COSMIC FSM ADOPTION AT EUROFINS

IWSM 2019

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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!!

Agenda

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

Situation

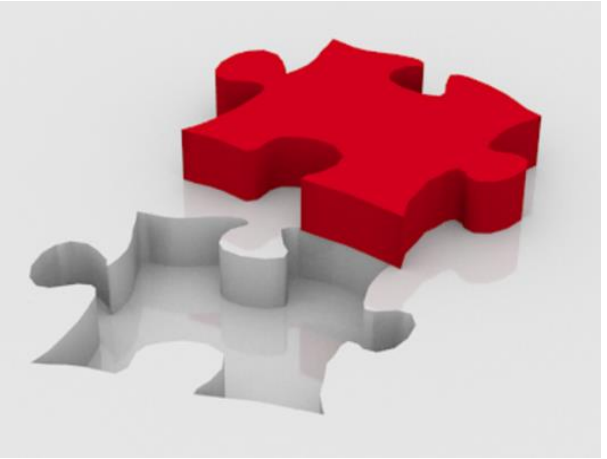
1. Improve the predictability of software releases
2. Compare Productivity of Project teams
3. Quick and Early estimation for new projects
4. Business-IT Alignment

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

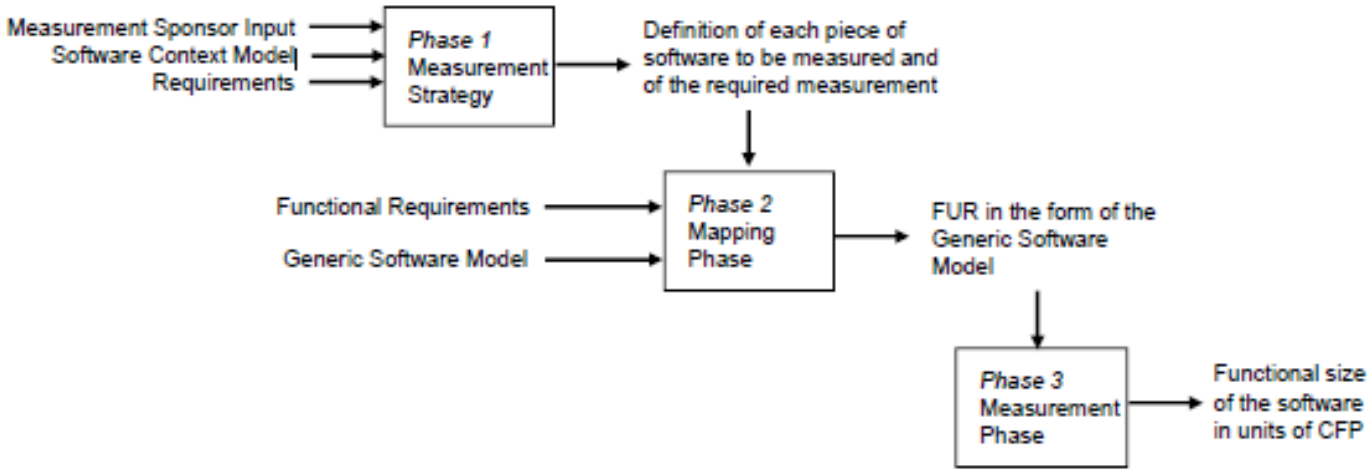
Considered for pilot

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

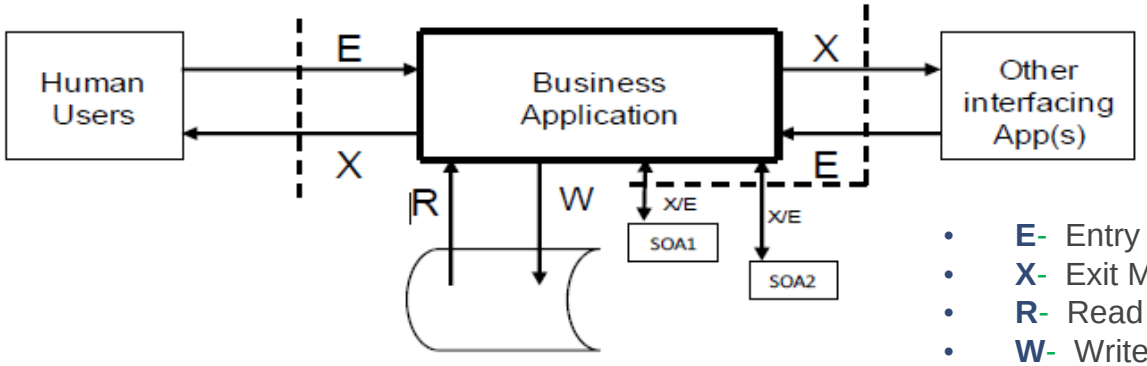
Decision to use COSMIC

- 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



- **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

eurofins

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

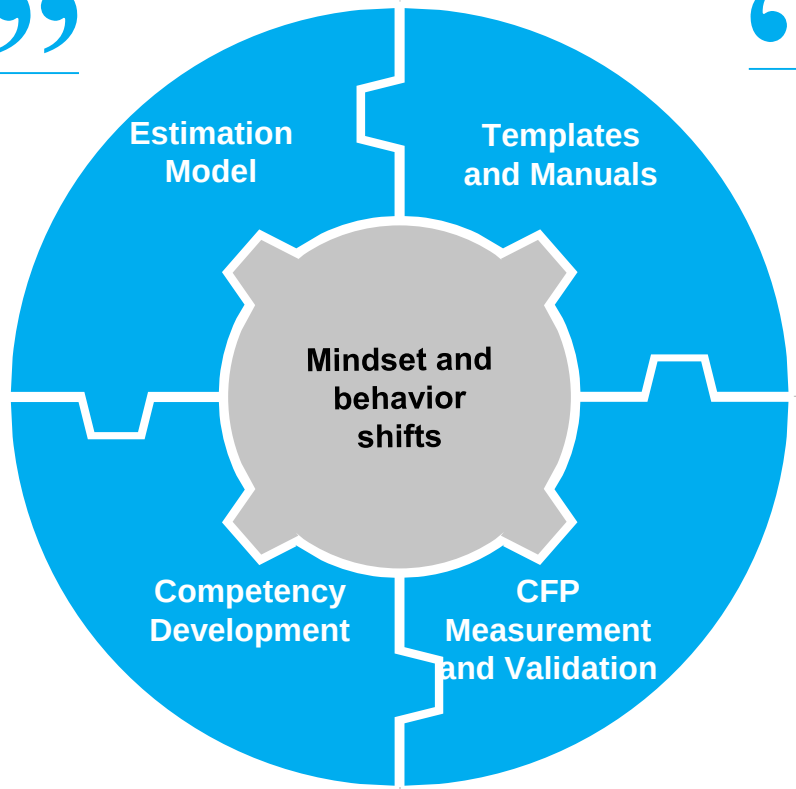
We are ready for Organization wide Adoption

