Function Points?

David Longstreet
www.SoftwareMetrics.Com

Some of My Metrics

- Over 2 million frequent flyer miles
- Consulted on every continent except Antarctica
- Presented papers at conferences in USA, Europe, Middle East, Asia, and Australia
- Written and published articles in American Programmer, Software Development Magazine and Journal of Information Systems Management

Clients

- Clients include Banking & Finance, Aerospace, Retailers, Animal Food, Telephony, Consulting Companies, Medical Research, Defense Contractors, Automotive, Universities, Government Agencies and others

- Some clients: Amadeus, MasterCard, Saudi American Bank, Ralston Purina, Sprint, Lockheed, The GAP, Nissan, Biologic, Ministry of Finance of Italy, IRS, ISSC Singapore, and several others.

Why Measure?

- The primary purpose of a measurement program should be to helping project managers make project decisions.

- You can't manage what you can't measure!

- If you are not measuring, then how are you managing?

Benefits of Function Point Analysis

- Improves requirements documentation

- Improves the estimating process

- Improves the communication of workload

- Improves the understanding of business functions

- Improves traceability of requirements through implementation

- Improves the allocation of resources

Recommend Questions?

- When you provide an estimate expect the question - How did you come up with that number?
- What percent of your time do you expect to spend in design, requirements, testing, coding?
  - How does this compare to past projects?
- What variables between like projects cause variations between projects?
- What have you done to improve productivity? Or reduce costs?
- What attributes of a project are inherent – nothing you can do about it.

Worst Practices

- No historical data

- Failure to monitor and report status

- Creating requirement and analysis documentation after project is completed.

- Excessive and irrational schedule pressures

- Failure to establish clear acceptance criteria

- Reduce testing time to make schedule

What is a Function Point?

- Function Points are a unit of measure
  - Like a hour is to measuring time
  - Or a inch is to measuring distance

- A unit is important to understanding and communicating such metrics as *Average Cost*.

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Function Point

- A software application is in essence a defined set of elementary business processes.

- A function point is not a screen, a report, an online, but instead an elementary business process. We often count screens, reports, and online's so on and so forth, but these are not function points.

The point of FPA

- All other industries are managed by unit cost except the software industry.

- FPA when combined with hours or $ is nothing more than the unit cost of software development or $/FP.

Function Points Analysis

- Is a structured technique of classifying components of a system.

- Is a method to break systems into smaller components, so they can be better understood and analyzed.

- Measures software by quantifying its functionality provided to the user based primarily on the logical design.

- Logical functionality from a sophisticated user view rather than a physical view.

- A standard method for measuring software development from the customers point of view

Estimate the Surface Area of a
A can of diet coke

World Class Organizations

- Little concern being the best maintenance organization
  - Concerned with delivering new and improved products.
- Focused on doing a few things very well

World Class IT Organizations Commonalities

- Consistent Documentation
  - Requirements
  - Analysis
  - Adopted Use Case (or similar) Methodology
- Consistent Processes
  - Staff creates software in the same manner
- Technical staff very focused on the business not on IT
  - Difficult to see the barrier between IT and Business

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World Class IT Organizations

- It is impossible to separate world-class organizations from world-class metrics organizations.

Measurement/Goals

- Measurements need to support the goals of the organization

- Measurement should not drive goals

- Management should drive goals

Current Metrics Process

- Focused on Senior Managers
- Limited usage by application managers
- Seen as overhead by staff
  - Seen as adding no value
- Focused on Application FP Counts
- Too much time spent on creating graphs instead of analysis of data

Current Metrics Process Continued

- Application managers have no idea of unit costs
  - By application, By business function, By type (online, reports, files, so on and so forth)
- Application managers do not analyze past project plans
- Estimating is not done consistently throughout the organization
- Application managers are not tracking productivity of their applications
- Data tells me the development process is inconsistent
- Design is done before requirements

Characteristics of Effective Measurement Programs

- Aligned with business objectives
- Integrated with continuous process
- Tied to decision making at lowest level possible
- Balanced metrics at all levels
- Focused on measuring processes
- Viewed as mission critical

Who is faster?

Hours Per Function Point

	World Class	Best In Class	Average
Hrs/ FP	19	25	35

But it depends!

