

# I.T. Benchmarking using ISBSG database

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A Workshop prepared by the C.I.M.

December 1998

# Workshop agenda...

- ① Context
- ① What is benchmarking?
- ① ISBSG, a tool for benchmarking
- ① Cases study
- ① Wrap-up

# Context...

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- ① Why benchmark ?
- ① How does it get started ?
- ① What is the result?
- ① Notes on credibility...

# Why benchmark?

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- ⊙ Overall corporate pressure on I.T. ...
  - ✓ ... dissatisfaction with performance,
  - ✓ ... justify outsourcing decision,
- ⊙ From a defensive perspective...
  - ✓ ... to justify that improvement is NOT an issue,
  - ✓ ... just enough to “get a number”,
- ⊙ From newly appointed manager...
  - ✓ ... to justify increased investments,
  - ✓ ... to justify cutting cost,
- ⊙ ...

# How does it get started?

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- ⊙ A guru gets hired from a reputable firm,
- ⊙ Delivery carried out by hired staff,
- ⊙ Whole approach based on the guru's database,
- ⊙ Internal coordinator appointed for data collection,
- ⊙ Internal pressure for a quick turn-around of data collection across the board...

# What is the result?

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- ⊙ Lots of numbers, graphs, nice slide presentation,
- ⊙ Industry data often not verifiable,
- ⊙ “Black box” approach,
- ⊙ No data for root cause analysis,
- ⊙ Bottom line: everybody sees what they want to see...

# Notes on credibility...

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- ⊙ Consequences of fast data collection:
  - ✓ impair credibility,
  - ✓ data not consistent across teams and organization,
  - ✓ No quality control, no outliers analysis,
  - ✓ Not complete or internally consistent.
- ⊙ Do not generate internal credibility,
- ⊙ Poor external credibility,
- ⊙ Lack of explanations for deviations from “industry averages”,
- ⊙ No insider knowledge on “best performers”.

# What is benchmarking?...

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- ⊙ Nature of benchmarking
- ⊙ Economics of benchmarking
- ⊙ Objects of benchmarking
- ⊙ Types of benchmarking
- ⊙ The 5 steps to success
- ⊙ Managing expectations
- ⊙ Summary



# Nature of benchmarking...

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« A **continuous** and **systematic** process for comparing ourselves with other units or organizations that represent excellence ».

⊙ **Impact on STRATEGY:**

- ✓ determination,
- ✓ formulation,
- ✓ implementation,
- ✓ leadership development,
- ✓ organization development and training

⊙ **Ability to define a direction for change and set achievable goals**

**STRIKE A BALANCE BETWEEN STABILITY AND RENEWAL**

# Economics of benchmarking

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**FREE MARKET:** Customer strive to choose freely between alternative suppliers to optimize his value.

**CAPTIVE MARKET:** Push for supply rather than pull for demand

**Benchmarking help equalize economic balance between supply and demand**

## **BENCHMARKING PURPOSE:**

Create or enhance economic value by supplying facts and information on what needs to be changed and what should remain intact.

Orient changes toward better performance; changes must produce credible, quantifiable improvements within a specified timeframe.

# Objects of benchmarking

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- ① Cost,
- ① Productivity,
- ① Time and speed,
- ① Quality and customer value.

# Types of benchmarking

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- ① Internal,
- ① External,
- ① Functional.

# Types of benchmarking

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## INTERNAL BENCHMARKING

- ⊙ Organizations can run benchmarking studies at their own pace,
- ⊙ Enable organizations to learn how to use methods for learning and action,
- ⊙ Access to internal information and data
- ⊙ Action will focus on performance increases and, over time, equalization of performance differences across units
- ⊙ **CONTROL THEN IMPROVE**

# Types of benchmarking

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## EXTERNAL BENCHMARKING

- ⊙ Against direct competitors,
- ⊙ In same or distinct markets,
- ⊙ With other countries.

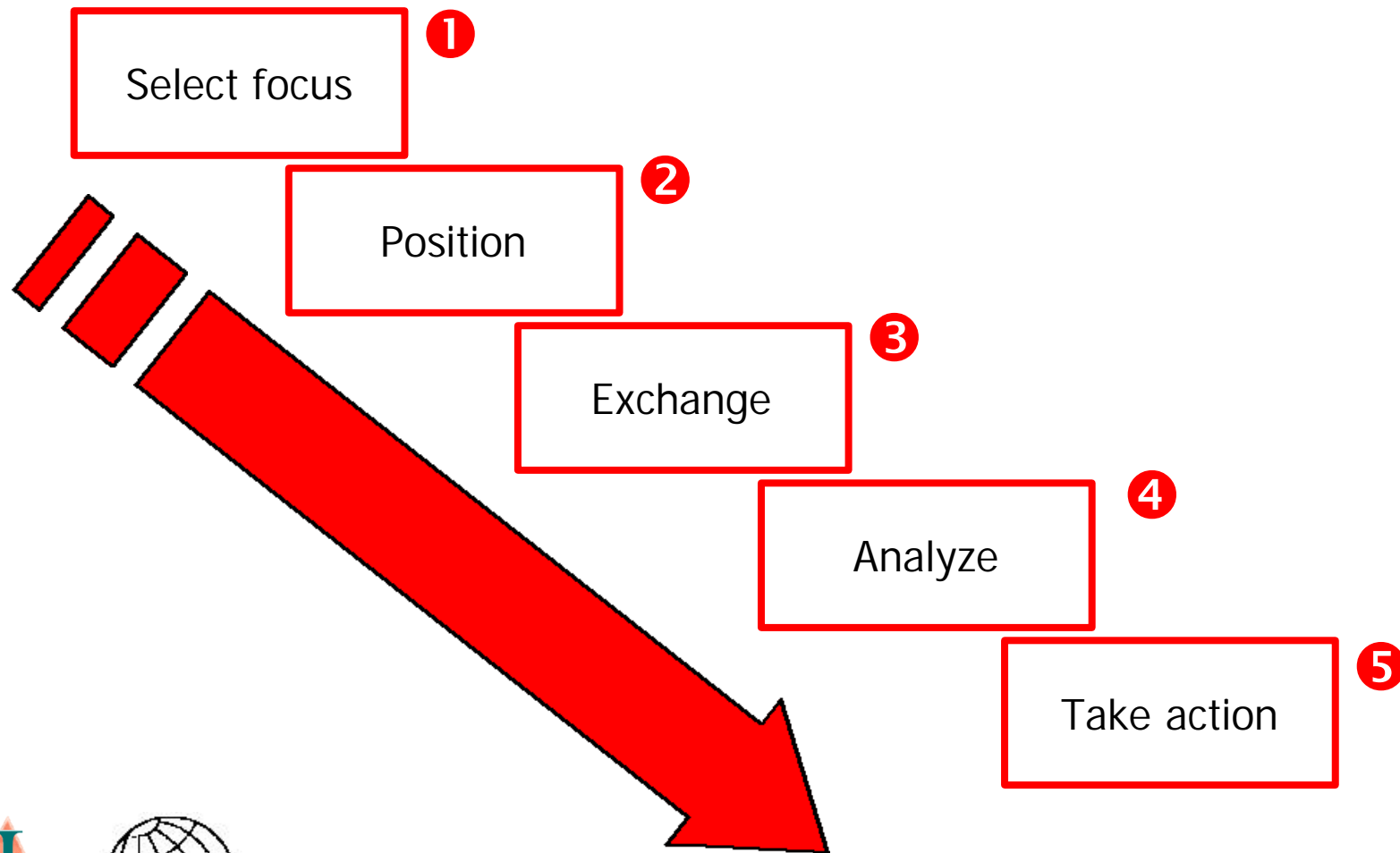
# Types of benchmarking

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## FUNCTIONAL BENCHMARKING

- ⦿ Compare products, services and work processes with those of top organizations regardless of what business they are in.
- ⦿ Basic idea: benchmark parts of the business that have similarities across industries.

# The 5 steps to success





# The 5 steps to success

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## 1- SELECT FOCUS

- ⊙ Decide **WHAT** to benchmark:
  - ✓ A matter of knowing your own business
  - ✓ Require a thorough understanding of factors influencing the performance of the benchmarking candidate
  
- ⊙ Use of benchmarking for exploratory purposes
  - ✓ identify factors that are critical to performance
  - ✓ learn how to measure them
  - ✓ support level of resolution study

# The 5 steps to success

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## 2- POSITION

- ⊙ Identify benchmarking partners
- ⊙ Establish a relationship favoring the exchange of information
- ⊙ Sequencing: internal, external and functional
- ⊙ Explain project objectives
- ⊙ Present project and action plan
- ⊙ Supply to the potential partner the information needed to decide whether or not to cooperate

# The 5 steps to success

## 3- EXCHANGE

- ⊙ Information gathering
  - ✓ Always start within your organization; it teaches a great deal from the viewpoint of what is to be benchmarked,
  - ✓ Define and specify precisely the info. needed from the partners, it bear a direct impact on the quality of the data you will get!
  
- ⊙ Points of ethics:
  - ✓ Treat all info. as **CONFIDENTIAL**,
  - ✓ Document all agreements,
  - ✓ **NEVER** ask for info. you are not prepared to release yourself.

# The 5 steps to success

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## 3- EXCHANGE

⊙ Be well prepared, use multiple sources:

- ✓ Questionnaires
- ✓ Industry conferences
- ✓ Video, phone, fax, e-mail, Web
- ✓ Face to face interviews
- ✓ Other publications
- ✓ Group meetings
- ✓ ...

# The 5 steps to success

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## 4- ANALYZE

- ⊙ Sort and organize information by levels
- ⊙ Control the quality of information
- ⊙ Non-comparable factors:
  - ✓ differences in operative content
  - ✓ differences in scope of operations
  - ✓ differences in market conditions
- ⊙ Identify performance gaps
- ⊙ Report:
  - ✓ Describe to supply enough context
  - ✓ Recommend in business terms:
    - Make or Buy Analysis
    - Improve
    - Integrate
    - Sell-off

# The 5 steps to success

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## 5- TAKE ACTION

- ⊙ This is where the **benefits** kicks in!
- ⊙ Close identified gaps
- ⊙ Thoroughly plan the changes
- ⊙ **Integrate** changes with business plans
- ⊙ Implement AND **TRACK IMPACT!**

