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Emergency Resource Management System Data Types

USER		
ATTRIBUTE	DATA TYPE	ALLOW NULL
name	STRING	Not Null
username	STRING	Not Null
password	STRING	Not Null

MUNICIPALITY		
ATTRIBUTE	DATA TYPE	ALLOW NULL
category	STRING SET (city, county, state ,country)	Not Null

GOVERNMENT AGENCY		
ATTRIBUTE	**DATA TYPE**	**ALLOW NULL**
agency_name	STRING	Not Null
local_office	STRING	Not Null

COMPANY		
ATTRIBUTE	**DATA TYPE**	**ALLOW NULL**
hq_location	STRING	Not Null
number_of_employees	INTEGER	Not Null

INDIVIDUAL		
ATTRIBUTE	**DATA TYPE**	**ALLOW NULL**
job_title	STRING	Not Null
hired_date	DATE (MM/DD/YYYY)	Not Null

RESOURCE		
ATTRIBUTE	**DATA TYPE**	**ALLOW NULL**
resource_id	INTEGER	Not Null
owner_resource	STRNG	Not Null
resource_name	STRING	Not Null
primary_ESF_number	STRING	Not Null
primary_ESF	INTEGER SET (1-15)	Not Null

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primary_ESF_description	STRING	Not Null
additional_ESF_number	STRING	Not Null
additional_ESF	INTEGER SET (1-15)	Null
additional_ESF_description	STRING	Null
model	STRING	Null
capabilities	STRING	Null
latitude	DECIMAL	Not Null
longitude	DECIMAL	Not Null
resource_location	DECIMAL	Not Null
cost	STRING	Not Null
time	STRING SET (hour/day/week)	Not Null
dollars	INTEGER	Not Null
assigned_to	STRING	Null
max_distance	DECIMAL	Null
status	STRING SET (available, in use)	Not Null

Incident		
ATTRIBUTE	**DATA TYPE**	**ALLOW NULL**
incident_id	STRING	Not Null
incident_number	INTEGER	Not Null
incident_type	STRING SET (MD, ED, FM, FS)	Not Null
owner_incident	STRING	Not Null
date	DATE (MM/DD/YYYY)	Not Null
description	STRING	Not Null
latitude	DECIMAL	Not Null
longitude	DECIMAL	Not Null
incident_location	DECIMAL	Not Null

REQUEST		
ATTRIBUTE	**DATA TYPE**	**ALLOW NULL**
exp_return_date	DATE (MM/DD/YYYY)	Null
assigned_to	STRING	Null
next_available	DATE (MM/DD/YYYY)	Null

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Emergency Resource Management System Constraints

No.	Entity Types, Relationship Types and Attributes Involved	Constraint Definition
1	Owns, User, Incident, Indecent.Declaration, Incident.Date, Incident.Description, Incident.Longitude, Incident.Latitude	When adding a new incident all fields are required and must be validated before saving the incident to the new database
2	Owns, User, Incident	All incidents are private to the current user and cannot be shared
3	Help from, Help For, Request, Resource, Incident	A resource cannot be requested before first selecting an incident
4	Help from, Help For, Request, Resource, Incident	A resource can only be deployed to respond to one incident at a time
5	Help from, Resource, Request, Request.ExpectedReturnDate	When a resource is requested an expected return date must be added
6	Help from, Help For, Request, Resource, Incident	A resource cannot be requested again for the same incident
7	Help from, Help For, Request, Resource, Incident	A resource that is currently in use cannot be deployed for another incident
8	Resource, Incident.IncidentID, Incident.owner_incident	A resource can either be not be assigned or can only be assigned to one incident ID and one owner
9	User, Incident,	If an incident is widespread, the user should choose a central location as the location of the incident
10	Help from, Help For, Request, Resource, Incident	Resources must be returned to the available status before they can be deployed again

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Emergency Resource Management System Task Decomposition with Abstract Code

Log In

Task Decomposition

Lookup Types: read only look-up of user to find match for Username and Password
Number of Lookup: 1
Enabling Conditions: N/A
Frequency: Many times a day for 100s of user logins.
Schemas: not big enough to decompose
Indices: N/A
Consistency: Not critical, user name must be active and loaded to database prior to log-in function working.
Subtasks: N/A

