COSMIC FSM ADOPTION AT EUROFINS

IWSM 2019

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Usha N
Let’s regroup post Lunch...

Form a group with following rules

• The group should contain the card sequence from A to 10

• The group should comprise of people with the same sign card

• Team which form the group first give a cheer!!
1. History behind COSMIC Adoption
2. The journey of COSMIC Implementation @Eurofins
3. Challenges and learnings
A little bit about me…

Engineering Leader @ Eurofins
Healthcare IT and Life Sciences

Sport Enthusiast with Family Ethos
We are a global life sciences company helping clients with a range of analytical testing

- Eurofins Scientific is an international life sciences company with more 30 years of experience in providing a unique range of analytical testing services to clients across multiple industries
- Over €4 billion in annualized revenues
- Around 45000 employees and more than 400 million tests performed year
- An international network of more than 800 laboratories across 47 countries in Europe, North and South America and Asia-Pacific
- A portfolio of over 200,000 validated analytical methods
- 1,250,000 m² of laboratories
- Growing IT Systems and Solutions

Customer Focus, Quality, Competence & Team Spirit and Integrity
## How to make IT a better deal to Business

<table>
<thead>
<tr>
<th>Situation</th>
<th>Complication</th>
<th>Resolution</th>
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</thead>
<tbody>
<tr>
<td>1. Improve the predictability of software releases</td>
<td>• Teams with varied degree of software delivery Maturity</td>
<td>• There is a need to have common unit of Measure for delivered software</td>
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<td>2. Compare Productivity of Project teams</td>
<td>• Agility as excuse. Story point not an absolute unit</td>
<td>• Based on Industry standards</td>
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<td>3. Quick and Early estimation for new projects</td>
<td>• Business requirements not well structured</td>
<td>• Comparable across project types</td>
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<tr>
<td>4. Business-IT Alignment</td>
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</table>

- Situation:
  1. Improve the predictability of software releases
  2. Compare Productivity of Project teams
  3. Quick and Early estimation for new projects
  4. Business-IT Alignment

- Complication:
  - Teams with varied degree of software delivery Maturity
  - Agility as excuse. Story point not an absolute unit
  - Business requirements not well structured

- Resolution:
  - There is a need to have common unit of Measure for delivered software
  - Based on Industry standards
  - Comparable across project types
We wanted a method to consistently measure the developed software for Baselining and Benchmarking

**Approach**
- Cross functional Special Interest Group formed
- AS-IS Mapping of selected Projects @ Eurofins
- Analyzed different FSM methods
- Map analyzed FSM methods to best Fit to Eurofins organization

**Considered for pilot**
- Parameters for relative evaluation of methods
- 50% of Program leadership interviewed
- COSMIC FP, IFPUG FPA, FiSMA, Agile SP were the analyzed FSM methods

**Decision to use COSMIC**
- Best fit on parameters relevant to Eurofins situation
- Easy to adopt, cost-effective to implement, scientific in nature
**Definition of Cosmic FP Model per ISO/IEC 19761:2011**

- **Software Context Model**: Characterize a piece of software measured
- **Generic Software Model**: How FUR of the software to be measured are modeled, so that can be measured

**Diagram Notes**:
- **E**: Entry Movement of a data group
- **X**: Exit Movement of a data group
- **R**: Read a data group from Persistent store
- **W**: Write a data group to Persistent store
We faced many challenges during the implementation

| Development          | • How to build the Model to measure software and for early estimation
|                      | • Model that closely map to Organization practice |
| Process              | • Different Project development and delivery practice followed
|                      | • FUR vs Functional Process across project types
|                      | • How to categorize the project types |
| Resources            | • Adopting in Agile teams – Mindset of team members
|                      | • Teams were busy with the project delivery |
| Governance and Methodology | • Who will measure the software and estimate the software
|                      | • Right governance model for consistent adoption and feedback |
We observed key benefits

Benefits

- Higher level of Accuracy compared to Agile Story Points
- Benchmarking results allude to higher degree of correlation among projects
- KPI's with Common unit of measure
- Could be adopted across the different projects at Eurofins

Impact

- Productivity comparison for better project performance of development and enhancement projects
- Improvement in estimation thought process (Intangible)
- Reduced inconsistencies in KPI measurement and baselines
We are ready for Organization wide Adoption

Models serve as blueprint for understanding and adoption

- Templates for
  - CFP Measurement
  - Approximate Estimation
  - Calibration of baselines

- Classroom and Online Trainings
- Methodology well understood

Evolving guideline for continuous process improvement

- COSMIC FP Measurement Manual
- Checklist for measurement process audit.
- Governance Model

Independent Measurement Team
- 8 Pilots with New Development and Enhancement

Measurement could be done unbiased by central team

I know what is expected of the model – I agree with it, and it is meaningful
Minimal disruption to current development practice and minimal involvement from Project teams

COSMIC FP Pilot

BUILD
- Build the Model for measurement and benchmarking
- Build the model for Approximate Estimation
- Develop measurement guidelines

IDENTIFY
- Identify Pilot projects for feasibility and correlation
- Projects from across the business lines for diversity

IMPLEMENT
- Measurement with project team involvement
- Measurement with independent measurer
- Insights and improvements from both the approaches
Mapping for COSMIC FP to Organization defined practice

**Purpose**: Measuring for benchmarking and subsequent baselining

**Scope**: Measure the size at the Application level

**Granularity**: Measurement at User story level Approximate at User Requirement (UR) level

**Functional Area (FA)**: UR/ Epic

**Functional User Requirement (FUR)**: User Story or Stories

**Functional Process**: Workflow within a story

**Data Group**: Data Model/ Entity
CFP Correlates better than Agile SP for similar project measurement

**Project 1D**

- Linear (Person Hours)
  
  \[ y = 6.0052x + 4.7681 \]
  
  \[ R^2 = 0.7716 \]

