

NAME

Stefan Larndorfer  
(Austria)

ADVISOR

Prof. Dr.  
Gerhard Weiß

COMPANY



# Concept, Implementation and Evaluation of a Software Cockpit

Software Cockpit

Goal-Question-Metric

Business Intelligence for Software Engineering

Dashboard

Quality

Metrics

Dysfunctional Effects of Software Measures

What is the degree of completion of current work packages in this iteration? Is the team on track? How accurate are effort estimates compared to actual efforts?

Software cockpits (also known as software project control centers) provide systematic support for answering such questions. Therefore, like a cockpit in an aircraft, software cockpits integrate and visualize accurate and timely information from various data sources for operative and strategic decision making.

In this thesis the young topic of software cockpits in software engineering environments is investigated. This is done with a discussion on existing software cockpit approaches and a presentation of fundamental related topics like software measurement, the Goal-Question-Metric approach, measurement dysfunction and information dashboard design.



## Introduction

The successful conduction of software projects involves many aspects to be considered and for sure is a very challenging task. One crucial factor is a well-formed, motivated collaborating team, that is able to create software that meets business goals with given (pre)defined resources. In order to do that, it is necessary to track progress of the project, evaluate the current status with key-performance indicators at a regular basis and be able to make good estimates about how much effort is needed to complete certain functionality.

Many organizations and software teams are currently establishing so-called software cockpits for systematic project management support. A software cockpit is comparable to an aircraft cockpit, that centrally integrates project relevant information in order to support operative and strategic decision making. Additionally, proper integrated software cockpits contribute to more transparency in the software development process, an increased team awareness and help to improve estimation capabilities.

Throughout the last years, a variety of different approaches how to provide, implement and use software cockpits have emerged. This reaches from simple single-tool-oriented dashboards to frameworks that offer a more comprehensive metrics evaluation.

In recent years, research projects, dedicated workshops and numerous published articles in magazines for the practitioner indicate, that introducing software cockpits for online interpretation and visualization of up-to-date development data is an important topic in the software industry today.

## Objectives

This thesis has the following objectives:

- Outline current software cockpit approaches and related topics. Pay attention to industry trends such as dash boards and application life cycle management.
- Implement a software cockpit for general purpose to specifically support data from an issue repository and time recording data.
- Establish the software cockpit in a software development team and evaluate its usage by means of a case study.

## Approach

According to the objectives listed above, the following approaches will be used:

- The theoretical part of this thesis will mainly be based on the results of the Soft-Pit research project conducted by the Fraunhofer IESE institute from 2005 until 2008. An important cornerstone concerning basic concepts and terminology was laid by the journal publication of Jürgen Münch in 2004.
- Software project data integration and visualization issues will be addressed by using techniques and tools of the business intelligence area.
- The implementation of the software cockpit will be based on open source software components.
- The evaluation of the software cockpits will be based on the Technology Acceptance Model (TAM), that also was used by Ciolkowski et al. to evaluate software cockpits in an industrial environment.

