Tool for Aiding Maintenance Procedures with Augmented Reality

BERNARDO REIS, VINICIUS CESAR, FELIPE BREYER, AND JUDITH KELNER

{bfrs, vmc, fbb3, jk}@cin.ufpe.br

Swedish Aerospace Technology Congress 2016

November 3, 2016

Maintenance

MOTIVATION

- Instruction manuals can lead to a cognitive gap
  - ↳ Not always easy to do what is written in a book

- Interpretation mistakes can be dangerous
  - ↳ Wrong configurations
  - ↳ Equipment damage
  - ↳ Technician at risk

- Hard to query every necessary data

- Specialist's time is expensive
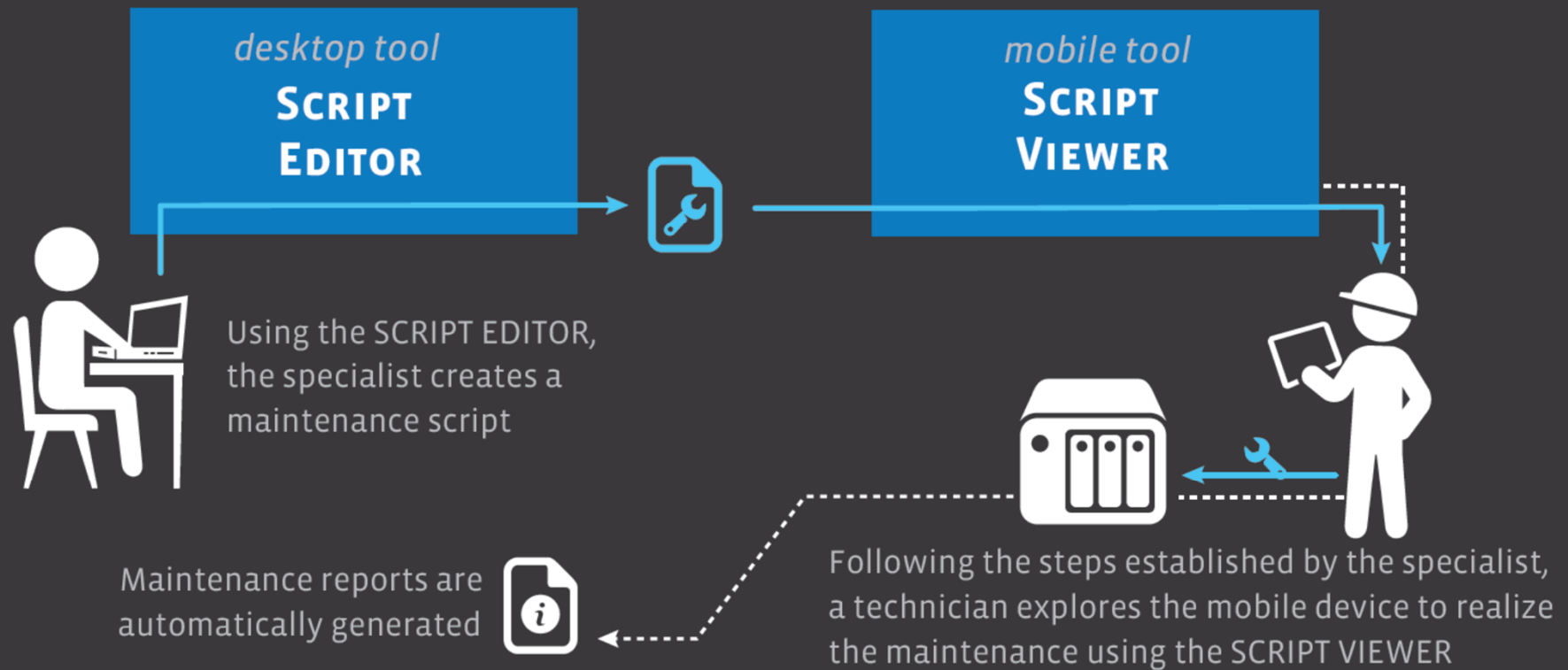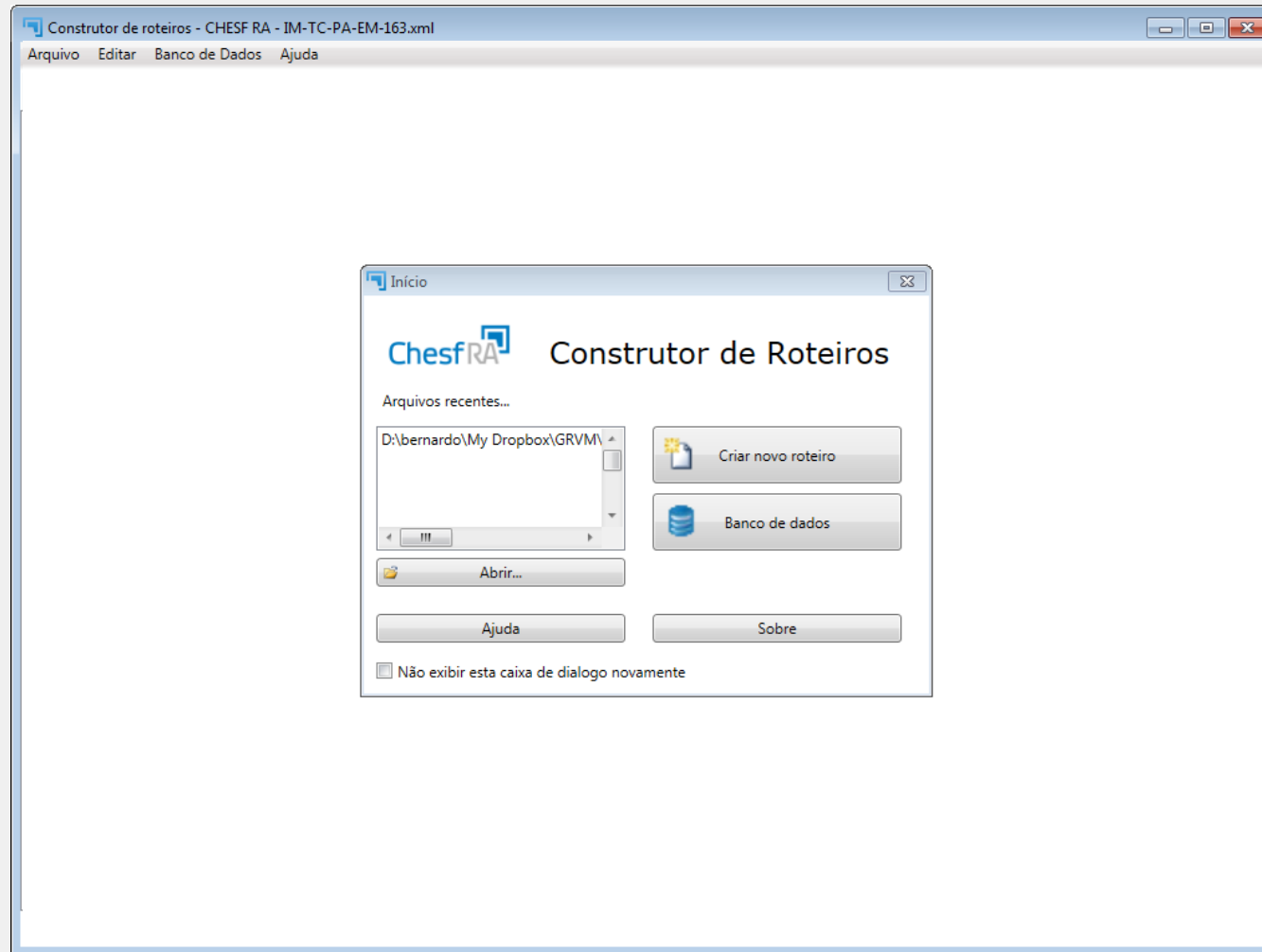
GOALS

