



# EMBRAER CASE STUDY: TEST MANAGEMENT USING PTC INTEGRITY LIFECYCLE MANAGER PLATFORM

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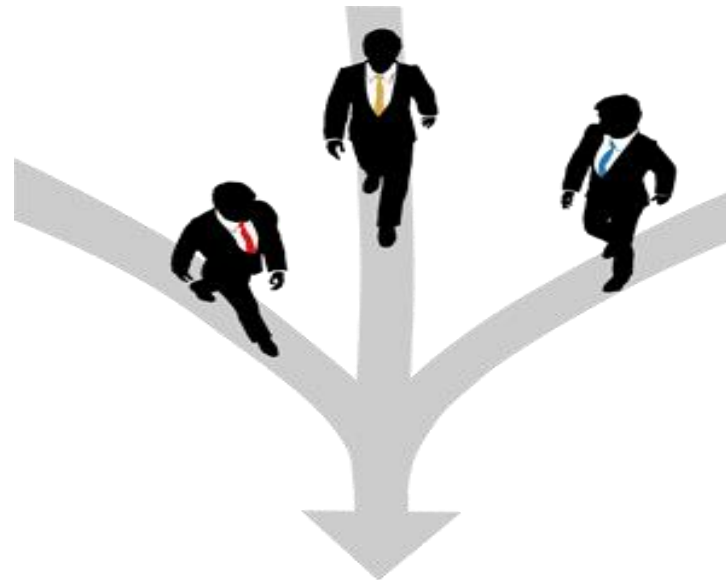


## Challenge from new Programs



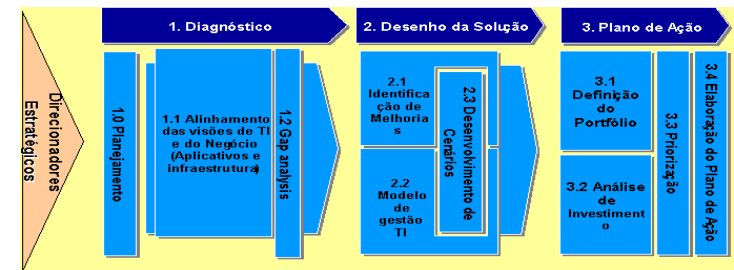
## Strategic Objectives

- ...offer better products... low maintainance cost...
- ...services and customer support in a very higher level...
- ... develop products in earlier time to market with maturity on EIS...
- ... integrate value chain participants ...
- ...work with international partnership...
- ...reduce cost on product development...
- ... excellence on knowledge management...



**PLM**  
Developing the Future

## IT Strategic Plan



Permitir evolução tecnológica compatível com mercado

# LIFECYCLE MANAGEMENT



## Structural Test Project



- 15 people from Embraer
- 7 people from PTC
- ~10 months of implementation

# LESSONS LEARNED – EVERYBODY IN THE SAME PAGE



Kaizen



Better Process



Target Sheet



Requirements alignment



SOW

# LESSONS LEARNED – WRITING USE CASES TOGETHER



-Requirements  
- Needs

Arquivo Editar Exibir Histórico Favoritos Ferramentas Ajuda

[EMBRAERPLM-6902] DL - Str... x +

https://ssp.ptc.com/jira/browse/EMBRAERPLM-6902?filter=34678

EMBRAER PLM Backbone Program / EMBRAERPLM-6902

DL - Structural Test Manufacture and Assembly Script (RFI)

Edit Comment Assign More

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EMBRAER PLM Backbone Program / EMBRAERPLM-6902

DL - Structural Test Manufacture and Assembly Script (RFI)

Edit Comment Assign More

Normal Sequence of Steps

1. Structural Test Engineer creates the Structural Test Assembly Script (RFI)
2. Structural Test Engineer select related Product
3. System automatically associate data with the Product
4. Structural Test Engineer informs the document
5. Structural Test Engineer inserts technical information
6. Structural Test Engineer select an Structure
7. If it is a revision, Structural Test Engineer r
  - o Revision Description
  - o Revision Reason
  - o Revision Impact
8. Structural Test Engineer submits this document
9. Notification to Structural Test Engineer app
10. When the document is approved:
  - o If the document has tasks to inspect execution" and the system should not document and also the Structural Test
  - o If the document has only tasks for Signed) then status is changed to "Approved" Members that are related to this document
11. Structural Test Assembly Team execute the tasks
12. Structural Test Inspectors Team execute the tasks
13. When all tasks are executed and digital signature