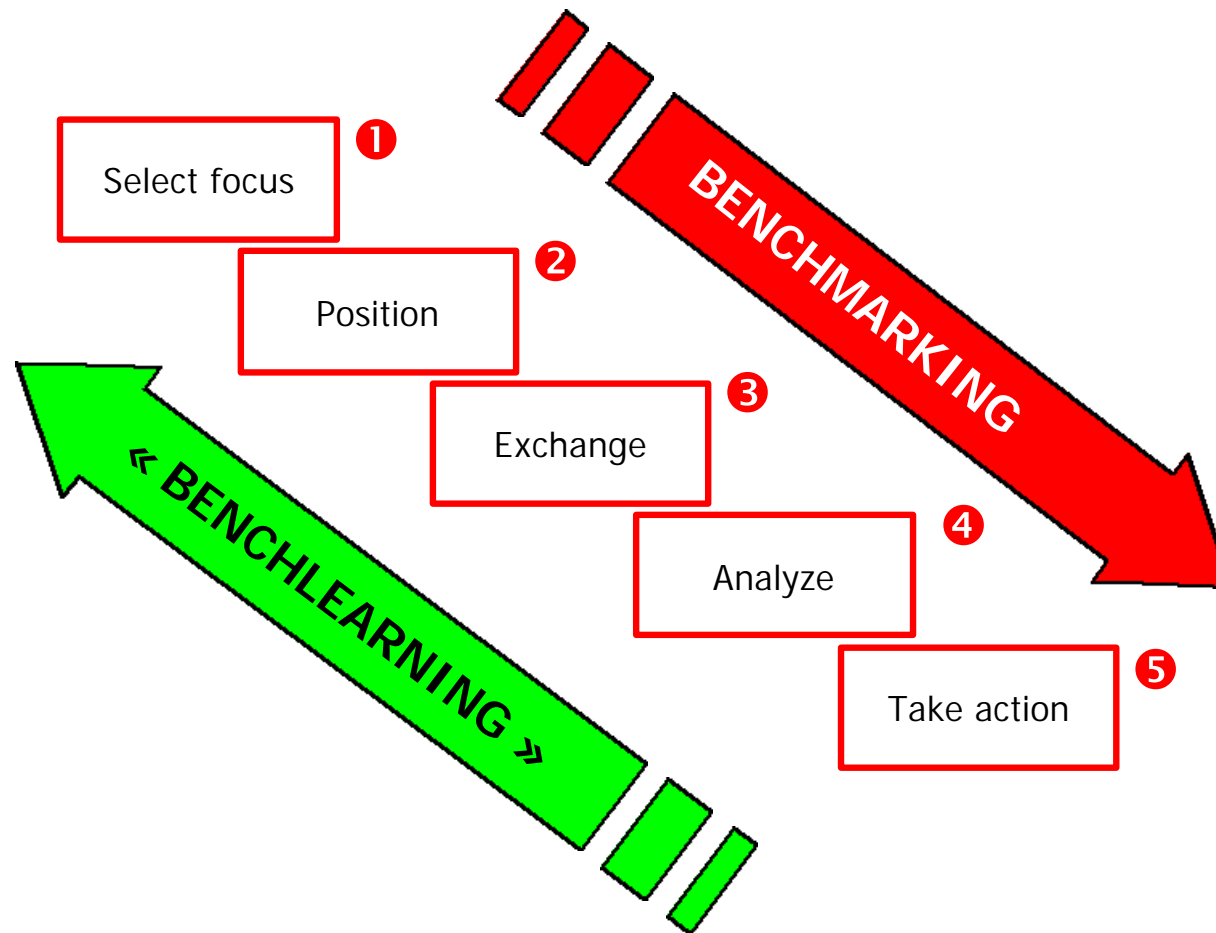
# Managing expectations

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- ⊙ What does the SEI maturity model mean?
- ⊙ Where are you on the SEI model?
- ⊙ Based on your status, what could realistically be expected?
- ⊙ What will be the quality of **YOUR** data?
- ⊙ What will be the quality of your **PARTNERS** process and data?
- ⊙ Your **EXPECTATIONS** should match your maturity status and incremental progress path.

## WHAT IS BENCHMARKING?

# Summary





# Summary

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- ⊙ The 6 conditions of **BenchLEARNING**:
  - ✓ have the will and courage to gain insights;
  - ✓ find out what is known about the subject, and by whom;
  - ✓ acquire info. and absorb knowledge;
  - ✓ internalize and pool experience to cement knowledge;
  - ✓ codify successful behavior and change work process accordingly;
  - ✓ training: apply knowledge, develop proficiency.



Break time!

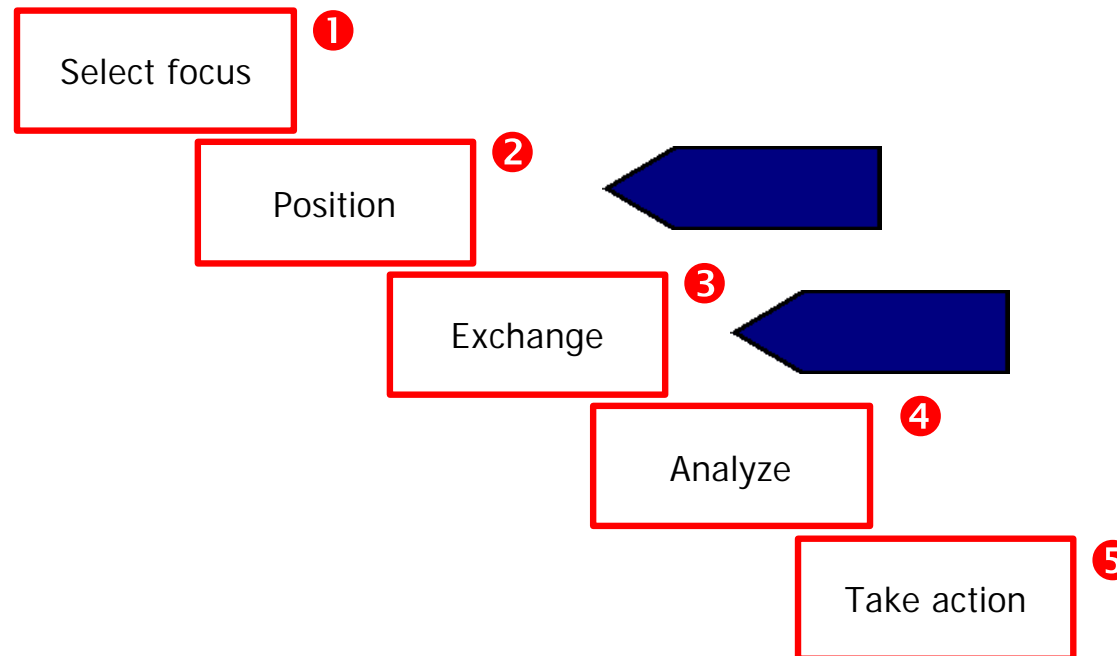
# ISBSG, a tool for benchmarking...

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- ① **Brief history of ISBSG**
- ① **ISBSG data collection tools and procedure**
- ① **Overview of ISBSG Benchmark report (r.5)**

# Brief history of ISBSG

Where does it fits in?



# Brief history of ISBSG

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- ⊙ **MOTIVATION:**  
Practitioners who wanted **CONTROL** and sought the **BEST PRACTICES**
- ⊙ Members of ASMA (1991)
- ⊙ Establish a database of IT projects productivity
- ⊙ 1st release contained 24 projects (1992)
- ⊙ Revised procedure and collection package twice
- ⊙ Supplied 5 more release up to June 1994

# Brief history of ISBSG

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- ASMA approached by UK AND USA
- Established International Software Benchmarking Standards Group (ISBSG) in 1994
  - ✓ Develop *defacto* international standards
  - ✓ Share collected data
- Membership: national metric associations (1998)
  - ✓ Australia
  - ✓ Canada
  - ✓ Germany
  - ✓ Italy
  - ✓ Netherlands
  - ✓ United Kingdom
  - ✓ USA

## ISBSG tools and procedure

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- ① **Submit a project and get it benchmarked against similar projects (free!)**
- ① **Use a data collection software called VENTURI, available on the Web** (<http://www.isbsg.org.au/idwnload.htm>)
- ① **Export a data file, send over by e-mail**
- ① **Receive a benchmarking report by fax or e-mail**