- Linear (Story Points)
  
  \[ y = 6.315x + 0.3728 \]
  
  \[ R^2 = 0.7708 \]

**Project 2D**

- Linear (Person Hours)
  
  \[ y = 6.315x + 0.3728 \]
  
  \[ R^2 = 0.7708 \]

- Linear (Story Points)
  
  \[ y = 4.2263x + 18.647 \]
  
  \[ R^2 = 0.5762 \]

- Linear (Man Hours)
  
  \[ y = 11.093x - 1.5347 \]
  
  \[ R^2 = 0.6688 \]
CFP Correlates better than Agile SP for similar project measurement

• Each dot represent the measured functional user requirement
• Higher $R^2$ value meant better clustering leading to higher predictability
• CFP is more linear in nature
Model - Development

\[ y = 4.789x + 12.234 \]
\[ R^2 = 0.645 \]

Performance Baseline

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P65 is the range for the arrived Baselines

<table>
<thead>
<tr>
<th>Delivery Rate (Person Hours/CFP) - Development Projects</th>
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<tbody>
<tr>
<td><strong>Project 1D</strong></td>
</tr>
<tr>
<td>3.0 3.5 4.0 4.5 5.0 5.5 6.0 6.5 6.8 7.0 7.5 8.0 8.5 9.0 9.5 10 10.5 11 11.5</td>
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<tr>
<td><strong>Project 2D</strong></td>
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<td>5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10 10.5 11 11.5</td>
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<td><strong>Project 3D</strong></td>
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<tr>
<th>Delivery Rate (Person Hours/CFP) - Enhancement Projects</th>
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<td><strong>Project 3E</strong></td>
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<td>5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10 10.5 11 11.5</td>
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<td><strong>Project 4E</strong></td>
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<td>5.0 5.5 6.0 6.5 7.0 7.5 8.0 8.5 9.0 9.5 10 10.5 11 11.5</td>
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<td><strong>Project 5E</strong></td>
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**Usability**
Productivity Baselines would help in project performance

Two broad project types were observed:
- **Development** – More newly created functionality with few enhancements
- **Enhancement** - More enhancements with few newly created functionalities

**Planned Release level KPIs**
Defect Density (Defects/CFP)
Defect Leakage [(Defects in Production)/ CFP]
CFP per FA
CFP per person month
• Development model gave better handle with less variation in terms of person hours/ CFP. Story points (SP) were comparable as well
• Enhancement Projects showed higher deviation
• Drop in productivity on a comparable team basis of Development and Enhancement projects
Standard Component Type as a common unit to map Functional Process

- Define Standard Component types as a pattern to map Functional process
- Serve as Common nomenclature for Business and Development
- During measurement, map Function Process to Standard Component type
- Measure the average CFP per standard component type
- Benchmark CFP/ Standard component type across the projects
- Testability for Measurement effectiveness
- Leveraged in Approximation model
Standard Component Type as a testability of measurement effectiveness

- Standard Component type is well understood by teams
- Comparable CFP/Standard component type signify measurement accuracy
- Statistical average serve as Wall of reference for Approximation
### Approximation Model With Example usage

<table>
<thead>
<tr>
<th>Wall of Reference COSMIC FP</th>
<th>8</th>
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- Shows the usage of CFP/Standard component type as Wall of reference from the Measurement.
- High level requirements are mapped to discrete Standard components.
- Approximate number of Standard component types are filled by PO/ BA.
- Number of CFP for the project arrived at.
- Effort needed is derived based on P65 measurement baselines.
Plan to move up the Measurement maturity curve

<table>
<thead>
<tr>
<th>Activities (Team involvement)</th>
<th>Level 3</th>
<th>Level 2</th>
<th>Level 1</th>
<th>Maturity Level</th>
<th>Project Team (PRJ T)</th>
<th>Measurement Team (CFP T)</th>
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<tbody>
<tr>
<td>Estimation @ planning</td>
<td>PRJ T</td>
<td>CFP T</td>
<td>PRJ T</td>
<td>CFP T</td>
<td>PRJ T</td>
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<td>- Approximation Model (UR/ PBI Level)</td>
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<td>Measurement @ sprint planning</td>
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<td>- CFP Methodology (PBI Level)</td>
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<td>Measurement @ Release Closure - CFP Method</td>
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<td>Calibration of baselines(+Data collection/verification)</td>
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R:: Team completely responsible for activities
C:: Team consulted during activities
I:: Team is involved during activities

- The proposed maturity is planned to be achieved for the selected projects
- At Level 1, central measurement team with minimal project team involvement
- The involvement from project needs to gradually increase and as we move to Level 2
- BAU for project teams with measurement in SDLC
- Average effort to measure a FUR ~0.75 hr

~10 Months

~5 Months
Measurement & Governance Model

- Approximation method applied at start of release based on UR and User story availability
- CFP Method applied at FUR level at the end of a project or milestone
- Regular audits to check on compliance of model and measurement guidelines
- Management reporting on project performance
- Baseline repository for CFP Measurement
- Organization wide roll out is planned. All the projects to be measured with CFP method by 2020
- Engineering excellence through continuous process and data improvement across development continuum
- Regular process governance through audit and reporting
- Cost modeling with baselined CFP is down the path
Journey of thousand miles begins with one step.....

Thank you