RFI\_Mockup.png 70 kB 2015-07-21 13:27

screenshot-1.png 71 kB 2015-06-22 22:55

screenshot-10.png 803 kB 2015-07-21 17:30

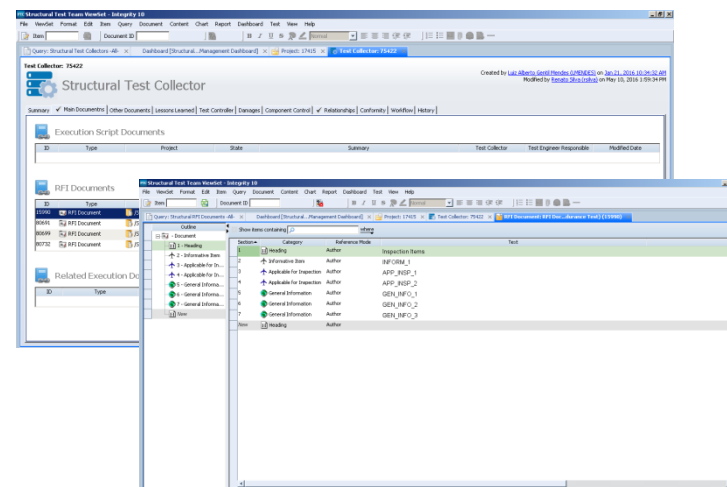
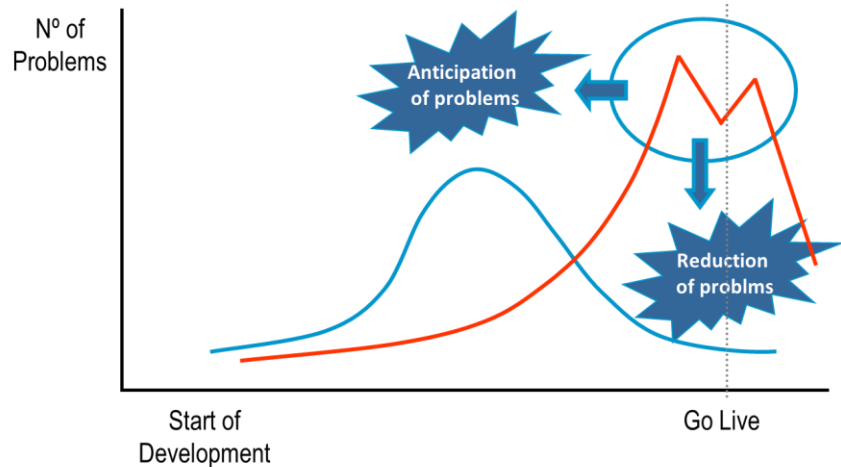
screenshot-2.png 80 kB 2015-06-22 22:57

