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# Stop guessing – Start using facts!

Pierre Almén, IFPUG - ImproveIT,  
Fact-Based IT Improvements  
[pierrea@coolmail.se](mailto:pierrea@coolmail.se)  
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# Stop guessing – Start using facts!



- Background
- IFPUG Overview
- Case – Background & Scope
- Case – Create metrics
- Case – Result



# Background

## Pierre Almén - ImproveIT

- FP usage/counting since 1984
- CFPS – Certified Function Points Specialist 1994
- CSMS Gold Level – Certified Software Measurement Specialist 2006
- ISBSG Board member from 2017
- IFPUG Committee member from 2008 and Board member 2014-2017
- Reviewer and co-author of "The IFPUG Guide to IT and Software Measurement"
- Responsible for a FP / Software Metrics network in Sweden (1990-)
- Benchmarking and sourcing studies etc. of systems development and maintenance at major Nordic companies and organisations
- Developer / project leader / systems development & maintenance manager within IBM



“Measuring programming progress by lines of code is like measuring aircraft building progress by weight”

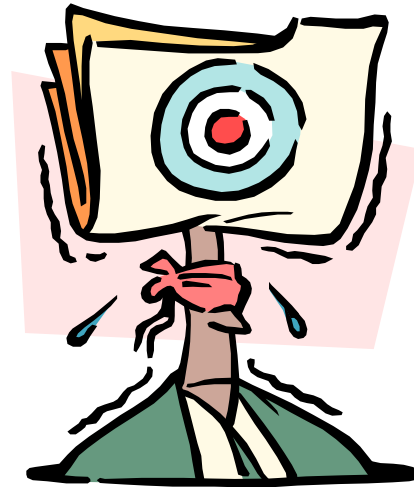


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Bill Gates



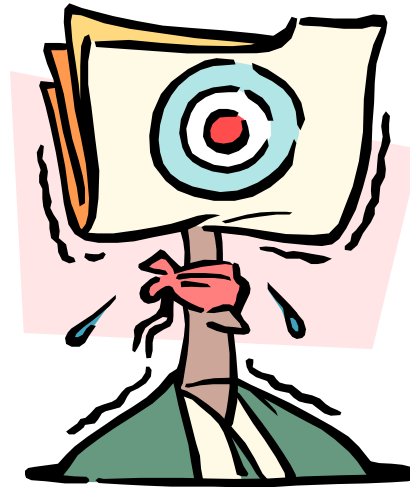
# Background



"I'm making a decision! Stop confusing me with facts!"




# Background



"I'm making a decision! Stop confusing me with facts!"

"Without metrics, you're just another person with a different opinion"



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Problems to predict software development effort and delivery at IBM caused a group of developers to create the first Function Points Assessment method mid 1970.

Allan Albrecht presented it externally 1979.



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# IFPUG

## International Function Point User Group - IFPUG

- A non-profit organisation established 1987
- Members (individual and organisations/companies) and chapters/affiliates world wide
- FP Analysis (FPA) - ISO standard (20926) since 2003
- SNAP – Software Non-functional Assessment Process
- Annual international conferences – ISMA 15 in Rome, Italy May 2018 with approx 400 attendees, ISMA 16 in Sao Paulo, Brazil Oct 18, 2018
- Committees and task groups
- Country representatives
- Industry Publication – MetricViews
- Professional Certifications
  - CFPS – Certified FP Specialist
  - CFPP – Certified FP Practitioner
  - CSP – Certified SNAP Practitioner
  - ??? – Ongoing project



