Activity	Customer Type	Customer	Project
Dan Jones	28064212	IT Security	General Meeting	Unbillable	Unbillable	NONE

Sun	Mon	Tue	Wed	Thu	Fri	Sat
0	3.0	2.5	2.25	4.0	0	3

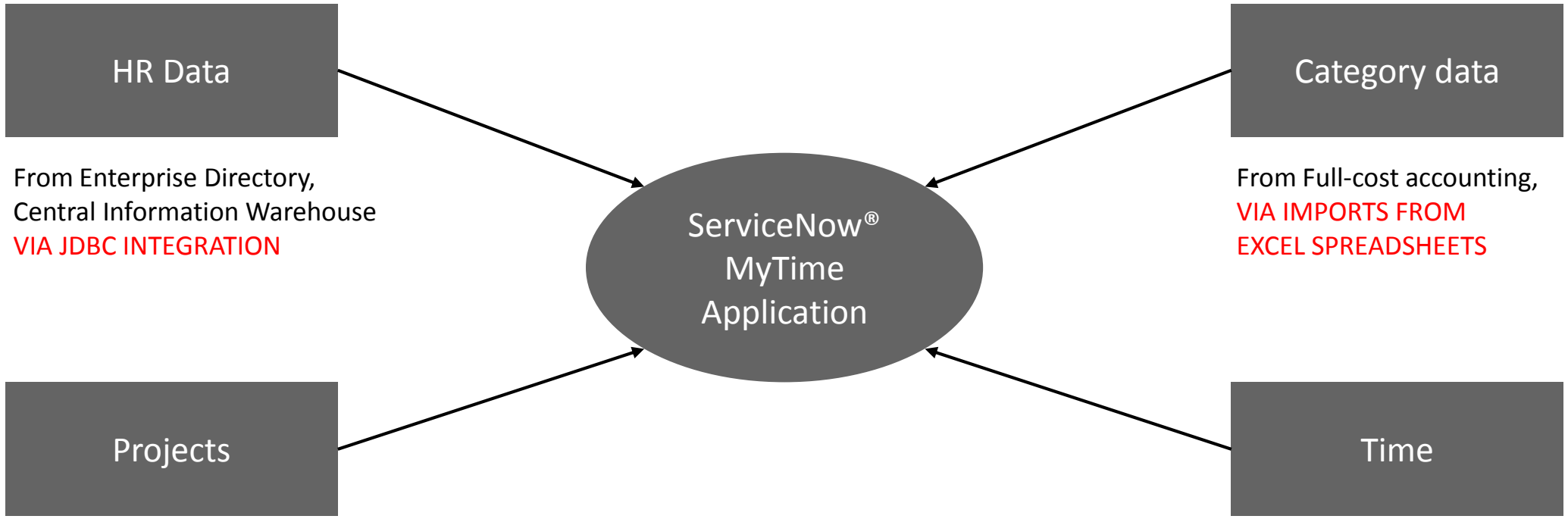
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Data Feeds into Application



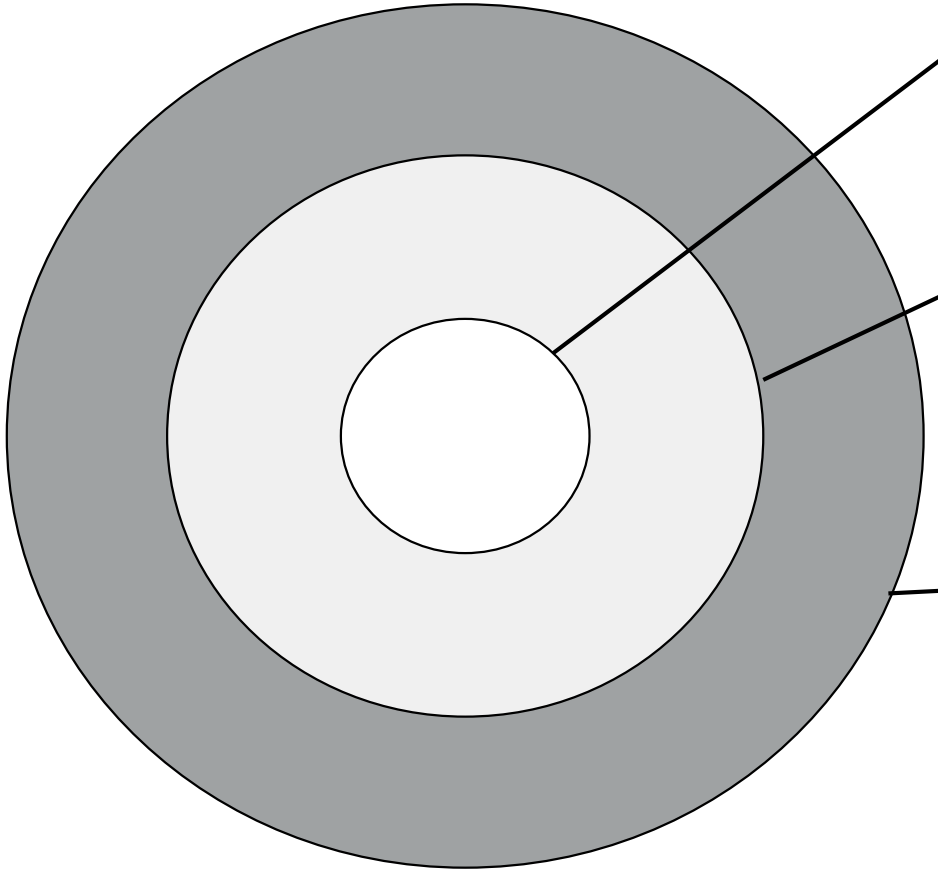
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Data Feeds into Application



