

The IRRAD Data Manager (IDM)



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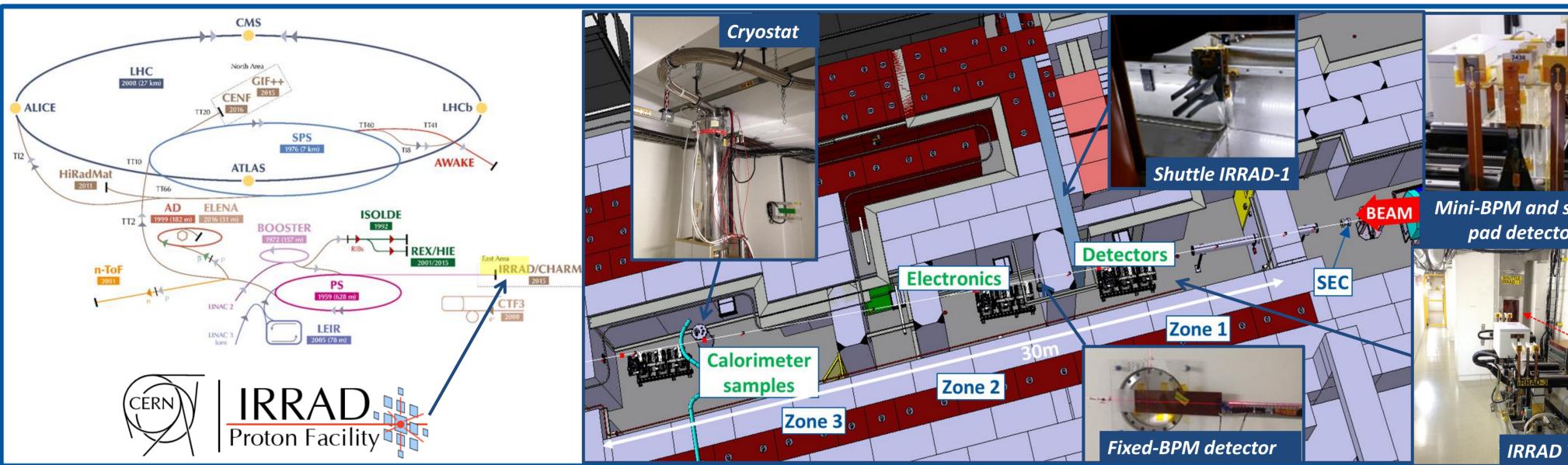


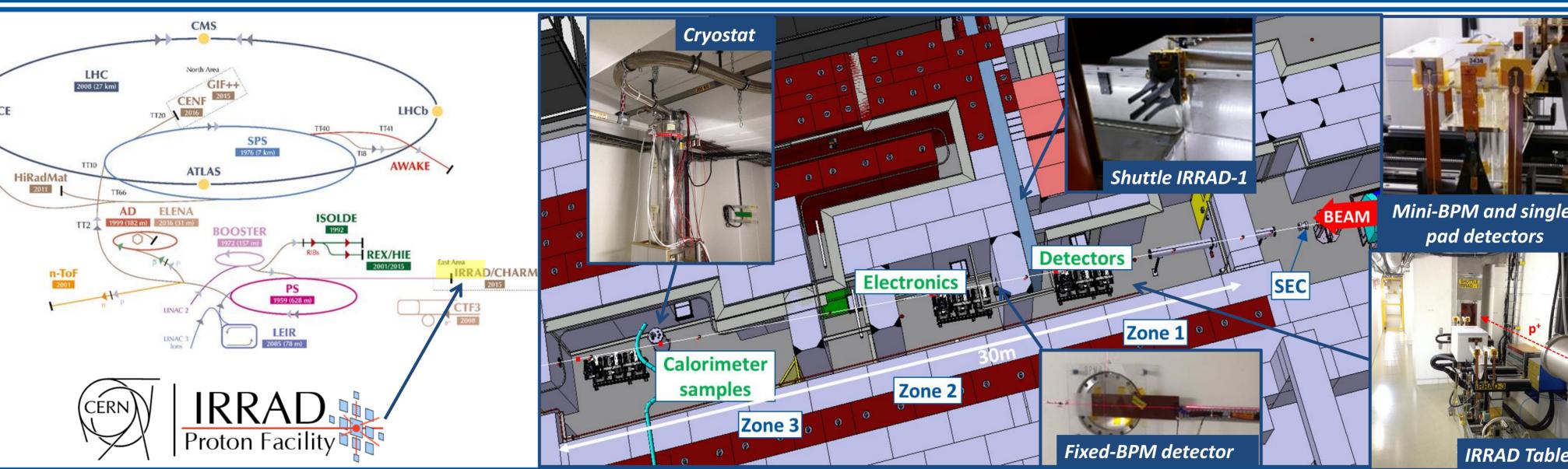
ABSTRACT

PROTON IRRADIATION FACILITY IRRAD

The Proton Irradiation Facility (IRRAD) is a reference facility at CERN for characterizing detectors and other accelerator components against radiation. To ensure a reliable facility operation and smooth experimental data handling, a new IRRAD Data Manager (IDM) web application has been developed and first used during the last facility run before the CERN Long Shutdown 2. Following best practices in User Experience design, IDM provides a user-friendly interface that allows both users to handle their samples' data and the facility operators to

manage and coordinate the experiments more efficiently. Based on the latest web technologies such as **Django, JQuery and Semantic UI**, IDM is characterized by its minimalistic design and functional robustness. In this paper, we present the key features of IDM, our design choices and its overall software architecture. Moreover, we discuss scalability and portability opportunities for IDM in order to cope with the requirements of other irradiation facilities.