Worst Practices Metrics Programs

- Making a metrics group responsible for the data

- Centralized function point counting

- Data created from inconsistent requirements and analysis documentation

- Completing FP Counts without a clear purpose

- Metrics are seen as separate process and/or overhead
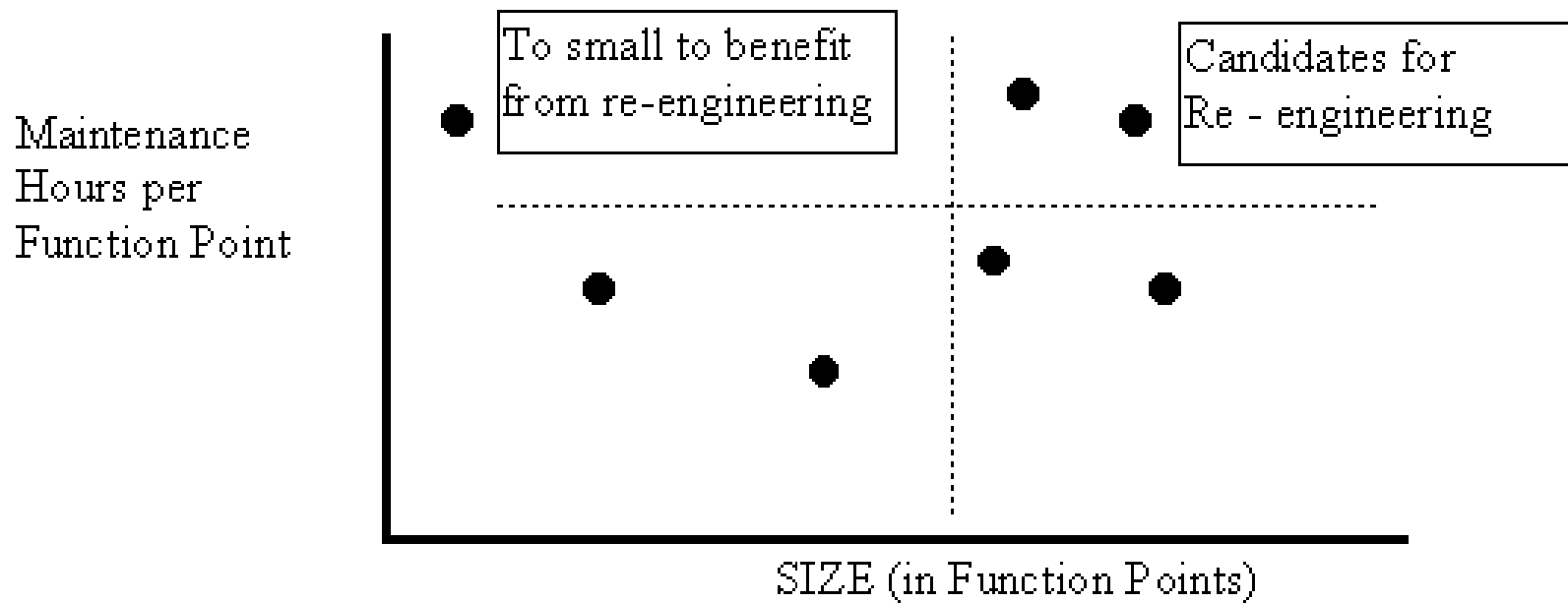
Best Practices Metrics Programs

- Making application teams responsible for the data

- Decentralized function point counting

- Data created from consistent documentation

- Organize FP Counts to be aligned with the business functional decompositions.

- Metrics seen as added value and **used by** application managers.

- Metrics team assist and advise application managers on the how to.

Recommendation

- Use the data that has been collected to date
- Create historical baselines
  - Examine several past projects and determine historical hours per function point ratio
    - Application by Application
      - May have multiple ratios for an individual application
        - By business functions
        - By online, reports, interfaces, so on and so forth
    - What is causing variances

What to Re-engineer?

Maintenance
Hours per
Function Point

To small to benefit
from re-engineering

Candidates for
Re - engineering

SIZE (in Function Points)

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What is causing variations

- Age of application
- Language or is it mixed (several languages)
- Size of project
- Size of project relative to size of application
- Methodology Used
- Blend of project (online's, interfaces, batch)
- Number of applications involved in project
- Rationality of Schedule
- Tenure of staff

Random Productivity Rates?
What is your trend?