> Models serve as blueprint for understanding and adoption

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

- Classroom and Online Trainings
- Methodology well understood

> I know what is expected of the model – I agree with it, and it is meaningful



> 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

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

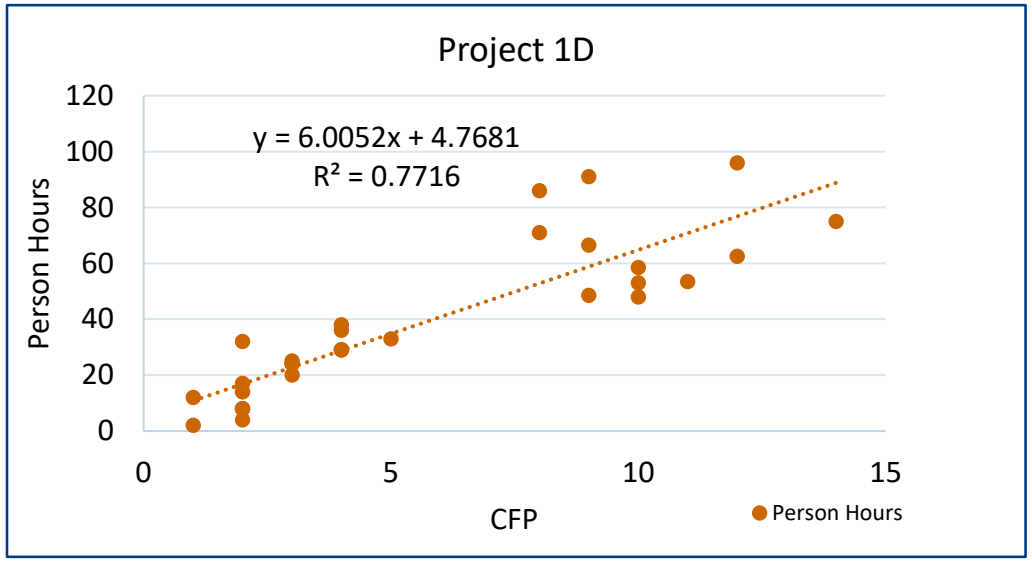
IMPLEMENT

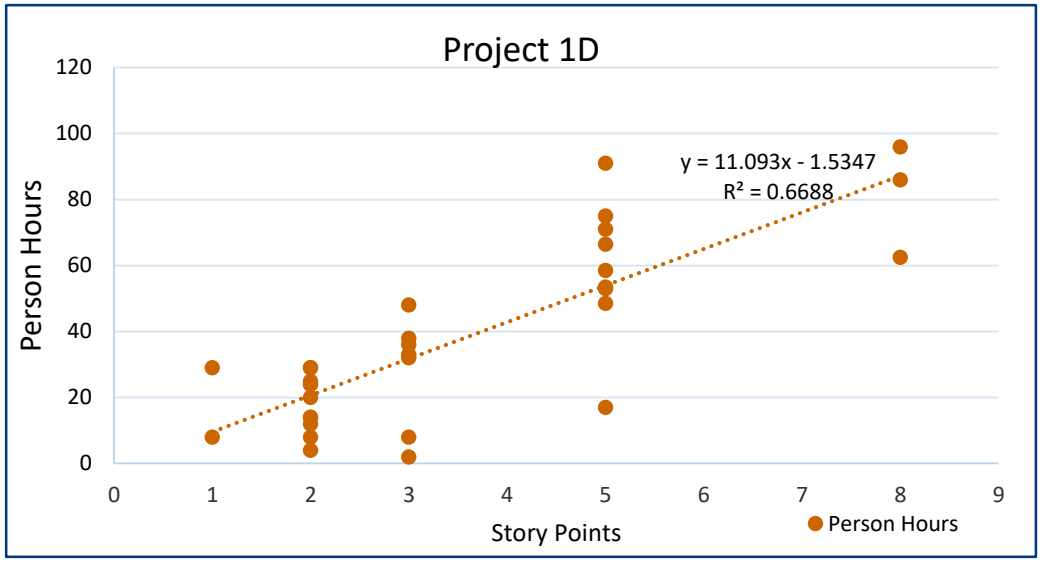
- Measurement with project team involvement
- Measurement with independent measurer
