SafeFITS Web Application:
Architecture and User Interface

Prof. Dr. Constantinos Antoniou

Chair of Transportation Systems Engineering
Department of Civil, Geo and Environmental Engineering
Technical University of Munich (TUM)

www.tse.bgu.tum.de

Outline

SafeFITS Application Functionalities and Requirements

High Level Architecture

Data Model

Website Platform Structure

User Interface
Introduction

Successful deployment of SafeFITS is linked to the dissemination potential

Components:
- Interactive Visualizations
- Implementation of the Statistical Model

Expected Functionalities:
- Forecasting of road safety related indicators
- Benchmarking among different countries
- Produce reports with the results of the model

Core Functional Requirements

Implementation of Statistical Model
- Base year estimation
- Forecast based on intervention groups
- Manual Selection of interventions and reactive behaviour

Visualization
- Interactive
- Responsive

Report Generation
- Results
- Visualization
- Multiple formats

Database Integration
- Concise expandable database structure
Supporting Functional Requirements

User Interface
- Follow widely accepted design conventions and guidelines
- Concise and logical structure of the different functionalities
- Following a path logic starting from general and moving to specific

User Management
- Password protected
- Authorized users

System Documentation
- System Administrators
- End-users (help)

User Interactions
- Straightforward platform design
- Predictable behaviour

High Level Architecture

Components:
- Database: MariaDB
- Website Platform: Drupal
- Statistical Model: Shiny
- Connection: <iframe>
Data Model

Structured tabular form

Normalized

Extendable

Concise

Website Structure

Combination of Open and Password Protected

Webpages
- SafeFITS Home
- SafeFITS Login
- SafeFITS app – Introduction
- SafeFITS app – Countries Benchmark
- SafeFITS app - Forecast
- SafeFITS app – Report Generation

Access (user group)
- Open
- Password Protected

Platform
- Drupal (external)
- Shiny - iframe
User Interface Design

Top navigation bar: tab-based interface

**Persistent:** Move across tabs without loss of information

**Responsive:** Reactive Design (without submit button)

**Forgiving:** Reset opportunity

SafeFITS App: Introduction

Welcome Message

Guidelines for use

Project information

Road safety is an important sustainable development die globally and another 20 to 50 million sustain non world's eighth-leading cause of death and young adult killed in road crashes are from low- and middle-income estimated to 2% to 5% of GDP in developing countries global death are among pedestrians and motorist.
SafeFITS App: Countries’ Benchmark

General Information

Base year

Diagrams for countries’ rank

Global and Regional

SafeFITS App: Forecast

Implementation of the Statistical Model

Benchmarking of country with implementation of interventions

Manual selection and implementation of interventions
Integrated Statistical Model Application

Shiny R
- Based on R Language for Statistical Computing
- Fills the gap between offline statistical implementations and web-based solutions
- Dedicated and directly integrated, application server
- Modular design
- Libraries for model estimation and prediction

![R Logo](https://www.r-project.org)

![R Studio](https://www.rstudio.com)

Report Generation and Documentation

Report Generation
- Optional Report Generation
- Multiple Data formats (pdf, html, MS Word)

Documentation
- User-friendly tool-tips
- Help in separate webpage
Live demo

Next steps

Today’s discussion and feedback!

Finalization of the UI
Completion of the back-office logic
Pilot test
Beta testing
Deployment!
Thank you for your attention!

Prof. Constantinos Antoniou
Chair of Transportation Systems Engineering
Department of Civil, Geo and Environmental Engineering
Technical University of Munich

c.antoniou@tum.de