

The Strengths and Weaknesses of FSM's as negotiation Tools for New Developments

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Background

- **To improve User Developer Negotiations**
- **Government of Canada**
 - **Suggested Function Points**
 - **For new developments**
 - **In 1998**

Purpose of Project

- **Measure two different project Products**
 - **From the Preliminary Requirements**
 - **From the Suppliers Specification**
 - **When the Projects were complete**
 - **NB the second product is due Fall 2001**

Criteria for Success

- To be Useful a size measure must be
 - Able to be estimated at an early stage
 - Sufficiently accurate at the early estimate
 - Cheap to apply

Initial Measurement

- **From the Preliminary Requirements**
 - Information at a high level
 - Drawn up from the user view
 - E.g., “The solution must provide the facilities to be able to control the functions that any user can access”
 - Stated with no reference to implementation
 - This is in the Spirit and the letter of FP
- **Requires experienced counter**
- **Also assistance of ‘client’ to interpret requirements**

Result of Initial Estimate

- An estimate of Project Product
- Based on a hypothesis about users real needs at the end of the project
- In order to arrive at the estimate
 - Counter was assisted by the ‘Client’
 - NB ‘Client’ is a government manager who has a good understanding of the user requirements

Second Measurements

- From Contractors Functional Specifications
- Architecture well described
- Complete Entity Relationship Model
- Descriptions of Different Functions based on requirements
 - Includes description of data manipulation, within different processes (read, write, entry and exit).

Result Of

- More Precise Estimate of the Size
- Architects and Analysts View of requirements
- Counter has same understanding of requirements as contractor
- Requirements were important reference as they were the basis of contractual agreement

Final Measurement

- Measure Software as Delivered
- System Deliverables
 - On time?
 - In Budget?
 - Satisfactory Quality?

Methodologies Used

- FPA – IFPUG 4.1
 - Used on Both Projects
 - Interpretations based on ‘industry’ rules
 - VAF not Used
- COSMIC-FFP
 - Used for partial count of second project
 - Field trials version 2.0

Project One

| | 1 st Count | Diff | 2 nd Count | Diff | Final Count |
|-----------------|--------------------------|------|--------------------------|------|----------------|
| No Report Gen | 1037 | 3% | 1073 | 2% | 1060 |
| With Report Gen | 951 | 4% | 987 | 2% | 974 |

Project One Results

- Measure in red presented to management
- Users required 30 reports
- Developers elect to use report generator
- This has consequence of reducing the FP Size
 - Size of reports was 150 FP
 - Size of report generator implementation 64 FP
- Report generator allows more than 30 reports
- Addition of Rep Gen Functionality
 - Will give misleading results
 - Hence only work to implement is counted

