# Overview of HRE User Data Model

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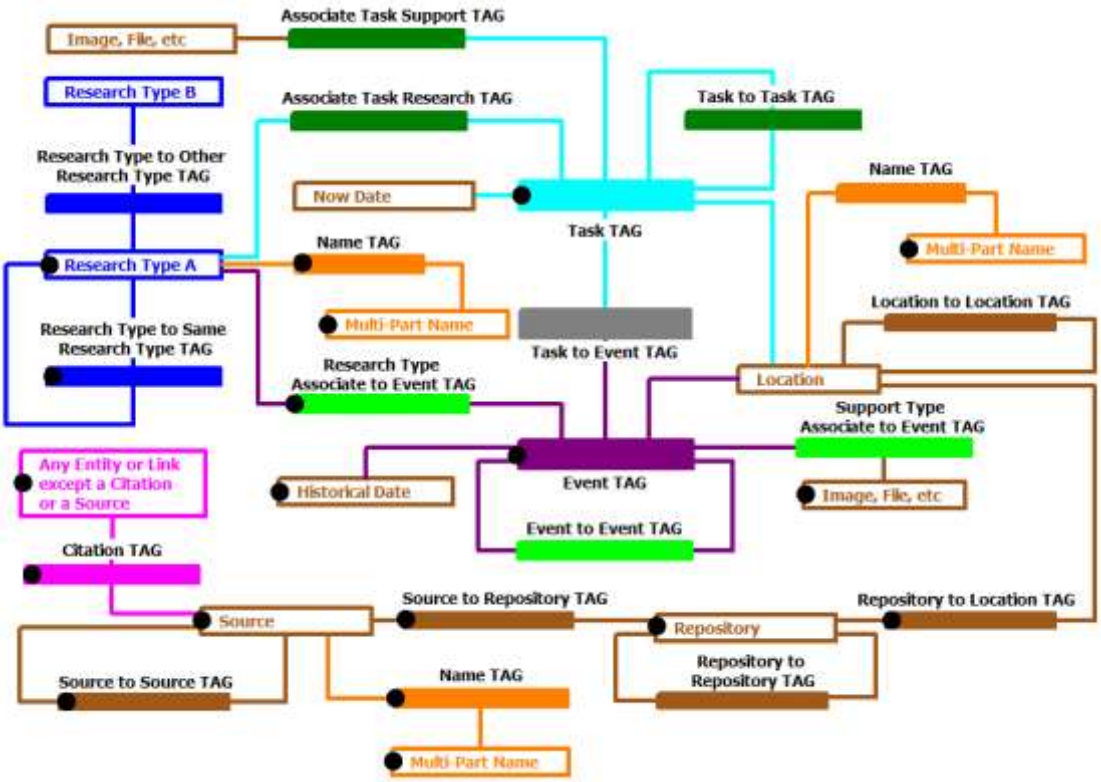
***Note: this document and the accompanying "03.04 Data Model Overview 2017-03-05" and "03.05 Architecture - Database Design Overview 2017-04-10" present slightly different views of the same material. Once the full HRE Data Model documentation has been published, these documents will be revisited and revised (and possibly be amalgamated).***

## SCOPE

The HRE Data Model consists of User Data Entities and User Data Links between Entities and Links. Tag values within the links are used to differentiate between Links in the HRE data model. This document describes in general terms the relationship between Entities and Links. It also describes Tags and their use. Below are some basic definitions:

- ***Entity*** –a named data object in a list of like items; often they have a lot of properties some of which are stored in a service database table. They form 2 groups (Research and Support) depending on their placement in the data model. They tend to be the headings of the HRE Main Menu branches. Using the road map analogy, the Entities are the intersections
- ***Link*** – a data object (not necessarily named) that allows data of one Entity to be related to another Entity. There are many more explicit types of Links. A Link provides the pathway from one instance of an Entity Type to another instance of another Entity Type instance. Using the road map analogy, the Links are the roads joining the intersections
- ***Tag*** –an entry in the Link Type's dictionary (usually with a unique label with additional property values) that characterizes the Link instance between 2 Entities or in special cases where an Associate Link has an Entity at one end and either an Event Link or Task Link at the other. Link Types may have different sets of properties. This depends on the subgroup of Tag definitions to which they belong. Using the road map analogy, the Tags are like the properties of that road, e.g. toll road, one way, has ferries, no exit, etc.

This diagram shows the connections between Entities (rectangles) and Links (solid thick lines). The Links are indicated by Tags in the HRE Data Model. This document describes these elements. Citations and Sources are special cases - they cannot have Citations.