- Insights and improvements from both the approaches

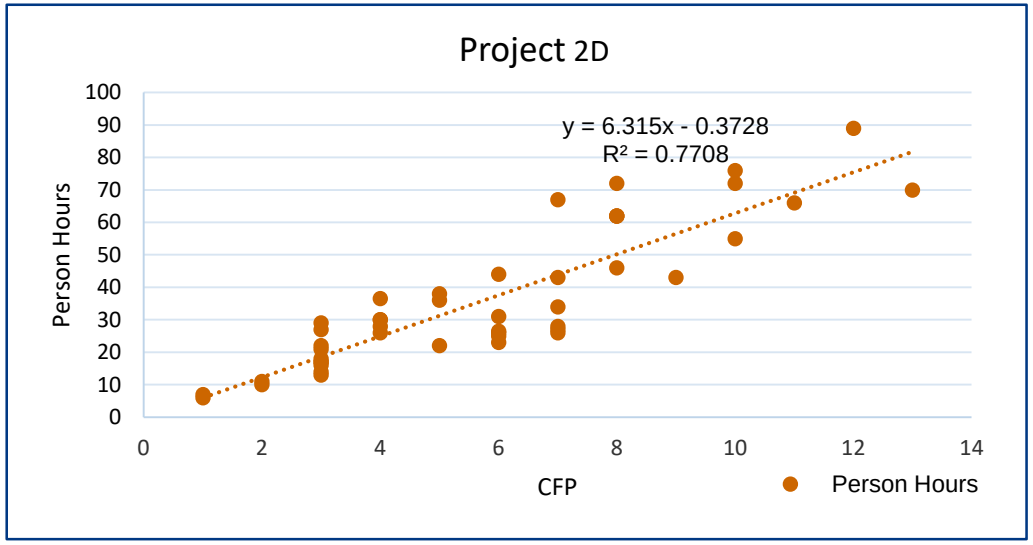
Mapping for COSMIC FP to Organization defined practice

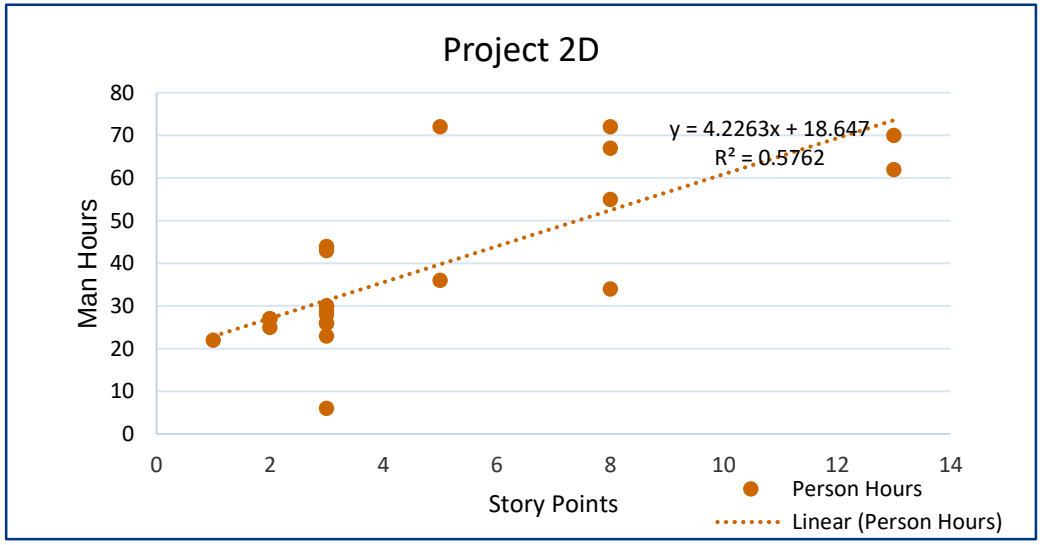
Purpose	Measuring for benchmarking and subsequent baselining
Scope	Measure the size at the Application level
Granularity	Measurement at User story level Approximate at User Requirement (UR) level
Functional Area (FA)	UR/ Epic
Functional User Requirement (FUR)	User Story or Stories
Functional Process	Workflow within a story
Data Group	Data Model/ Entity