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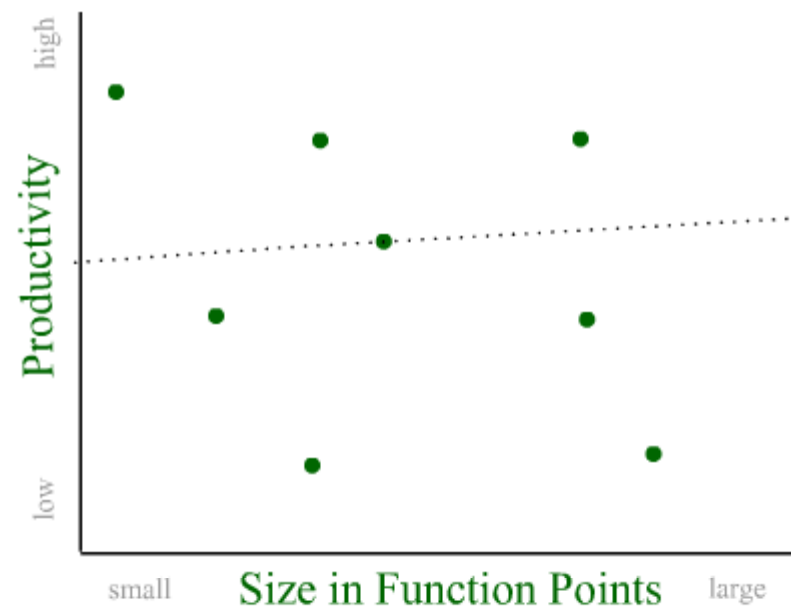
Recommendation

- Create just in time function point training
- Training needs to be application specific
- Training needs to be short, concise and too the point
- OJT Function Point training if possible
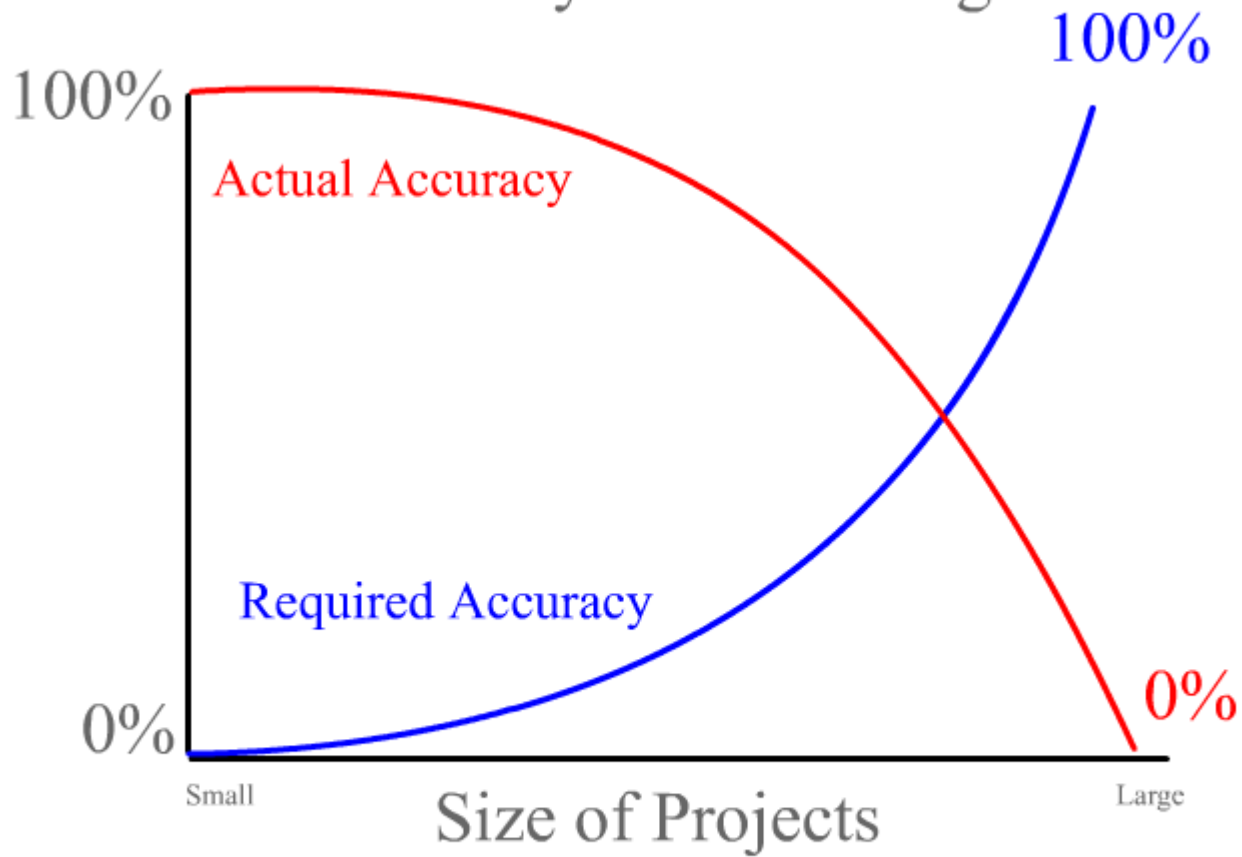- Clear up any outstanding FP Counting Issues