- ▸ Make aircraft maintenance
  - ↳ Faster
  - ↳ Less dependent on technician knowledge
  - ↳ Less prone to human errors

- ▸ Using augmented reality

- ▸ Improving step-by-step instructions with multimedia

OUR SOLUTION

desktop tool
SCRIPT EDITOR

mobile tool
SCRIPT VIEWER

Using the SCRIPT EDITOR, the specialist creates a maintenance script

Maintenance reports are automatically generated

Following the steps established by the specialist, a technician explores the mobile device to realize the maintenance using the SCRIPT VIEWER

Script Editor

SCRIPT VIEWER

ChesfRA

SELECIONAR MANUTENÇÃO

digite aqui sua busca

Manutenções do Sistema
nome

MANUTENÇÃO 1
Substituição do kit de iluminação

MANUTENÇÃO 3
Verificação de temperatura

MANUTENÇÃO 4
Checar superaquecimento do servidor

MANUTENÇÃO 7
Verificar oxidação

Importar manutenção

Manutenções em Andamento		
nome	data	passo
MANUTENÇÃO 1 Substituição do kit de iluminação	12/05/2013	3/7
MANUTENÇÃO 3 Verificação de temperatura	12/05/2013	8/24
MANUTENÇÃO 4 Checar superaquecimento do servidor	12/05/2013	5/11
MANUTENÇÃO 7 Verificar oxidação	12/05/2013	13/22

Iniciar manutenção

Benefits

- ‣ Reduces the cognitive gap

- ‣ Provides all the data for each step

- ‣ Detailed report of the procedure

- ‣ Improved remote collaboration with specialists

- ‣ Can be used for training and simulation

Weaknesses

‣ Creating interactive maintenance scripts are more onerous than instruction manuals

‣ Augmented reality algorithms demands a lot of processing power

‣ Tablet is held with both hands
  ↳ Preventing the use of other tools

8

Challenges

- ▶ Very small objects are hard to detect

- ▶ Reflective objects are hard to detect

- ▶ User acceptance for new process / tool

OUR EXPERTISE

Thank you!

Judith Kelner

jk@gprt.ufpe.br

GRVM

3 November 2016