Abstract

Early Estimates based on uncomplete Requirements.

In software development we are often asked to provide early estimates based on uncomplete requirements.

This session will take you through methods and techniques to perform an early estimate based on uncomplete requirements.

The session will guide you in how to document the uncomplete requirements and the early estimate. In addition, it will guide you in how to monitor and control both requirements and the estimates to monitor changes and impact to your planned delivery.

This session is relevant for both Software Business Analyst, Product Owners, Project Managers and Scrum Masters.

Bear in Mind that The Great IT Professional has changed my abstract from Uncomplete to Incomplete…

Event: Training

Place: Virtual

Time: 14th of December 2021

Host Organization: Great IT

IP by Green

Early Estimates based on Incomplete/Uncomplete Requirements

IP_{by} **Green**

CHRISTINE GREEN

Owner of IPbyGreen - Senior Consultant

25+ years of experience in the software industry. Focus on Process Improvement, Complex and Critical software projects. **Software delivery with success.**

Worked on Critical contracts and projects for both government and private sector since 2003 for EDS & HPE (employed between 1996-2017). Independent Consultant since 2017.

Current assignments:
Project/Program Manager at Healthcare Industry Projects (UK, IE and Sweden) Contractual Price Model Advisor on Large Scale EU Project.

M.Sc. in Mathematics and Computer science
Certified - PMP, CSM, SA, LSS BB, CFPS
www.linkedin.com/in/christinegreendk

President of IFPUG 2019-2021
CFPS Fellow since September 15th 2020

Incomplete vs Uncomplete

Incomplete, we're focusing on the condition something is in at that moment and **stating that it's missing something**.

Uncompleted, we're focusing more on the fact that work still needs to be done on or to something in order to finish it.

With **uncomplete**, we're not thinking so much about the fact that something is missing (as we are with incomplete), but on the fact that this is still a work in progress.

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Realistic Expectations

The single most important task of a project: **setting realistic expectations**.

Unrealistic expectations based on inaccurate estimates are the single largest cause of software failure.
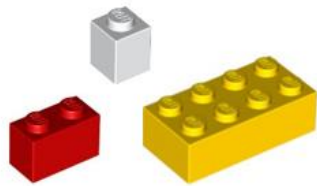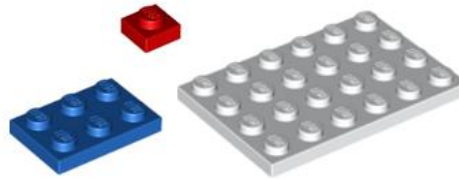
What does it take to build a LEGO construction?

Simple construction   Complex construction
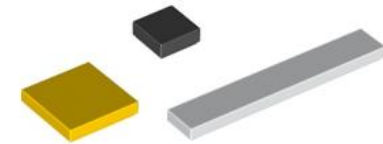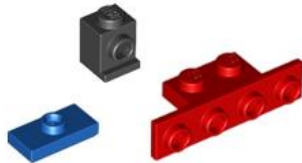
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…it certainly depends on the requirements