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Roles and Permissions



mytime_user

- Allows access to enter new time cards, view and modify previously entered time cards (for self only)

mytime_supervisor

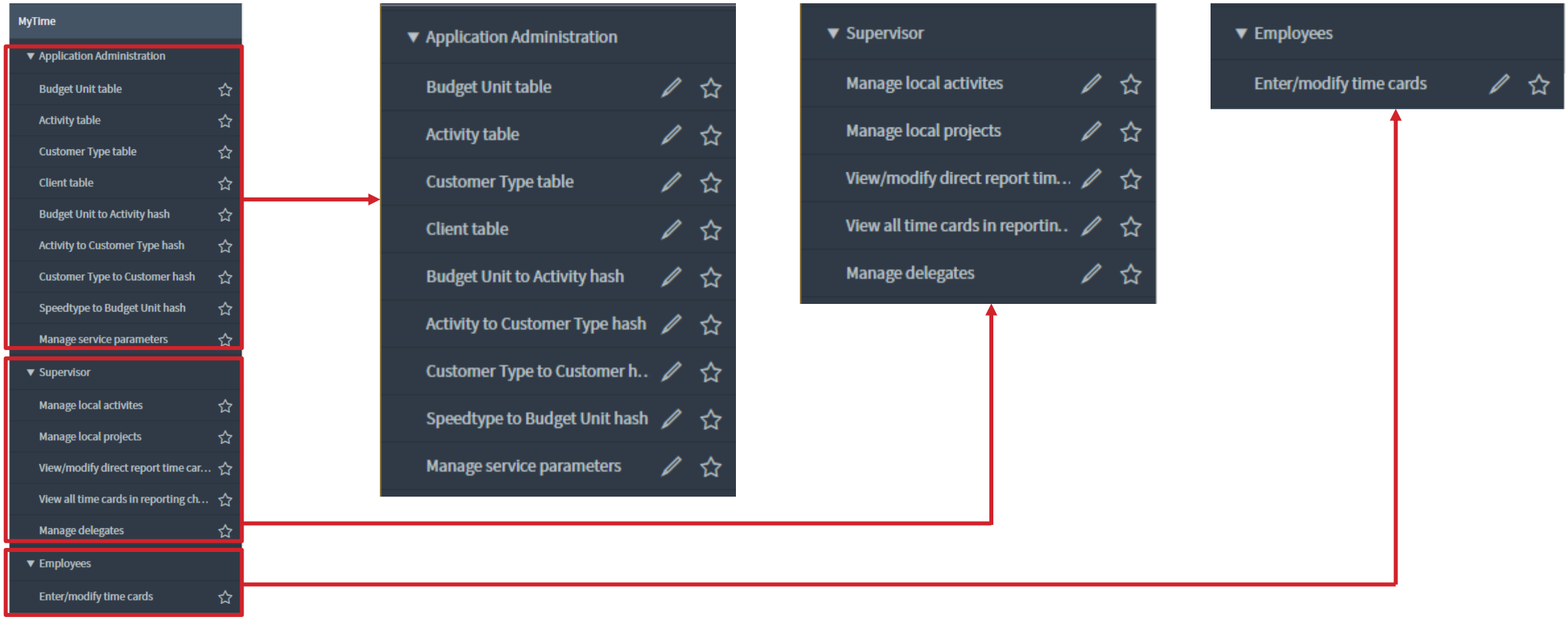
- Can add activities and projects that are ‘local’ for their Budget Unit
- Can view and modify submitted time cards for direct reports
- Can run reports against data for all employees in reporting chain (via Scripted ACL)

mytime_admin

- Allows viewing and management of limited back-end data – Budget Units, Activities, Customer Types, Clients
- Allows viewing and management of limited hash tables – Budget Unit & Activity, Activity & Customer Type, Customer Type & Customer
- Manage service parameters; e.g. period in which time cards can be updated by employees

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LHS Menu Snapshot



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Reporting

How much total time did OIT spend working on Service B over the last 6 months?

How much time did Joe spend working on each of our services over the last month?

How much time did Bob spend doing work for Department A last week?



How much total time did we spend implementing Project X?

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Time Entry UI – Design Goals

- Ease of use
- Minimize entry effort
- Fully accessible for sight-impaired users
- Ability to customize
- Support for dependent drop-down lists

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Input UI – Design Challenges and Tradeoffs