screenshot-3.png 384 kB 2015-06-22 23:03

screenshot-4.png 15 kB 2015-06-23 10:07



# LESSONS LEARNED – ANTICIPATE THE PROBLEMS



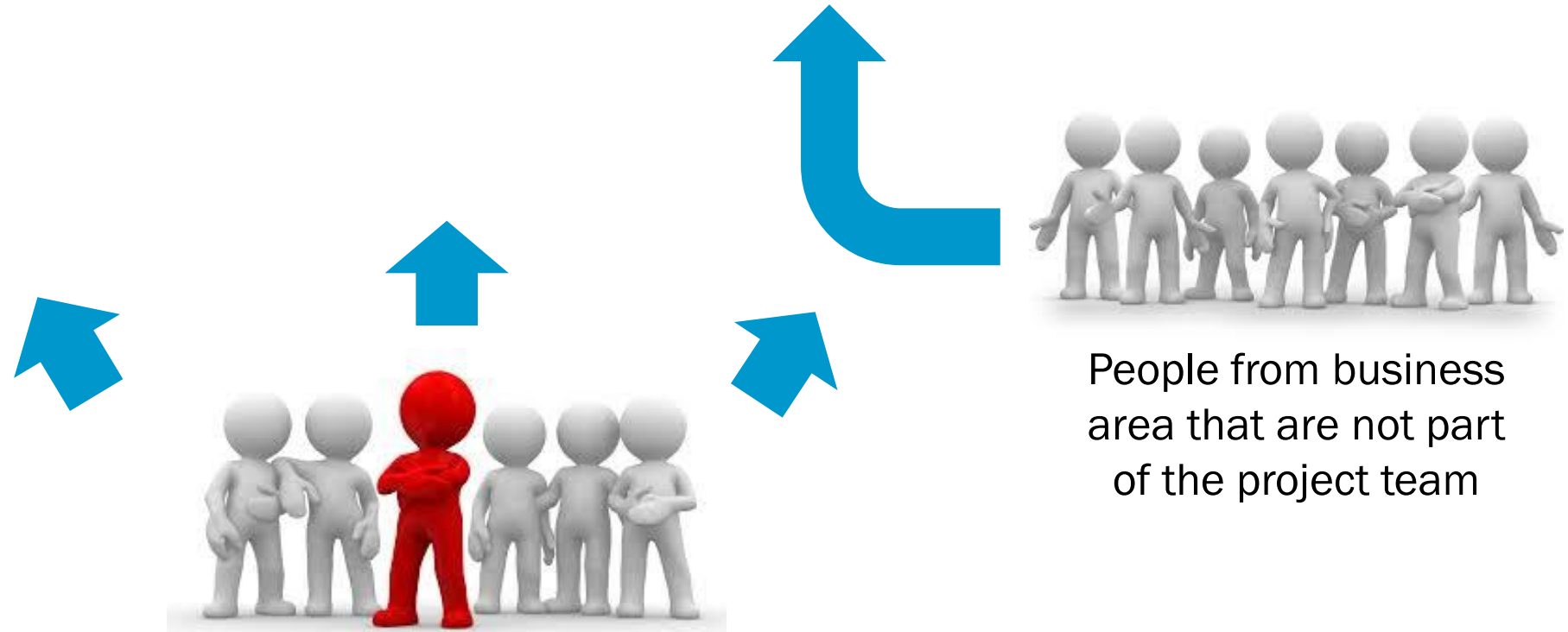
Prototypes to evaluate the Design/Development



