

## Automated System: Managing the Production and Distribution of Radiopharmaceuticals

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**Abstract :** Radiopharmacy is the art of preparing high-quality, radioactive, medicinal products for use in diagnosis and therapy. Radiopharmaceuticals unlike normal medicines, this dual aspect (radioactive, medical) makes their management highly critical. One of the most convincing applications of modern technologies is the ability to delegate the execution of repetitive tasks to programming scripts. Automation has found its way to the most skilled jobs, to improve the company's overall performance by allowing human workers to focus on more important tasks than document filling. This project aims to contribute to implement a comprehensive system to insure rigorous management of radiopharmaceuticals through the use of a platform that links the Nuclear Medicine Service Management System to the Nuclear Radio-pharmacy Management System in accordance with the recommendations of World Health Organization (WHO) and International Atomic Energy Agency (IAEA). In this project we attempt to build a web application that targets radiopharmacies, the platform is built atop the inherently compatible web stack which allows it to work in virtually any environment. Different technologies are used in this project (PHP, Symfony, MySQL Workbench, Bootstrap, Angular 7, Visual Studio Code and TypeScript). The operating principle of the platform is mainly based on two parts: Radiopharmaceutical Backoffice for the Radiopharmacist, who is responsible for the realization of radiopharmaceutical preparations and their delivery and Medical Backoffice for the Doctor, who holds the authorization for the possession and use of radionuclides and he/she is responsible for ordering radioactive products. The application consists of seven modules: Production, Quality Control/Quality Assurance, Release, General Management, References, Transport and Stock Management. It allows 8 classes of users: The Production Manager (PM), Quality Control Manager (QCM), Stock Manager (SM), General Manager (GM), Client (Doctor), Parking and Transport Manager (PTM), Qualified Person (QP) and Technical and Production Staff. Digital platform bringing together all players involved in the use of radiopharmaceuticals and integrating the stages of preparation, production and distribution, Web technologies, in particular, promise to offer all the benefits of automation while requiring no more than a web browser to act as a user client, which is a strength because the web stack is by nature multi-platform. This platform will provide a traceability system for radiopharmaceuticals products to ensure the safety and radioprotection of actors and of patients. The new integrated platform is an alternative to write all the boilerplate paperwork manually, which is a tedious and error-prone task. It would minimize manual human manipulation, which has proven to be the main source of error in nuclear medicine. A codified electronic transfer of information from radiopharmaceutical preparation to delivery will further reduce the risk of maladministration.

**Keywords :** automated system, management, radiopharmacy, technical papers

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