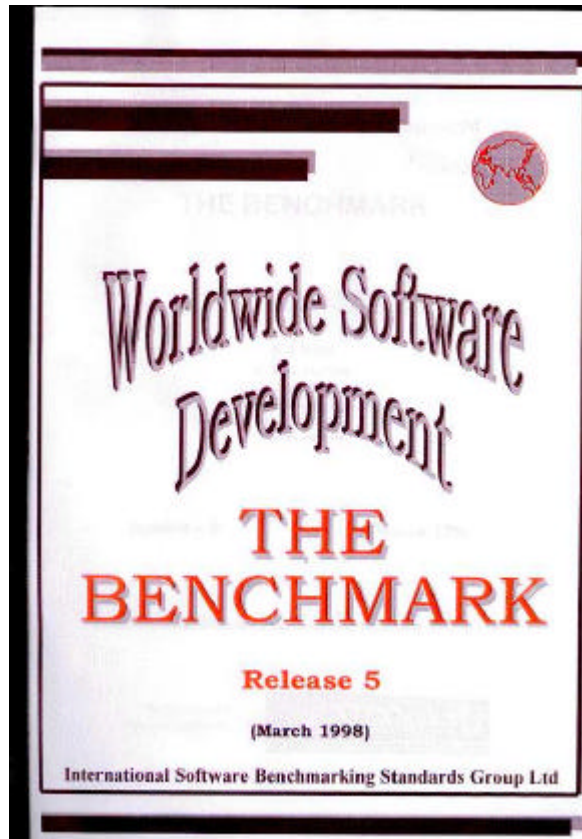
# ISBSG tools and procedure

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## 🎯 The VENTURI software

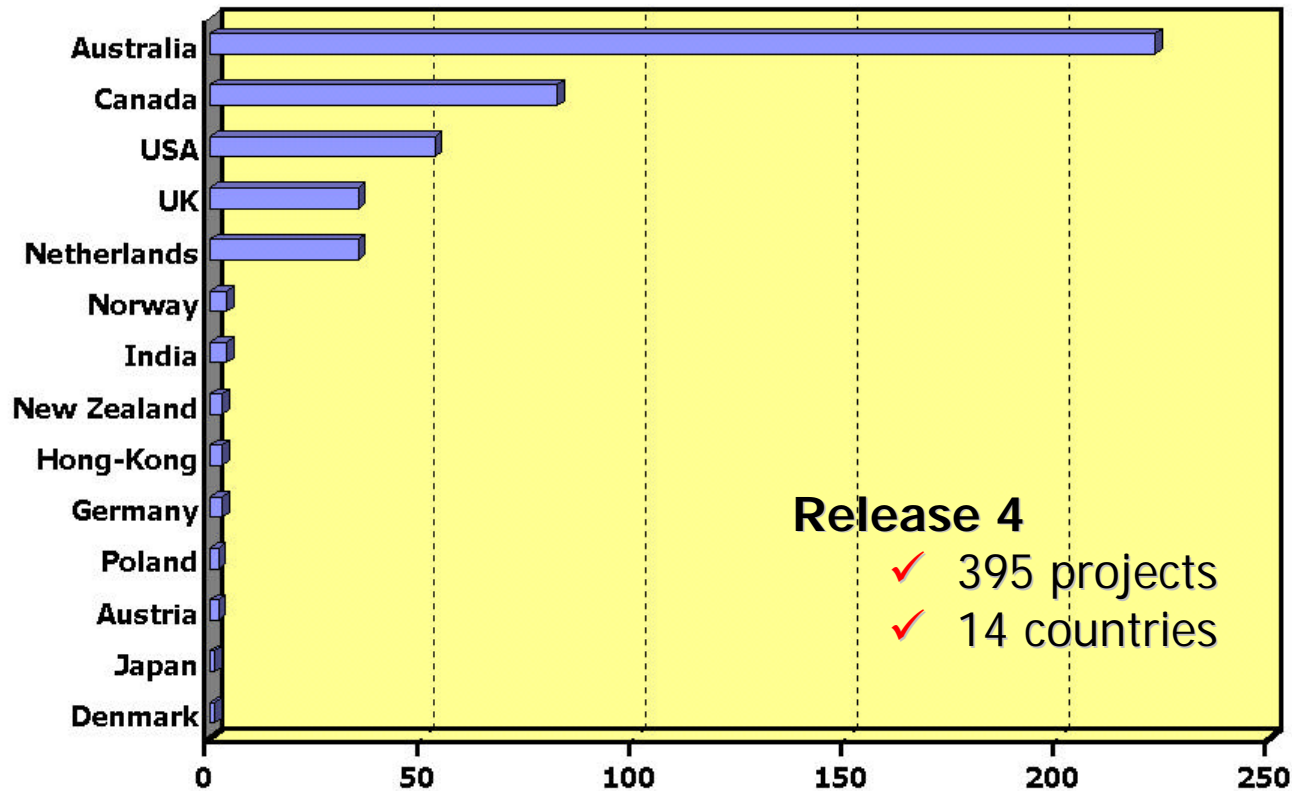


# ISBSG benchmark report



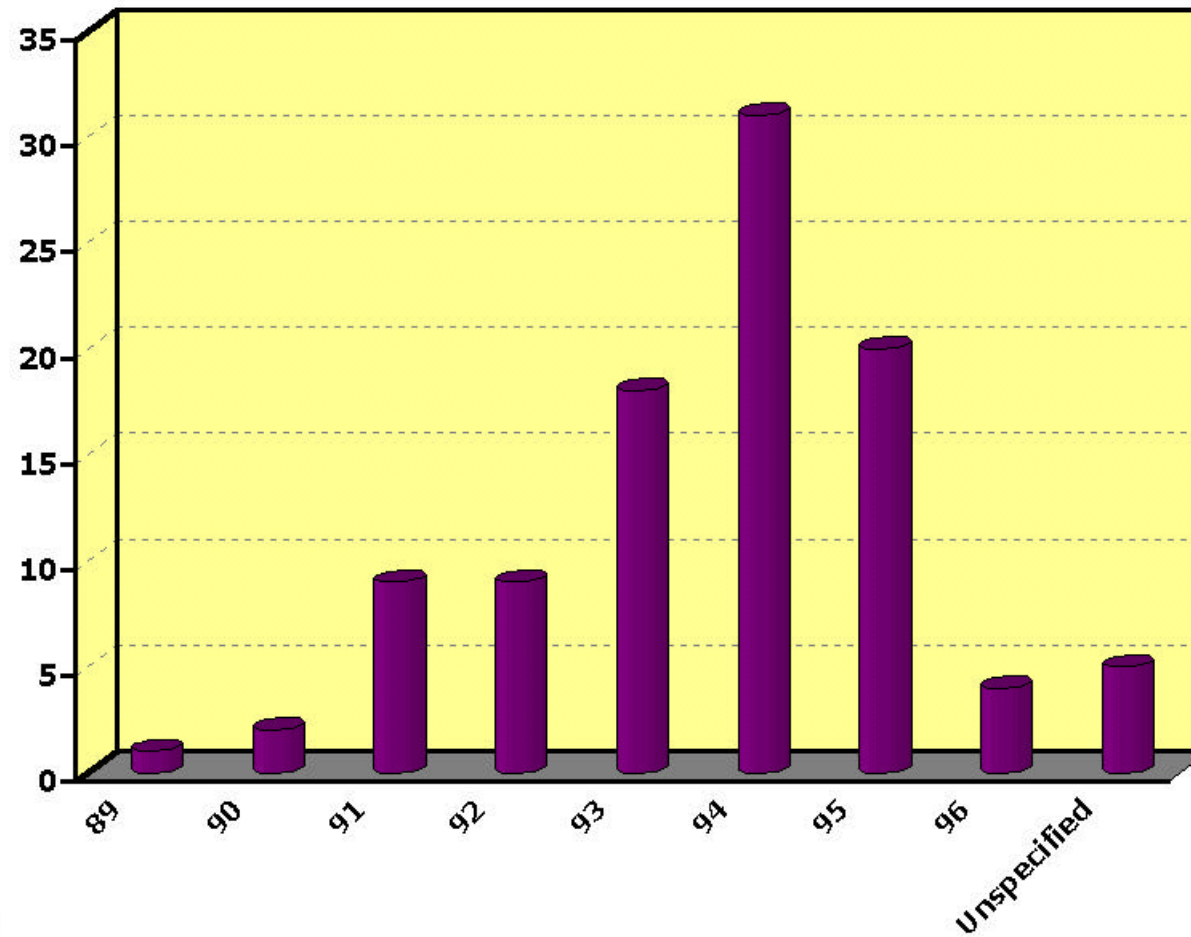
- OVERVIEWS
  - General managers
  - Practitioners
  - Researchers
- SUMMARY
- DEMOGRAPHIC
- PROJECT SIZE
- WORK EFFORT
- DEVELOPMENT PRODUCTIVITY
- DEFECTS
- DELIVERY RATES BY CATEGORIES
- SPECIAL ANALISYS
  - Comparing development platforms
  - Effect of maximum team size
- DESCRIPTIVE BENCHMARKING
- APPENDICES

