

11. Management Pattern of Index Data (used for Destination Setting and Service & POI Access)

Index data consists of a pair of POI information (point of interest) data and a search data frame (which is made up of category and matching table). The pair of POI information and search data frame is managed by a "volume management record." The volume management record defines the search data frame format. The "POI information" is managed by a "POI information management record" in parallel with the volume management record.

The "volume management record" and "POI information management record" are managed by a "data management frame."

A "data management frame" can be stored when a single-directory structure. It can be stored per route directory or subdirectory for a multiple-directory structure. (It must be specified with a unique name or unique identification with which metadata is used. In addition, it must confirm the method to define map data.)

Search frames allow searches with different types of search keys (by railroad station, by Japanese syllabary, and by area) sharing information to be used as search parameters. Thus, POI information is set up for sharing as much as possible so that the media space is saved.

In the example above, there are "search frames" for searches "by railroad," "by character," and "by area." These search frames are handled by a "volume management frame" named "Railroad stations." It is allowed to specify a different search method at any position in a hierarchy by transition from a volume management frame to another volume management frame.

POI information can be classified into various groups by purpose (such as the telephone number is needed but the name is not needed, or the name is needed but the telephone number is not needed) or information (such as data reading for voice composition is needed, or information about links with road data is needed). If these information is represented by one POI information gathered up, the data will be redundant. Therefore, it is allowed to specify multiple POI information for purposes of searches. (Volume 1 in the figure below.)

It is also allowed to use multiple POI information frames and represent which fields in the POI information is used with bit flags. The bit fields allow whether the fields are present or not. However, each POI information cannot be always represented with 8 or 16 fields (1-byte or 2-byte fields) in any case or in any country. Therefore, multiple POI information frames can be specified aiming at optimization. However, if there is only one POI information frame, it is necessary to use only the storage data flag. You do not have to set information for identifying POI information frames into each search frame.

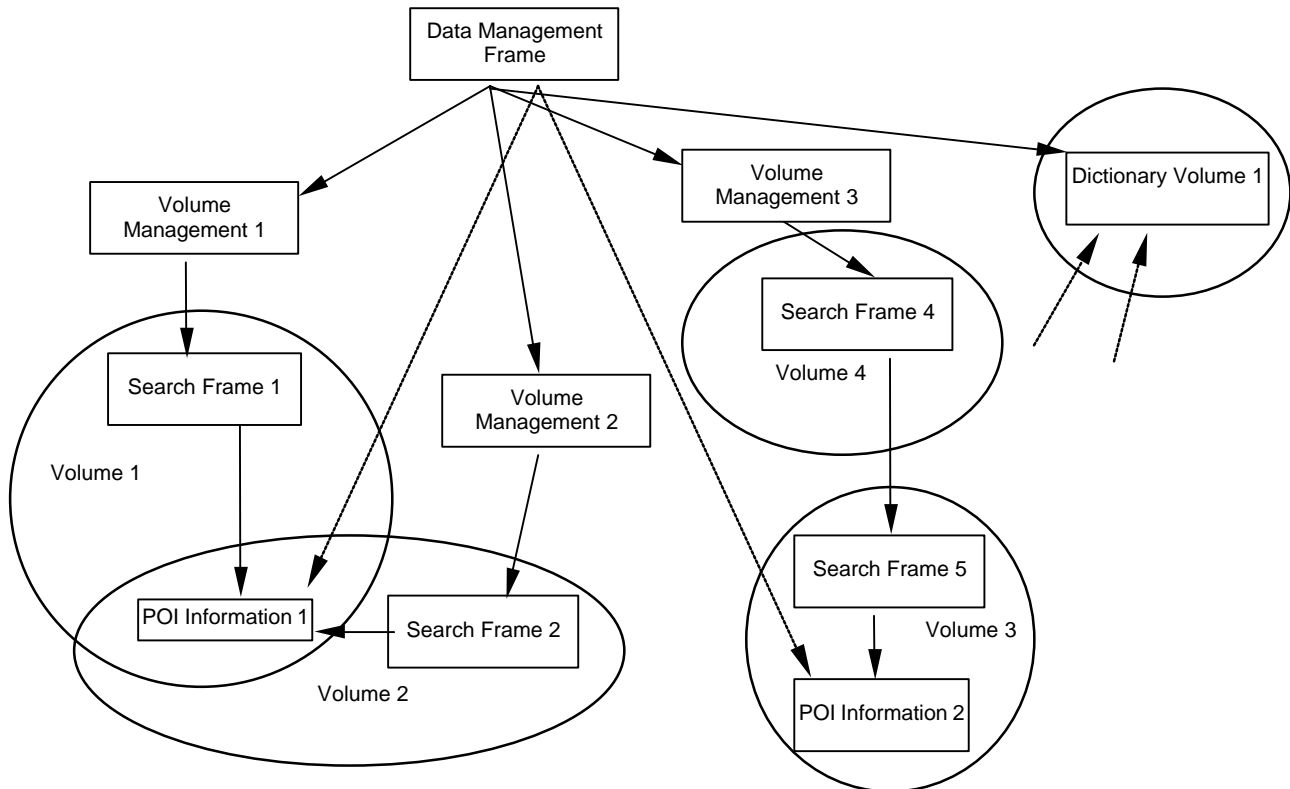
When data such as registered points seems a "volume" that consists of POI information only (data frames gathered by purpose), it always contains "search frames" for managing the POI information (used when they are handled to make a list of them).