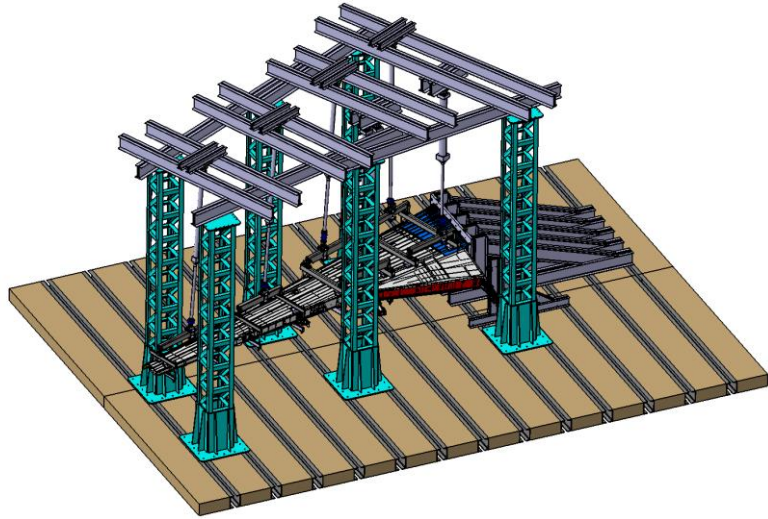
Colocalization



# LESSONS LEARNED – INVITE OTHER PEOPLE





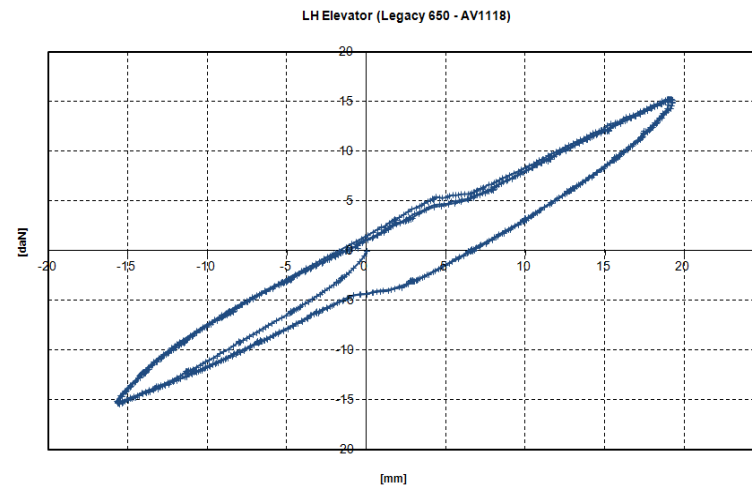


## Structural Tests

- Fatigue
- Static
- Ground Vibration



## Flammability Tests

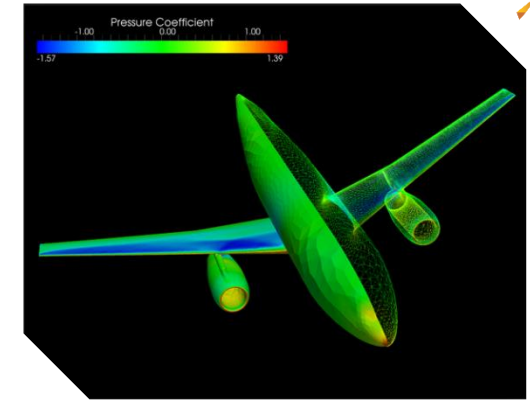


## Data Analysis

# STRUCTURAL, MATERIALS AND FLAMMABILITY TESTS

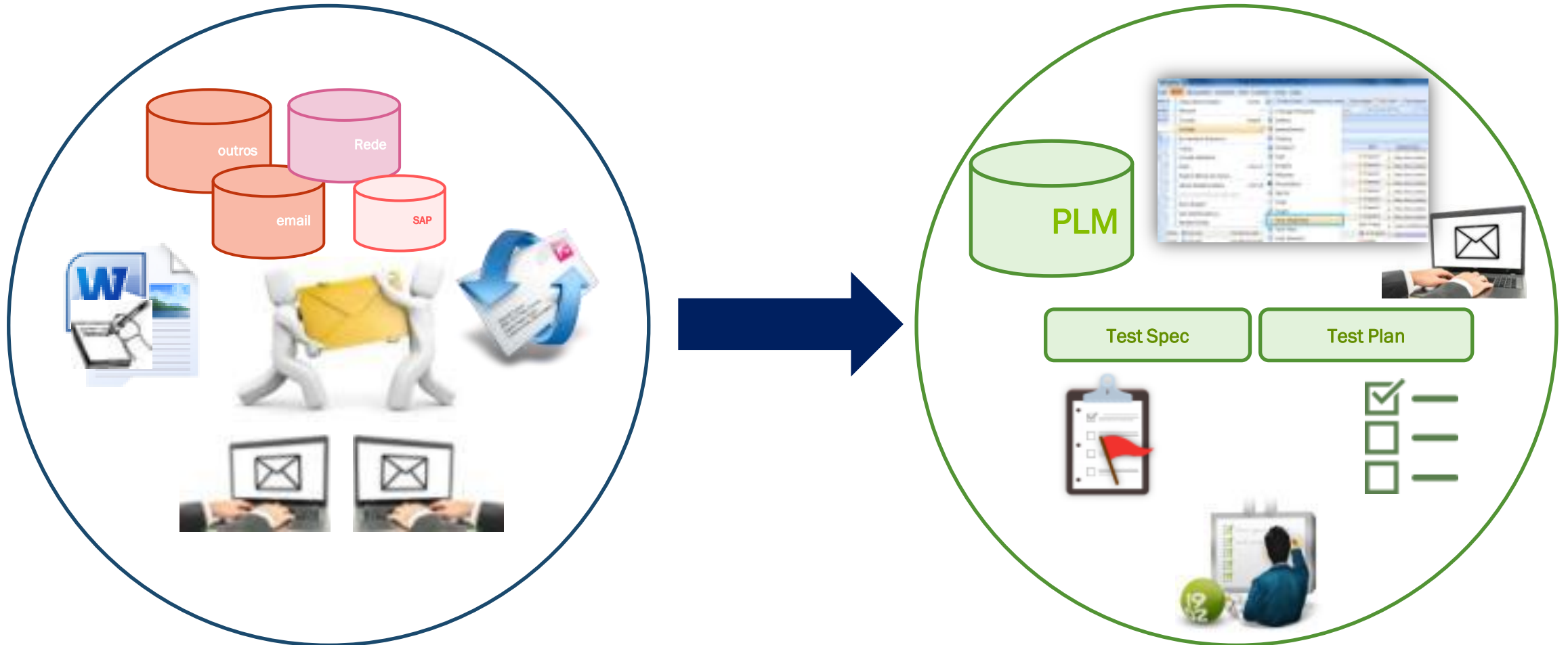


- Structural Tests and Materials are performed as part of the development and certification process of Embraer products and validation of mathematical models.
- During testing, load applied (force) similar to those which the aircraft would be subjected when in flight.
- For application of these loads, hydraulic actuators are used and capture of the results are achieved through data acquisition systems (strain gage, load cell, etc.).

