**Chapter 1: Introduction**

In this chapter, we introduce the research context for our work, problem statement, the research objectives, and thesis contributions that we have proposed to resolve the required issue. We conclude this chapter by describing the structure of this report.

* 1. **Research context**

The design of user interfaces adapted to contexts of use became a constant interest for many researchers in the field of human-machine interaction. For this reason, numerous researches are published on the field of adaptation.

The adaptation of the interfaces is considered as a challenge for developers to improve the interactions between the user and the system while reducing the rate of errors and by enhancing the satisfaction of the users.

Nowadays, many research approaches in the adaptation field are focused on adaptive user interface taking in consideration different profiles. In fact, the wide-spread use of the adaptive systems became a need for the users who want to look for their information anywhere and at any time. In addition, adaptive user interface intend to create a good interaction between human and computers by customizing the context of use. Moreover, it has been applied in many areas such as education, transport, medical treatment …

In this chapter we are going to introduce the research question of this master’s thesis along with the organizational structure of this document.

* 1. **Problem statement**

The adaptation of the interface drew the attention of several researchers to generate a personalized user interface. Then, evaluating this adaptive user interface becomes a new challenge for many researchers who try to improve the quality of adaptive interfaces.

In this master thesis, we highlight the different problems and challenges that are mainly related to the evaluation of user interface based on several quality metrics to generate a set of evaluation rules.

Problem 1: *Providing a rigorous definition for the context of use*: In general, it is necessary to define primarily the context of use because there are:

* A diversification of user's preference (age, motivation, experience…) and of its token values (Low, Medium, High) that differs from user to another.
* A diversification of platform of interaction between user and system (PDA, Smartphone…).
* A diversification of environment of interaction (location, temperature …).

Problem 2: *Improving the metrics of quality*: The metrics of evaluation of the user interface is numerous and diversified but there is no metrics of evaluation denoted for the adapted user interface. Thus it is important to improve the existing metrics and to adapt them to the context of the adapted user interfaces.

Problem 3: *Automating the extraction of evaluation rules*: There is a consensus that the generation of the evaluation rules is important to assess the quality of such interface. Thus it is necessary to propose an automatic approach to extract these rules based on a well defined meta-heuristic. So generating evaluation rules is difficult according to the diversification of the context of use.

The following sentence represents the question of this research:

*How to generate an evaluation rules for adaptive user interface?*

**1.3 Research objectives and main contributions**

**1.3.1 Objectives**

The aim of our research is to generate automatically the evaluation rules of adaptive interface. This generation is performed by an evolutionary algorithm. So, we propose an evaluation method to verify the quality of the interface by considering the context in the user interface design. In addition, this context is modeling by three main dimensions: User, Platform, and Environment.

The purpose of this evaluation is to verify the adaptive systems if it corresponds to the specific needs defined by the user and to validate the feasibility of the adaptive user interface

**1.3.2 Contributions**

This report includes two Contributions:

* ***Proposing a set of quality metrics for adaptive user interface***: By returning to the previous works, we must seek the metrics that are used to evaluate user interface and adapt them to the context of adaptive user interface.
* ***Extraction the evaluation rules***: we will evaluate the required adaptive interface by using an evolutionary algorithm. Then, we will generate a set of rules by taking in consideration user’s preference and the set of proposed metrics.

**1.4 Thesis organization**

As mentioned, the first chapter is an introduction of this master report. It provides a content summary of each chapter with a description of the research context, problem statement and the descriptions of the objectives and the mains contributions. The second chapter is provides to describe a review of literature that is relevant to the field of adaptation user interfaces. It consists on defining the adaptive user interface and their impact on interaction computing systems. It gives a state of art about the evaluation of adaptive user interface. The third chapter presents the overview of our proposal. It starts by proposing a set of quality metrics and how can we adapt it to our context. It finishes by describing the proposed approach which is used to reach the goal of this research. The fourth chapter details the proposed approach and presents the experimental study for validating our result. Then, it discusses the efficient of the proposed approach according to the obtained result. Finally, it present a comparison of the used evolutionary algorithm with same others. The fifth chapter is the conclusion of our thesis and it presents the limitation of our contribution and the perspective of ours research.