Summary Phase 1 Report

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Data Types

A. Users:

Attribute	Data Type	Constraint
Username	String / Char	PK, NOT NULL
Password	String / VarChar	NOT NULL
DisplayName	String / Char	NOT NULL

➔ Cert_Member

Attribute	Data Type	Constraint
PhoneNumber	String / VarChar	NOT NULL

➔ Resource_Provider

Attribute	Data Type	Constraint
Number	Char	NOT NULL
Street	String / VarChar	NOT NULL
ApartmentNumber	Char	NULL

City	String / VarChar	NOT NULL
State	String / Char	NOT NULL

➔ Admin

Attribute	Data Type	Constraint
Email	String / VarChar	NOT NULL

B. Resources:

Attribute	Data Type	Constraint
Resource_id	String / Char	PK, NOT NULL
Resource_name	String / VarChar	NOT NULL
Description	String / VarChar	NOT NULL
Capabilities	String / VarChar	NULL
Distance	Decimal (3, 1)	NULL
Cost	Decimal (5, 2)	NOT NULL
Unit_id	String / Char	FK (Unit_id),NOT NULL
Primary_function	Integer	FK (Function_id), NOT NULL
Secondary_function	String / Char	COMPOSITE FK (Resource_id, Function_id), NOT NULL
Owner	String / VarChar	FK (Username), NOT NULL

➔ Cost_unit

Attribute	Data Type	Constraint
Unit_id	String / VarChar	PK, NOT NULL
Unit	String / VarChar	NOT NULL

➔ Function

Attribute	Data Type	Constraint
Function_id	Integer	PK, NOT NULL
Description	String / VarChar	NULL

➔ Secondary_function

Attribute	Data Type	Constraint
Function_id	Integer	FK, NOT NULL
Resource_id	String / VarChar	FK, NOT NULL

C. Incidents:

Attribute	Data Type	Constraint
Incident_id	Int	PK, NOT NULL
Date	Date	NOT NULL
Description	String / VarChar	NOT NULL
Category	VarChar	FK (Category_id), NOT NULL

➔ Category

Attribute	Data Type	Constraint
Category_id	Int	PK, NOT NULL
Type	String / VarChar	NOT NULL

Business Logic Constraints **(These are our assumptions based off of the given business requirements)**

- A resource is available if it is not currently being used to respond to an incident.
- New resources entered into the system are available by default.
- In no circumstances should the system allow a resource that is currently in use be deployed to respond to another incident.
- In no circumstances should the system allow a resource be deployed to respond to an incident if the resource cannot be delivered to the site of the incident in a reasonable time to assist.
- In no circumstances should the system allow a resource be deployed to respond to an incident if the resource cannot be realistically accessed due to scenarios; such as, the resource being damaged because of the incident, the owner not being present to give access to the resource, financial incapability, etc.
- A resource cannot be deployed to an incident that has already passed.
- A resource provider can only submit resources that they are realistically owners of, and have available to deploy at any time.
- A submitted resource must be in compliance with the law.
- The system does not account for SQL injections.
- User can only login from one machine at a time.

Markup Annotations

- **Bold Underline: Form / View.**
- **Bold Italics: Buttons**
- **Bold: Task.**
- Italics: Form Input fields / Column names in tabulated form.
- $XYZ: Database field/column named ‘XYZ’.

Task Decomposition with Abstract Code:

Login

Task Decomposition:

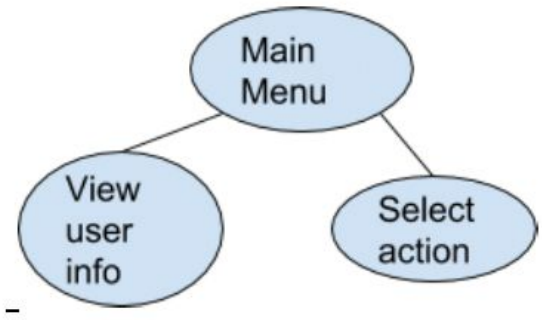
Abstract Code:

- User enters *Username* (‘$Username’) and *Password* (‘$Password’) input fields.
- If data validation is successful for both *Username* and *Password* input fields, then:
- When ***Login*** button is clicked:
    - If *Username* exists but *Password* != ‘$Password’, or *Username* is not found:

        - *Username* and *Password* input fields are invalid. Go back to **Login** form and display error message.
    - Else, log user in and go to **Main Menu** view.

Main Menu

Task decomposition:



Abstract Code:

- User successfully logged in from the **Login** form
- Run the **view user info** task by querying the user to display the user's '$Name' and type:
    - If type = "municipality", show municipality's '$Category'.
    - If type = "government agent", show '$AgencyName'.
    - If type = "company", show '$Headquarter' (location of the headquarters) and '$NumberOfEmployees'.
- Run the **select action** task to display "***Add Resource***", "***Add Emergency Incident***", "***Search Resources***", "***Resource Status***", and "***Resource Report***" links.
  Upon clicking:
    - ***Add Resource*** button - Jump to **Add Resource** form.
    - ***Add Emergency Incident*** button - Jump to **Add Emergency Incident** form.
    - ***Search Resources*** button - Jump to **Search Resources** form.
    - ***Resource Status*** button - Jump to **Resource Status** view.
    - ***Resource Report*** button - Jump to **Resource Report** view.
    - ***Exit*** or "***X***" button - Invalidate login session and go back to **Login** form.
- When ***Exit*** button is clicked on **Main Menu** view:

- Exit the current form, invalidate login session, and take user back to the **Login** form.