Many parameters to select

Limited screen space



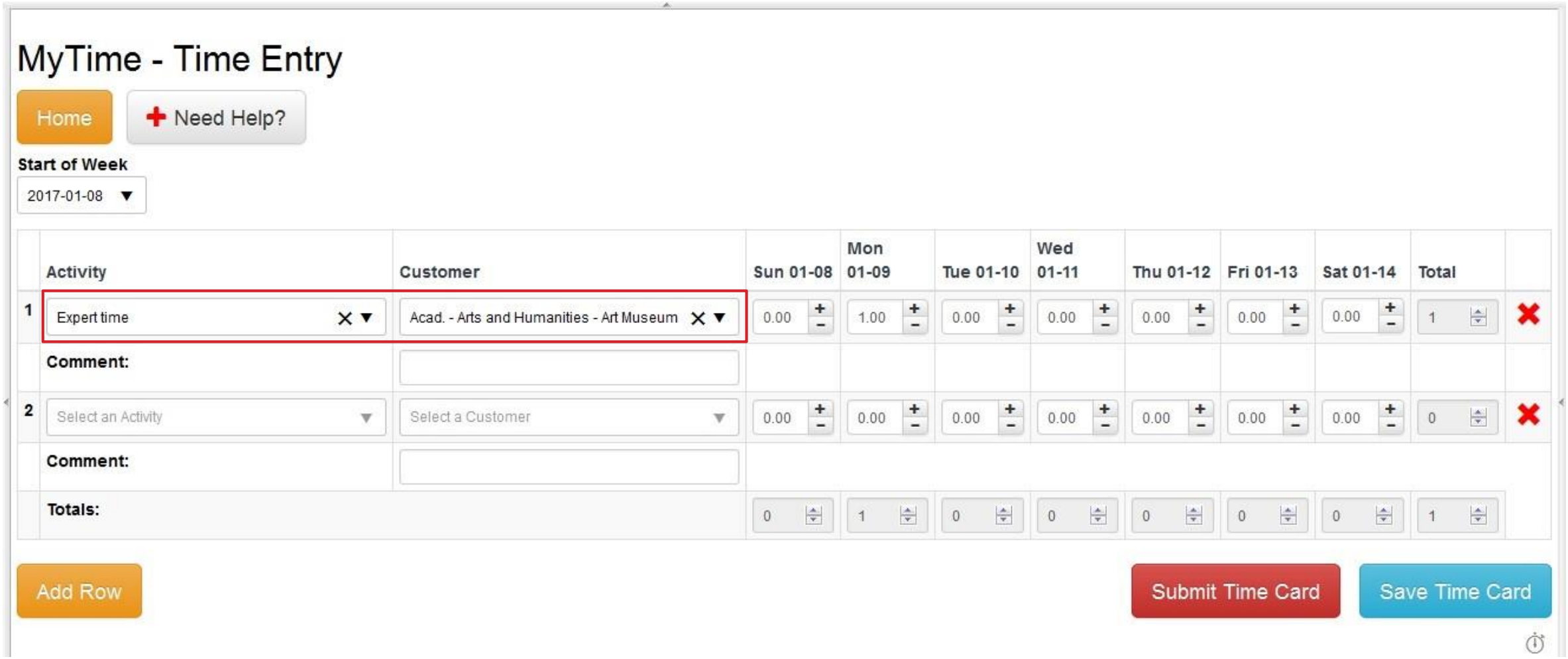
Design for sighted users

Design for sight-impaired users

EVOLVING REQUIREMENTS

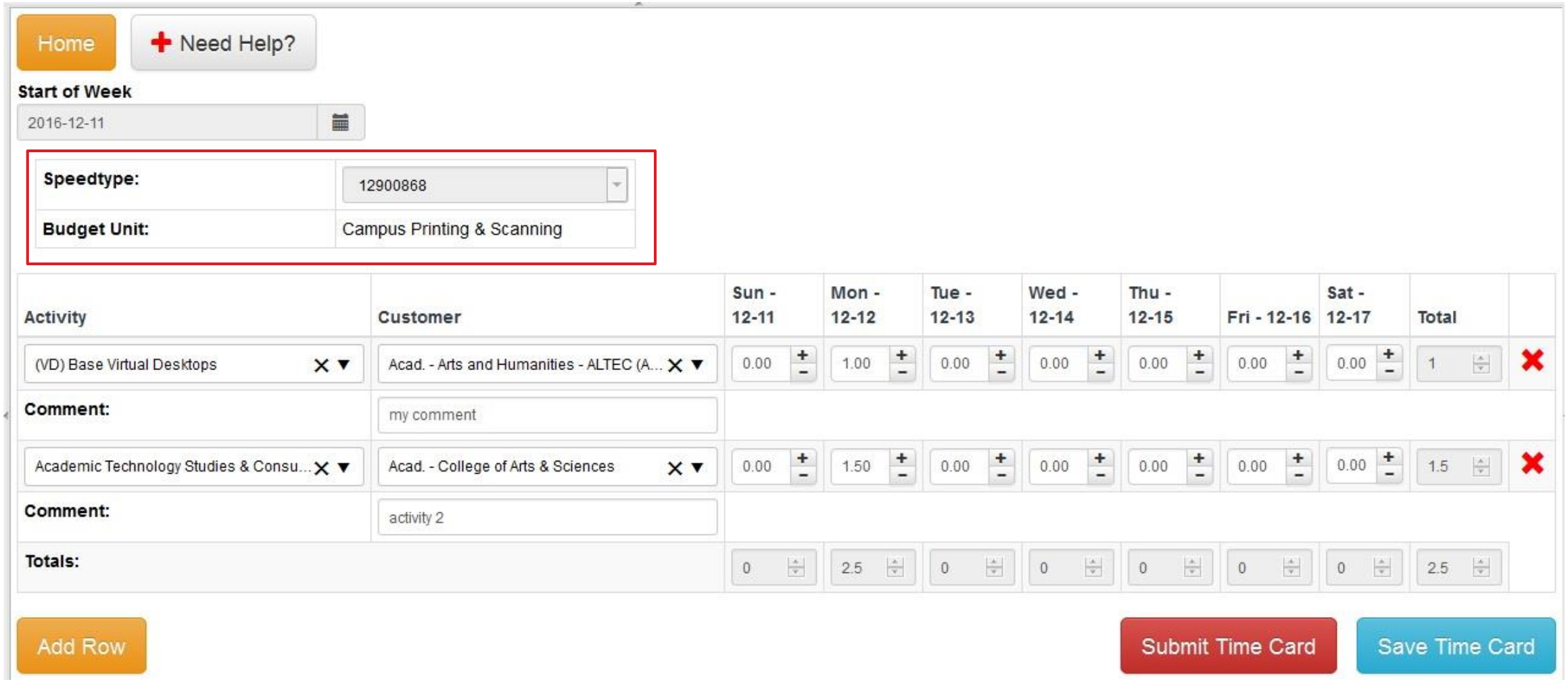
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Early Prototype – Horizontal Layout