Bricks

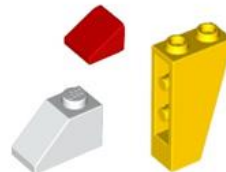Plates

Tiles

SNOT

Slope

Technic

IP by Green

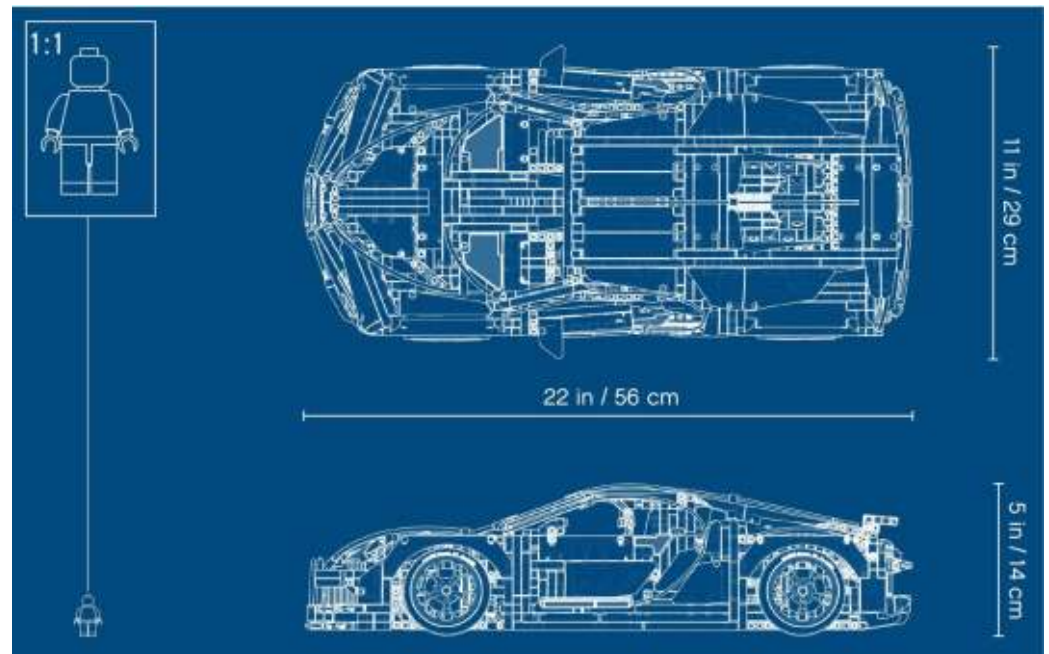# How accurate you know the requirements

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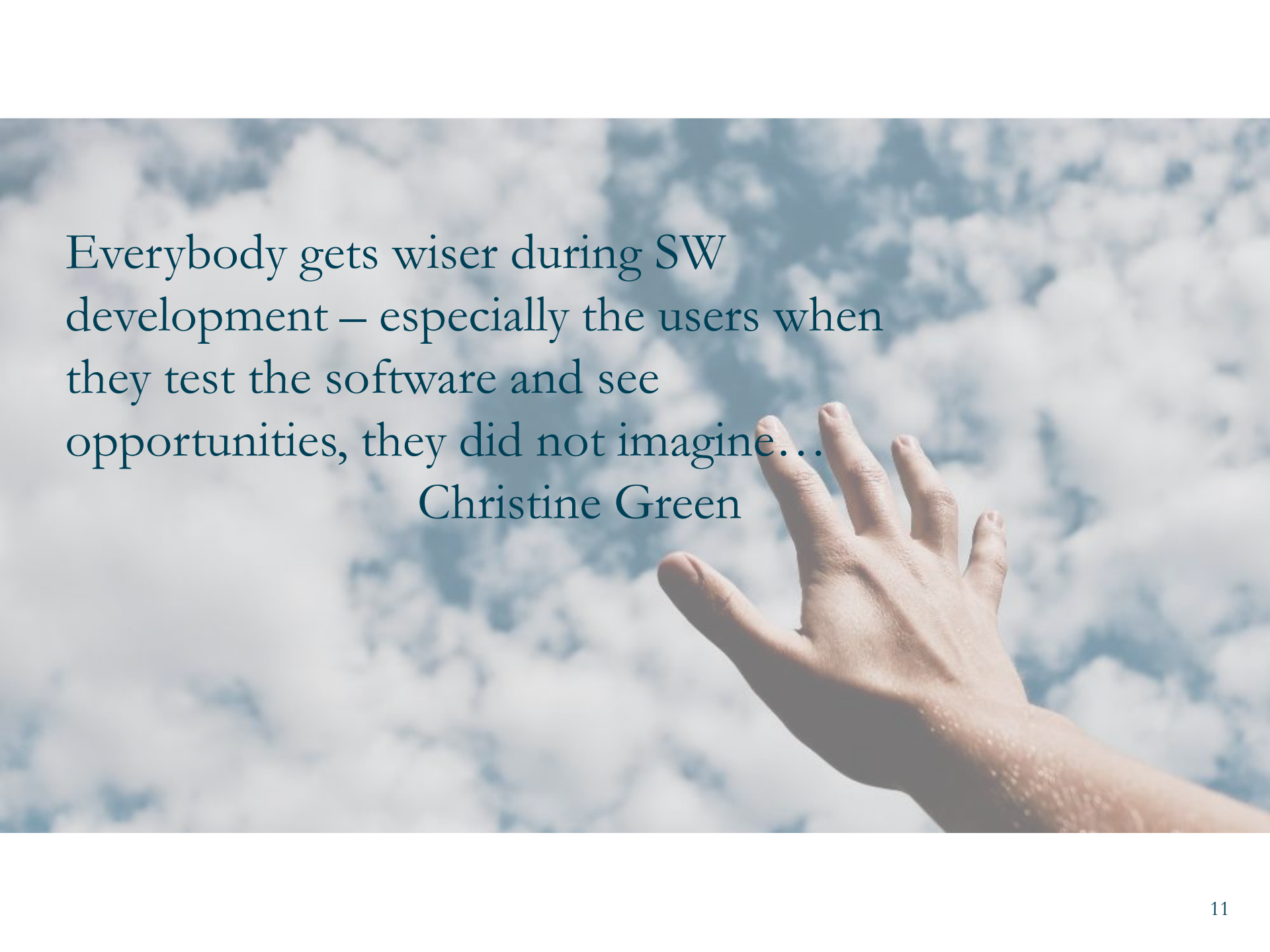
…and the expertise at hand