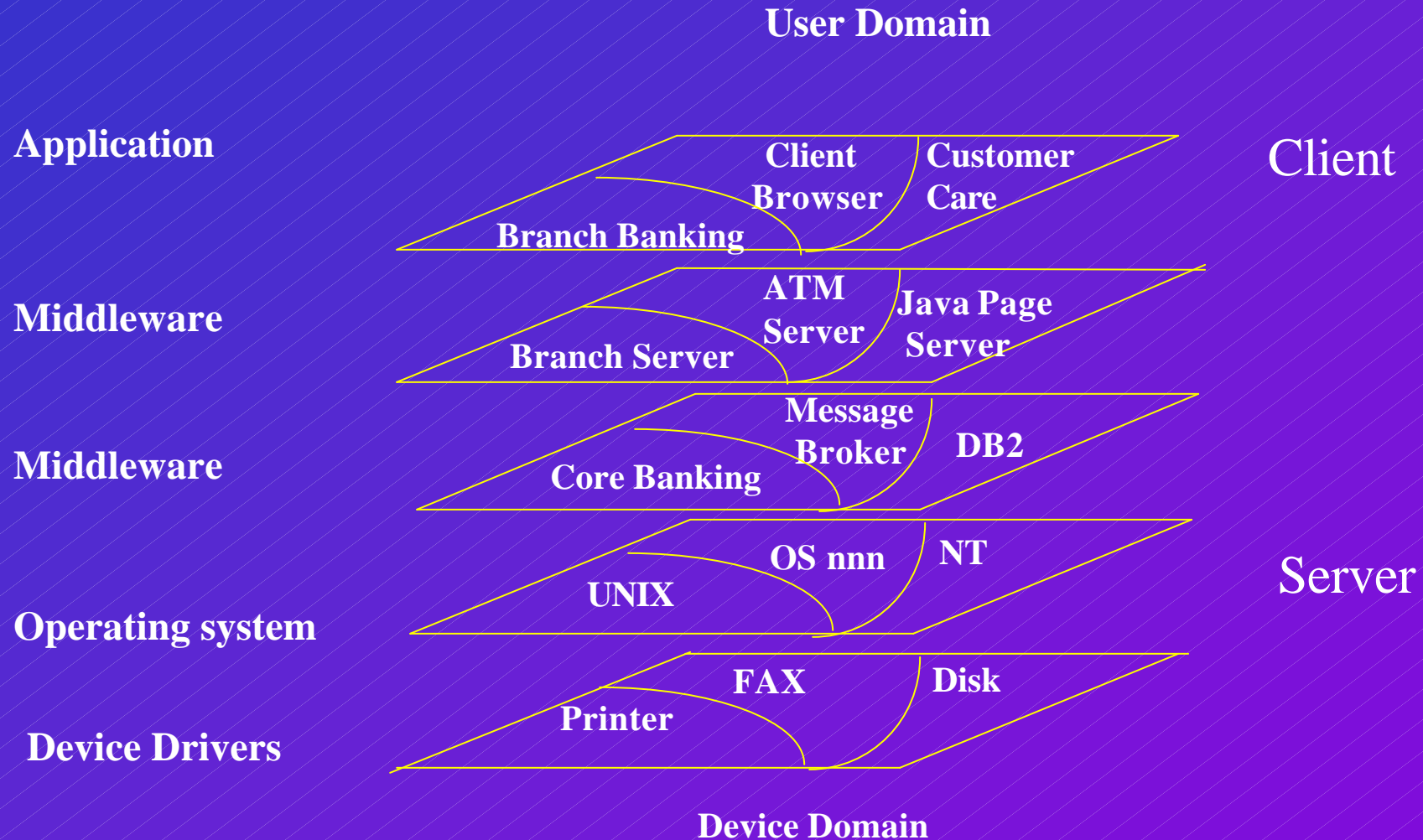
Project One Results

| | 1 st Count | Diff | 2 nd Count | Diff | Final Count |
|-------------------------------------|--------------------------|------|--------------------------|------|----------------|
| Contractor 1 st Solution | 1189 | -16% | 993 | N/A | N/A |
| Include COSMIC-FFP | 1189 | 2% | 1210 | N/A | N/A |
| Include functional Changes | 1468 | 2% | 1489 | N/A | N/A |

Project Two Results

- From the Preliminary Requirements
 - Software was clearly mutli-layered
- Contractor felt that the size did not reflect the functionality or quality being delivered
- Client accepted this but wanted objective measure
- Decided to measure functionality provided to 'Technical' users
- COSMIC-FFP was used to measure the layered software defined by the contractor
- Resulted in an additional 279 points
- NB for MIS - FPA and COSMIC are roughly the same points

Problems of Layered Software



Results

- FPA is a good predictor at the user function level
- Accuracy of 2% to 16%
- However Neither Client nor Contractor
 - Consider 16% to be sufficiently accurate
 - Both were satisfied by the 2% level

Factors contributing to Outcomes

- The client had a good idea of what was required
- Client and contractor experienced in the domain
- Requirements relatively clear at functional level
- Contractor was fully cooperative with process
- The FP counter is very experienced
 - In FP counting
 - And Data Processing
- The same counter was used throughout
- Client and contractor respected the experience of the counter

Cost of counting

- In this case the counts for both systems took around 5 person weeks each
- The developments were between 2 and 5 person years
- Cost between 6.25% - 2.5% development costs
- The normal count speed will be between 250 – 500 FP/day
- The need for multiple verifications and validations causes the count speed to be lower

Strengths of FP

- FPA gives good results when comparing estimates/counts
- Can compare requirements with results at different steps of the exercise
- FPA allows the user to control scope creep
- FPA can be used as a tool to discuss final cost of contract
- FPA can give more insight into some requirements
- FPA allows the user a means of knowing what will be delivered
- Counting is quite reliable when using a validation method

Weaknesses

- Not possible to determine the impact of a change to a process on the complete project
- No direct relation between adding a function and the effort required to implement
- Unable to measure the quality of the delivered software
- It is not possible to determine the impact of one layer upon another
- FPA does not allow us to deal with different levels of software

Future Research

- An evaluation should contain some quality measures
 - Speed, Number of defects allowed, quality of documentation
- There is a need for a measure which relates directly to the effort for a particular function
 - This will allow more insight into the impact of a particular change
- There is a need to improve the interpretation of the rules of FPA