

Lars Windauer

Performance analysis of an XForms
framework with the main focus on profiling
by example of Chiba

Diploma Thesis

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*Performance Analysis of an XForms
Framework with the Main Focus on
Profiling by Example of Chiba*

Thesis

submitted by

Lars Windauer

at

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Abstract

The goal of this thesis is to analyse a common XForms framework (Chiba) with the focus on profiling for performance inadequacies and to fix them if possible. A prototype of a largely automated performance measurement setup to underpin the analysis and the verification of enhancements has been designed and implemented.

The thesis starts with a theoretical part to specify terms & methodologies. Before the paper comes to its practical part the analysed project is introduced. Afterwards a practical performance analysis from the first steps to the narrow of the analysed project is exemplarily described.

In detail, chapter 1 Performance & Profiling elaborates how to quantify and profile performance in theory. Chapter 2 Methods introduces various methods to analyse performance. XForms and the analysed product Chiba are presented in chapter 3 XForms / Chiba Fundamentals. The implemented performance analysis is described in chapter 4 Performance Analysis Iteration and chapter 5 Tuning XForms Actions.

The Performance Analysis Iteration focuses on the design and implementation of tests to analyse and validate potential performance shortages, while Tuning XForms Actions illustrates how profiling techniques can be utilised not only to analyse but also to enhance a validated shortage. Finally - in chapter 6 Closing- the results of the analysis and the enhancements are reconsidered.

An overview of figures and tables, referenced resources as well as the appendix can be found at the end of the thesis. Project files and measurement results are placed on the attached CD.

1. Performance & Profiling

Before starting the analysis some definitions have to be made as a base for the further thesis.

1.1. Performance

"Someone's or something's performance is how successful they are or how well they do something" (cp. [Corb06, p. 1066]).

This definition of performance does not only focus on how someone or something is or does something. But it implies to be or do something successful. Hence, it must be possible to measure performance to analyse someone's or something's performance.

To prove that someone is more, equal or less successful a scope within performance can be compared is needed. An example: Stanley won the Grand Challenge (GP) II¹. Hence Stanley was performing best within that race. The GP II was a race by the Defense Advanced Research Projects Agency (DARPA) in 2005. Robot cars had to drive autonomously 175 miles through the Mojave Desert (USA). Hence, Stanley was not the driver but a VW Touareg V5 modified by the Stanford University Racing Team. And within this race in 2005 Stanley was proven to be the best performing robot car.

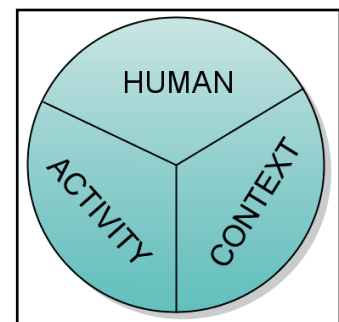


Figure 1 Bailey's Human Performance Model
(fig.: [Rubi94, p. 4])

A model to analyse human performance is Bailey's human performance model displayed in Figure 1. The three categories and their co-operation can be understood as: somebody (human) does something (activity) in someplace (context). Comparing this to the former example works too: Stanley (machine) was the fastest driving (activity) car and won the Grand Challenge II in 2005 (context).

Before going deeper into the details of performance we take a look why performance matters at all.

¹ DARPA. *Grand Challenge*. 2007. <http://www.darpa.mil/grandchallenge05/gcorg/index.html>