Recommendation

- Create internal function point counting guidelines
  - Developed from application specific training

- Develop Standardized estimating process
  - Estimating is important so resources can be allocated in the most efficient manner possible.
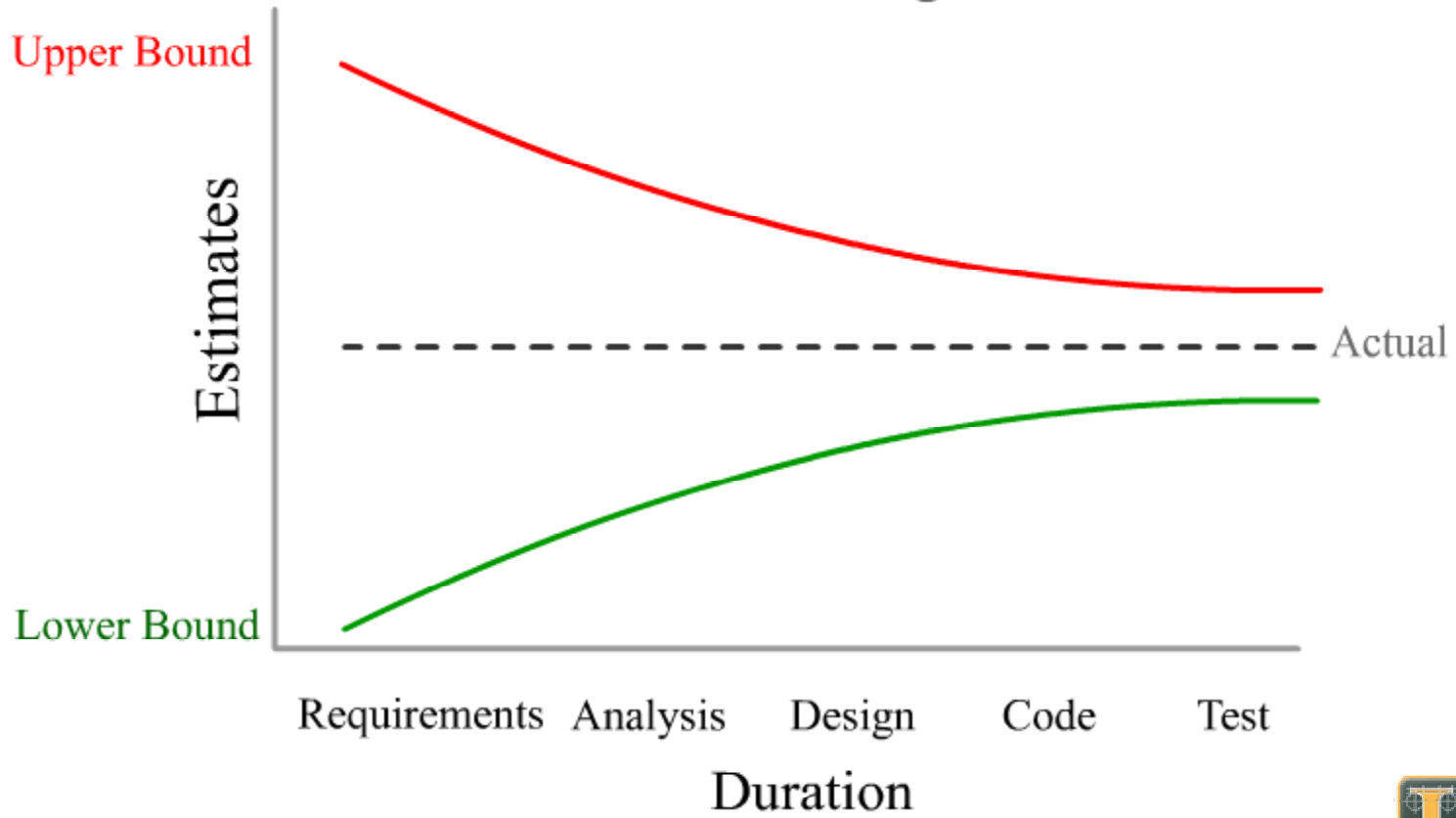
Accuracy of Estimating