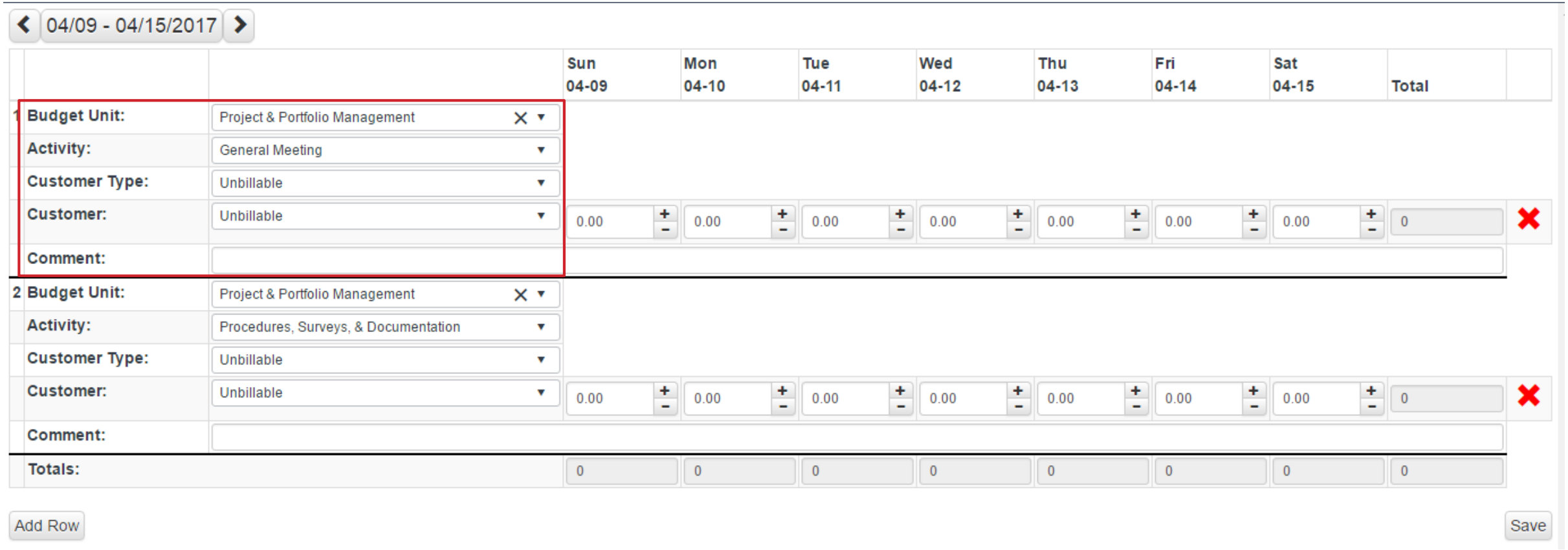
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Early Prototype – Accommodating Speedtype/Budget Unit



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Current Layout



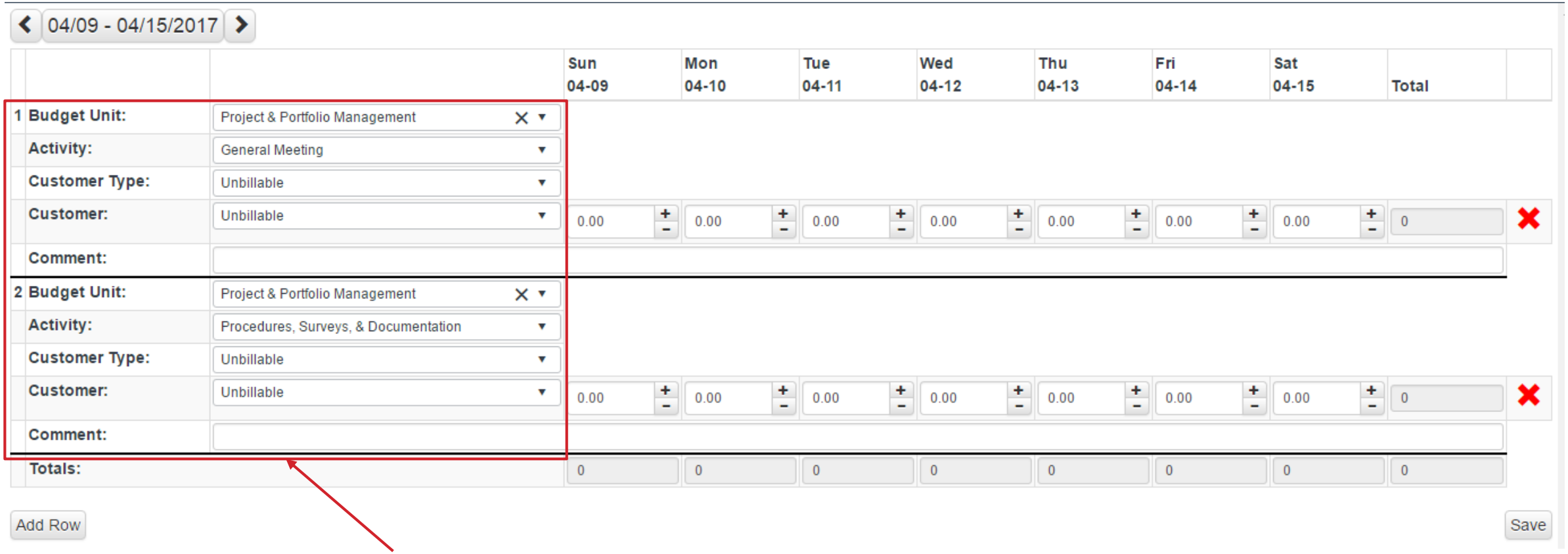
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Time Entry UI – Ease of Use Features

- When user only has one choice for a field, automatically populated
- Entries from previous week (minus hours) automatically populated when opening new time card
- Ability to choose templates from previous weeks