Low expertise   High expertise

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The Technology & Methodology you use

Everybody gets wiser during SW development – especially the users when they test the software and see opportunities, they did not imagine…
Christine Green

Early Estimation
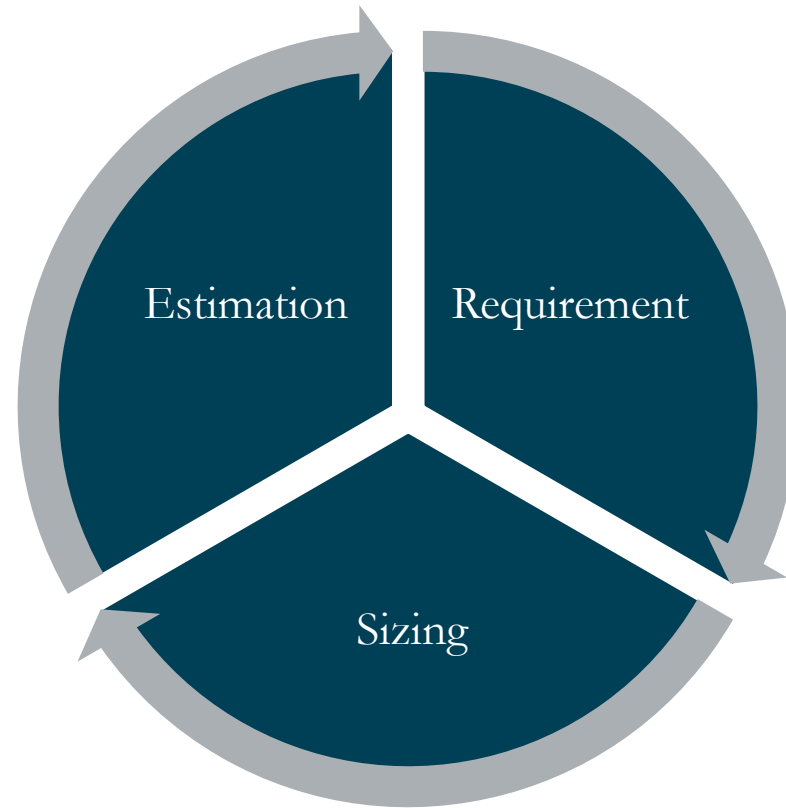
Requirement

The Early Estimation

Value
- The benefits - Why
- What do we want to gain - ROI
- What does it cost, when can it be delivered

Requirements
- What is our Focus Areas
- What do we need to deliver
- User and Developer with the same perspective

Acceptance
- Acceptance by the users
- Test of usability and functionality
- The compliance with Value and Scope

Delivery
- The delivery and final success measure
- Functional Availability, Quality & Performance
- The real measure of value for money