# ISBSG benchmark report



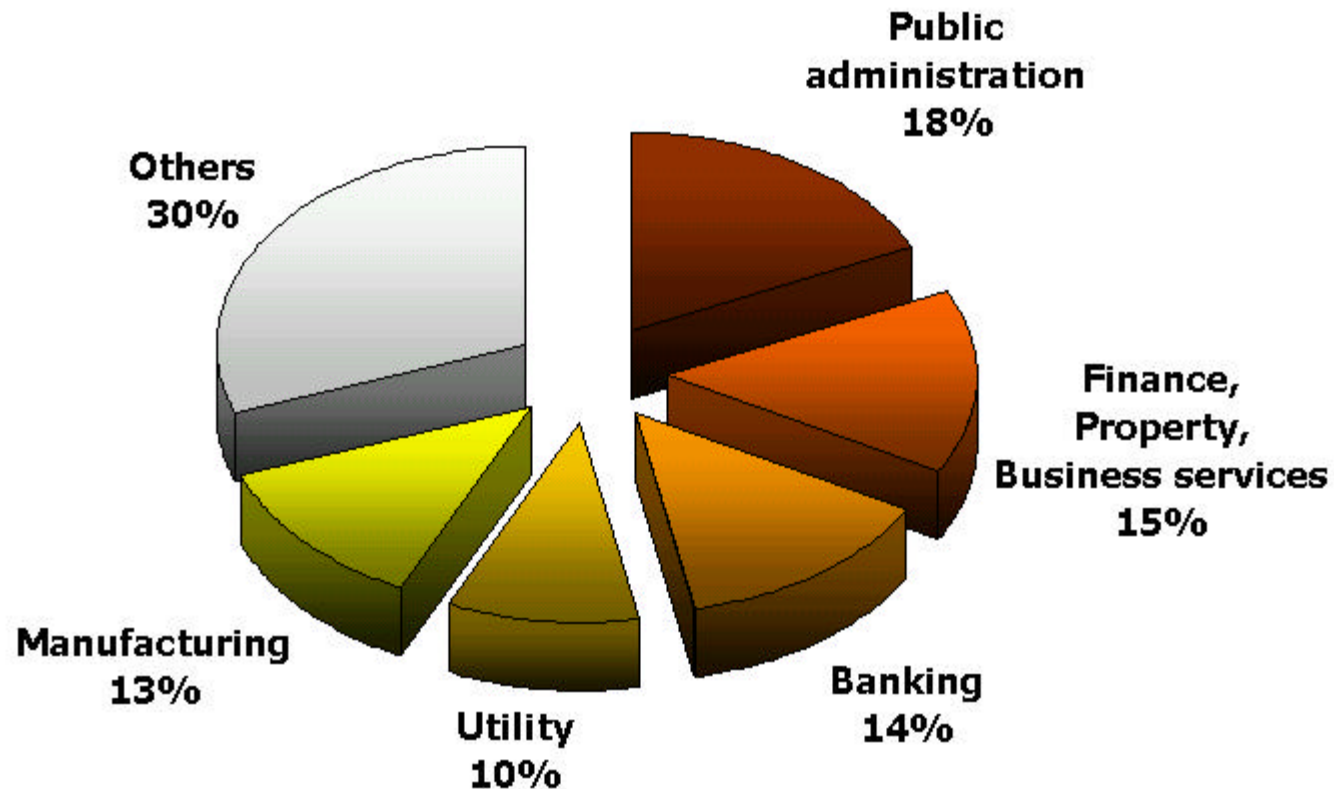
# ISBSG benchmark report

## Projects aging profile



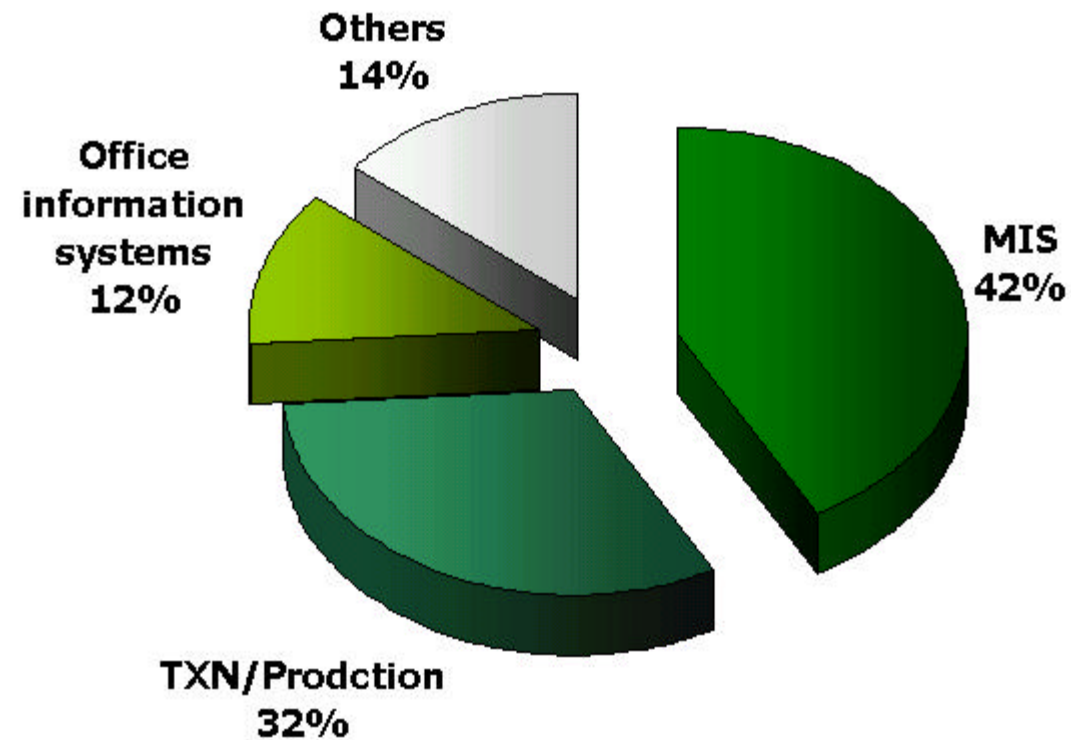
# ISBSG benchmark report

## Types of contributing organizations



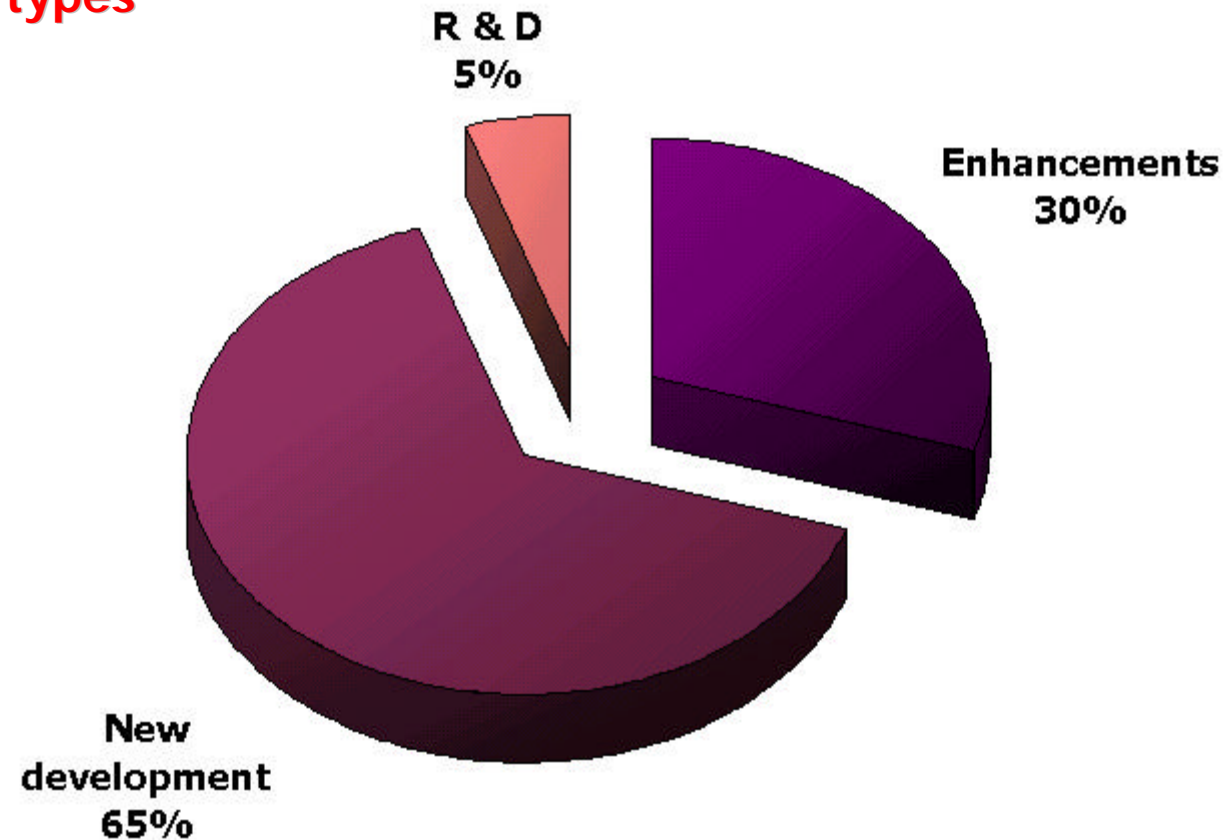
# ISBSG benchmark report

## Application types



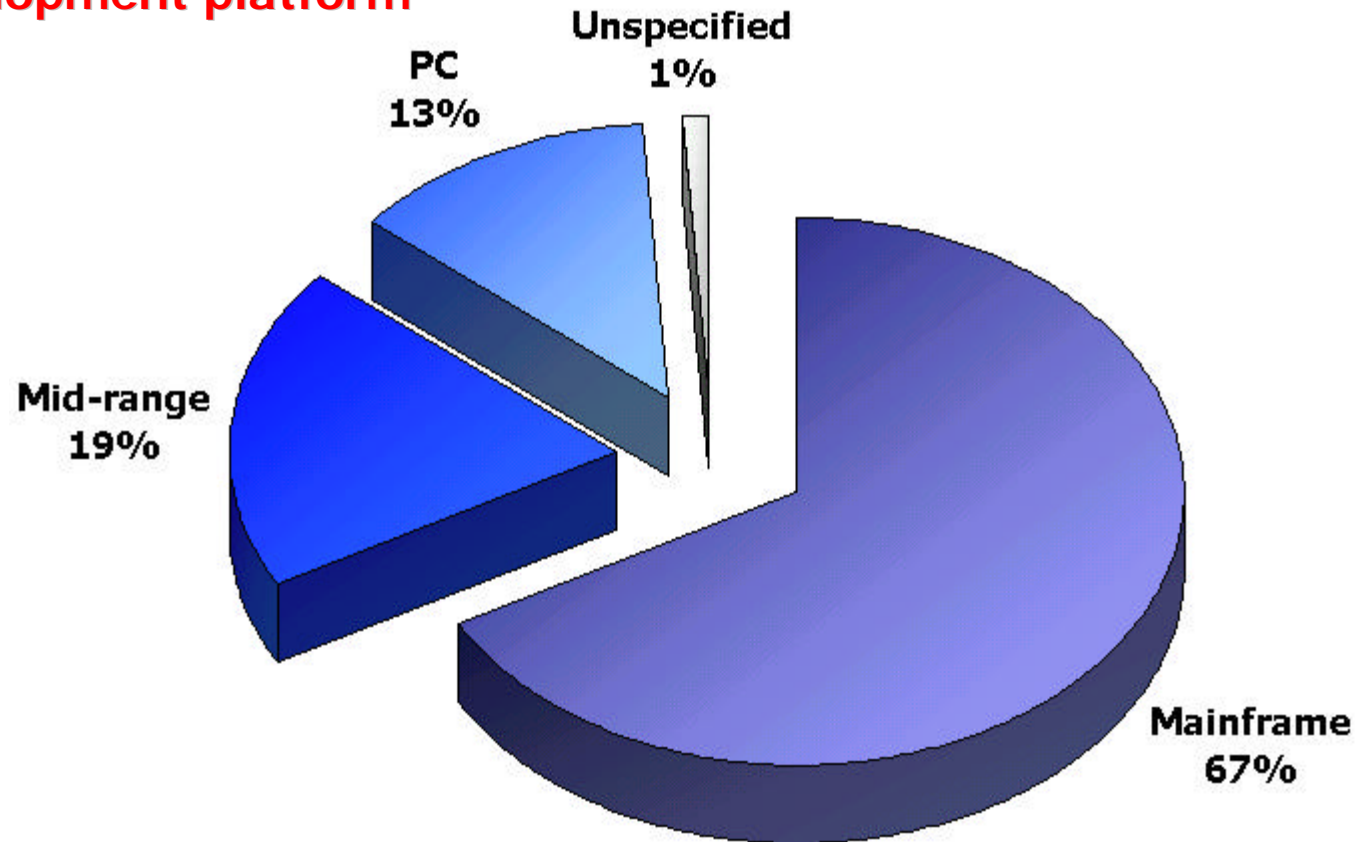
# ISBSG benchmark report

## Project types



# ISBSG benchmark report

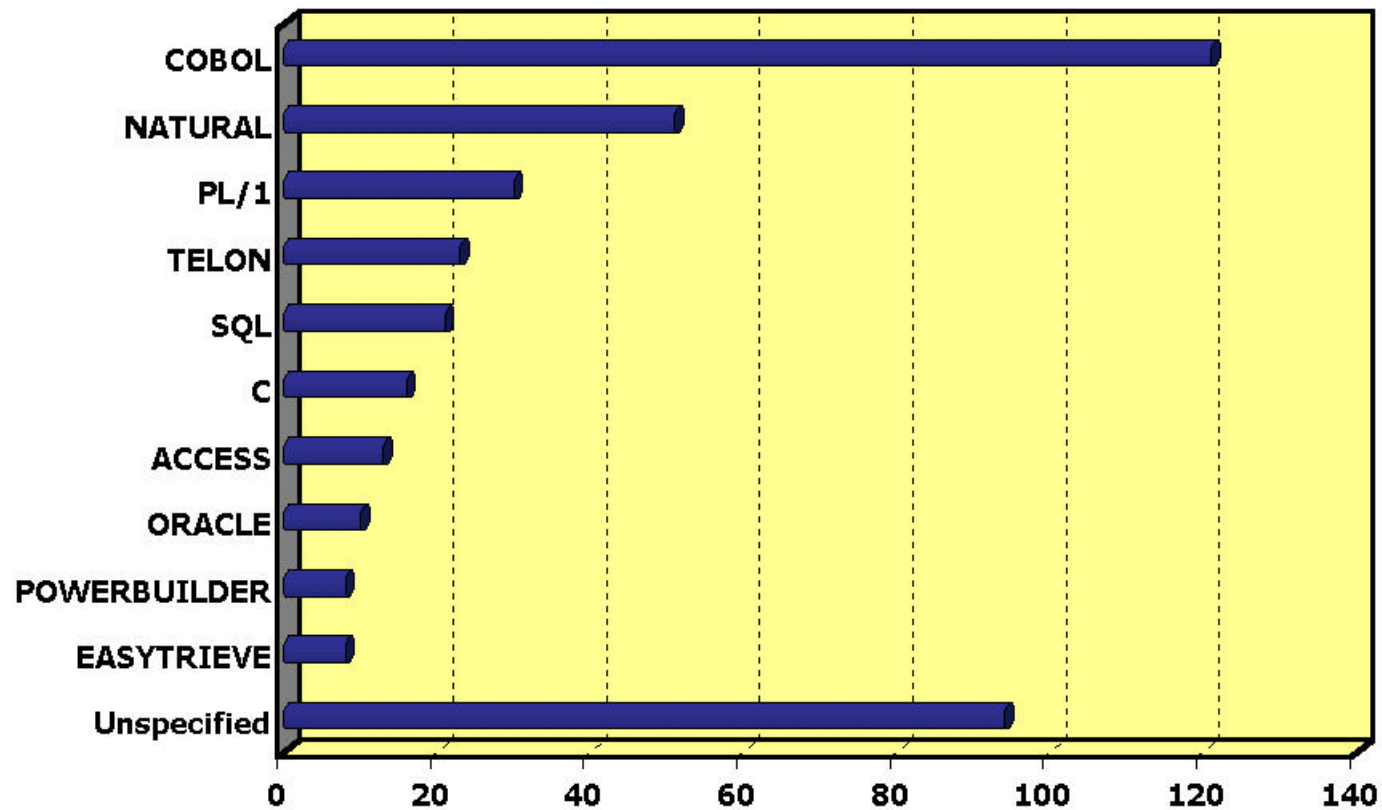
## Development platform





# ISBSG benchmark report

## Development languages

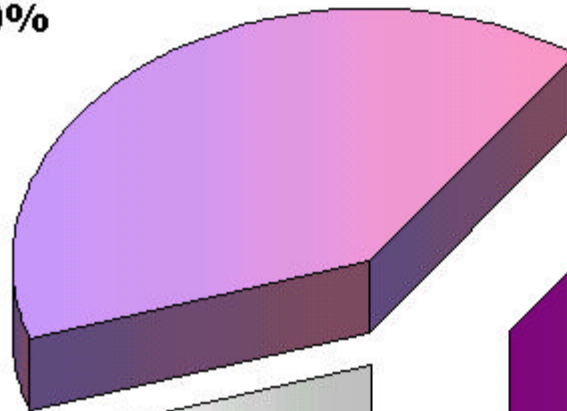




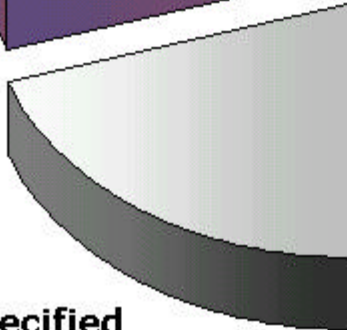
# ISBSG benchmark report

## CASE tools usage

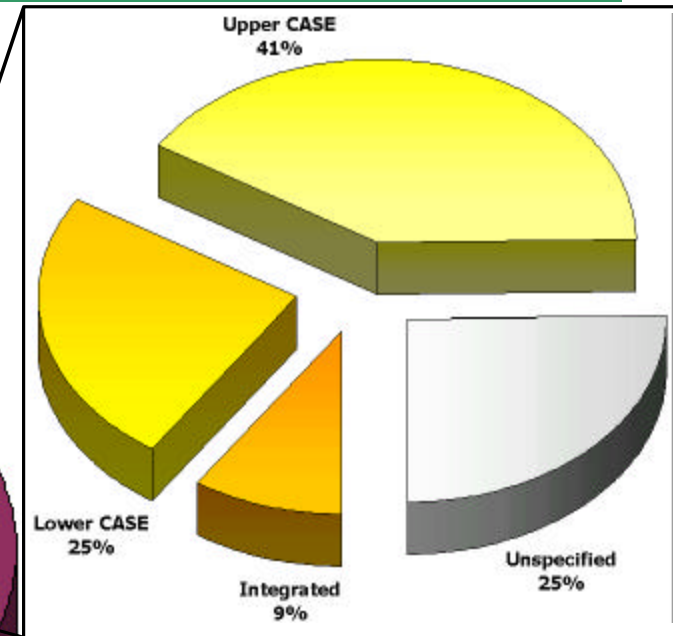
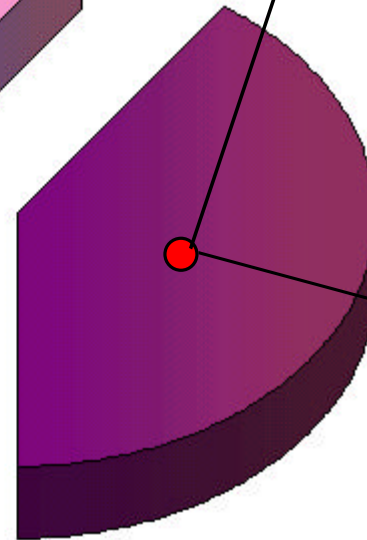
No CASE tools  
40%



Unspecified  
20%

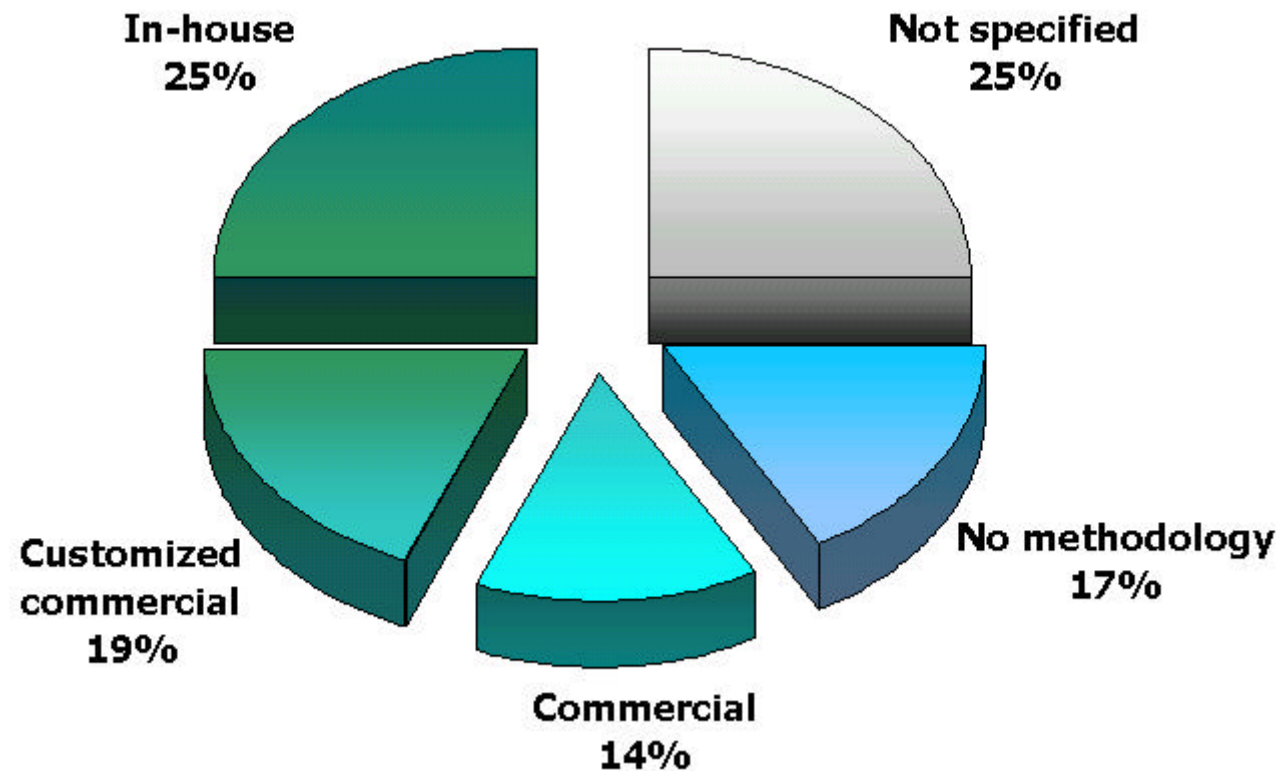


CASE tools used  
40%



# ISBSG benchmark report

## Methodologies usage





Break time!

# Cases study...

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- ① Context
- ① Schedule benchmarking
- ① Effort benchmarking
- ① Performance analysis

# Context...

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- ⊙ **Subset of 201 projects,**
