**Pre-Proposal of the Doctoral Research Project**

**Problem: Recommender Systems in Digital Marketing**

**Recommend what? For whom? Where? HOW?**

**How to combine structured data and unstructured data for the recommendation?**

**How do you solve the recommendation relying on several data sources and data from different nature?**

**Solution:**

**overview**

**which techniques?**

**propaganda — personalização (how you personalize? via consumer behavior?)**

**how do you use psychographic customer segmentation for the recommendation?**

**how do we explore/understand [consumer behavior](https://www.questionpro.com/blog/consumer-behavior-definition/) for the recommendation?**

**WHAT IS THE PROBLEM?**

**WHAT IS YOUR PROPOSED SOLUTION (CONCEPTUALLY) ← HYPOTHESES!**

**WHAT IS THE ORIGINALITY? ← LITERATURE**

**HOW YOU IMPLEMENT IT? [DEVELOPMENT] TRAINING MODELS ETC**

**HOW DO YOU EVALUATE IT ? (EXPERIMENTS) ←- WHICH DATA? WHICH CONTEXT?**

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**Title:** Use of the Semantic Web in Mobile Recommender Systems

1 Motivation

Recommender Systems have been developing a lot since the Machine Learning revolution, which is one of the many types of artificial intelligence. The Recommender Systems have helped several other platforms, such as social networks, e-commerce, and even the generation of stock portfolios; however, recommendations are rarely used in mobile systems, as the features are of a lower level. Recommender Systems can use other forms of Artificial Intelligence besides Machine Learning. Another type of artificial intelligence that is on the rise and expected to be widely adopted in the future is the Semantic Web. This technology emerged almost simultaneously with the web. Thus, we have an absence of Recommender Systems on mobile devices and a type of artificial intelligence (Semantic Web) that has not yet been used in the context of Recommender Systems. Thus, the main objective of this project is to investigate the use of Recommender Systems in mobile devices and to verify the feasibility of integrating such Recommender Systems with the Semantic Web.

2 Problem Characterization

Recommender systems are increasingly present in users’ lives, even in non-explicit ways. Several social networks, such as Facebook, use internal recommendation systems to recom mend content and services. It is a fact that recommender systems have already helped users stay on social networks, but how do you use recommendations on mobile systems? In Brazil, mobile devices are the ones that most connect people to the internet, so it is essential to keep these users connected in an increasingly inclusive way. Recommender systems can help users achieve their goals when using mobile devices. There is a considerable amount of use of recommendations on mobile systems, either as personalized assistants for better use of devices or guiding in remote learning processes, or even monitoring dangerous, harmful, and criminal behavior, always following the rules of the LGPD (General Personal Data Protection Law).

3 Research Questions

1. Existing Recommender Systems benefit from the Semantic Web?

2. How can the Semantic Web correlate mobile features with the current bases?

3. What are the possible mobile features? How to work with them?

4. What types of artificial intelligence best adapt to mobile features?

5. How to generate specific Recommender Systems for mobile devices?

6. What possible recommendations can be sent to the user through mobile devices?

4 Overall Goals

1. Review of the State of the Art;

2. Review of the State of the Technique;

3. In-depth Study of mobile features;

4. Implementation of hybrid Recommender Systems;

5. Systems Assessment;

6. Practical Application of the Generated Recommender System.

5 Goals In This Phase (8 months)

1. Review of the State of the Art;

2. Review of the State of the Technique;

3. In-depth Study of mobile features.

6 Methodological Synthesis

1. Review of the State of the Art:

• Recommender Systems;

• Recommenders on Mobile Devices;

• Semantic Web applied to Recommender Systems;

• Machine Learning applied to mobile features.

2. Review of the State of the Technique:

• Recommender Systems;

• Recommenders on Mobile Devices;

• Semantic Web applied to Recommender Systems;

• Machine Learning applied to mobile features.

3. In-depth Study of mobile features:

• Search for Artificial Intelligence methods best adapted to mobile features; • Study of the correlation between mobile features through the Semantic Web.

4. Implementation of Hybrid Recommender Systems:

• Implementation of a State of the Technique Recommendation System on mobile features;

• Integration of the Recommendation System developed with queries via the Se mantic Web.

5. Systems Assessment:

• Evaluation of the Recommendation System in the State of the Technique; • Evaluation of the Recommendation System using Semantic Web;

• Comparison between assessments.

6. Practical Application of the Generated Recommender System.

7 Key Milestones

1. Review of the State of the Art:

• **Objective:** Fullest possible documentation of the State of the Art in Recom mender Systems, Recommenders in Mobile Devices, Semantic Web applied to Recommender Systems, and Machine Learning applied to mobile features; • **Time Period:** 2 months.

2. Review of the State of the Technique:

• **Objective:** Fullest possible documentation of the State of the Art in Recom mender Systems, Recommenders in Mobile Devices, Semantic Web applied to Recommender Systems, and Machine Learning applied to mobile features; • **Time Period:** 2 months.

3. In-depth Study of mobile features:

• **Objective:** Search for Artificial Intelligence methods better adapted to mobile features, and carry out a study of the correlation between mobile features through the Semantic Web;

• **Time Period:** 4 months.

4. Implementation of Hybrid Recommender Systems:

• **Objective:** Implement a Recommender System in the State of the Technique on mobile features, and integrate such Recommender System with queries via Semantic Web;

• **Time Period:** Still Undefined.

5. Systems Assessment:

• **Objective:** Evaluate the Recommender System in the State of the Technique, the Recommender System using Semantic Web, and compare both evaluations; • **Time Period:** Still Undefined.

6. Practical Application of the Generated Recommendation System:

• **Objective:** To propose and implement a mobile application focused on a topic not yet determined, which uses all the functions and possibilities of the Recom mendation System generated in step 4;

• **Time Period:** Still Undefined.