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Acceptance Criteria and Test
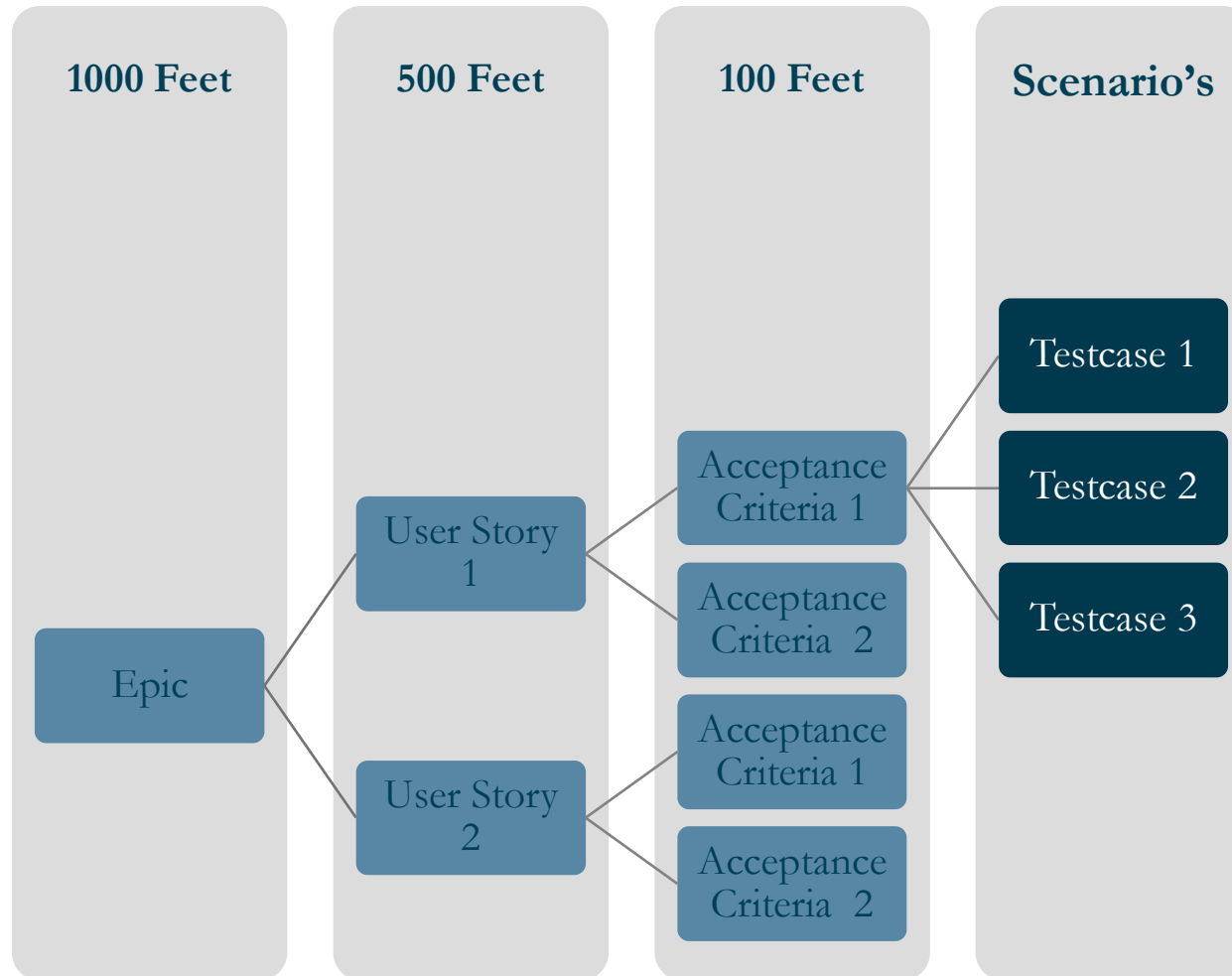
Cynefin

Complex
Probe-Sense-Respond

Don't try to find all the stories.
Find one or two proving some value and teaching you something about the problem and solution,
build those and use what you learn to find the rest.

Emergent Practice

Complicated
Sense-Analyze-Respond

Find all the stories and
do the most valuable and/or
most risky ones first.

Good Practice

Disorder

Figure out which domain
you're in before
splitting so you don't take
the wrong approach

Novel Practice

Put out the fire!
Splitting stories probably isn't important
right now.

Act-Sense-Respond
Chaotic

Best Practice

Just build it. If it's too big
find all the stories and do
the most valuable ones first.