CFP Correlates better than Agile SP for similar project measurement









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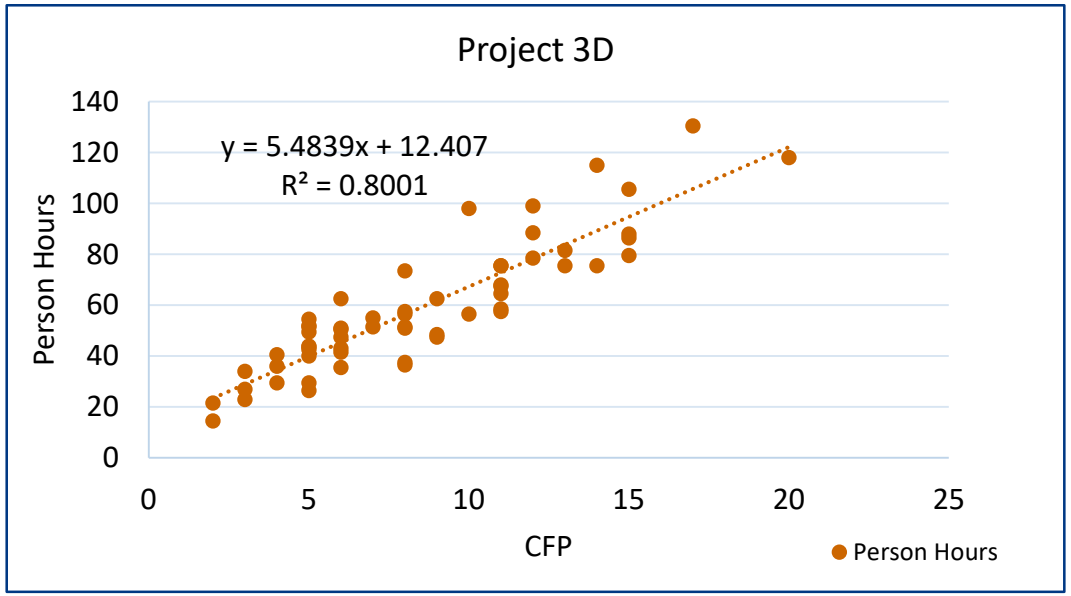
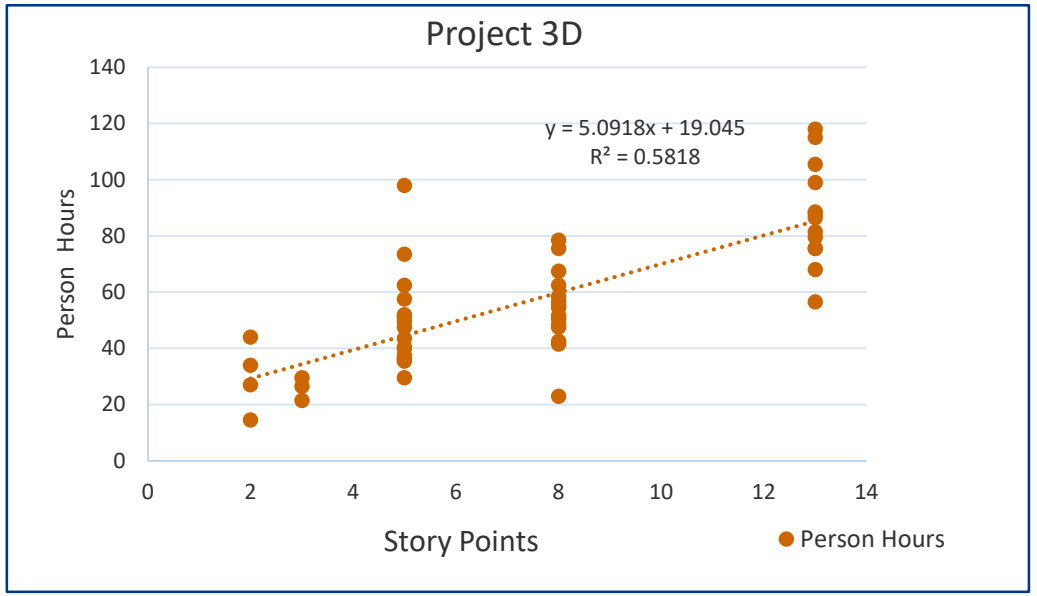
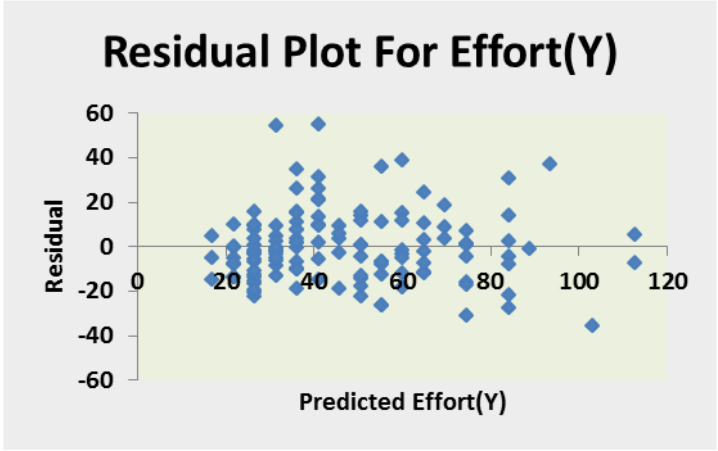
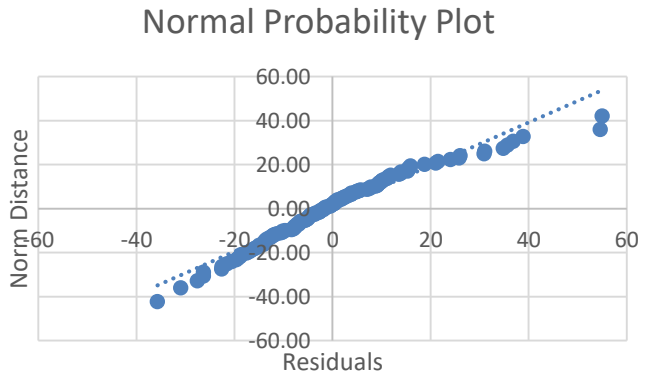