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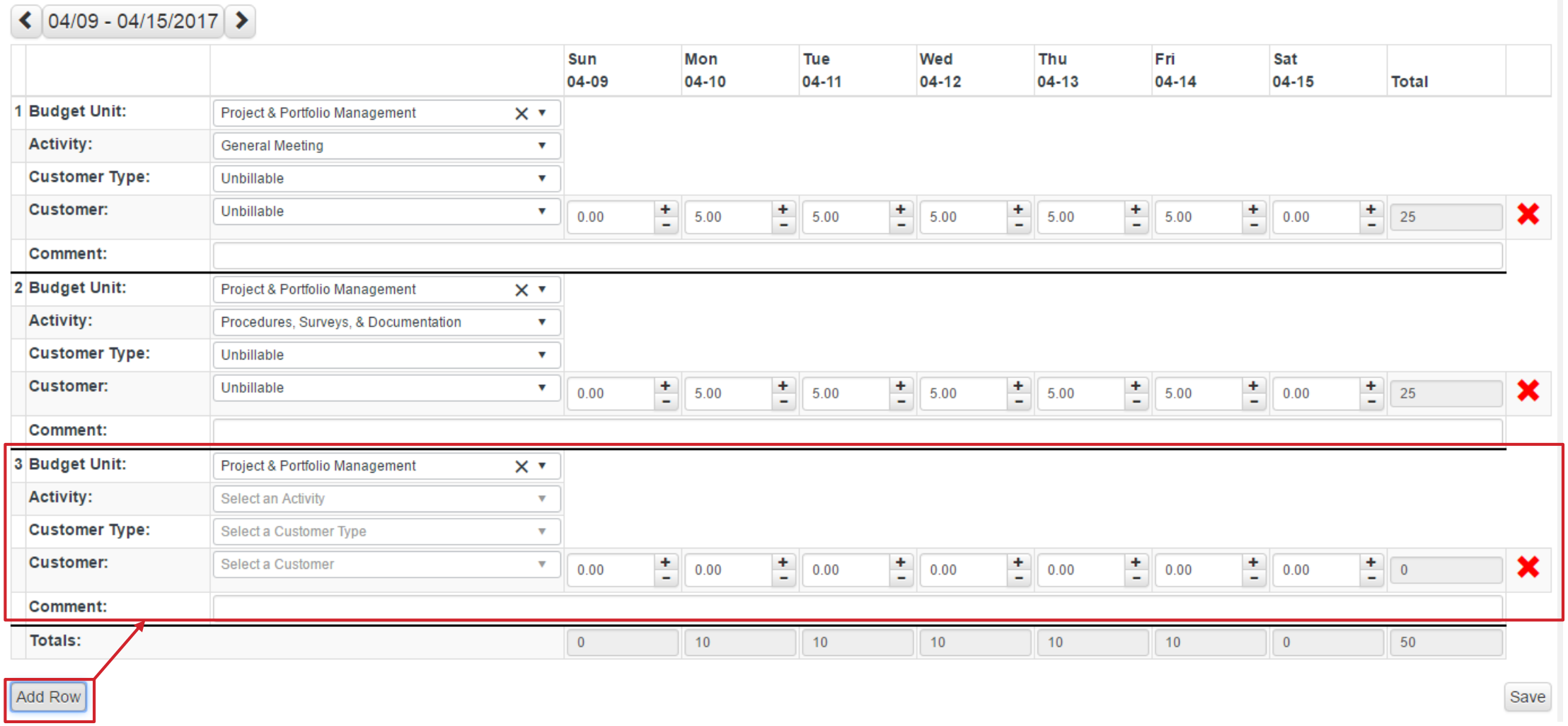
Enter New Time Card Screen – Carry Over from Previous Week



Categorization carries over with blank time entered

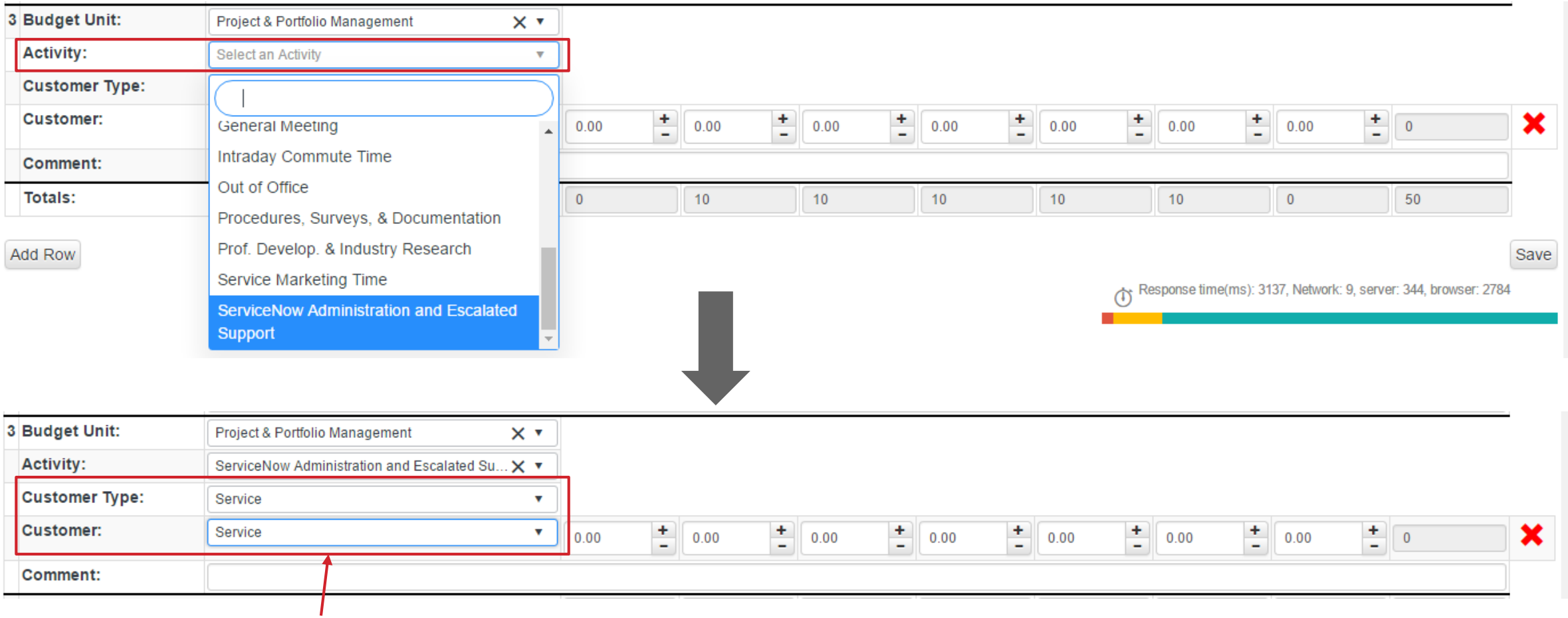
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Add New Row