Abstract Code

- Display at the top left hand box 'Login to ERMS'
- Display Box Title 'ERMS Emergency Resource Management System'
- Display *User Name* and *Password*
- User Writes *User Name* and *Password* fields on the **LOG IN** form to database;
- User clicks Enter button:
    - If no match is found return error message displaying "invalid username or password";
        - Find if match of combined *User Name* and *Password* exists in USER table;
    - If successful match is found, advance user to **MAIN MENU**;
- If user 'x' is pressed then window closes

.Main Menu

Task Decomposition

- **LookupTypes:** read only look-up to find user name and other details depending on the user type
- **Number of Lookups:** 1 USER schema is involved
- **Enabling Conditions:** A user must be logged in
- **Frequency:** Many times a day for 100s of user logins.
- **Consistency:** One task and not critical
- **Schemas:** not big enough to decompose
- **Indices:** N/A
- **Subtasks:** N/A

Abstract Code

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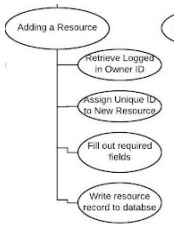
- Display available menu options on the MAIN MENU;
- A user can:
    - Click ***Add a Resource*** – Advance User to ADD A RESOURCE Screen.
    - Click ***Add an Incident*** – Advance User to ADD AN INCIDENT Screen.
    - Click ***Search for Resources*** – Advance User to RESOURCE SEARCH Screen.
    - Click ***Resource Status*** – Advance User to RESOURCE STATUS Screen.
    - Click ***Resource Report***– Advance User to RESOURCE REPORT Screen
    - Click ***Exit*** - Logs user out of the system, redirects to the MAIN MENU.
- Retrieve current *User Name* using credentials of current logged in user on the MAIN MENU screen;
- Display *User Name*;
- Retrieve M*unicipality Category* if user is a municipality, *Agency Name* if the user is a government agency, *Location* and *Number of Employees* if the user is a company.
- Displays *Exit* action button which logs the current user out of the system and returns to the LOG IN screen.
- If 'x' is pressed then window closes
- Display Box Title on the left 'ERMS'
- Display at the top left hand box 'Login to ERMS'

.Adding a Resource

Task Decomposition



- Lookup Types: a read only look-up to find current user (user id and owner) and a lookup that modifies since it adds a resource to the database and makes several changes and updates
- Number of Lookups: 2, USER and RESOURCE schemas are involved and a few lookups that modify the database
- Enabling Conditions: a User must be logged in to add a resource
- Frequency: all have same frequency
- Consistency: consistency is not critical
- Schemas: several different schema types are needed
- Indices: yes
- Subtasks: yes several subtypes

Abstract Code

- User clicks on the Add a Resource button from the MAIN MENU;
- User advances to the ADD RESOURCE screen;
    - Retrieve current User Name and display as the Owner on the ADD RESOURCE screen and display;
    - Retrieve available set of selection options for Primary_ESF from the database and display;
    - Retrieve available set of selection options for Additional_ESF from the database display ;
    - Retrieve available set of selection options for Cost_Per from the database ;
- User fills out form on the ADD RESOURCE screen display;

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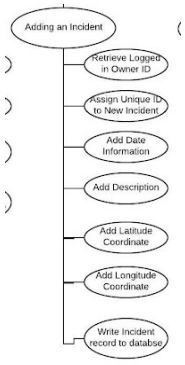
- User submits a new Resource by clicking the Save button
- Upon saving validate that all required fields are entered
    - Resource Name, Primary ESF, Model, Capabilities, Latitude, Longitude, Max Distance Cost, Cost_Per should all contain values.
        - If at least one required field has a missing value then error box appears stating 'Missing value, please fill all required fields'.
- Ensure that a non-negative Cost has been entered
    - If it has not been entered correctly then an error box appears stating 'error'
- Ensure that valid Longitude and Latitude coordinates have been entered;
    - If it has not been entered then an error box appears stating 'error'
- Generate next sequential Resource ID
- Display at the top left hand box 'Add a New Resource'' Display Box Title 'New Resource Info'
- If 'x' is pressed then window closes
- If 'Cancel' button is pressed then user is returned to 'Main Menu' Page
- If '+' is clicked additional resource appears
- When hovering over additional ESF selection a blue highlight will appear
- When 'Add' button is clicked string entered in the box adjacent to the left is added to the capabilities box.
    - If there is no string in the adjacent box and 'Add' is clicked then nothing happens.
- Scroll Arrows appear in additional ESF's and Capabilities boxes
- Dropdown menu arrows are displayed in Capabilities and Hour Box