- Each dot represent the measured functional user requirement
- Higher R^2 value meant better clustering leading to higher predictability
- CFP is more linear in nature

Model - Development



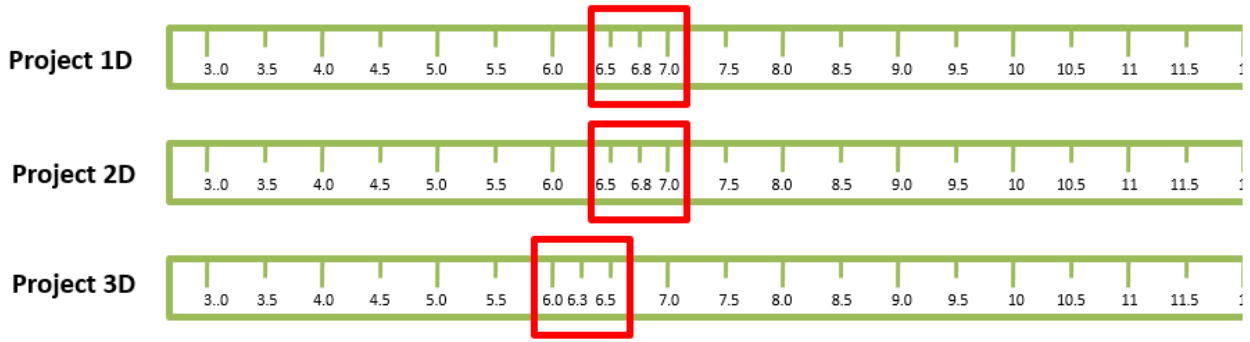


Performance Baseline

P5	P10	P20	P30	P40	P50	P60	P65	P70	P80	P90	P95
3.3	3.9	3.9	5.3	5.8	6.6	7.3	7.6	7.9	8.9	10.9	12.2

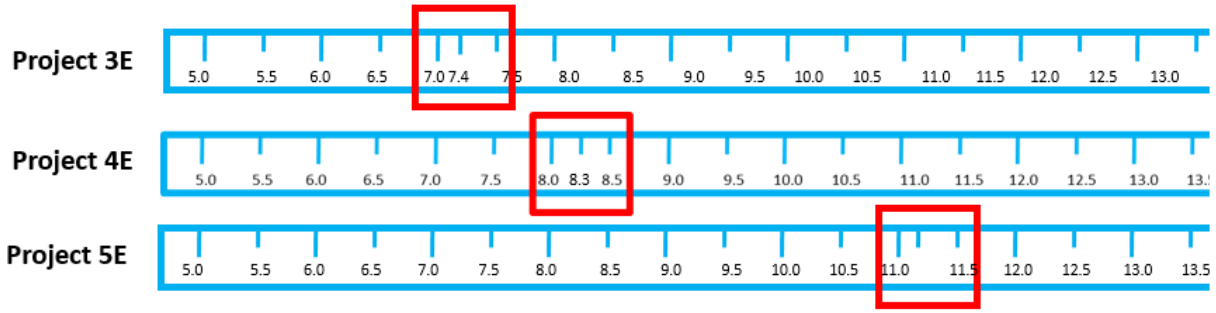
P65 is the range for the arrived Baselines

