INTRODUCTION

The idea of the new Plant Manager software was born in order to meet the need for a database collecting the diagrams and graphics of all the electrical boards located in the LNL Laboratories (see figure 3). Moreover, thanks to the QR-code (see figure 1) linking every specific board, additional information can be made available, like electrical drawings, photos and other data.

THE SERVER

Plant Manager is a web based software built for working in a LAMP (Linux, Apache, Mysql, Php) web server with a client-server architecture. The software was developed in house and hosted in the new cloud service provided by LNL and INFN-Padova [1]. This cloud service offers a very scalable system that allows users to quickly rebuild their VPS (Virtual Private Server) and reconfigure them by dynamically allocating memory and cpu according to the performance needs.

DATA STRUCTURE

The software is written for the most part in HTML5 and PHP, while the core system is based on CackePHP, a free fast development framework, with a commercial responsive theme for graphics effects and responsive layout. The underlying Data Base Management System (DBMS) is MYSQL and it is used to manage both the common application data and the users ACL (Access Control List). The data structure organization of the boards is composed by a hierarchical tree of objects: Plants -> Electrical Boards in Plants -> single Data Object.

SESSIONS

Currently the software offers two levels of users access, Administrators and Editors:
• Admin level let users to create new Admin and insert/update/delete data about electrical boards,
• Editors can only read data from qr-code attached on a specific electrical boards.

We are now importing into the new software all existing data stored on paper drawings and excel files. Once this is completed, all QR-codes (see figure 3) will be printed and attached to the electrical boards, end points and power rooms.

Besides creating and organizing collection of the electrical boards, this will be a valuable tool for supporting the work of the maintenance team who need to retrieve information about electrical schemes: by just taking a picture of the QR-code by smart-phone or tablet (see figure 4) they will be redirected to the boards information and schemes.

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Fig. 3. Qr-code ready to be printed.
**FUTURE DEVELOPMENT**

We are currently planning to add into the software all the dependencies linking together several electrical boards which are logically connected (i.e. high voltage cabin and distribution boards). Furthermore, in order to have full coverage of this service in all LNL Laboratories we hope that the wi-fi network will be expanded to all buildings and rooms.

**AKNOWLEDGEMENT**

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