What is the Layout Service?
The Layout Service consists of an Oracle Database, a web-based Graphical User Interface for reading and editing data, and a team of people (across BE-CO and EN-ACE) to support the infrastructure and perform beam-line data management.

The Layout Database centralises the management of integrated, controlled Functional Positions (FP) data across CERN, for any FP potentially having an impact on accelerator operations. CERN accelerator infrastructures are documented by modelling their architectures as topologies of Functional Positions.

What are Functional positions and how are they used?
A Functional Position is a placeholder for a piece of physical equipment of a given type or function, which specifies the size and the position of the space that it occupies in the accelerator.

Each Functional Position is named according to CERN naming conventions. New Equipment Codes (also known as Types) are defined by the Group Coding Officer, in collaboration with the Accelerator Naming Service.

Functional Positions are defined in hierarchies, also known as Assembly Breakdown Structures (ABS). Functional Positions are defined relative to their parent, therefore if the parent is repositioned then the children are moved automatically.
Who should use Layout?
In order to have a complete picture of the accelerator infrastructure, any component having an impact on accelerator operations should be defined in the Layout Database. It is important to note that due to the integrated manner of Layout Data, the Group owning the Functional Position may not be the main end-user of the data.

Should my Functional positions be defined in Layout or Infor (or both)?
Layout and InforEAM share a common notion of Functional Positions. However, when considering FPs in the two systems, there are a number of differences in the related features provided. For more detailed information see: https://wikis.cern.ch/display/Layout/InforEAM

As a general rule, any Functional Position which has a direct impact on accelerator operation must be defined in the Layout database. These Functional Positions can be published to Infor to facilitate Asset Management, if required. Other auxiliary Functional Positions (e.g. street lighting, fire extinguishers etc) can be defined only in Infor, Layout or both.

What is the difference between Functional Positions and Assets?

Functional Positions are:
- The theoretical position of a component of a given type (placeholders)
- Stored in the Layout Database
- Identified by Functional Position Name
- The topology of components and their connections in the accelerator complex

Assets are:
- Physical pieces of equipment with specific characteristics
- Stored in InforEAM/MTF
- Identified by CERN Unique Identifier
- Installed in different positions over their lifetime

How can Layout help me perform Asset Management and Maintenance?

Five ways that Layout supports asset management are:

1. Assets can be attached to functional positions that have been published to InforEAM. Over time, an asset may be installed in several different functional positions. Successive assignments between functional positions and assets are recorded, which provides traceability. The position of the assets may be correlated with the failure rate of the asset over time i.e. Multiple failures of assets installed in the same position could indicate a problem related to the position.

2. By using Layout it is possible to identify both unused functional positions (with no assets installed) and empty space. For example, the crate pictured below has space for 5 extra modules.
3. Layout assembles information from different systems and presents it graphically. This helps to quickly localise components on site when intervening for urgent maintenance.

4. Layout data is time-oriented, meaning that it is possible to work on future evolutions of equipment without disturbing the current version. This allows equipment layouts to be planned in advance of installation and the associated data management work to be distributed more evenly between shut-downs and runs. It also allows equipment groups to see how their installations evolve over time.

5. Layout provides the ability to navigate through the connections (circuits) between functional positions in order to quickly diagnose failures in acquisition chains. Once the faulty position and its asset are identified, a work order can be created.
What do I need to start using Layout?

All data is available to search and read via the web interface at https://layout.cern.ch. A valid CERN login is required to view the data.

To edit existing data or create new data, specific access rights need to be configured based on the types of Functional Position that you wish to edit. To setup the necessary access rights please contact layout.service@cern.ch.

Before defining new Functional Positions, please verify that the required Equipment Codes (types) exist in the Layout Database (using Search > Functional Position Types). In order to define new Equipment Codes, please contact your Group Coding Officer and the Accelerator.Naming.Service@cern.ch. Once Equipment Codes exist in the Naming Database, they can be imported into Layout by making a request to Layout.Service@cern.ch.

Before starting to edit data, it is recommended to contact the Layout.Service@cern.ch to organise an initial training session tailored to your requirements.

How do I search for and view information about a Functional Position?

1. Log in to Layout.cern.ch
2. By default the Functional Position Search is displayed
3. Select one or several parameters from the list (e.g. Name(s) like) and enter value(s) to search (e.g. CVREC%). The wildcard characters % and _ can be used. Press the Search button to run the query and display the results.
4. To display all information about a particular Functional Position, click on the Name.

How do I create a Functional Position?

Note: Beam-line Functional Positions can only be defined and modified by EN-ACE, unless special permission has been granted to the Equipment Groups to manage their own data i.e. Cryogenic Instrumentation, Vacuum. All changes to beam-line equipment require approved ECRs.

All other non-beam line Functional Positions, such as racks, electronics etc., should be maintained by the owning equipment groups, once the appropriate access rights have been configured.

1. To create a new Functional Position, first search for its parent (location or assembly) using the Search facility (as described above). In this example we will search for the electronics crate CVREC.02.365 in order to add a new module of type HCCTRV_.
2. Click on the “Add Element” button to display the following modal window.

3. Complete the form with details about the module Functional Position and press “save” when complete.
   a. If the component is in the beam line, select the naming format "LHC STANDARD", else "IN CIVIL WORKS" covers most cases in surface buildings. For special cases contact the Layout Service for advice.
   b. Type => Equipment Code of module i.e. HCCTRVR
   c. Name Location => prefilled with location of assembly
   d. Expert Name & Label => Name or label of component as defined by equipment group
   e. CERN Unit => Group name
   f. Responsible => individual person or e-group
   g. Validity Period => The date that the component was installed until the date it will be uninstalled (if known, else ENDLESS)
4. The new Functional Position will be created and displayed

How do I position elements (for types with a grid layout defined)?

1. To position the module element created above within its parent crate, navigate to the Schematics Tab of the crate element and press the “Edit” button. This will open the Schematics Editor.
2. Unpositioned elements are listed in the bottom right of the window. Click the “+” icon to add the module to the crate. The module will be displayed in a default position in both the graphical visualization and the report.

3. Adjust the size and position of the module by either dragging and dropping the module in the graphical visualization, or by adjusting the values in the wp, hp, dp, w,h,d columns in the report. When the positioning is correct and valid (no elements overlap), press “Save”.
How to publish (or update) Functional Positions and structure in InforEAM from Layout?

1. In order to associate the functional positions between Layout and InforEAM, one can use the green button "Publish to InforEAM", that allows the publication of functional positions and their structures from Layout to EAM:

2. Clicking on this button will open a modal window that allows you to preview, tailor and validate what will be published before clicking on the publish button:

3. In order to publish to InforEAM, it is necessary to set a valid responsible (not an e-group) and a so-called "Department code", which is required by Infor for each functional position. For every invalid line, click on the preview tab and complete the
missing data. Note: Department codes are inferred from the Administrative Group of the responsible person.

4. Once all of the missing data is complete, the “invalid” tags disappear and the “Publish” button is activated. Press this button to start the publishing process. The Plan tab shows the status of the publishing action in real-time.
Note: This tool does NOT yet manage renaming of functional positions in InforEAM (it is a delicate task managed by CMMS support)

This tool should only be used for hardware because the locations and regions are generally managed by the Location DB / GIS and are synchronised to InforEAM and Layout on a daily basis.

This tool should only be used to publish CURRENT Layout elements and structures and NOT future Layouts - since InforEAM is not time-oriented.

Where can I find further information?
More specific use-cases can be found on the Layout wiki: https://wikis.cern.ch/display/Layout/User+How+To%27s