Actual Accuracy

Required Accuracy

100%

0%

100%

0%

Small   Size of Projects   Large

Not Difficult   Difficulty of Estimating   Very Difficult

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Estimating

Upper Bound

Actual

Lower Bound

Estimates

Requirements Analysis Design Code Test

Duration

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Level 5 - Optimized

Measure, analyze, and improve

Level 4 - Managed

Introduce Quality Control

Level 3 - Defined

Formalize Procedures

Level 2 - Repeatable

Identify roles and responsibilities

Level 1 - Initial

Increasing Stability
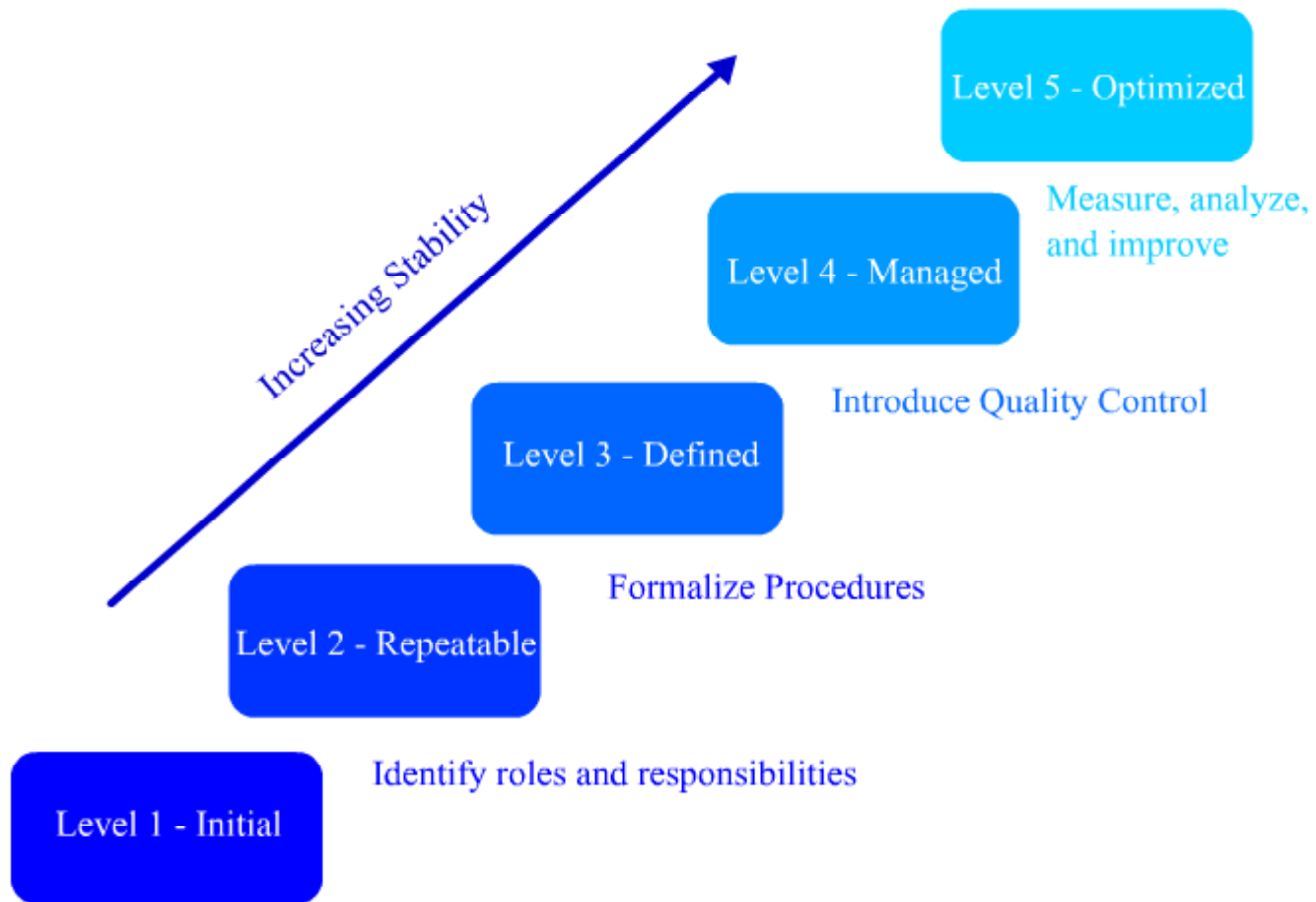
Characteristics of a good estimate