The black dots indicate that TMG had a similar component in its data model.
This diagram has 5 regions:

1. Event-related in **VIOLET** (VIOLET), with Associate links as **BRIGHT GREEN (**BRIGHT GREEN).
2. Task-related in **CYAN** (CYAN), with Associate links as **DARK GREEN (**DARK GREEN)
3. Support-related Entity elements in **BROWN (**BROWN)
4. Research-related Entity elements in **DARK BLUE (**DARK BLUE)
5. Citation-related elements in **BRIGHT PINK (**BRIGHT PINK).

## ENTITIES

In HRE there are 2 groups of Entities:

1. Research Type Entities – (in the diagram as **DARK BLUE** text and lines). These are the entities that hold the identity and properties of objects which are the focus of research, like Persons, Places, Ships, etc. A Research Type Entity can belong to one of 3 families, within each they have common characteristics:
    a. Inanimate Items, (indivisible items, no reproduction):
    such as Paintings, Houses, Artefacts, etc
    b. Biological Items (individual items, with sexual reproduction):
    such as Persons, Water Birds, Wheat Varieties, Tribes, etc
    c. Inanimate Groups, (a conceptual existence, act as a collection, no reproduction, but membership can merge or split amongst other groups of the same type. They can have members of other Research Types):
    such as Sporting Clubs, Companies, Plots of Land, Conservation Parks, etc.
2. Support Entities – (in the diagram as **BROWN** text and lines) these are the entities that hold other supporting data structures to implement the whole HRE Data Model:
    such as Sources, Images, Locations, NowDates, HistoricalDates, Repositories, External Files, Internal Text, etc.

## LINKS AND TAGS

Links are additional data that connect 2 objects. These are usually Entities, but they may be a link from a link to another Entity. Tasks and Events are very important Links in the HRE data model. For example, a Citation link from an Event to a Source provides the connection between that Event and the Source that recorded the event's details.

All Link types can have at least 1 Tag. A Tag is a label and extra data that can be used to group Links by the type of connection that the Tag represents. Some Links can have a very large dictionary of Tags. Each Link type will have a list of built-in Tags, but the user can define more.

Within each Link definition there are a collection of default sentences stored that form the basis of narrative reports. These alternative sentences can be selected according to other properties of the subject of the sentence, e.g. present versus past tense, the gender of the subject and whether the subject is a single or plural. These sentences can be overridden by creating equivalent sentences at the time of Link creation. Those sentences can allow the contents of individual memos to be included in any output.

In HRE there are a number of groups of Entity to Entity Links that hold properties about the relationship between a pair of Entities (NOTE: Only combinations in the diagram are implemented):

1. Same Entity Type Links (Symmetric) – where the relationship between the 2 Entities has the same meaning independent of which is the first or the second Entity, e. g. NAME (***Person A***) is a ROLE (***a friend of***) of NAME (***Person B***), also implies that NAME (***Person B***) is ROLE (***a friend of***) of NAME (***Person A***). NOTE: Internally, symmetric and asymmetric Links are managed together

2. Same Entity Type Links (Asymmetric) – where the relationship between the 2 Entities has a different meaning dependent on which is the first or the second Entity., e.g. NAME (***Person A***) is ROLE (***a Son of***) of NAME (***Person B***), also implies that NAME (***Person B***) ROLE (***is the Father of***) NAME (***Person A***).
   NOTES: Internally, symmetric and asymmetric Links are managed together. When used with Inanimate Group Type Entities, these Links can create collections of collections. When an inanimate group is split into 2 parts to become 2 new identities, the link back to the original larger unit is retained
3. Entity to Entity Name Links – an Entity may have more than one name. This also occurs where the entity has a multi-part name which may be output using different output templates. The Tag on the link determines what type of name it is. For Persons, it might be a birth name, a baptismal name, a married name or an alias name. NOTE: These Entity Name Links are unusual compared with all other Links. They apply to Location Names, Source Names and most Research Type Names (e.g. Persons)
4. Standard Entity Type A to Entity Type B Links –where the relationship between the 2 Entities has a different meaning dependent on which is the first or the second Entity, e.g. NAME (***Person X***) VERB1 (***owns***) NAME (***House Y***) also implies that NAME (***House Y***) VERB2 (***is owned by***) NAME (***Person X***).
   There are a number of special types of Link:
   a. The Event Link – This is a link between a Location Support Entity and a Historical Date Support Entity. (NOTE: This link can exist in its own right even if the Location value and / or the HistoricalDate value are unknown.) This permits the entry of data about several research type instances to be associated with an Event whose Location and date of occurrence is not known. This link has special properties that allow the addition of Event Associate Links to be linked to it, e.g. "TITLE (***The Sydney Opera House***) WHERE (***at Bennelong Point, Sydney NSW***) ACTION (***was opened***) HDATE (***on 20 October 1973***)"
   b. The Event Associate Link – This link type allows the recording of other Research Entity Types to be added to the description of the Event. This is controlled by the choice of Event Associate Role when creating the Link. It allows, for example, to add "Formerly opened by ROLE (***opener***) NAME (***opener***, ***Elizabeth II, Queen of Australia***)". Also at the opening a recital was played by ROLE (***violinist***) NAME (***violinist,*** *Wanda Wilkomiska*) and ROLE (***pianist)*** NAME (***pianist, Geoffrey Parsons***)"
   c. The Task Link –This is a link between a Location Support Entity and a NowDate Support Entity. (NOTE: this link can exist in its own right even if the Location value and / or the NowDate value are unknown.) This link has special properties that allow the addition of Task Associate Links to be linked to it, e.g. "TITLE (***Arkaroola History***) at REPOSITORY (***Mortlock Library***) ACTION (***arranged for***) NDATE (***20 July 2017***)"
   d. The Task Associate Link – this link type allows the recording of other Research Entity Types to be added to the description of the Task. This is controlled by the choice of Task Associate Role when creating the Link. It allows, for example, to add "The meeting was ROLE (***attendee)*** by NAME (***attendee***, ***John Smith***). NOTE: An Event can be a linked to a Task by use of a Task Associate Link
   e. The Citation Link – These can be linked to any of the above Entities or Links. They always have a Source Support Type as the other Entity.