# IFPUG

## iTips and uTips as of 2018 September

- **FPA iTips available:**
- [iTip #08 – Integrated Queries](#)
- [iTip #07 – Derived Data in Classifying an EO](#)
- [iTip #06 – Shared Data Real-Time Responses](#)
- [iTip #05 – Real-time Data Sharing](#)
- [iTip #04 – Data Conversion](#)
- [iTip #03 – Logon \(updated 2018\)](#)
- [iTip #02 – Charts and Graphs](#)
- [iTip #01 – Help!](#)
- **FPA uTips available:**
- [uTip #03 – Early Function Point Analysis and Consistent Cost Estimating](#)
- [uTip #02 – Project Testing](#)
- [uTip #01 – Using FPA in COTS Software Acquisitions](#)
- **FPA vTips available:**
- [vTip#01 – Project Testing](#)
- **SNAP iTips available:**
- [SNAPiTip #05 – The SNAP Counting Spreadsheet](#)
- [SNAPiTip #04 – Counting Algorithms Using SNAP](#)
- [SNAPiTip #03 – The SNAP Method – More](#)
- [SNAPiTip #02 – The SNAP Method – Continued](#)
- [SNAP iTip #01 – The SNAP Method](#)



# IFPUG

- Automated FP counting by OMG based on IFPUG FPA
- IFPUG FSM used by Italy and Brazil government for close to 2 decades
- IFPUG FSM used by ADM benchmarking companies for over 2 decades
- SNAP to be used for non-functional sizing by Italy government
- Cooperative work examples with other metrics organisations
  - WP – Managing Agile activities using standardised measures (COSMIC, Nesma, IFPUG)
  - Glossary for NFRs and Project Reqs (COSMIC, IFPUG)
  - ICEAA sCEBoK will include FSM based sizing for cost estimation (Nesma, COSMIC, Galorath, IFPUG)



# Function Points - Overview

**5**  
**Components**

**External User**

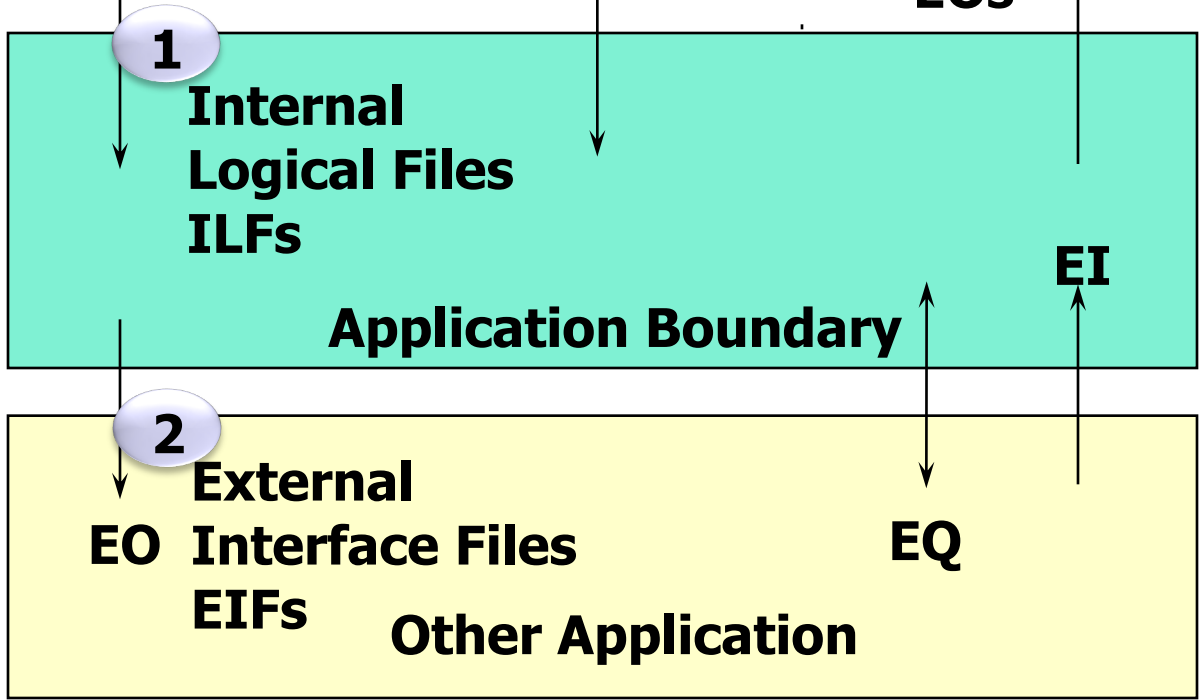
**3** **External Inputs**  
**EIs**

**4** **External Inquiries**  
**EQs**

**5** **External Outputs**  
**EOs**

IFPUG Function Points (FP) measures the "logical" size of an application based on the functional user requirements.

