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1. Can a booking cancellation prediction model that uses Property Management System (PMS) data obtain better results compared to a model that uses Passenger Name Record (PNR) data?
2. Can this model's performance improve with the inclusion of data from additional sources?
3. Can such a model be integrated into at the hotel's Revenue Management System (RMS)?

It is expected that this research should make three valuable contributions in the field of hospitality revenue management:

1. The identification of which PMS feature have effective predictive value for predicting the probability of a booking being canceled and show that PMS data allows better model results than the use of "standard" PNR data.
2. The demonstration of the expressive power that the use of combined data sources for better (more precise) prediction models' results.
3. A procedural definition of how such predictive models should be implemented in a RMS for management decision support.

Ana de Almeida and Luis Nunes act as PhD supervisors, holding periodic discussions over the development of the research and collaborating in the dissemination of results. As a possible side-by effect, Nuno António was invited for presentation talks for Machine Learning Master's classes, and students have shown interest for future work in the project.

## A Conceptual Model for Building Design Coordination using open source tools

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### Abstract

Building Design Coordination is the process of communicating and integrating multi-disciplinary designs into a single, coherent set of information that can be used for construction, to anticipate problems that would otherwise only be raised on the construction site. As projects grow in complexity and size, digital communication tools and other technological improvements have made it possible for physically distant design teams to collaborate in novel ways. More recently, BIM (Building Information Modelling), has opened even greater possibilities, although the design process nevertheless is often one of trial and error, demanding on each small change multiple possibilities to be considered, with decisions requiring to be validated among designers and other project stakeholders. Regardless of all the advantages that BIM has brought to the industry, testing for design changes in BIM models often requires a big effort and is a time-consuming activity that should be avoided whenever simpler processes can be used.

Further developments on this study will propose a framework for building design coordination, using a non-relational graph database. The system can track design issues between unlimited

users, organized into teams, handling formal project documents and keeping an historical record of the design development timeline. Since all the information regarding the design development process is stored in the form of Nodes and Relationships these can be intuitively be manipulated making it easier for teams to provide input on design decisions in real time with least cost impact to the project, providing at the same time access to pertinent information on the status of design issues and how the various stakeholders are contributing to the project. Through the use of reliable open source tools, a prototype can be implemented and made available to the industry professionals for testing, providing guidelines for modelling a Building Design Coordination system.