   NOTE: The descriptions are to illustrate the concepts and do not match the actual method of making the value substitutions in a narrative sentence.

## LIST OF ALL HIGH LEVEL USER DATA TABLES

This list of tables is the set of high level user tables that need to be created to service the user data side of HRE. Pale yellow background indicates the extra entries for the first additional Research Type - New RT. It is these tables that grow proportionally to the number of instances created within a project. In most HRE projects the Event Link table will have the greatest number of records as typically there will be a number of Event Links for each Research Type instance that has been entered.

Although there is a single entry in these lists for each data model element, in practice many of these entries are a whole collection of self-contained user-data tables. The set of tables for a multi-part name is quite extensive and is inflated further if multiple data entry languages are in use. Also to support the data record creation for each of these collections of tables, there will be another collection of configuration support tables each of which has a special purpose and generally will not have more than 200 records each. Some of these configuration support tables have contents which are sharable to service more than one element in these lists.

### SUPPORT TYPE ENTITIES

There are 7 initial Support Entities within HRE. They exist in every HRE Project.

| Label | Use |
|---|---|
| Source | Store data |
| Repository | Store data |
| Location | Store data |
| Image | Store data |
| External File | Store data |
| Internal Text | Store data |
| Multi-Part Name | Store data |

### RESEARCH TYPE ENTITIES

There is 1 initial Research Type Entity with HRE. It exists in every HRE Project.

| Label | Use |
|---|---|
| Person | Store data |
| New RT | Store data |

### SUPPORT TYPE LINKS

There are 5 initial Support Type Links within HRE. They exist in every HRE Project.

| Label | Tags | Use |
|---|---|---|
| Source to Source | YES | Inter-Relationship (Source of Source) |
| Source to Repository | NO? | Link |
| Repository to Location | NO? | Link |
| Location to Location | YES | Inter-Relationship |
| Location to Name | YES | Type of Name |

**RESEARCH TYPE LINKS**
There are 2 Research Type Links within HRE. They exist in every HRE Project.

| Label | Tags | Use |
|---|---|---|
| Person to Person | YES | Relationship |
| Person to Name | YES | Type of Name |
| New RT to New RT | YES | Inter-Relationship |
| New RT to Name | YES | Type of Name |
| New RT to Person | YES | Relationship |

**EVENT LINKS**

There are 6 initial Event Links within HRE. They exist in every HRE Project.

| Label | Tags | Use |
|---|---|---|
| Event | YES | Event Type |
| Event to Event | YES | Event Relationship (Within, Grouping) |
| Person to Event | YES | Person Associate with Role |
| Image to Event | YES | Image Associate with Type |
| External File to Event | YES | External File Associate with Type |
| Internal Text to Event | YES | Internal Text Associate with Type |
| New RT to Event | YES | New RT Associate with Type or Type |

**TASK LINKS**
There are 7 initial Task Links within HRE. They exist in every HRE Project.

| Label | Tags | Use |
|---|---|---|
| Task | YES | Task Type |
| Task to Task | YES | Event Relationship (Within, Grouping) |
| Person to Task | YES | Person Associate with Role |
| Image to Task | YES | Image Associate with Type |
| External File to Task | YES | External File Associate with Type |
| Internal Text to Task | YES | Internal Text Associate with Type |
| Event to Task | YES | New RT Associate with Type or Type |
| New RT to Task | YES | New RT Associate with Role |