Each component (EI, EQ, EO, ILF, EIF) is weighted as low, average or high with separate FP values.





# SNAP - Categories

## Data Operations

- Data Entry Validation
- Logical and Mathematical Operations
- Data Formatting
- Internal Data Movements
- Delivering Added Value to Users by Data Configuration

## Interface Design

- UI Changes
- Help Methods
- Multiple Input Methods
- Multiple Output Methods

## Technical Environment

- Multiple Platforms
- Database Technology
- Batch Processes

## Architecture

- Component based software
- Multiple Input / Output Interfaces

# FPA certification: CFPS - CFPP



- English, Brazilian Portuguese, Italian
- Three sections: Definitions, Implementation, Case
- CFPS: 90% overall correct, 80% on each section
  - 749 certified
- CFPP: 80% overall correct, 70% on each section
  - 142 certified
- Certification valid for 3 years
- Certification Extension Program (CEP): Up to three years extension
- CFPS Fellow: 20 years of continuous certification



# SNAP certification: CSP

- English, Brazilian Portuguese, soon Italian
- Two sections: Definitions and Implementation
- CSP: 80% overall correct, 70% on each section
- Certification valid for 3 years





# Benchmarking certification

- Ongoing project
- Certification of Benchmarking Suppliers
- Ideas from ISO/IEC 29155 - Information technology project performance benchmarking framework
  - Benchmarking Repository
  - Benchmarking Instruments
  - Experience/Skills
  - Track Record
  - Appropriate Resources

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# Benchmarking background

Application development & maintenance often 50% of IT budget

## Standish Group CHAOS Report 2018

- Successful projects 30% (32% 2009)
  - Delivered on time, on budget, with required features and functions



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  - Are late, over budget, and/or with less than the required features and functions



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  - Delivered on time, on budget, with required features and functions
- Challenged projects 51% (44% 2009)
  - Are late, over budget, and/or with less than the required features and functions
- Failed projects 19% (24% 2009)
  - Cancelled prior to completion or delivered and never used



# Client Case

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## Case background

- Supplier shall develop and deliver a system including major business processes (mini-ERP)



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## Case background

- Supplier shall develop and deliver a system including major business processes (mini-ERP)
- Quality criterias exists in the contract and the supplier is unsure if they are market-like and if they can be fulfilled
- Primary purpose was to do a market comparison of relevant quality metrics
- Secondary purpose was to prognosticate the upcoming resources needed for application maintenance



# Scope

## Create metrics for the project

- Based on Function Points (FP)
- Estimate # of system faults / FP
- Estimate # of acceptance test faults / FP
- Estimate project productivity (FP / Person month)



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  - Estimate project productivity (FP / Person month)
- Find metrics in benchmarking DB for similar projects and applications
  - Reported faults / 1000 FP
  - Faults distribution in three categories : "Critical, Major, Other"
  - Productivity for application maintenance (user support, faults fixing and non-functional enhancement) : # of FTE / 10000 FP



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  - Faults distribution in three categories : "Critical, Major, Other"
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- Estimation of Function Points
  - Estimation from LOCs
  - Estimation from user functions

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# Case - Creation of metrics

## Estimation of project / application functional size

- Convert lines of code (LOC) to Function Points using converting factors from different sources
  - Gives probably bad result for a single project / application, might give better result for a whole portfolio
  - Result based on data from several suppliers of conversions tables:

12700 – 24000 FP



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# Case - Creation of metrics

## Estimation of project / application functional size

- Convert Use Case Points to Function Points
  - Uncertain basic data existed for Use Case Points
    - Counting was done in early stage, many functions may be missing
  - No standardized way of documenting Use Cases
  - Limited conversion data existed:

4050 FP





# Case - Creation of metrics

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4050 FP ?