- ⊙ **Subset of 12 variables,**
- ⊙ **All product size measured using IFPUG  
Function Points,**
- ⊙ **All project effort include direct S.E.  
labor only.**

# Context...

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## Description of variables

- ⊙ **PID**: project unique identifier,
- ⊙ **REG**: world region where product was developed (N-A, ASI, EUR),
- ⊙ **YEAR**: Last two digits of the year product has been put in production,
- ⊙ **LGEN**: Technological generation of programming language used (3GL, 4GL, ApG),
- ⊙ **MET**: Type of S.E. methodology used (No, Yes, Prch, Comb, Inhs),
- ⊙ **CASE**: Type of S.E. CASE tool used (No, Yes, Lowr, Uppr, Intg),

# Context...

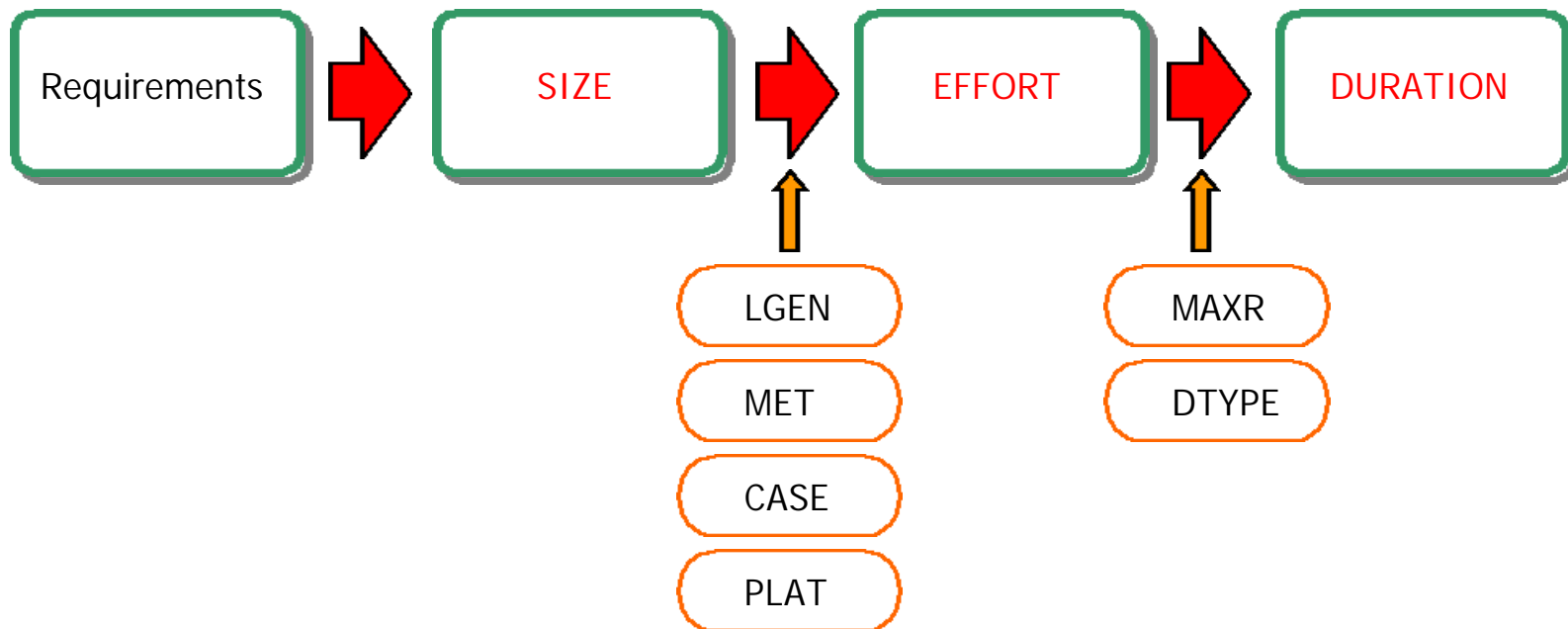
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## Description of variables

- ⊙ **DUR**: project duration (elapsed months),
- ⊙ **MAXR**: maximum number of individuals assigned to the project,
- ⊙ **EFF**: project effort (person-hours),
- ⊙ **SIZE**: resulting software product size (function points),
- ⊙ **DTYPE**: Type of project (ND, EN),
- ⊙ **PLAT**: Development platform used (MF, MR, PC).