Each search frame described in the medium shall relate to one or more "volumes." Data that is not relating to any "volume" cannot be used in a search.

It is also allowed to use a volume to be retrieved for that determines a volume to be used in the subsequent search (i.e., subsequent search volume management). (Search frame 5 at the right in the figure below)

In order to reduce the space to be used for data in the entire medium, a volume can be used as a dictionary by assigning specific codes and keys to character data and image data and handling them in it altogether.

name [Index Data Correlation Diagram]



Data creators have to create "volumes" depending on the data, target user, and how the system will be used.

Note that the term "volume" indicates a group of information. It does not represent a pack of data (data or frames). Some POI information or Index data can be used efficiently by storing them with map units displayed (such as nearby facilities to be retrieved). Such data may be duplicated into multiple frames by unit. To the contrary, although "Volume 1" and "Volume 2" indicated in the figure above are recognized as separate groups, an identical POI information is used in view of the data structure.

The number of data frames that can be simultaneously stored in a map unit for a nearby search or another search is multiple volumes that are handled with two frames for additional information A and B. By handling them by volume, it is possible to describe entities of data in map units (the response speed is increased) and describe only links to real data (the space of the map units is saved). However, the formats and purposes of data entities are common. The order in which the data is sorted is the same with that in which data in the volume is described. Data described in map units normally takes priority over data to be linked.

11.1 Index Data Frame Structure

An Index data frame consists of four frames: data management frame that manages whole searches and POI information, search frame that gathers search-related data (category data used to narrow down the range of matching data and matching data that points to the POI information) at each search, POI information frame, and volume management frame that handles information in each frame.

The control can be moved from the data management frame to a search frame or POI information frame using an offset (when the entire data is continuously located and composes one block) or (displacement) sector address (when the entire data is divided by frame and located separately).

The following types of data are relating POI information and searches:

1) Data Management Frame

This frame manages a volume management frame and POI information. One directory is set per one data management frame.

2) Volume Management Frame

This frame manages index data volumes.

Index data is handled by volume. Multiple search frames can be managed.

3) Search Frame

This frame is used to manage the index data frames.

It consists of a header in which the name to be retrieved is described, category data used to narrow down the data, and matching data pointing POI information.

a) Category Frame

This frame is mainly used to describe the hierarchical structure of index data. It consists of selections or other items used to narrow down the range of matching data.

b) Matching Data Frame

This frame is used to set data for pointing POI information sorted as required to make a (search) list screen as a matching data in order to share the POI information, like multiple searches with "Volume 1" and "Volume 2" in the [Index data, Data correlation diagram]. This table enables an optimum list to be displayed.

POI information can be directly called using a category frame like a search using a telephone number.

For registered points, there is no need to narrow down the range of data to be retrieved. The registered points can be listed. Thus, no category frames are needed. Prepare data for which the number of hierarchys is zero and that does not have any entity.

4) POI Information Frame

This frame contains information (about the longitude/latitude or links) used to set coordinates, detailed information, and routing for a point.

Respective POI information are independent (regardless of the search method). Index data can use multiple POI information frames. Index data also can determine which fields are used using the bit flags.

Symbols can be displayed to indicate that related information (detailed information about a facility with photographs or voice used) is set in a list using a POI information frame number (or bit flags) described in a search frame.

The POI information frame may be stored depending on a map unit (in a search for facilities nearby) or independently (in a search for railroad facilities).