Delivery Rate (Person Hours/CFP) - Development Projects



P50	P60	P65	P70	P80
6.6	7.3	7.6	7.9	8.9

Delivery Rate (Person Hours/CFP) - Enhancement Projects



P50	P60	P65	P70	P80
7.55	8.71	9.84	11.00	12.68

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

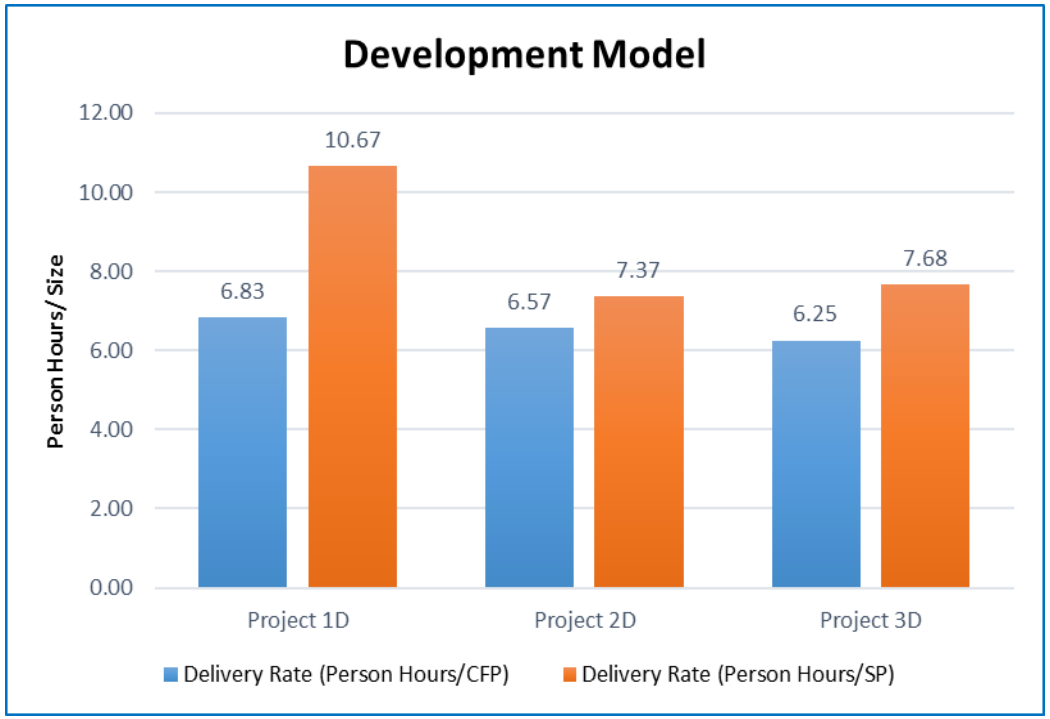
Defect Density (Defects/CFP)

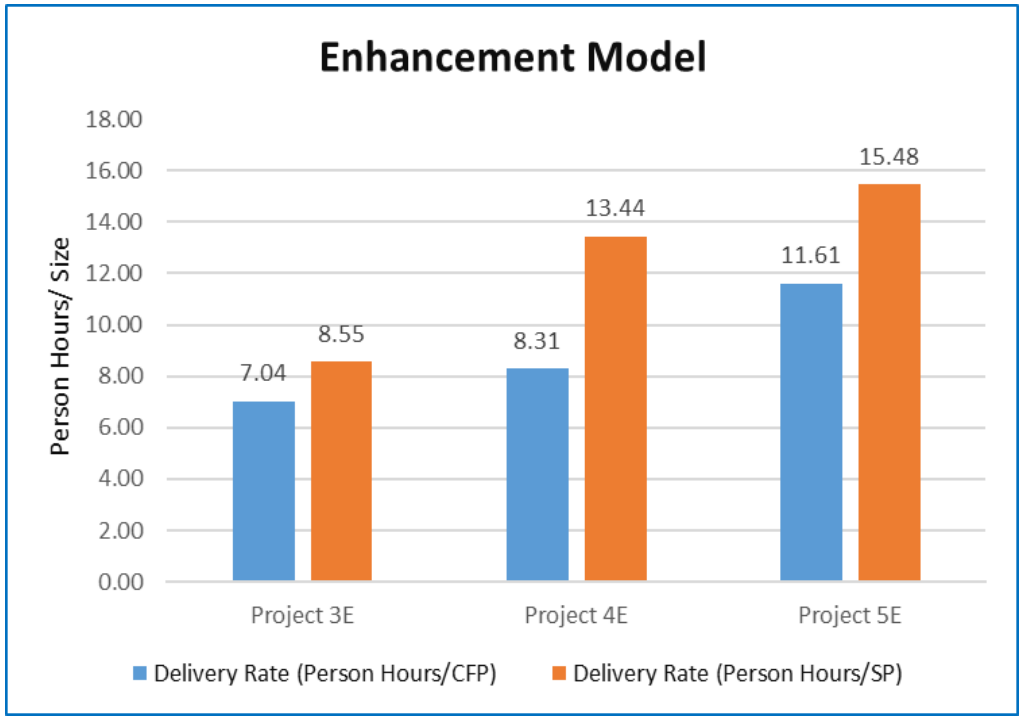
Defect Leakage [(Defects in Production)/ CFP]