- Explainable
  - What method was used to derive the estimate?
  - Can changes in project effort be communicated in a concise manner?

- Revisable
  - As the project progresses will the estimate be revised using the initial process.
  - Is the estimating process continuous and repeatable?

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Growth of Projects

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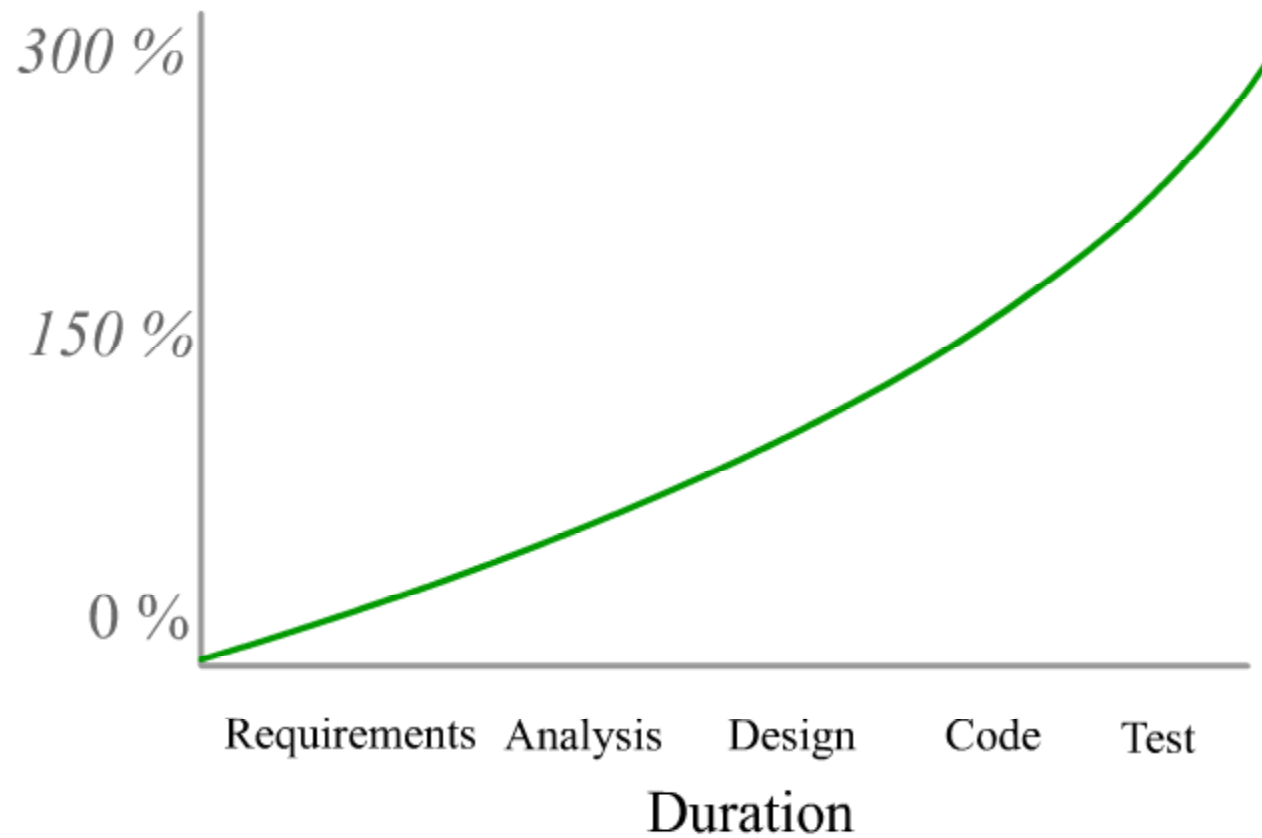
Recommendations

- Track project growth from requirements to implementation.