# Case - FP sizing

## Estimation of project / application functional size

- Fast Function Point counting of first sub system (estimated by the supplier to be just over 13%)
- Counting transaction FPs, data FPs estimated
- Assuming just over average complexity for transaction FPs
- Added 10% for missing functionality

4900 FP



# Case - FP sizing

## Estimation of project / application functional size

- Fast Function Point counting of second sub system (estimated by the supplier to be approx 20%)
- Counting transaction FPs, data FPs estimated
- Assuming just over average complexity for transaction FPs
- Added 10% for missing functionality

8150 FP



# Case - FP sizing

Estimation of project / application functional size

- Summarizing of both sub systems gives a total FP size of

6850 FP

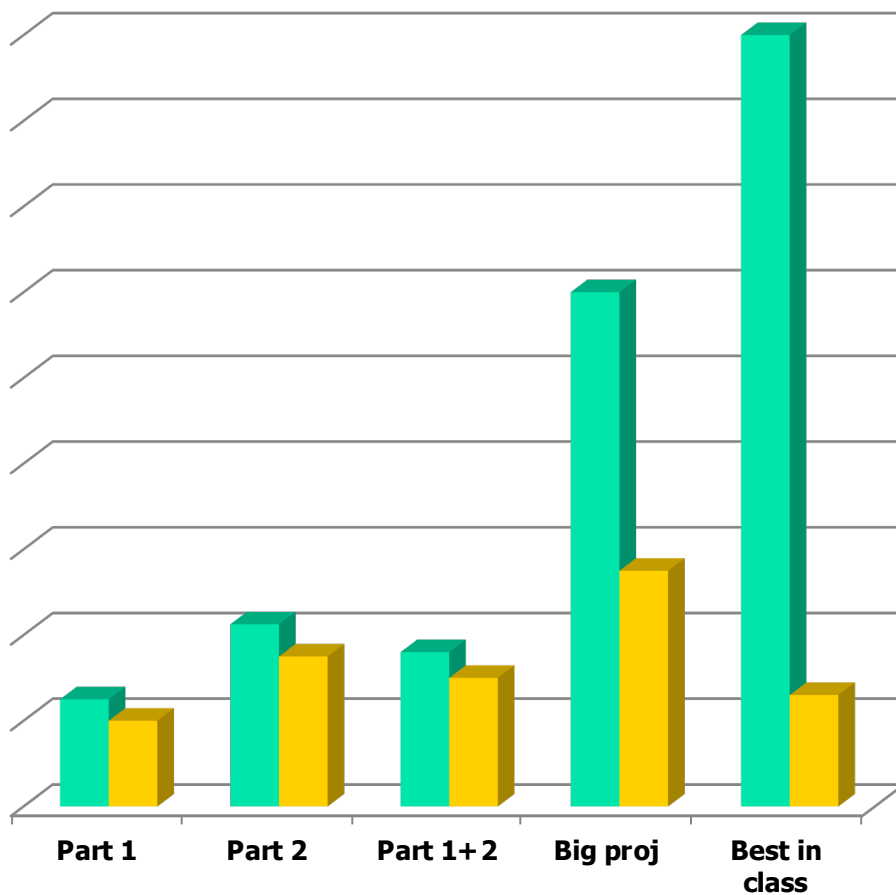
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# Case - Result 1(5)