Adding an Incident

Task Decomposition

- **Lookup types:** 2 read only look-ups to find current user, latest incident ID and look lookups to modify database, and many additional fields
- **Number of Lookups:** USER and INCIDENT schemas are involved for the read only, and many more for the modified ones.
- **Enabling Conditions:** a user must be logged in and selected to add an incident
- **Frequency:** all have same frequency
- **Consistency:** not important
- **Subtasks**: yes 1
- **Schemas:** yes



Abstract Code

- User clicks on the Add an Incident button from the MAIN MENU;
- Retrieve current User Name and display as the Owner on the ADD AN INCIDENT Form;
- Retrieve available set of selection options for IncidentType from the database ;
- User fills out all fields on the ADD AN INCIDENT screen;
- User submits a new Incident by clicking the Save button

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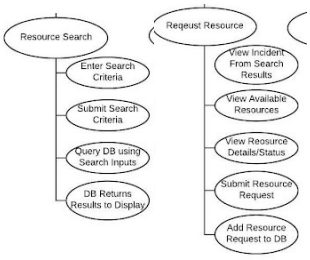
- Upon Saving Validate that all required fields contain valid values ;
    - Ensure that valid Longitude and Latitude coordinates have been entered
    - Ensure that correct date format is entered
    - If required fields are entered incorrectly display error message
- Declaration, Date (MMDDYYY format), Description, Latitude, Longitude
    - Generate Incident ID using abbreviated IncidentType value and concatenate sequential numeric ID for that IncidentType;
- Display at the top left hand box 'New Incident'
- Display Box Title 'New Incident Info'
- If 'x' is pressed then window closes
- If 'Cancel' button is pressed then user is returned to 'Main Menu' Page
- Dropdown menu arrows are displayed in Declaration box

Searching for Resources

Task Decomposition



- **Lookup Types:** 2 look-ups to find current user, incidents matching criteria added to search form
- **Number of Locks:** 0
- **Enabling Conditions:** Searching for resources will then allow a user to click on the resources returned and assign them to an incident
- **Frequency:** Many times a day
- **Consistency:** An incident must be active before a resource can be assigned to it.
- **Subtasks:** N/A

Abstract Code

- User clicks on the Search for Resources button from the MAIN MENU;
    - Display at the top left hand box 'Search Resources'
    - Display Box Title 'Search Resource'
- If 'x' is pressed then window closes
- If 'Cancel' button is pressed then user is returned to 'Main Menu' Page
- Display dropdown menu arrows for ESF and Incident Boxes
- User enters info on the SEARCH Screen;
- Retrieve resources from the RESOURCE table matching only the entered values on the Search Form- (KeyWord, ESF, Location, and Incident Fields);
- If user does not input any fields for the search, display all available resources.
    - Resources are displayed on Search Results Table
- (Display ID, Name, Owner, Cost and Status ("In-Use") of each returned RESOURCE on SEARCH RESULTS Screen sorted by shortest distance from location then alphabetical order by name)
- If user selects an incident from the SEARCH RESULTS Screen, retrieve Resource Location and available actions;

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- (Display "Request" for the available action if the resource is currently in use and "Deploy" if the resource is not currently in use)
- If user selects "Request," require the user to enter a Date for the estimated time when the resource will be returned;

Resource Status

Task Decomposition

- **Lookup types:** read only look-ups to find current user, available resources
- **Number of Lookups:** 4 lookups
- **Enabling Conditions:** a user must be logged in with resources assigned to him or owns resources
- **Frequency:** all look ups have same frequency, happens many times a day
- **Consistency:** not important
- **Subtasks**: yes many
- **Schemas:** yes User, Incident, Resource, return date by