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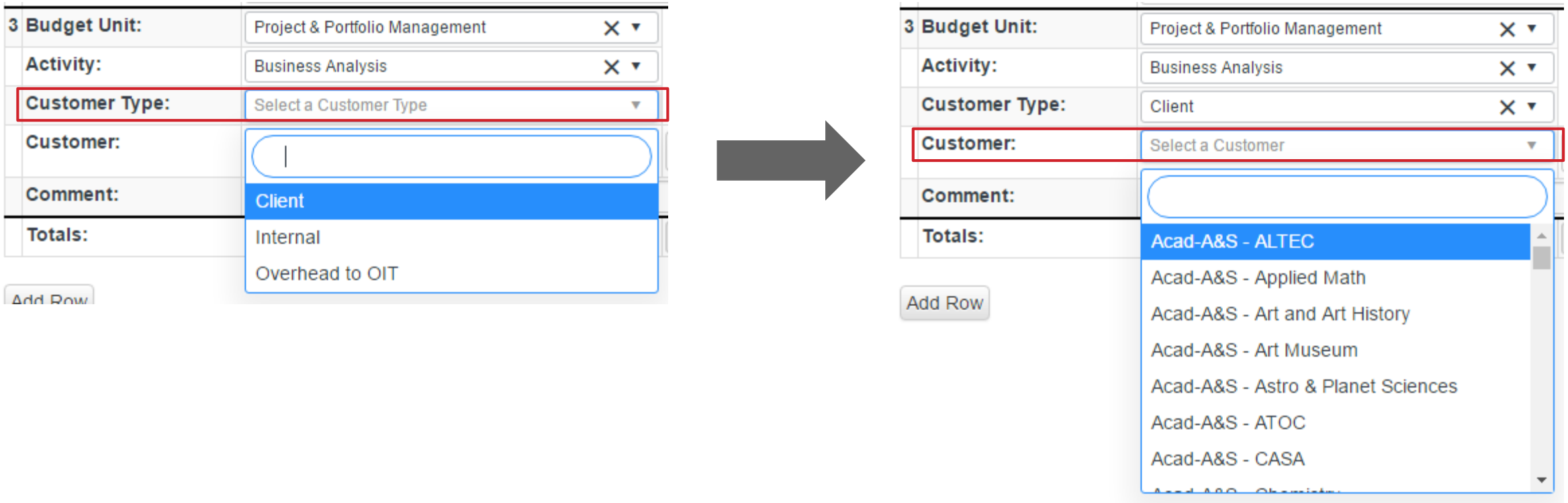
Adding New Rows - Example



Drop-downs are automatically populated when there is only one choice

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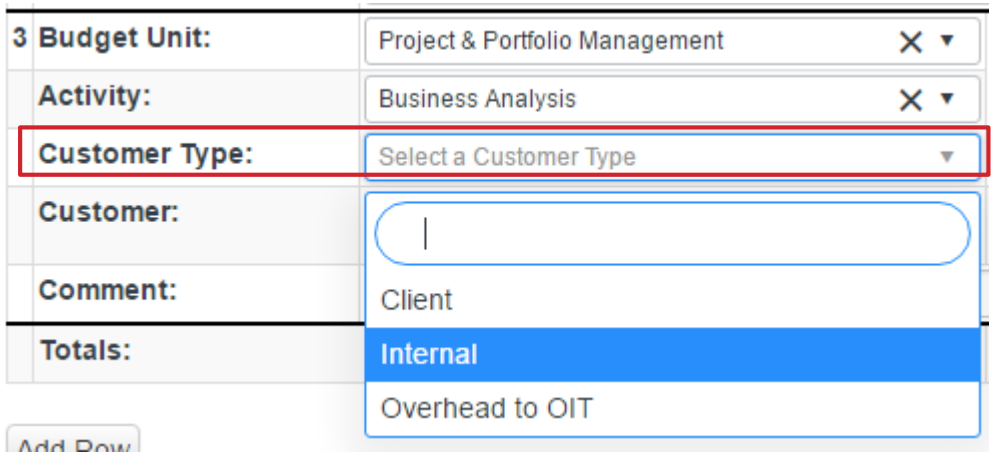
Adding New Rows - Example