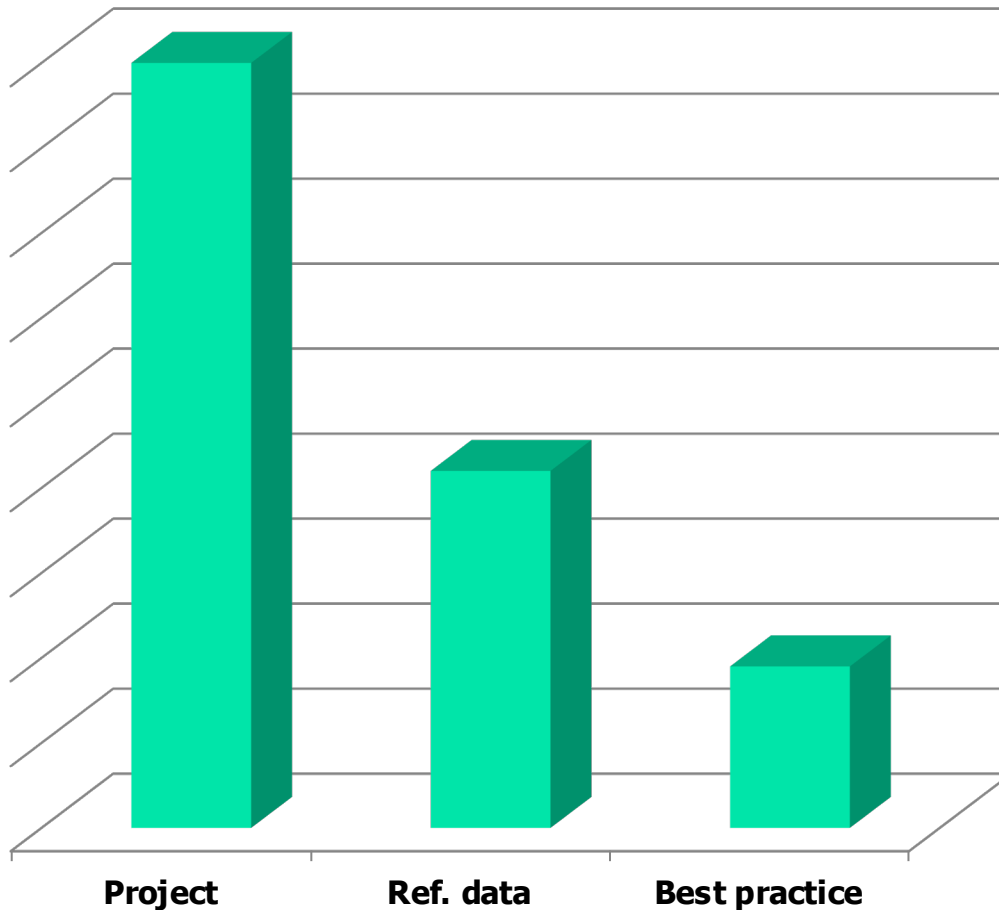


Project showed lower productivity and delivery capacity compared to reference data