# Context...

## A shared *a priori* process model





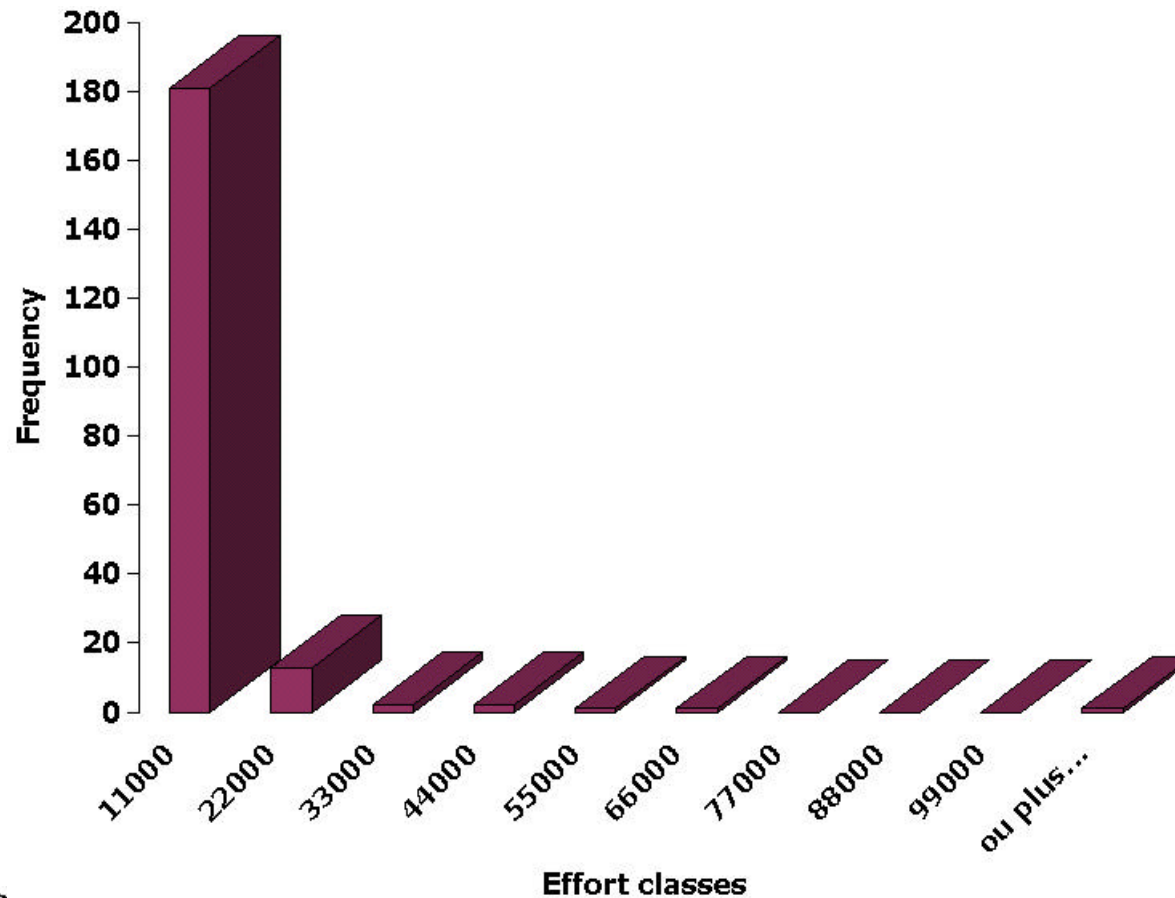
# Schedule benchmarking

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- ⊙ TASK: Establish a **general quantitative** relationship between direct S.E. **effort** and overall project **schedule**.
  
- ⊙ PROPOSED APPROACH
  - ✓ Study each variable separately,
  - ✓ Know the limitations of statistical tools,
  - ✓ Appreciate the hypothesized relationship,
  - ✓ Quantify the relationship,
  - ✓ Establish model limitations.

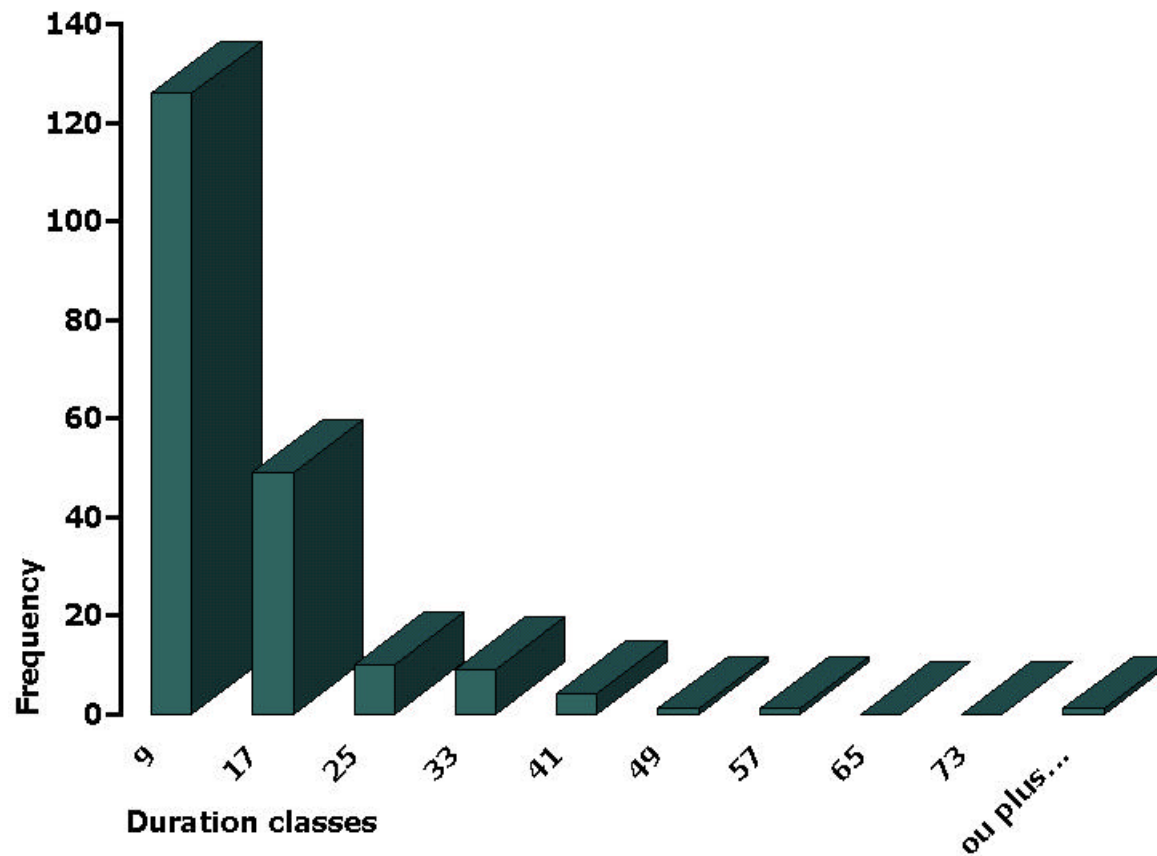
# Schedule benchmarking

## Effort sample behavior



# Schedule benchmarking

## Duration sample behavior



# Schedule benchmarking

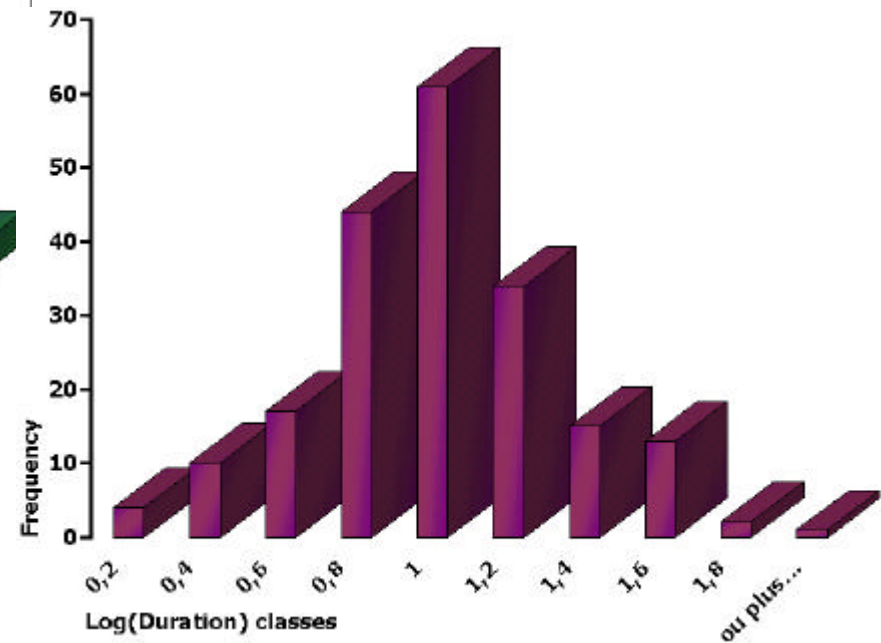
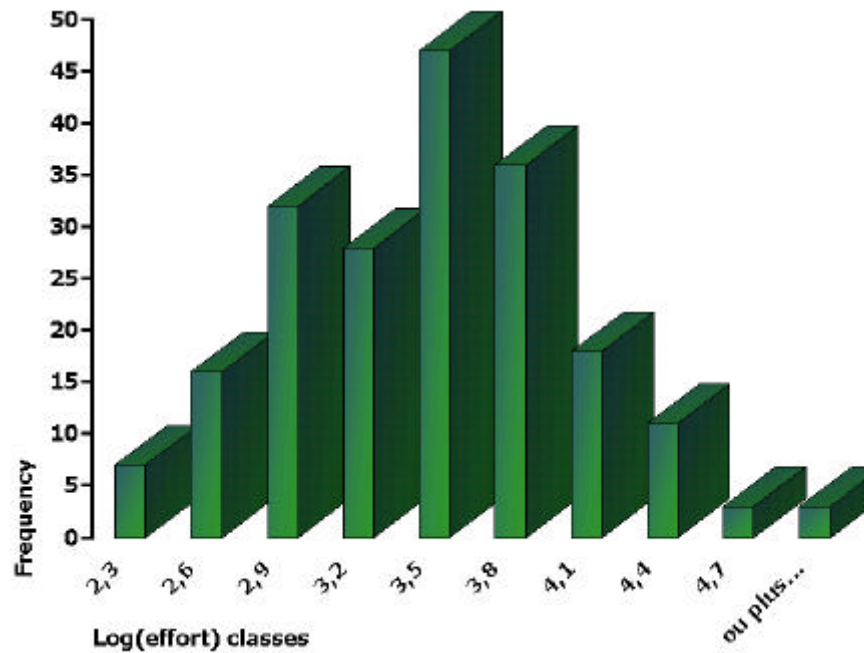
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**A Limitation of regression analysis:**