- Charge a different cost per function point for changes made during requirements, design, analysis, coding, testing and implementation.

Recommendations

- Force the use of historical data for estimating purposes

    – It will improve the quality of future data

- Create a consistent estimating process using function points (historical hours per function point)

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Recommendation

- Decentralize the function point and metrics mechanics

- Force project teams to take the initiative to develop their own dashboards.

Recommendation

- Continue to benchmark, but benchmark activities not just data!
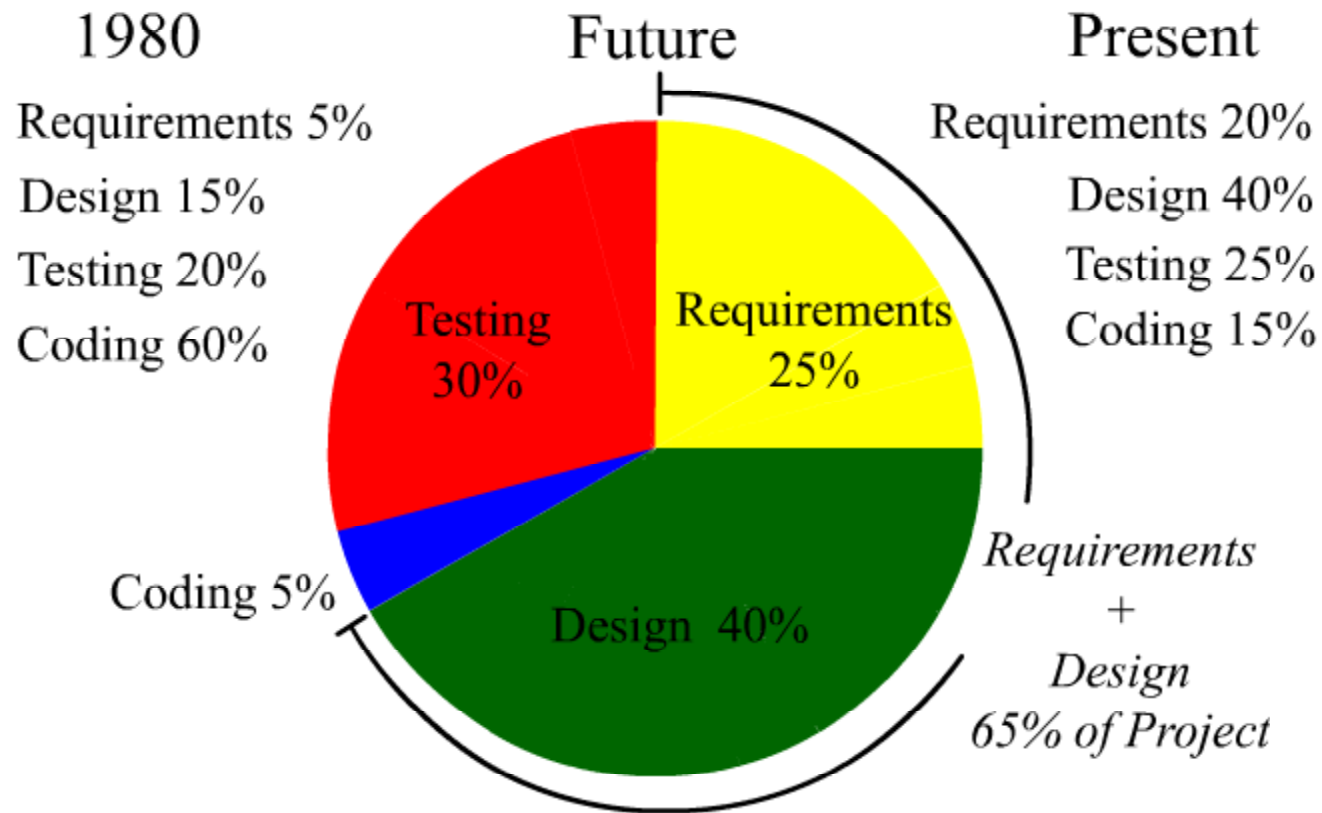- Visit best in class companies

Recommendation

- Comparing % of time spent in testing, design (or any phase) across projects
- Examine hours/fp ratios within the application
- Create control charts with upper and lower bounds (based upon past performance).
- Develop standardized terminology
- Use metrics to identify problem areas