Sense-Categorize-Respond
Simple

Cynefin – Estimation

Complex **Complicated**

Assumption

500 Feet

Disorder

Constrain

100 Feet

Chaotic **Simple**

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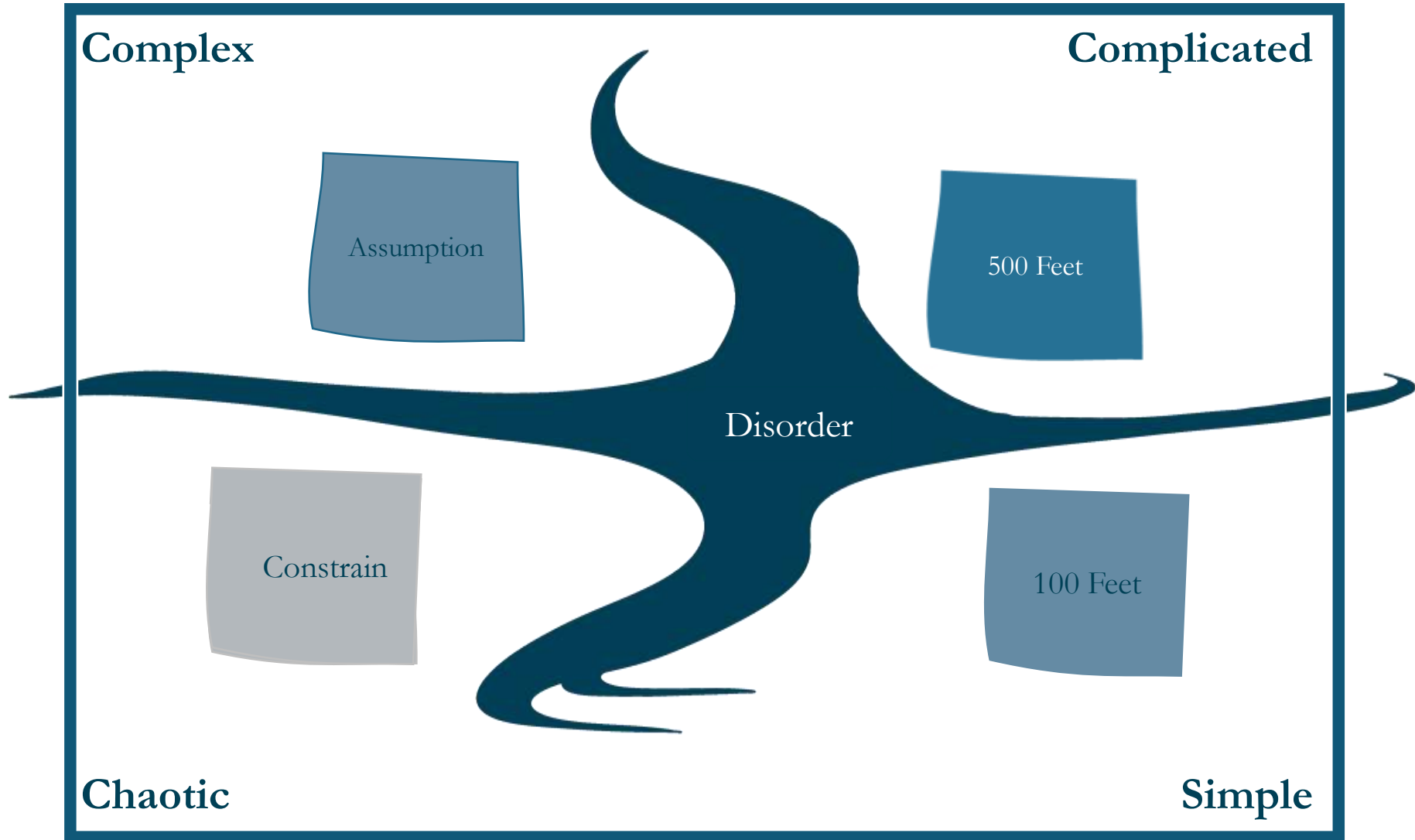
User Story and Acceptance

- Nouns – is usually logical data groups (Order, Employee etc.)
- Verbs – is usually a transaction, menu etc.