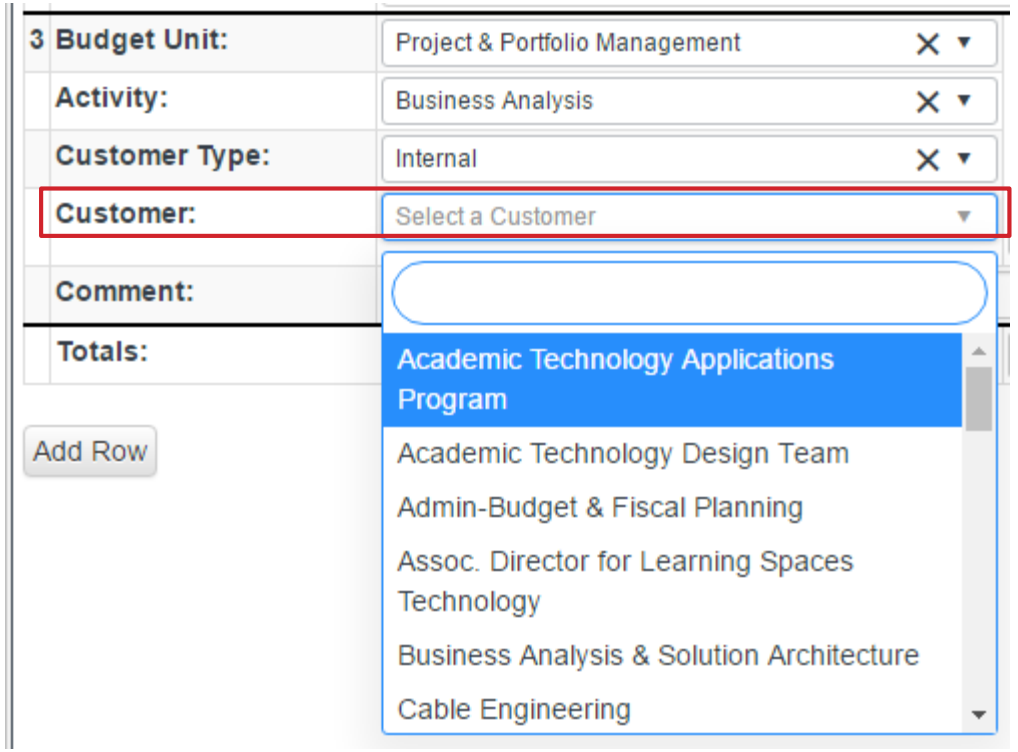
Example of dependent drop-down lists

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Adding New Rows - Example



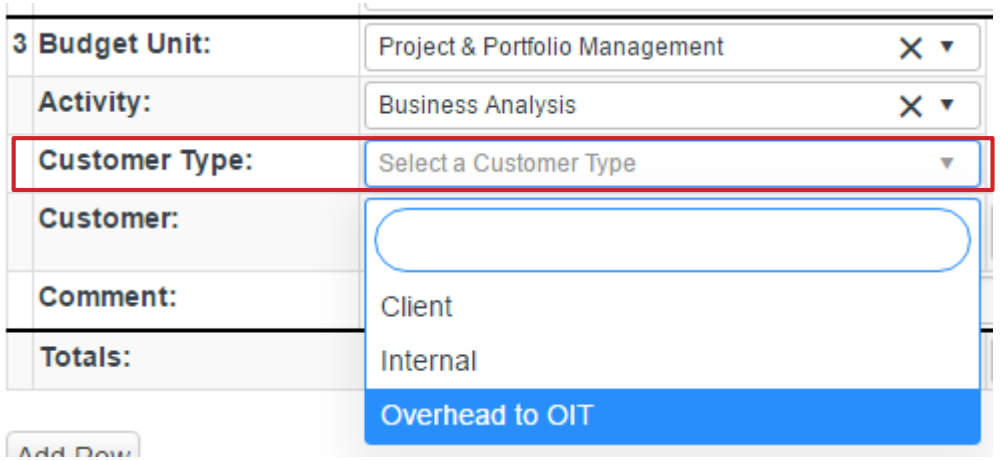


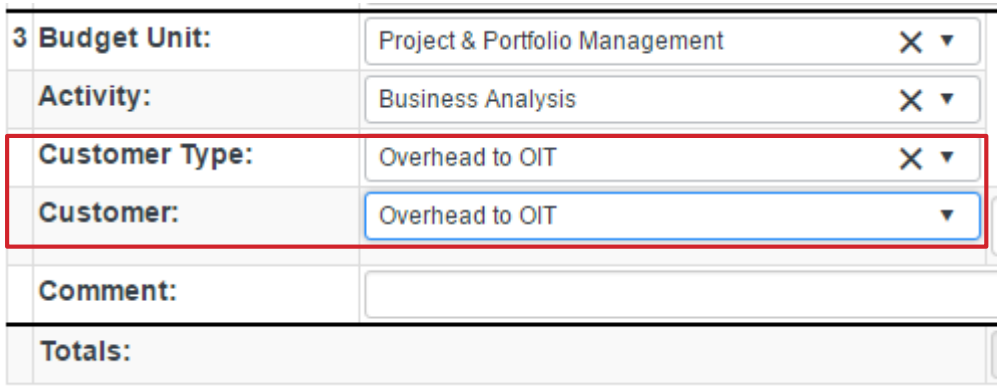


Example of dependent drop-down lists

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Adding New Rows - Example





Example of dependent drop-down lists and auto-populating choice

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Designing for Accessibility - Overview

- WCAG – Web Content Accessibility Guidelines
  - A, AA, AAA compliance levels
- Section 508 Amendment of Rehabilitation Act of 1973
  - Requires WCAG 2.0 AA compliance
- CU-Boulder mandate that all new digital services have to meet WCAG 2.0 AA standards for Accessibility
  - Same interface for all
- ServiceNow® supports WCAG 2.0 AA compliance with exceptions
- ***We're learning as we go***

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An Analogy on the Benefits of Accessible Design







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Accessible Web Design Can Benefit All Users

- When search engines index a site, they include:
  - Image alt attributes
  - HTML5 semantic elements; e.g. <header>, <nav>, <section>, <footer>
  - ARIA roles
- Making sites navigable using only the keyboard allows power users to operate more efficiently
- Encourages the web design best practice of separating content and structure (HTML) from presentation (CSS) and behavior (JavaScript).

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WCAG Standards – Challenges

- The WCAG2.0 standards document doesn't necessarily provide concrete guidance:
  - Example:
    - 1.3.1 Info and Relationships: Information, structure, and relationships conveyed through presentation can be programmatically determined or are available in text. (Level A)
    - 1.3.2 Meaningful Sequence: When the sequence in which content is presented affects its meaning, a correct reading sequence can be programmatically determined. (Level A)
- If you are a developer on a deadline, how are you going to use that to achieve your work?

