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 (4, 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	Integer	PK, NOT NULL
Unit	String / VarChar	NOT NULL

➔ Function

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

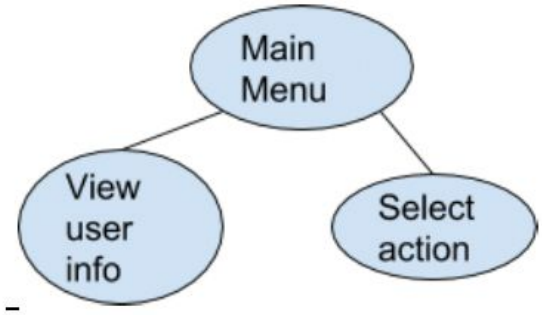
- User enters *Username* (‘$Username’) and *Password* (‘$Password’) input fields.
- If data validation is successful for both *Username* and *Password* input fields, then:
- When ***Login*** button is clicked:

```
SELECT COUNT(1) = 1 AS valid_login
FROM `user`
WHERE username = ' $Username' AND password = ' $Password ';
```

- 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 user's specific information:

```
SELECT u.disp_name, a.email, c.phone_number, r.street_number,  r.street,
IFNULL( r.apt_number, ' '), r.city, r.state, r.zip
FROM `user` u
LEFT JOIN `admin` a ON (u.username = a.username)
LEFT JOIN `cert_member` c ON (u.username = c.username)
LEFT JOIN `resource_provider` r ON (u.username = r.username)
WHERE u.username = '$Username';
```

- If user type = "admin", show '$specific_info' (email).
- If user type = "cert member", show '$specific_info' (phone number).
- If user type = "resource provider", show '$specific_info' (address).

- 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:

```
SELECT CONCAT (function_id, " ", description) AS "Primary Function"
FROM `function`;
```

        - 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 INTO `resource` (`username`, `primary_function_id`,
`resource_name`, `description`, `capabilities`, `distance`, `cost`, `unit_id`)
VALUES
('$Username', ‘$primary_function_id’, 'resource1', NULL, NULL, NULL,
'500.00', ‘$Unit_id’),
('$Username', $primary_function_id’, 'pasadena city college', NULL, NULL,
NULL, '900.00', ‘$Unit_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:

```
SELECT category_id, description
FROM `incident`;
```

        - 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 INTO `incident` (`username`, `category_id`, `date`, `description`)
VALUES
('$Username', ‘$Category_id’, '2019-05-02 00:00:00', 'Active shooter'),
('$Username', ‘$Category_id’, '2019-05-08 00:00:00', 'Earthquake drill');
```

        - 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:

```
SELECT CONCAT (function_id, " ", description) AS "Primary Function"
FROM `function`;
```

        - 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 ***Search*** button is clicked, query the ('**Resource**') table to run a comparison:

```
SELECT u.username, r.resource_id, r.resource_name, r.cost, c.unit, r.distance
FROM `user` u
LEFT JOIN `resource` r ON (u.username = r.username)
LEFT JOIN `cost_unit` c ON (r.unit_id = c.unit_id)
WHERE r.resource_name LIKE '%("$Keyword")%'
    OR r.description LIKE %("$Keyword")%
    OR r.capabilities LIKE %("$Keyword")%;
```

    - If *Keyword* == ('$Resource_name') or ('$Description') or ('$Capability'), then:

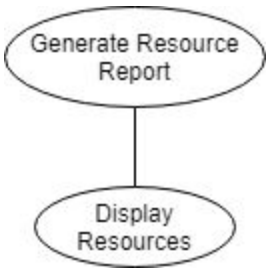
        - Return (‘$Resource_id’), (‘$Resource_name’), (‘$Owner’), (‘$Cost’), (‘$Unit’), (‘$Distance’). Sort by resource’s distance and display.
    - Else if “value” selected in *Primary Function*, then:
        - Return (‘$Resource_id’), (‘$Resource_name’), (‘$Owner’), (‘$Cost’), (‘$Unit’), (‘$Distance’) where (‘$Primary_function’) == “value”
    - Else if “value” input in *Distance*, then:
        - Return (‘$Resource_id’), (‘$Resource_name’), (‘$Owner’), (‘$Cost’), (‘$Unit’), (‘$Distance’) where (‘$Distance’) to 0.1 precision <= “value”.

```
SELECT u.username, r.resource_id, r.resource_name, r.cost, c.unit, r.distance
FROM `user` u
LEFT JOIN `resource` r ON (u.username = r.username)
LEFT JOIN `cost_unit` c ON (r.unit_id = c.unit_id);
```

    - Else if no data input from user, then:
        - Return all resources.
- 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 **<u>Resource Report</u>** form according to each resource's primary function sorted by their Primary Function #.

```
SELECT tf.function_id AS "Function ID", description AS "Function",
IFNULL(total.total_resources, 0) AS "Total Resources"
FROM function tf LEFT JOIN
(SELECT f.function_id, COUNT(r.primary_function_id) AS "total_resources"
FROM `function` f LEFT OUTER JOIN `resource` r ON (f.function_id =
r.primary_function_id) WHERE username = '$Username' GROUP BY
f.function_id WITH ROLLUP)
AS total
ON (tf.function_id = total.function_id)
ORDER BY tf.function_id;
```

    - 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 **<u>Add Resource</u>** 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.