Purpose and Characteristics

- Qualification of radiation hardness of materials, detectors, and electronic systems for High-Energy Physics experiments.
- **Proton beam 24 GeV/c,** size of 12×12 mm², 5×10¹¹ protons / spill.

Software requirements for IRRAD data management • Web-based application.

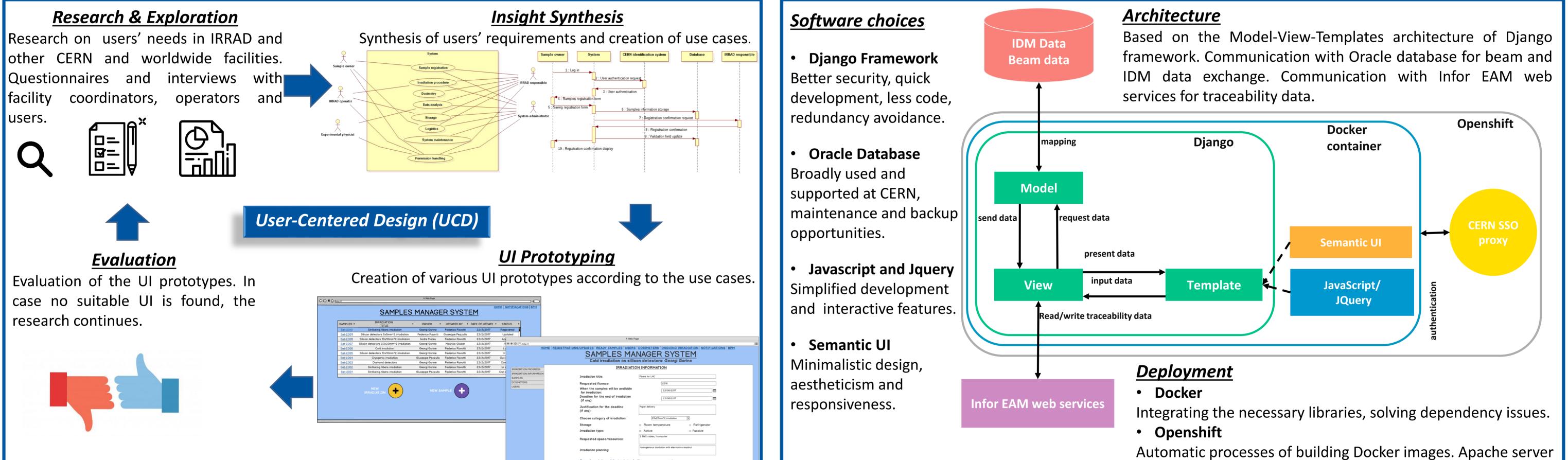
- - Compatibility with the CERN software infrastructure.
 - Focus on the User Experience (UX).
 - Communication with CERN system for the traceability of potentially radioactive equipment (TREC).

http://cern.ch/ps-irrad

- Dosimetry data integration.
- Security.
- Scalability.
- Portability.

DEVELOPMENT

DESIGN LIFE CYCLE



	Justification for the deadline (if any):	Poper delivery						
	Choose category of irradiation:	20x20mm^2 irradiation						
_	Storage	Room temperature Refrigerator						
	Irradiation type:	 Active Passive 						
	Requested space/resources:	2 BNC cobies, 1 computer						
	Irradiation planning:	Homogenious irradiation with electronics readout						
	General regulations of the irradiation fac	ility 🗆 Agree						
	Clone	월 Save						

deployed as a SSO authenticating proxy.

FEATURES

Key functionalities:

Registration

Registration of experiments, samples, users and dosimeter data.

• Planning

Planning of the irradiation experiments according to the availability, radiation length, IRRAD capacity.

• Follow-up

Follow-up of the irradiation experiments status. Estimation of accumulated fluences. Notification of irradiation completion.

Dosimetry Results

Final dosimetry results, provided through γ spectrometry, necessary for further physics data analysis.

Traceability

Naming conventions compatible with the CERN Traceability System of Potentially Radioactive Equipment (TREC), communication with the TREC database and printing necessary labels.

History

Archiving performed experiments. Visibility of other irradiation experiments details with the users' permission.

UI Customization

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Adapting the user interfaces to the users' preferences, e.g., different background color, font size or font color.

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CONCLUSION AND FUTURE WORK

Statistics of 2018 IRRAD Run

Irradiation Experiments	81
Users	97
Samples	78
Dosimeters	405
Dosimetry results	2056

• New tool for the management of the data from IRRAD;

- User-centered design (UCD);
- Use of modern technologies such as Django framework, JavaScript, JQuery and Semantic UI; •
- Key functionalities for the IRRAD data management and follow-up implemented;
- Deployment of Docker containers and Openshift.

Future Work

- New functionalities due to users' requirements and facility upgrades to be implemented;
- Possibility of IDM customization for other irradiation facilities;
- Motivation for the development of an irradiation experiment data management ontology (IEDM) and use for the automatic generation of web applications [1].

[1] B. Gkotse, P. Jouvelot, and F. Ravotti, "Automatic Web Application Generation from an Irradiation Experiment Data Management Ontology (IEDM)", presented at ICALEPCS'2019, New York, USA, Oct. 2019, paper TUBPL01, this conference.

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