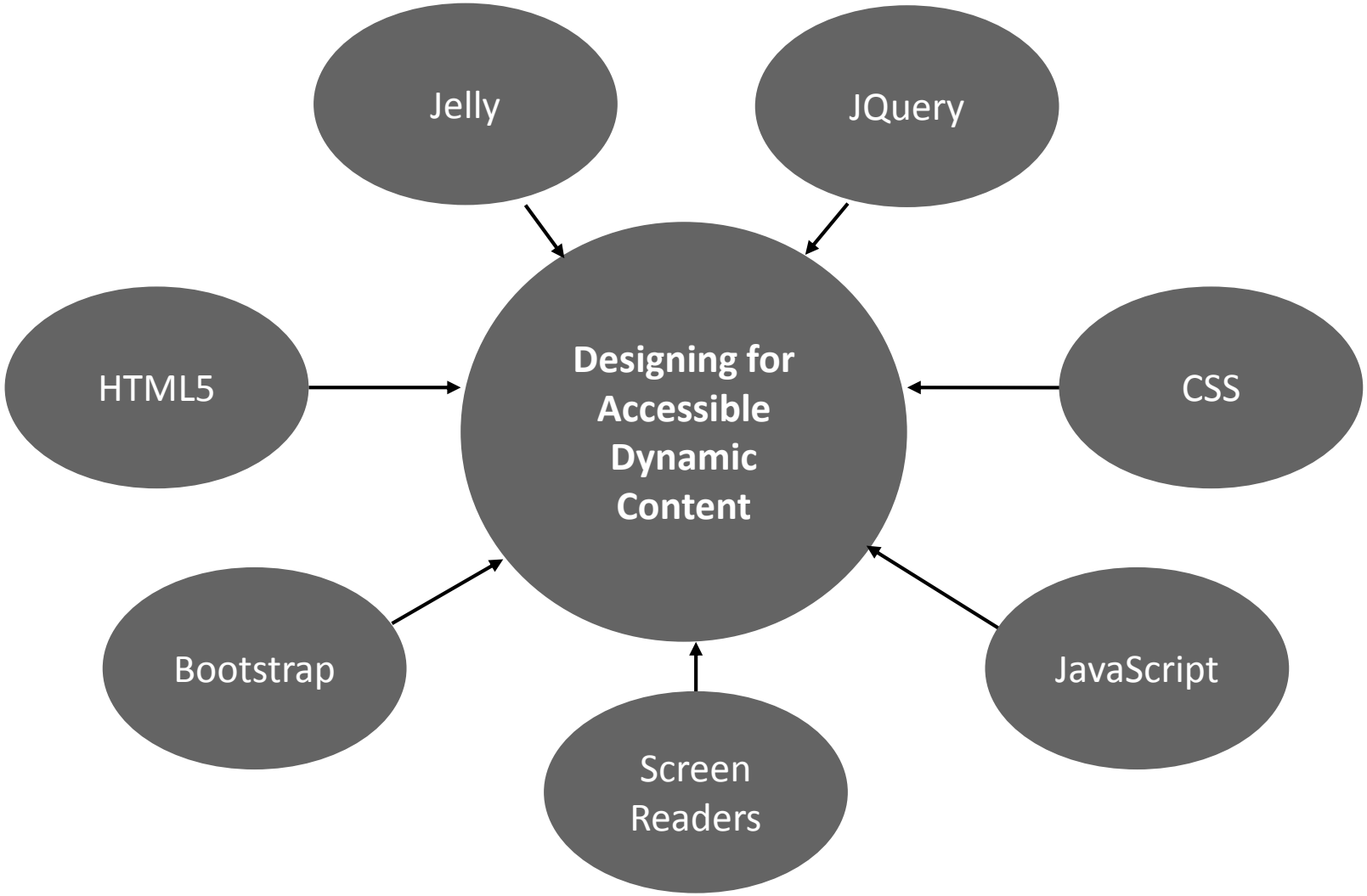
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WCAG Standards – Challenges

- Many statements made about developing for Accessibility are vague or inaccurate:
  - 'Just make sure you can tab through all of the fields'
  - 'Use HTML5 tags such as <button> rather than and you'll be fine.' Just reading out the basic HTML information will generally not provide enough context to unsighted users.
  - 'Don't use <table> tags in your HTML.' What if you have tabular data, like we did?
  - 'Developing for Accessibility need not change your UI for sighted users.'

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Frameworks and Tools



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Screen Readers

- There are a number of screen reader & browser combinations that could be used and need to be tested against. E.g.
  - JAWS & IE/Edge
  - NVDA & Firefox
  - VoiceOver & Safari
- Screen reader technology not always mature
- Implemented as browser plug-ins

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Designing for Accessibility – Key Takeaways

- Developing for Accessibility WILL change your design
- Visually impaired or unsighted users CANNOT use the mouse
- Screen Readers will generally only respond to content that receives focus
- Screen Readers ONLY respond to the Document Object Model (DOM) within the HTML page
- Tab order between fields must make sense for unsighted users

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Accessibility – Additional Resources

- **CU-Boulder Digital Accessibility Program**
  - http://www.colorado.edu/accessibility/digital-accessibility-program
- **Web Content Accessibility Guidelines (WCAG) 2.0**
  - https://www.w3.org/TR/WCAG20/
- **Wikipedia Web Content Accessibility Guidelines**
  - https://en.wikipedia.org/wiki/Web_Content_Accessibility_Guidelines#United_States
- **ServiceNow Accessibility 508 Compliance**
  - https://docs.servicenow.com/bundle/istanbul-release-notes/page/administer/accessibility-508-compliance/reference/r_Accessibility508Compliance.html

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Lessons Learned

1. Design from the beginning with Accessibility in mind
2. UI pages provide flexibility to meet complex business requirements
3. Clear separation between data model and user interface allows concurrent development

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Top Takeaways

1

The train is leaving the station on Accessibility - Get on board

2

The ServiceNow® platform makes highly customized applications possible

3

Accessibility guidelines support good web design

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Thank You

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Q & A

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