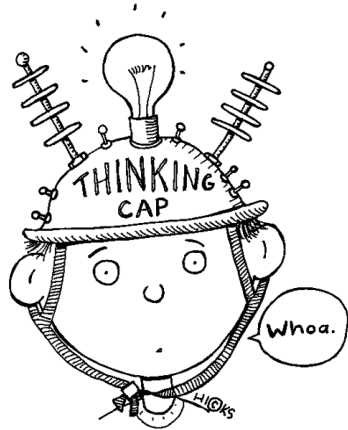


# PROJECT OBJECTIVES

- Streamline management, control e documentation for structural tests



- KAIZEN workshops were performed in order to capture key requirements.



## MAIN USE CASES

DOCUMENT MANAGEMENT

STATIC TESTS

FATIGUE TESTS

FLAMMABILITY TESTS

### Informações do Projeto

**I. Cenário Atual:**

- Companhia Full Scale (Ensaio de Fadiga) FFL190

- Quantidade de ocorrências a serem feitas: 4000
- Quantidade de reparos: 1200
- Quantidade de consultas: 1872

SAP EXCEL

**II. Problemas:**

- Ferramenta não amigável (SAP);
- Tempo perdido para registro das informações devido a grande quantidade de telas a preencher;
- Número limitado de licenças e tempo na análise de uso em 30 dias;
- Dificuldade de obter informações de reparos realizados;
- Dificuldade de controlar o número de reparos pendentes;
- Dificuldade de registrar falhas que não tiveram a aprovação da engenharia;
- Dificuldade de controlar a configuração do CDP;
- Dificuldade de gerar relatórios finais com todas as informações;
- Dificuldade de localizar as falhas de uma determinada região da aeronave (não tem um mapa de falhas);
- Ferramenta funciona como folha de papelada;

**III. Fluxo do processo e informações:**

**IV. Melhorias propostas:**

- Reduzir o tempo de registro e controle das ocorrências (tarefas);
- Validar a consistência dos dados de atividades;
- Validar a consistência dos dados históricos das atividades;
- Reduzir o tempo de emissão de relatórios finais (relatório histórico de uso (flow com relatórios));
- Eliminar a necessidade de controle de ocorrência;
- Validar a utilização da ferramenta para os usuários.