New Resource Information

Task Decomposition:

Abstract Code:

- User selects **add resource** task from **select action** task.
- Display **Add Resource** form, and run the **add resource** task.
- Display *Owner* ('$Owner') with the logged in user display name.
- User enters *Resource Name* ('$Resource_name'), *Primary Function* ('$Primary_function'), *Secondary Function* ('$Secondary_function'), *Description* ('$Description'), *Capabilities* ('$Capability'), *Distance* ('$Distance'), *Cost* ('$Cost'), and *Unit* ('$Unit') input fields, drop down menu, and list view:
  - *Primary Function* drop down menu:
    - Query ('**Function**') table -> ('$Function_id**'**) and ('$Description'), return and display *Primary Function* ('$Function_id') ('$Description').
  - If *Primary Function* drop down menu selected value is "value", then:
    - *Secondary Function* list view does not include "value"
- If data validation is not successful for all fields, then:
  - Display red error message instructing user to input correct format next to input field or drop down menu.
- Else if data validation is successful for all fields, then:
- When ***Save*** button is clicked:
  - If *Resource Name*, *Primary Function*, *Cost*, or *Unit* is empty or not filled out:
    - Go back to **Add Resource** form, and display red error message next to required empty fields (error message: " * ").
  - Else, uniquely generate ('$Resource_id')
    - Insert user-entered *values*.

- User adds new resource.
    - Run **display added resource** task: display user-entered fields as read-only.
- When "**+**" button is clicked:
    - Clear user entered values from input fields and drop down menus.
- When ***Cancel*** button is clicked:
    - Exit the current form, and take user back to the **Main Menu** form.

New Incident Information

Task Decomposition:

Abstract Code:

- User selects **add emergency incident** task from **select action** task.
- Display **Add Emergency Incident** form, and run the **add incident** task.
- User enters *Category* ('$Category'), *Date* ('$date'), *Description* ('$Description') input fields and drop down menu.
    - *Category* drop down menu:
        - Query ('**Category**') table -> ('Category_id') and ('$type'), return and display *Category* ('$type').
- If *Date* format is not "mm/dd/yyyy", then:
    - Display red error message instructing user to input correct format: mm/dd/yyyy
- Else if data validation is successful for all fields, then:
- When ***Save*** button is clicked:
    - If *Category*, *Date*, and *Description* is empty or not filled out:
        - Go back to **Add Emergency Incident** form, and display error message next to required empty fields (error message: " * ").
    - Else, uniquely generate ('$Incident_id')
        - Insert user-entered *values*.
- User adds new incident.
    - Run **display added incident** task: display user-entered fields as read-only.

- When "**+**" button is clicked:
    - Clear user entered values from input fields and drop down menus.
- When ***Cancel*** button is clicked:
    - Exit the current form, and take user back to the **Main Menu** form.

Search Resources

Task Decomposition:

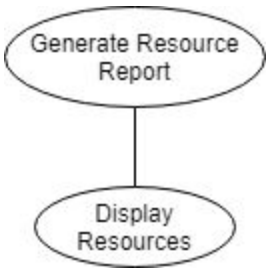
Abstract Code:

- User selects **search resources** task from **select action** task.
- Display **Search Resources** form, and run the **search results** task.
- User enters *Category* ('$Category'), *Date* ('$Date'), *Incident* ('$Incident'), and *Distance* ('$Distance') input fields and drop down menu.
    - *Primary Function* drop down menu:
        - Query ('**Function**') table -> ('$Function_id**'**) and ('$Description').
- If data validation is not successful for all fields, then:
    - Display red error message instructing user to input correct format next to input field or drop down menu.
- Else if data validation is successful for all fields, then:
- When ***Save*** button is clicked, query the ('**Resource**') table to run a comparison:
    - If *Keyword* == ('$Resource_name') or ('$Description') or ('$Capability'), then:
        - Return ('$Resource_id'), ('$Resource_name'), ('$Owner'), ('$Cost'), ('$Unit'), ('$Distance'). Sort by resource's distance and display.
    - Else if "value" selected in *Primary Function*, then:
        - Return ('$Resource_id'), ('$Resource_name'), ('$Owner'), ('$Cost'), ('$Unit'), ('$Distance') where ('$Primary_function') == "value"
    - Else if "value" input in *Distance*, then:

        - Return (‘$Resource_id’), (‘$Resource_name’), (‘$Owner’), (‘$Cost’), (‘$Unit’), (‘$Distance’) where (‘$Distance’) to 0.1 precision <= “value”.
- Search returns results matching the user's search criteria.
    - Run **display search resources** task: display *Resource ID* (‘$Resource_id’), *Resource Name* (‘$Resource_name’), *Owner* (‘$Owner’), *Cost/Unit* (‘$Cost’) (‘$Unit’), *Distance* (‘$Distance’) in table list fashion.
- When “**+**” button is clicked:
    - Clear user entered values from input fields, drop down menus, and search results.
- When ***Cancel*** button is clicked:
    - Exit the current form, and take user back to the **Main Menu** form.
- User searches for resources using Keyword (optional).

Generate Resource Report

Task Decomposition:



Abstract Code:

- User selects **generate resource report** task from **select action** task.
- Displays the user’s **Resource Report** form according to the each resource’s primary function sorted by their Primary Function #.
    - Displays title “Resource Report” on top of the form.
- The table format of the report consists of:
    - *Primary Function # (PF#)*: pulled from *PF* in the database. *PF#* starts from 1 and goes up in ascending order.
    - *Primary Function (PF)*: a brief description of the *PF* in the database. Description of the *PF* is originally entered on **Add Resource** form which serves as a mandatory field.

- *Total Resources*: row-wide aggregation by grouping all the resources belonging to each PF in the system for the user.
- *Total*: column-wide aggregation by grouping all the resources across all PFs in the system.