**Data follow a normal distribution (!)**

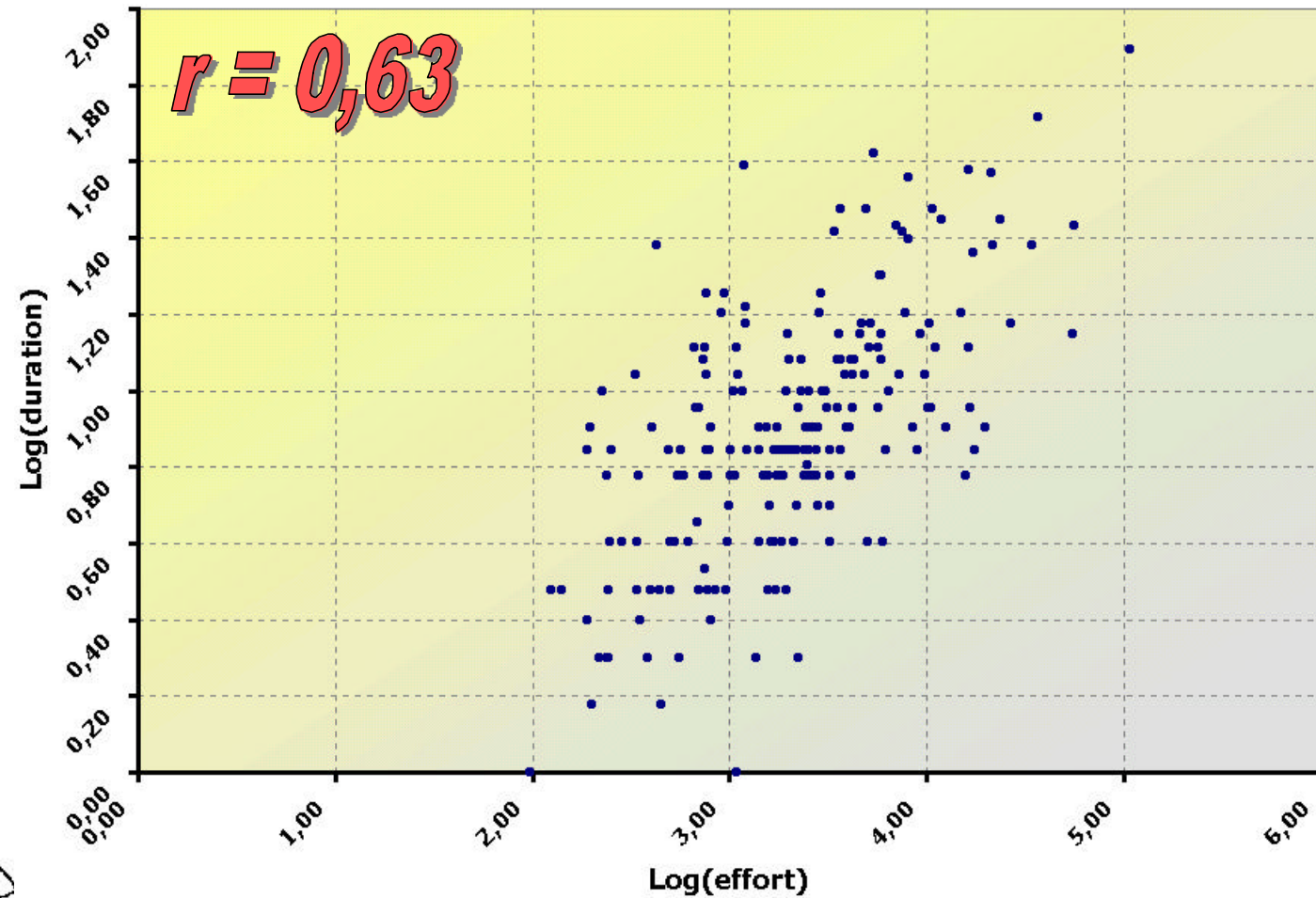
# Schedule benchmarking

Applying a Log transform to the variables:



# Schedule benchmarking

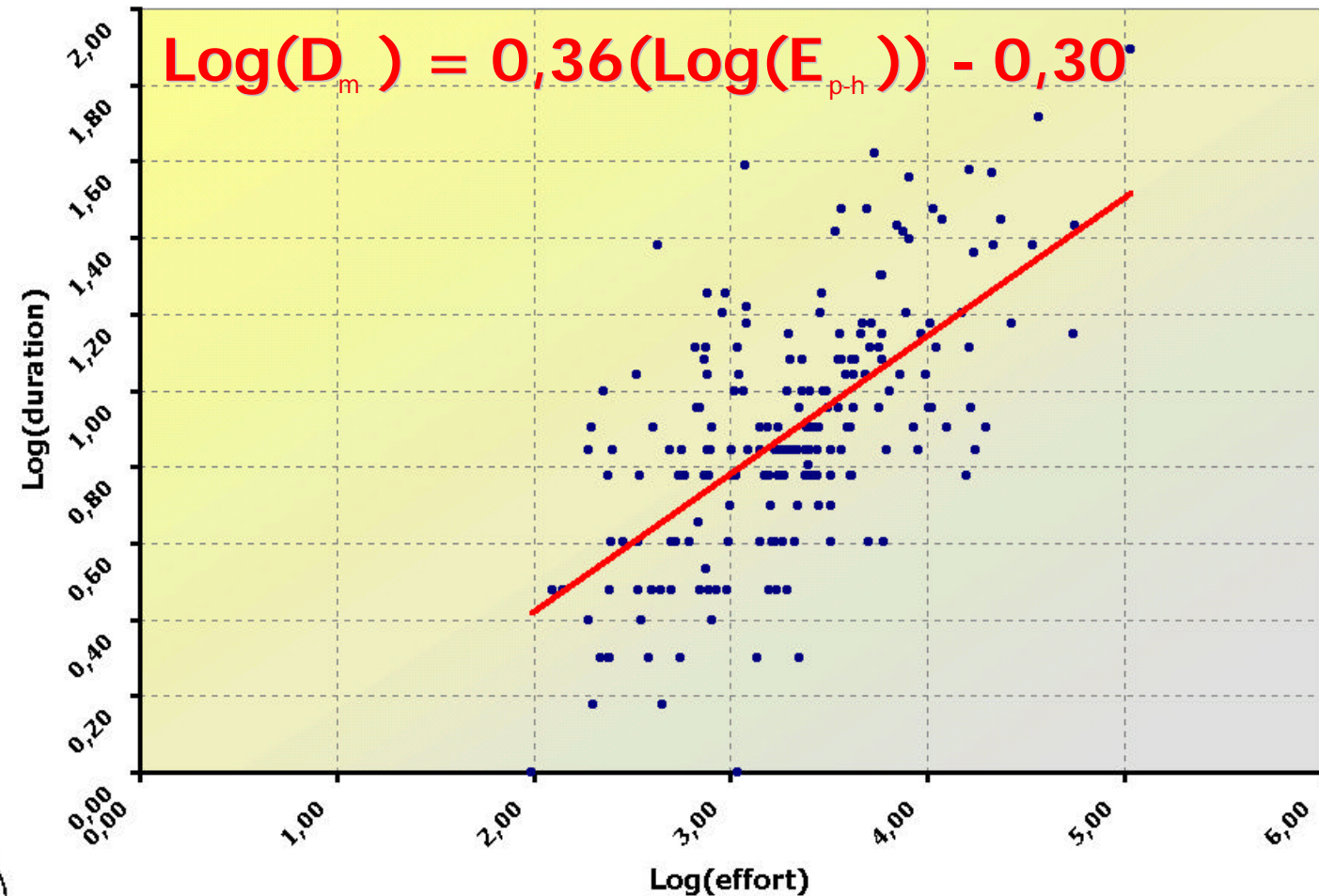
## Appreciation of the relationship





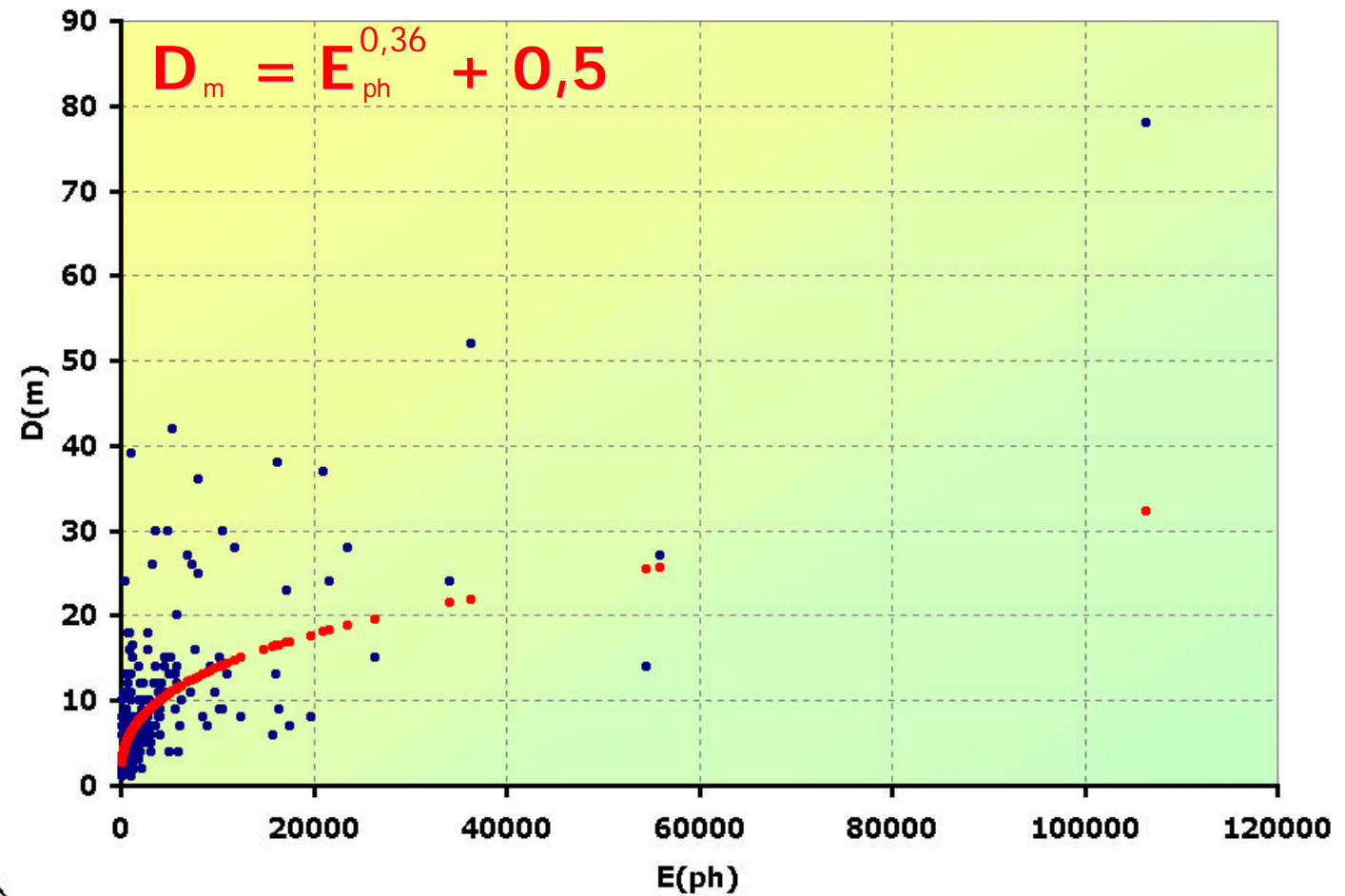
# Schedule benchmarking

## Quantifying the relationship



# Schedule benchmarking

## First cut





# Schedule benchmarking

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## Model limitations

- ⊙ Identify outliers
- ⊙ Verify regression hypotheses
- ⊙ Apply confidence intervals
- ⊙ Determine acceptable input range
- ⊙ Measure model performance

# Effort benchmarking

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## Exercise:

- ⊙ Produce two simple effort benchmarking models using
- ⊙ Software product size as the model input
- ⊙ First model: for product developed with 3GL
- ⊙ Second model: for product developed with 4GL
- ⊙ Compare the two models; do they differ significantly?