### As Is x To Be – Controle de Ensaio de Fadiga

**Problema:** Processo burocrático (vários registros)    **Ganhos:** Ciclo mais rápido

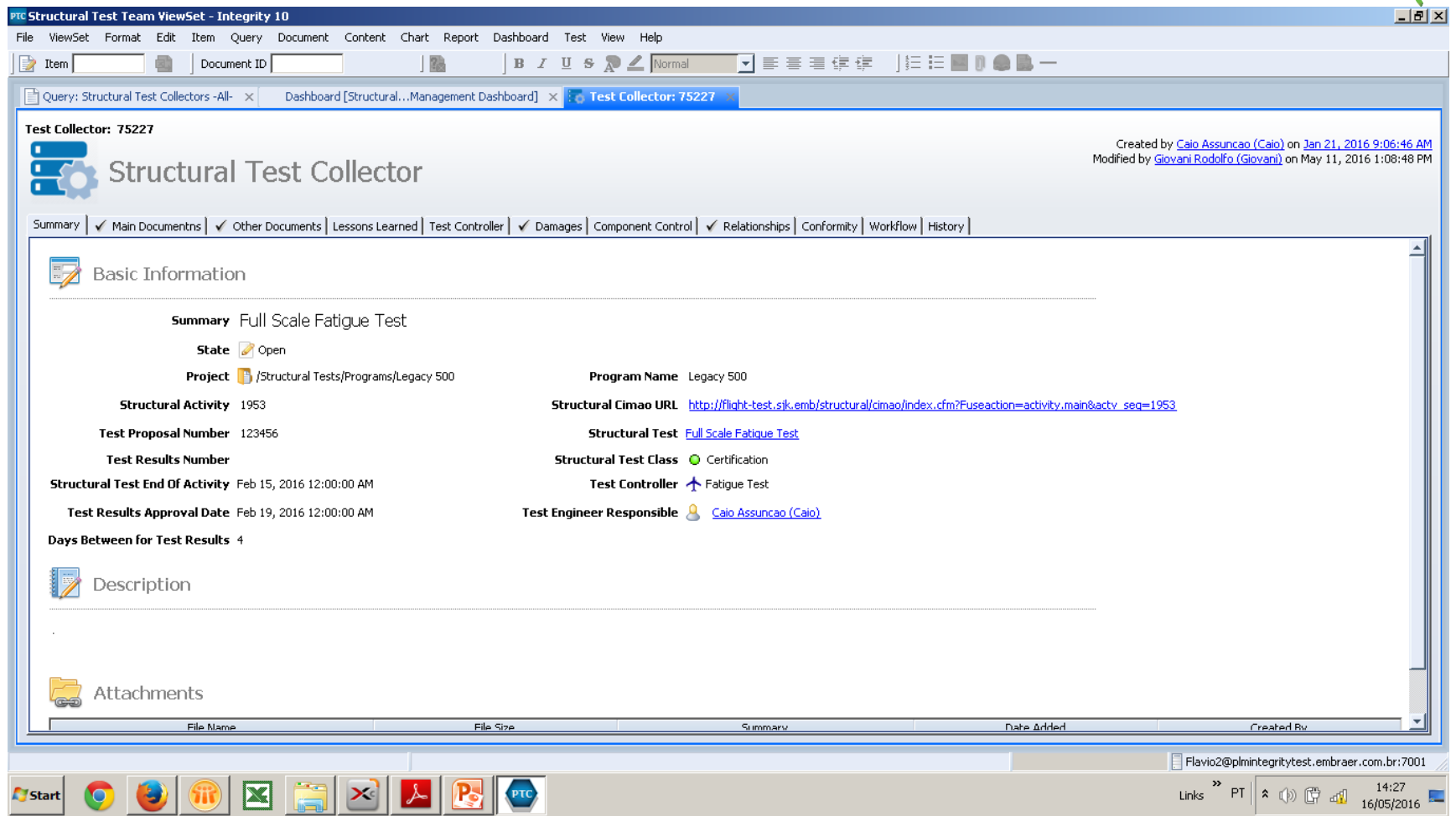
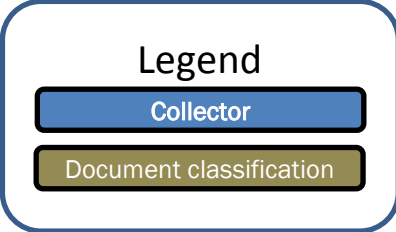
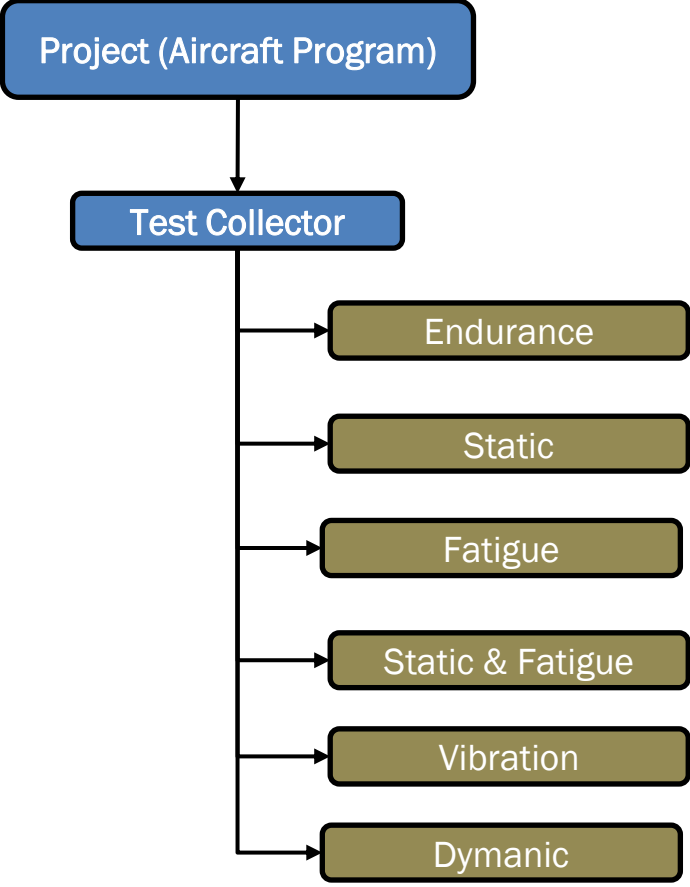
**ANTES**