- Productivity
- Del. Capacity



# Case - Result 2(5)

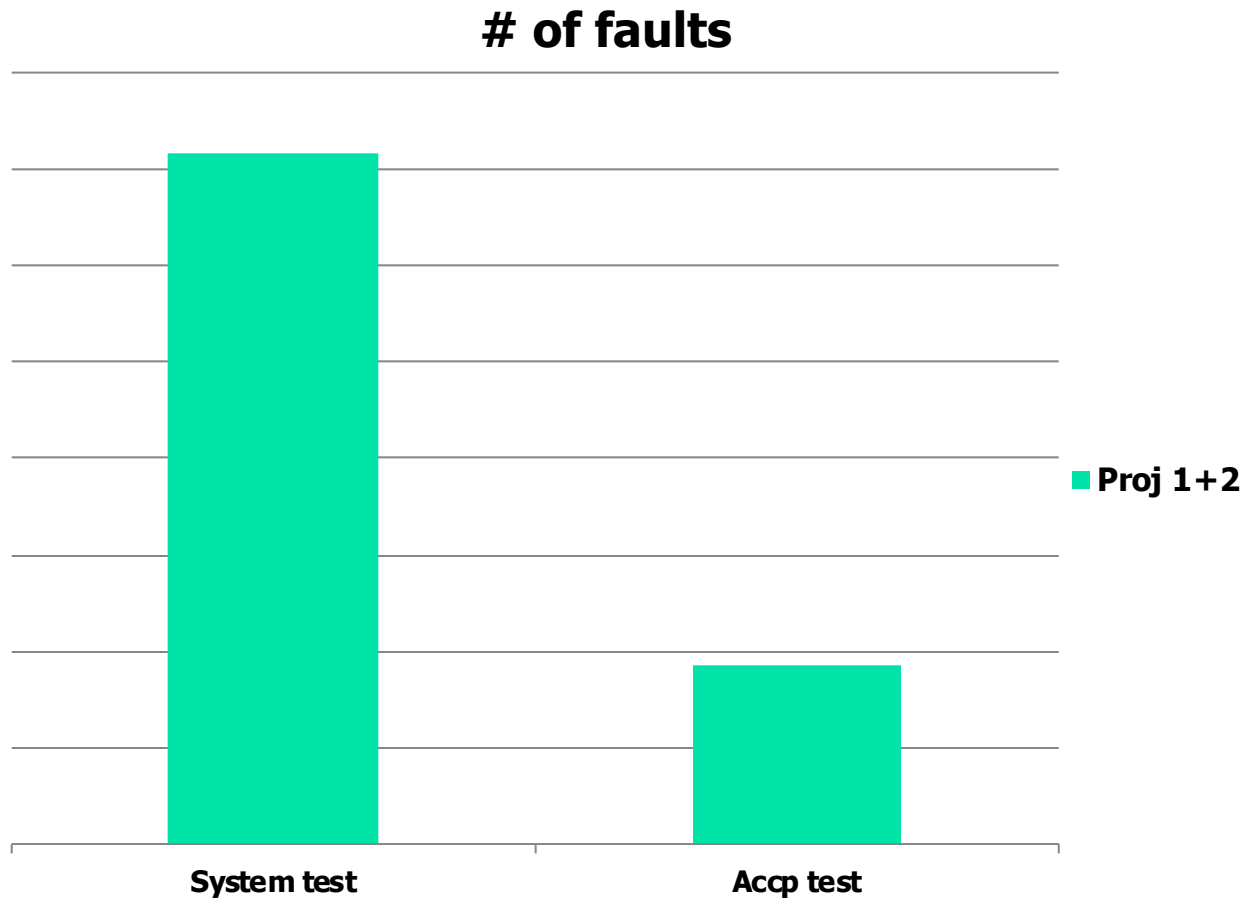


The project has had higher staffing (more reported hours per day) vs reference data