CFP per FA

CFP per person month

Pilot KPI Comparison which proves CFP is consistent





- 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

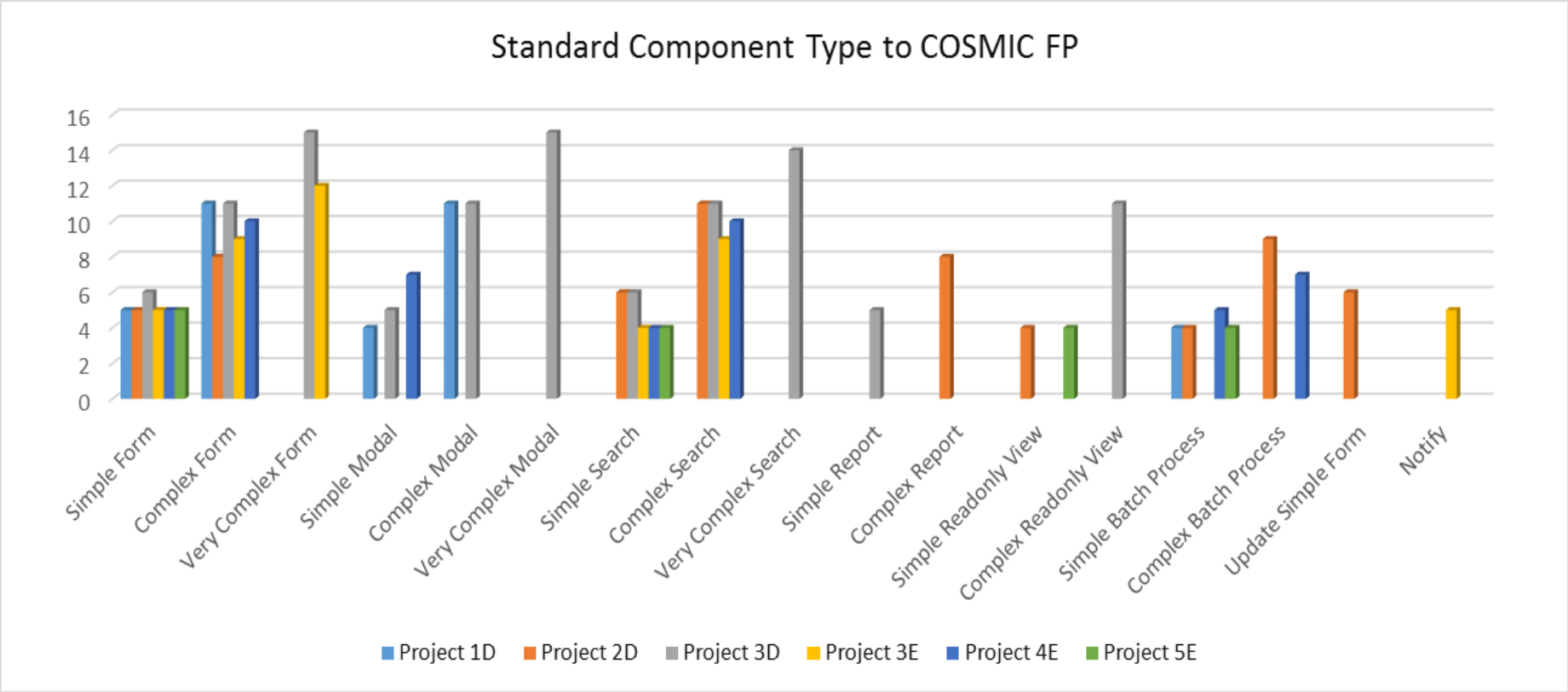
Standard Component Type as a common unit to map Functional Process

- 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

Wall of Reference COSMIC FP	8	4	8	6	8	17	6	12	8	16	4	7		
User Requirements/Functoinal Process	Readonly View	Simple Report	Complex Report	Simple Search	Simple Form	Complex Form	Update Simple Form	Update Complex Form	Simple Modal	Complex Modal	Simple Batch Process	Complex Batch Process	Cosmic FP Units	Effort to Develop
SMS Reporting			1			3	3			2		3	130	910
Advanced Customer Ordering Agreements	2			2	2		2		3		1	3	105	735
Manual Smart Registration	1			1			1				3		32	224
External Comments on Invoice		1		1			1						16	112
M2M Reporting							1					2	20	140
Integrate with CRM													0	0
Dashboard & Reports		2											8	56
Planning Dashboard	1			1				1				1	33	231
													0	0
Total Standard Component Units	4	3	1	5	2	3	8	1	3	2	4	9		
Cosmic FP Units	32	12	8	30	16	51	48	12	24	32	16	63	344	2408