Software Past, Present, Future

1980
Requirements 5%
Design 15%
Testing 20%
Coding 60%

Future

Present
Requirements 20%
Design 40%
Testing 25%
Coding 15%

Testing 30%

Requirements 25%

Coding 5%

Design 40%

Requirements
+
Design
65% of Project

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Recommendation

- Create appropriate cost categories.
  - Maintenance
    - Corrective
    - Adaptive
    - Perfective
  - Enhancement
  - Development

Recommendation

- Create appropriate hours per function point categories (basis for budgeting).
  - Maintenance Hours Per Baseline Function Point
    - Corrective Hours Per Baseline Function Point
    - Adaptive Hours Per Baseline Function Point
    - Perfective Hours Per Baseline Function Point
  - Enhancement Hours Per Project Function Point
  - Development Hours Per Project Function Point

Create Standard Glossary

- When querying (no calculations) data use the following verbs.
  - **Get**: a search of a single data base where the data base resides entirely within the application boundary.
  - **Find**: a search of multiple databases where the data bases resides entirely within the application boundary.
  - **Retrieve**: a search where the information resides entirely outside the application boundary.

Recommendation

- Organize applications so they match the business functional decomposition.

  - Function Point Counts need to be organized in such a manner.

- Explore training and having business partners participate in function point counting.

Recommendation

- Go to the requirements table with the right questions and be able to offer business alternatives.
  - Same business functionality implemented in the shortest time frame and shortest duration
- Offer innovative solutions to business problems.
  - Same business functionality, but in a different application

Static HTML Pages?

- How does this differ from user documentation?
- Who should be updating these pages?
- How much additional time does this take?

Re-Use

- Inter – application
  - Reusing business functionality between applications.

- Intra – application
  - Reusing business functionality within a single application.

What's Next

- Execute the recommendations
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Questions and Answers

- Do we really need to improve?
    - If you are pretty confident that your competition(other insurance carriers) is not trying to improve the answer would be no. But I am pretty sure your competition is trying to improve.

- How often should a baseline be revised or re-counted?
    - If you do a function point count for your projects, then you should know what is new functionality. This functionality should be added to your baseline FP counts.

Q&A Continued

- How often should I revise my function point count for a project?
    - Whenever there are enough changes to cause your estimate to increase. If your project increases by 20 percent during design, should you wait until design is done to raise a flag and communicate this to your management? No. As your project grows you should communicate the impact to your management.

- What you are really suggesting is behavioral changes, right?
    - Yes, but keep in mind what gets rewarded gets done. The behavior that gets rewarded gets done. The behavior that gets punished stops – or it should stop.

Q&A Continued

- Is there a cost to achieve higher levels of CMM or higher levels of productivity?
  - Of course, but there will be a payback also. There is a cost and benefit. It is much easier to move from CMM 1 to 2 than it is from 2 to 3. Organizational improvement becomes more difficult as it progresses. This is true for dieting also. As we lose weight it becomes progressively more difficult to lose more weight.

- Is there any plan to communicate this to our business partners?
  - That is a good suggestion and I would recommend that, but I am not sure if there is any plan to do this or not.

Q&A Continued

- How do we educate our customer?
  - Most people react well to facts and figures. I saw a video of your CEO and it is clear that the culture is to manage by the numbers and to be fact based. I do not imagine metrics and function points is going to be a hard sell to your customers.
  - **Keep in mind that IT needs to adapt to the business not the other way around!**

- Are we going to be asked to answer questions for which we have no data?
  - Ha, that is a great question. I would recommend that you find the answer if you do not know. I don't know, but I will find out is a suitable answer.

Q&A Continued

- What are reasonable expectations to achieve 19 hours per function point, when, how long, cost?
  - Your management has given you a target (a pretty clear target). They are not telling you how to get there, I expect they will look to you to define how, when, cost.
- What other metrics (besides function points) do I need to gather and use for my dash board?
  - At a minimum you should know the percent of time you spend by phase (and by task) and how this relates to past and current projects.

Q&A Continued

- You said that World Class companies do not work over time, are you communicating this to our management?
  - OK…I am not suggesting that if you do not work overtime you will become world class. What I am
- How distributed do I need to have my function point counts?
  - It really depends on your application. Some applications unit cost (hours/fp) will not be as varied as other applications. The correct answer is you want to have your unit costs defined at enough granularity to help you understand variations.