# Performance analysis

## How do we stand process wise ?

- Critical business elements:
  - ✓ cost (strive for the lowest),
  - ✓ duration (strive for the shortest),
  - ✓ quality (strive for the highest).
- We will use two of them
  - ✓ cost and duration
- Remove effect of currency
  - ✓ effort used as a “proxy” of cost

# Performance analysis

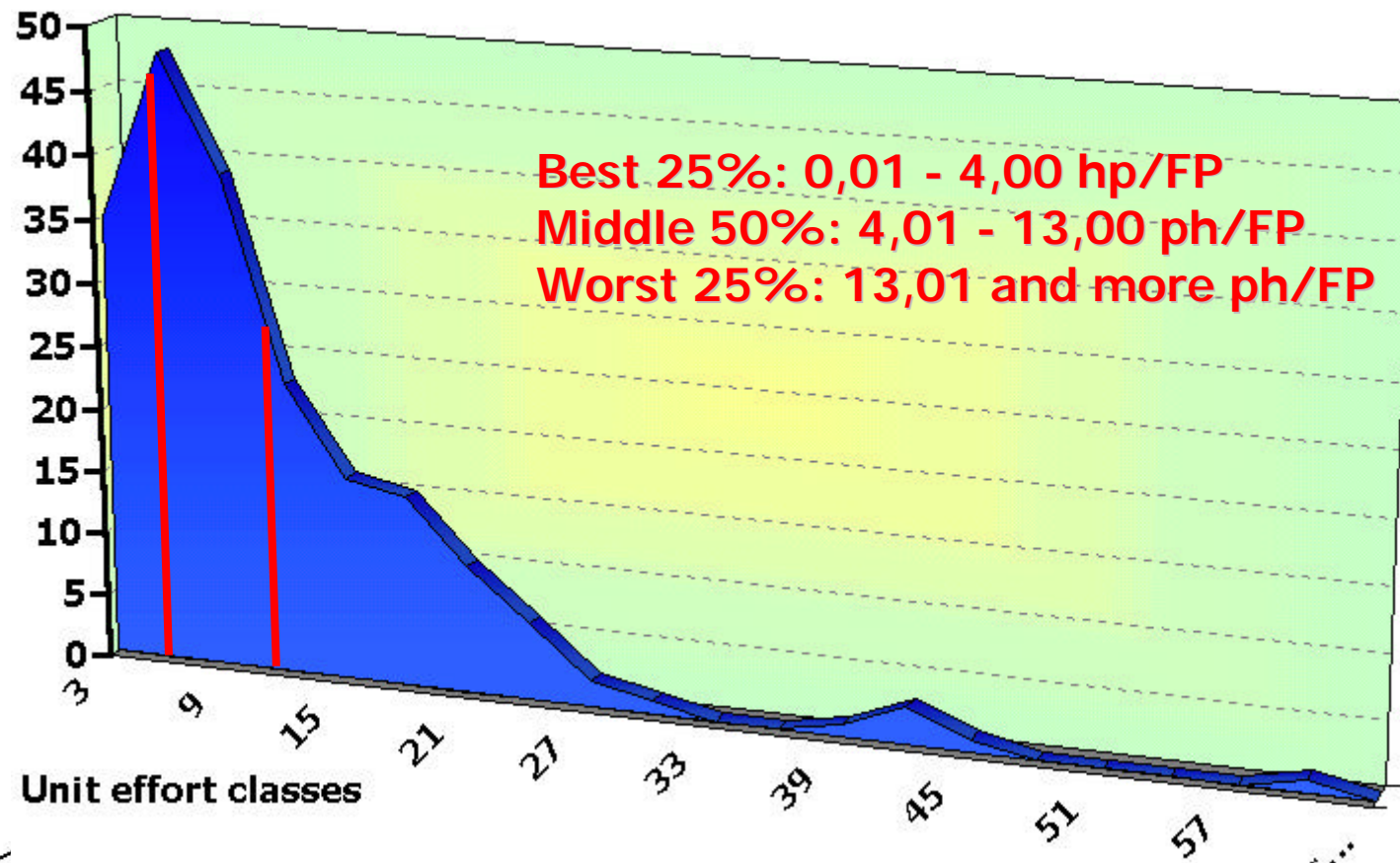
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How do we stand process wise ?

- ⊙ Remove effect of size
  - ✓ use unit effort (ph/FP)
  - ✓ use schedule delivery rate (FP/m)
- ⊙ Ranking:
  - ✓ worst 25%
  - ✓ middle 50%
  - ✓ best 25 %

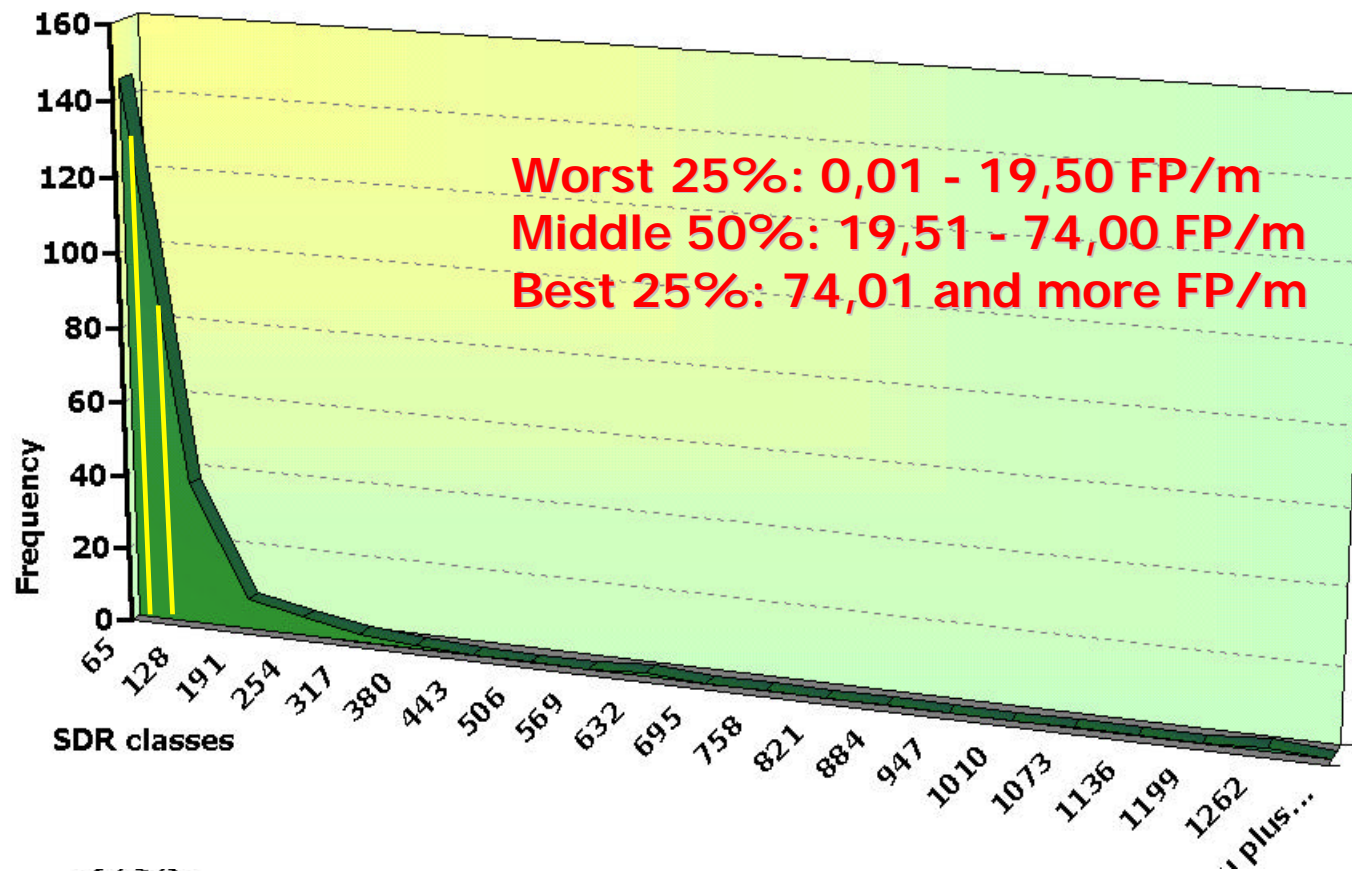
# Performance analysis

## Ranking projects unit effort



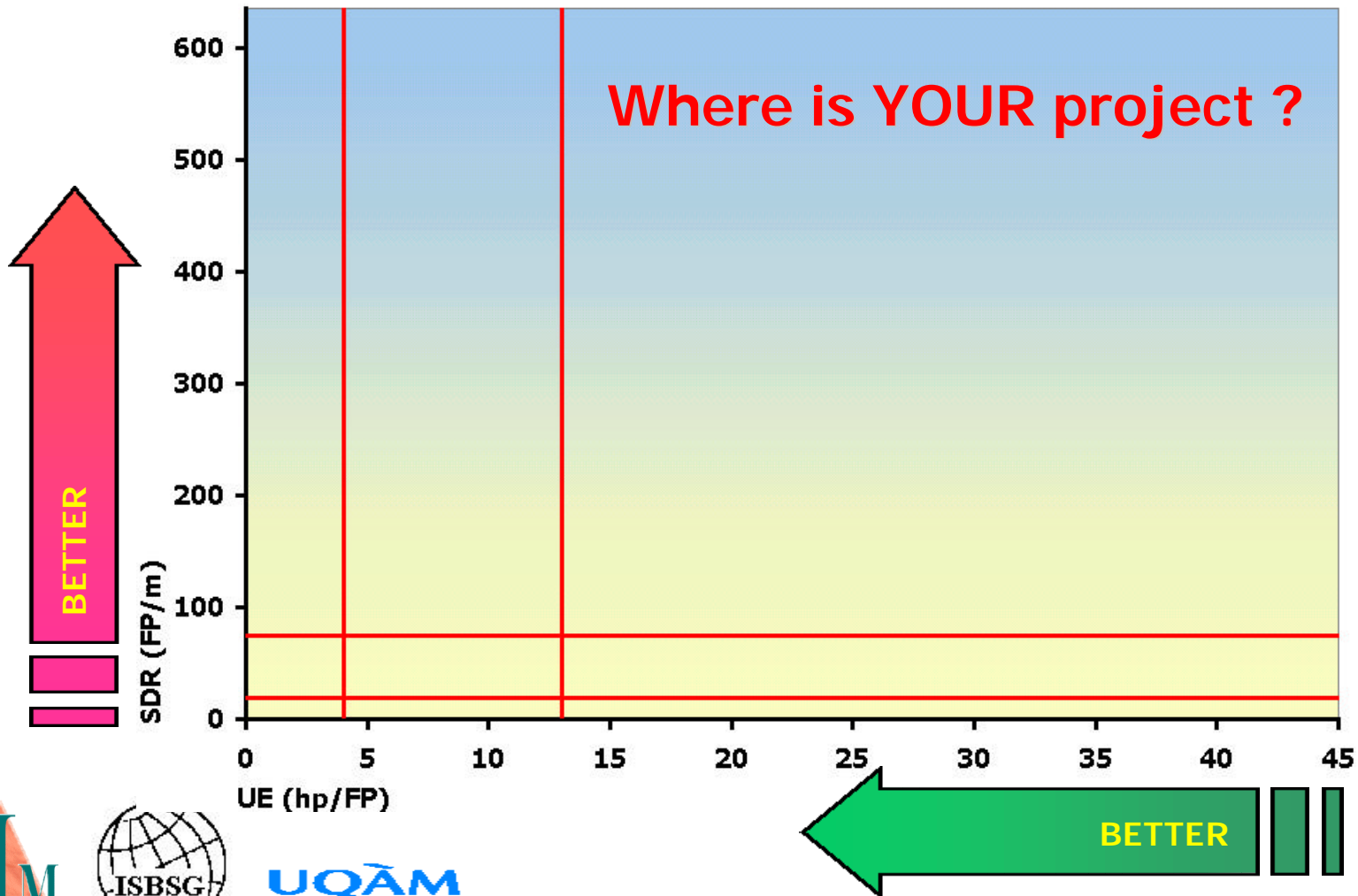
# Performance analysis

## Ranking projects schedule delivery rate



# Performance analysis

## Combining both



# Wrap-up...

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