**DEPOIS**

**Causa Raiz:** Arquitetura do SAP    **Contra Medida / Solução:** Ter uma arquitetura simplificada por ensaio

Será implementado até dez/2015

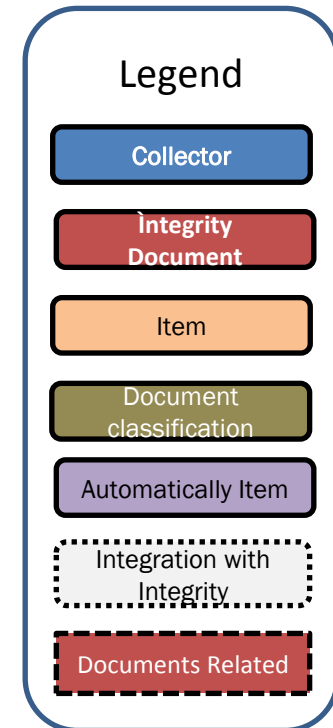
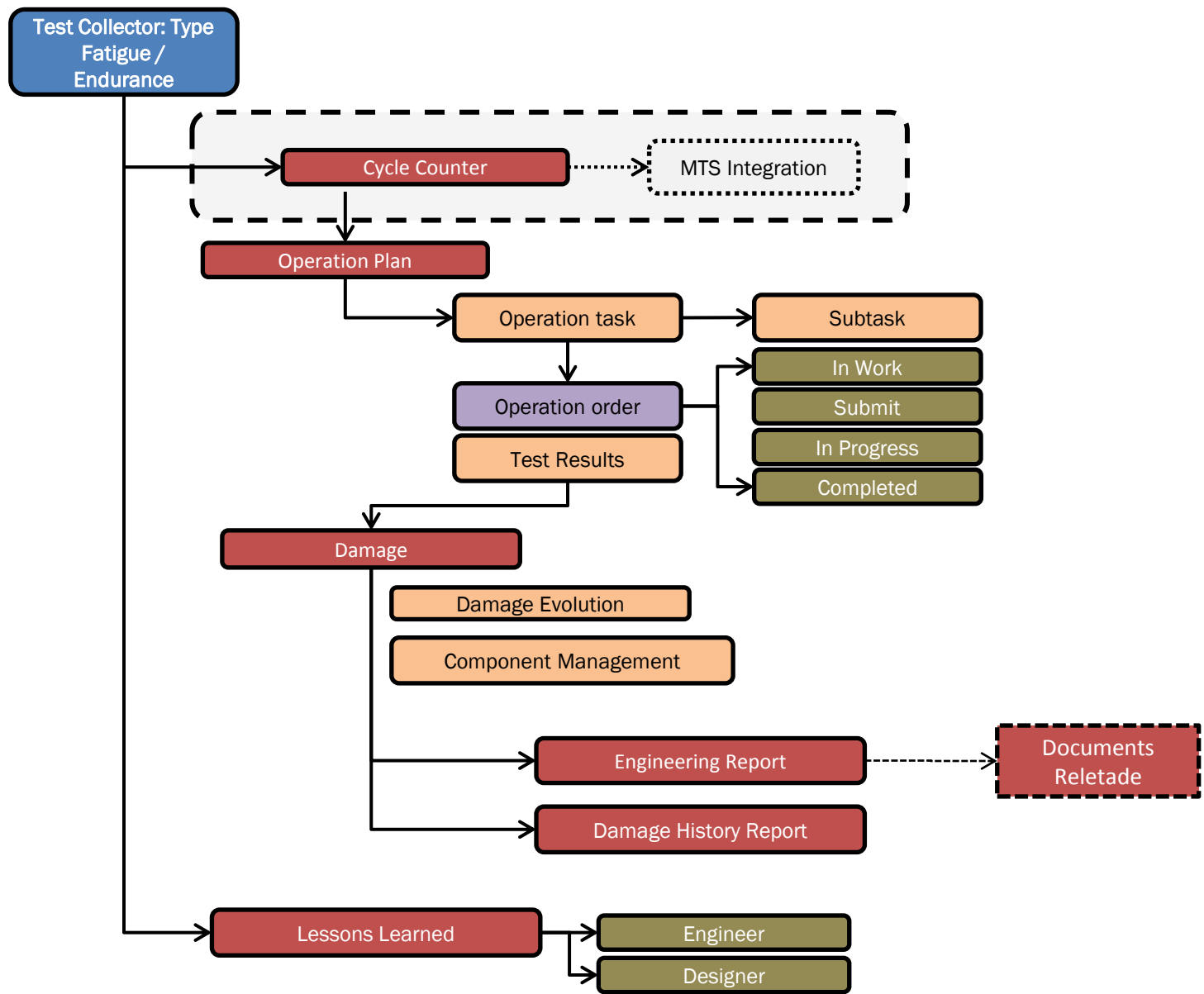
# PROJECT DEVELOPMENT - TEST COLLECTOR STRUCTURE