Abstract Code

- User clicks on the Resource Status button from the MAIN MENU;
- Retrieve resources currently set to "in-use" status;

(Display Resource ID, Name, Incident Responding to, Start Date, Return By, Owner, and a Return button);

- Retrieve User Name of current user;
- Retrieve resources currently requested by the current User;

(Display Resource ID, Name, Incident, Owner, Return by and a Cancel button);

- Retrieve resources requests currently received by the current User;

(Display Resource ID, Name, Incident, Owner, Return By and a Deploy button only if the resource status is set to "Available" along with a Reject button);

Resource Report

Task Decomposition

- **Lookup types:** read only
- **Number of Lookups:** 1 lookups – should be Resources
- **Enabling Conditions:** a user must be logged in
- **Frequency:** happens many times a day depending on a user and number of users logged in
- **Consistency:** not important
- **Subtasks**: yes. Aggregate resources based on emergency function
- **Schemas:** yes

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Abstract Code

- User clicks on the Resource Report button from the MAIN MENU;
- Retrieve User Name of current user;
- Retrieve resources currently owned by the current user; (Display Primary ESF Number, Primary ESF Name, Number of Total Resources Grouped By each ESF as “Total Resources”, Number of Total Resources Currently set to “In-Use” Grouped By each ESF as “Resources In Use” – 0 values should be displayed so that even if a user does not own a resource in a given ESF, that particular ESF is still displayed)
- Display Totals for “Total Resources” and “Resources In Use”;

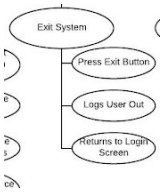
Exit

Task Decomposition

- Lookup types: N/A
- Number of Lookups: N/A
- Enabling Conditions: a user must be logged in
- Frequency: happens many times a day depending on a user and number of users logged in
- Consistency: not important
- Subtasks: no
- Schemas: no

Abstract Code

- User clicks on the Exit button from the MAIN MENU;
- Logs the current user out of the system;
- Redirects the system back to the LOGIN screen;



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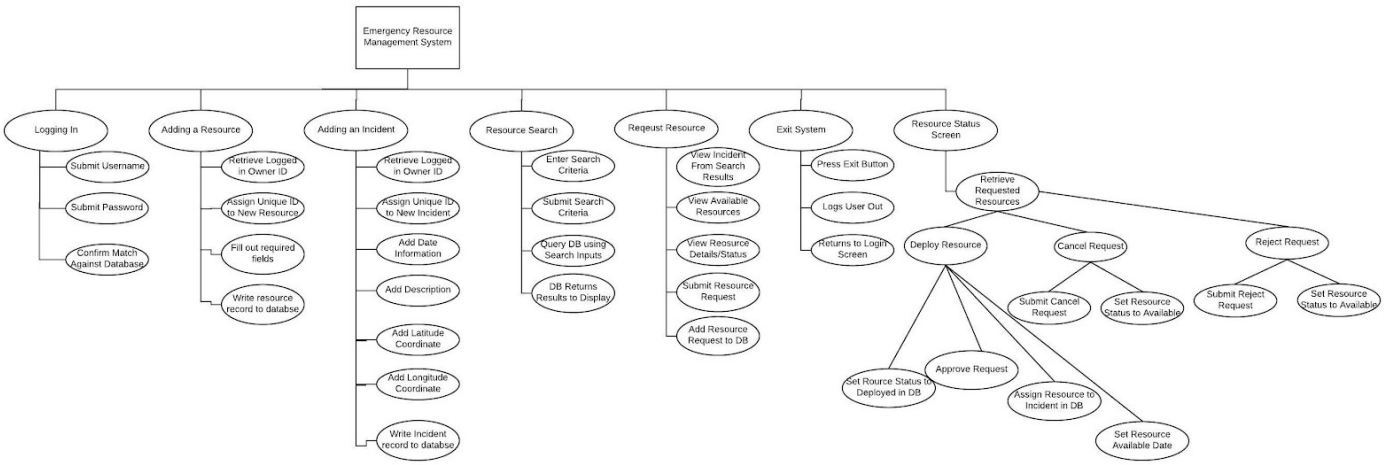

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