However, it is allowed to make the POI information frame as independent data in appearance by linking the POI information frame with an entity of data even if it depends on a map unit. (POI information frames depending on a map unit may be simultaneously used with POI information frames independent of any map unit. However, they are handled with different volumes.)

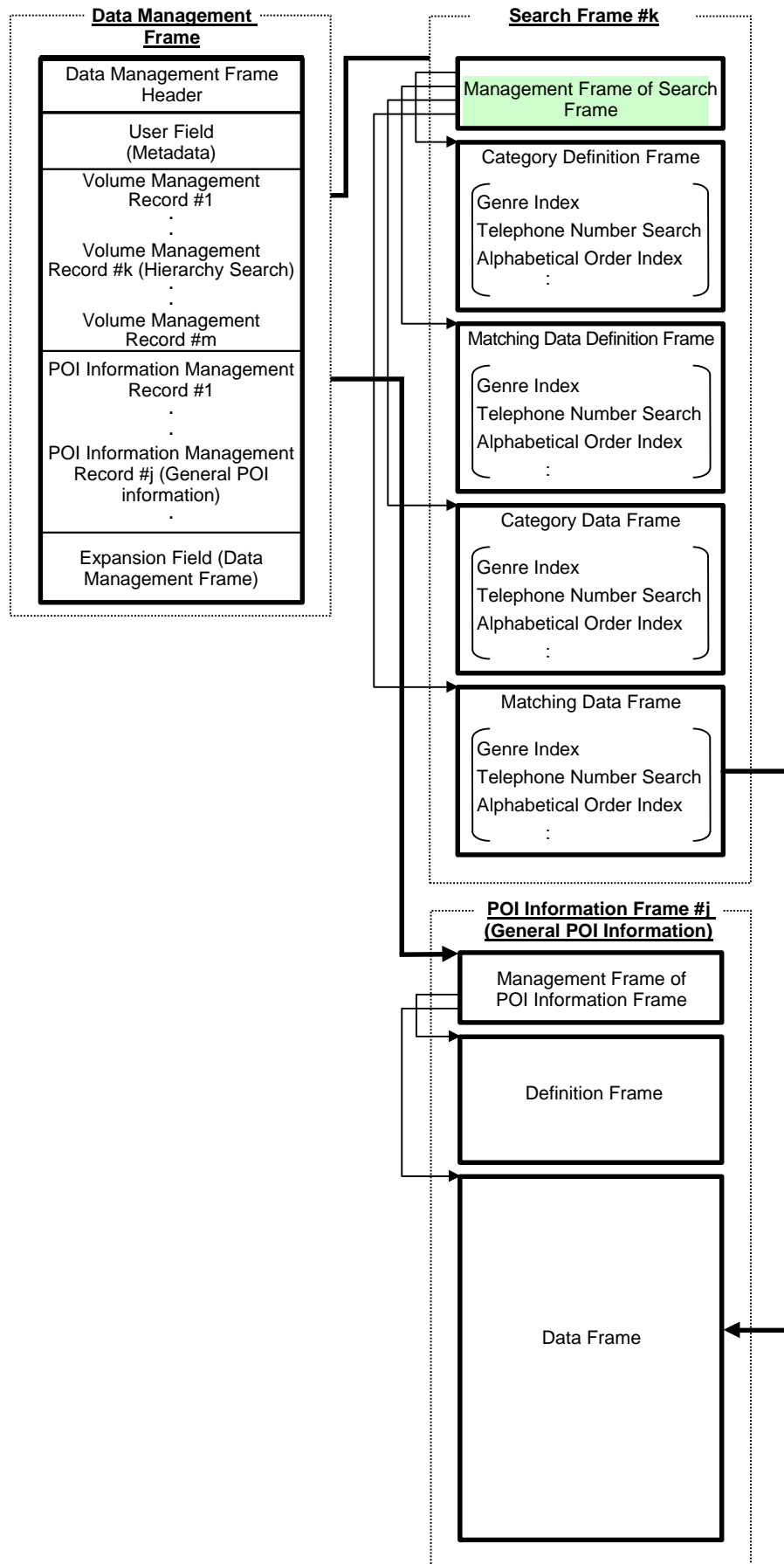
POI information frames are used for data about registered points (for purposes of exchange).

5) Dictionary Frame

A dictionary collectively handles character data and image data using specific codes or IDs that identify groups of information (various types of IDs corresponding to the usage) in search frames/POI information frames (entire medium).

The dictionary is independently set up, but can be used with search frames.

name [Index data Configuration]



name [Data Management Diagram]