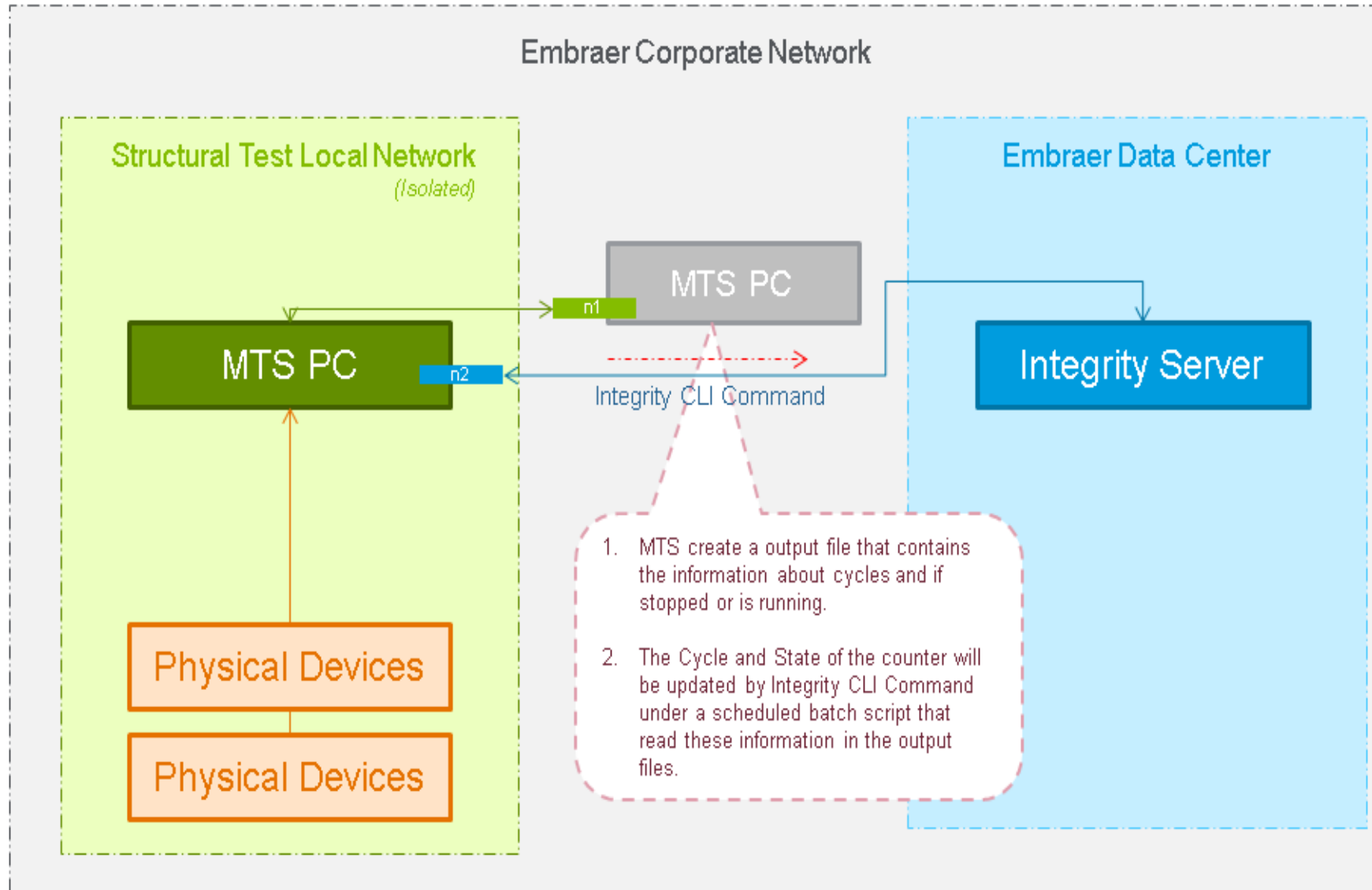


# PROJECT DEVELOPMENT – FATIGUE TESTS BACKBONE





# PROJECT DEVELOPMENT – FATIGUE TESTS MTS-INTEGRITY INTEGRATION



# DEMO



**One Challenge !  
One Team !  
One Great result !**

Thank You

The image features several colorful geometric shapes, including triangles and lines in shades of blue, green, yellow, orange, pink, and purple, scattered across the background. A large, multi-colored triangular shape is prominent on the right side. The text 'LIVE WORX 16' is centered, with 'LIVE' in a thin, outlined font and 'WORX 16' in a bold, solid black font. A small 'TM' trademark symbol is positioned to the upper right of the '6'.

LIVE  
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