- 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

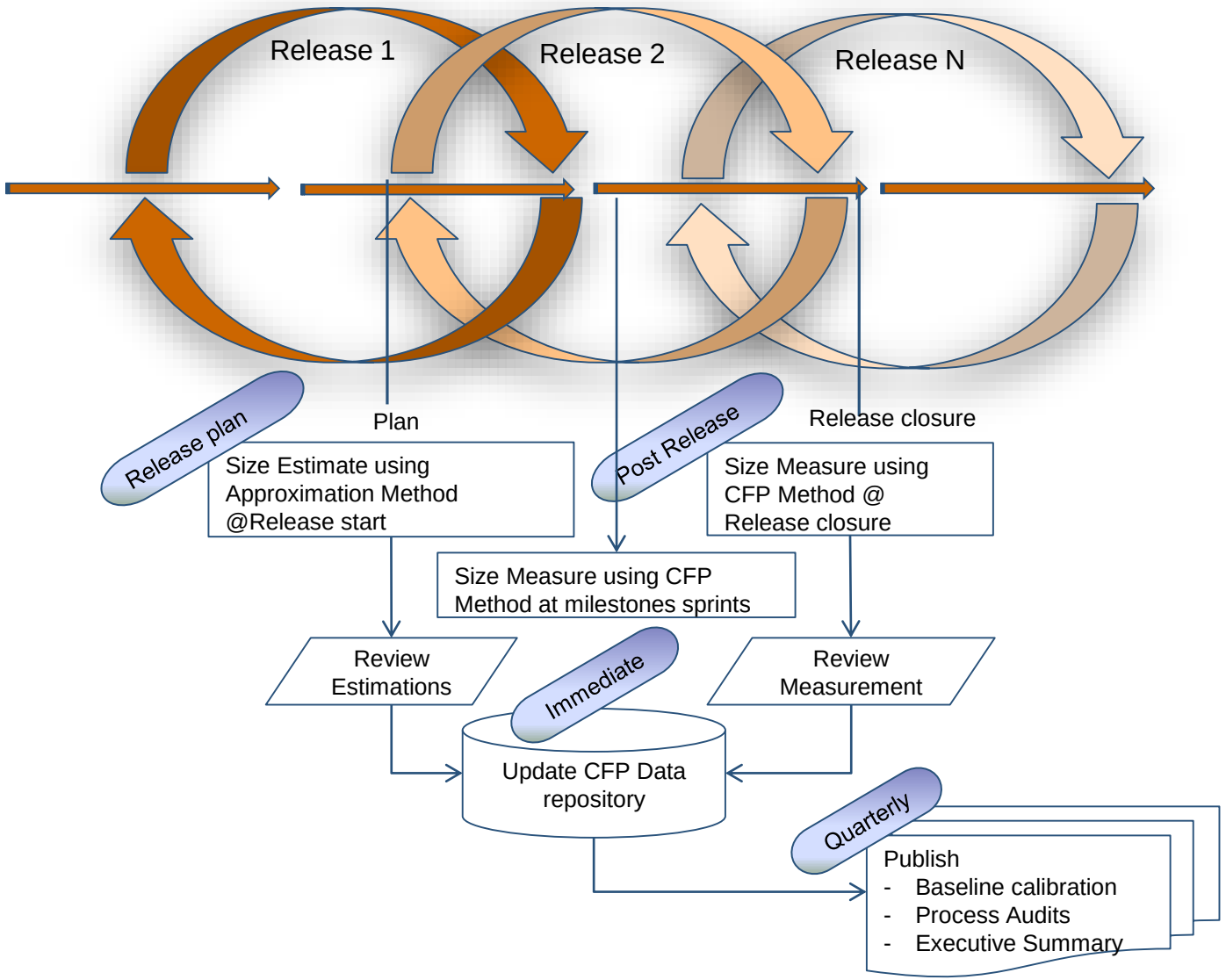
Activities (Team involvement)	Level 3		Level 2		Level 1	
	PRJ T	CFP T	PRJ T	CFP T	PRJ T	CFP T
Estimation @ planning - Approximation Model (UR/ PBI Level)	R	C	R	C	R	C
Measurement @ sprint planning - CFP Methodology (PBI Level)	R	C	R	C		
Measurement @ Release Closure - CFP Method	R	C	C	R	C	R
Peer Review	C	R	C	R	C	R
Caliberation of baselines(++Data collection/verification)		R		R		R
Other support activities						
Trainings	I	R	I	R	I	R
Refinement of documents, templates, checklists		R		R		R
Audits	I	R	I	R	I	R
Executive Summary Meetings+Publishing Reports	I	R	I	R	I	R

R:: Team completely responsible for activities
C:: Team consulted during activities
I :: Team is involved during activities

Maturity Level	Project Team (PRJ T)	Measurement Team (CFP T)
Level 3	Does size estimation at start of Release using E&Q Method and CFP sizing at start of sprint. Also measures CFP post-sprint.	Guides/ reviews measurements and calibrates baselines.
Level 2	Does size estimation at start of Release using E&Q Method and CFP sizing at start of sprint.	Guides/ reviews estimations, measures FUR post release and calibrates baselines.
Level 1	Does size estimation at start of Release using E&Q Method.	Does CFP size measurement post release; Some POC with projects on CFP; Calibrates baselines.

- 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

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

Next steps of action at Eurofins in adoption journey

- 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…..