■ Hrs/day



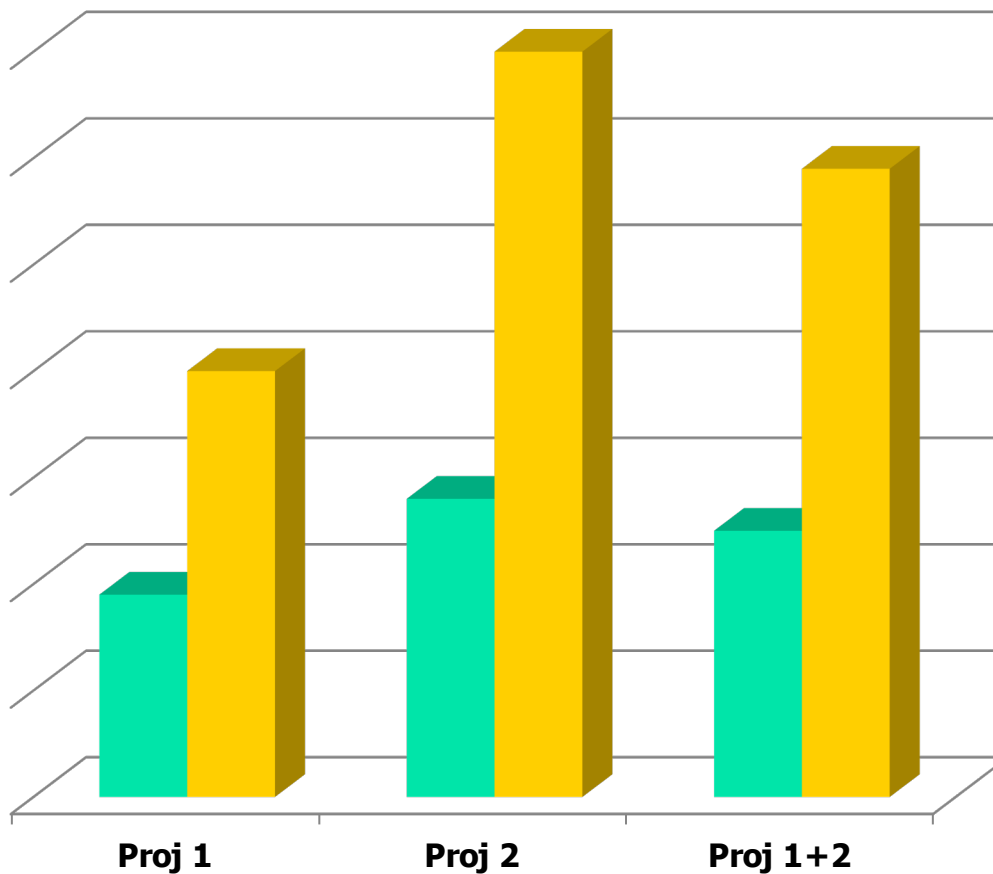
# Case - Result 3(5)







# Case - Result 4(5)



■ # FTE  
■ # Faults

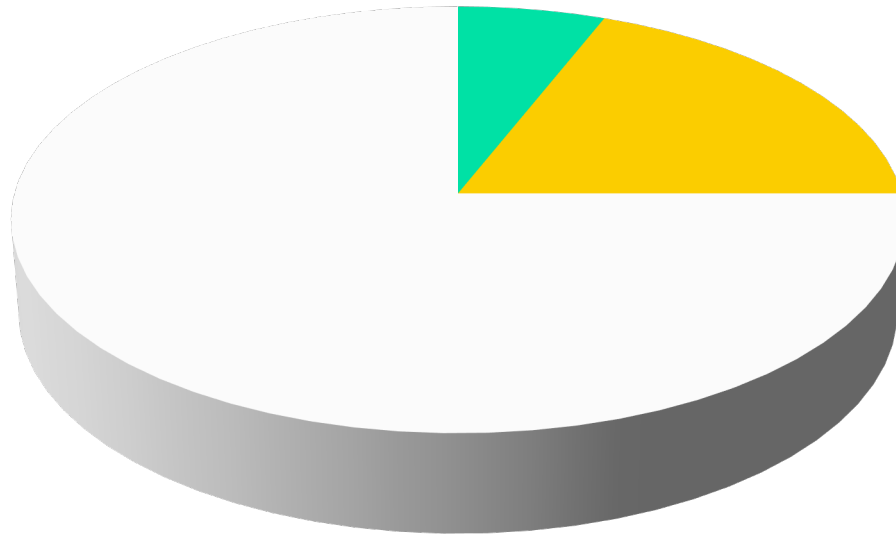
Based on reference data the number of FTEs to maintain the application and # of faults in production are prognosticated.



# Case - Result 5(5)



## Appl faults



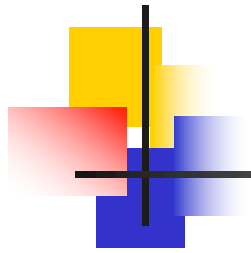
- Critical**
- Major**
- Minor**

Distribution of faults for big appl.

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**Gracias!**

**Thanks!**

**Tack!**