- As an {actor} I want to {do something} in order to {achieve an outcome}
- Given {an initial context} When {something is done} Then {expect an outcome}

- Always focus on one actor – if more – then there might be two different transactions and data groups
  - Sometimes there is a need for support from management to solve an escalation of different perspectives

EPICs ~ Business Process

- Be aware of EPICs

- Map to Business Process

- Define the User view

- Cap it

Sizing

Function Point Elevations

1000 Feet

Business Process
Business Boundary

500 Feet

Scope and Purpose boundary

Data

Approximation, Assumptions, Planning, Project Control

Estimation

Forecast

100 Feet

Detailed Analysis

Data

Transactions

Detailed planning

Critical Estimates

Test input

Delivery checklist
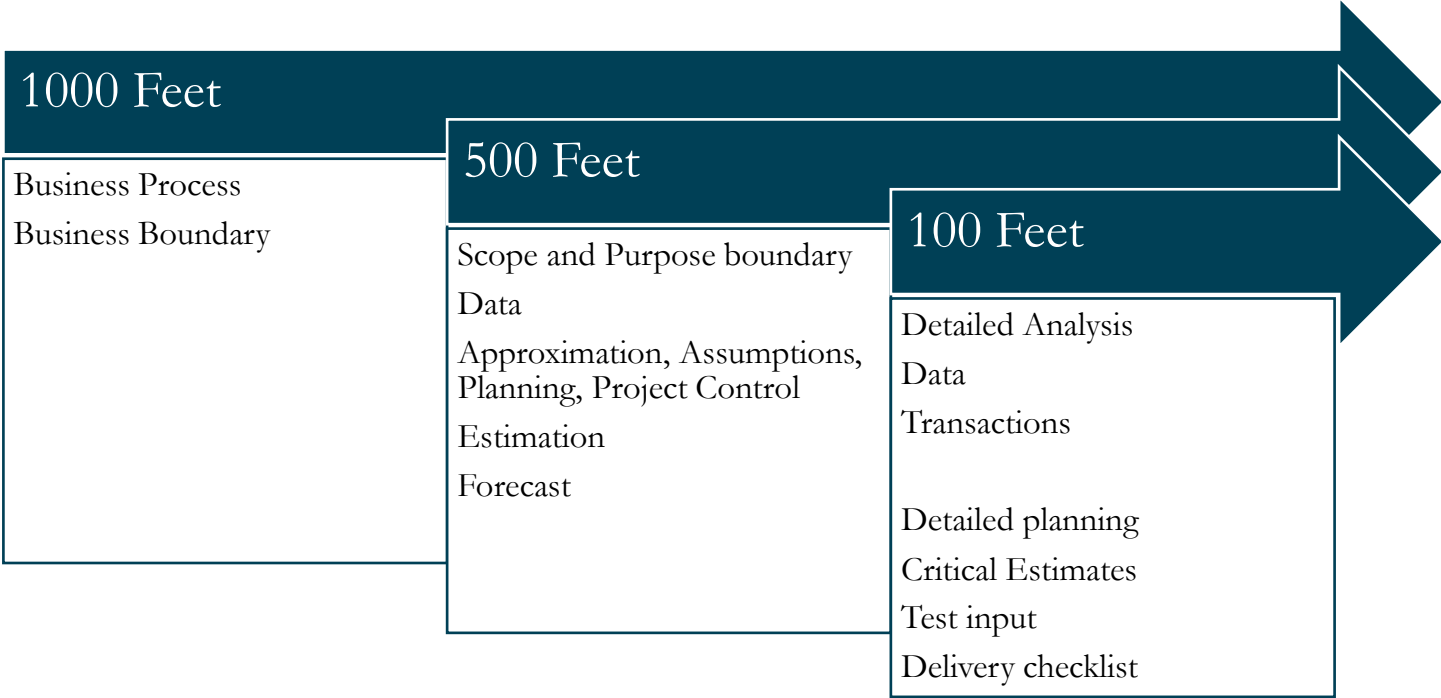
User View

User

- Any person or thing that communicates or interacts with the software at any time.

User recognizable

- Requirements for processes and/or data that are agreed upon, and understood by, both the user(s) and software developer(s).

User view

- Functional User Requirements as perceived by the user.

Meaningful.

- User recognizable and satisfies a functional requirement.

From the user view
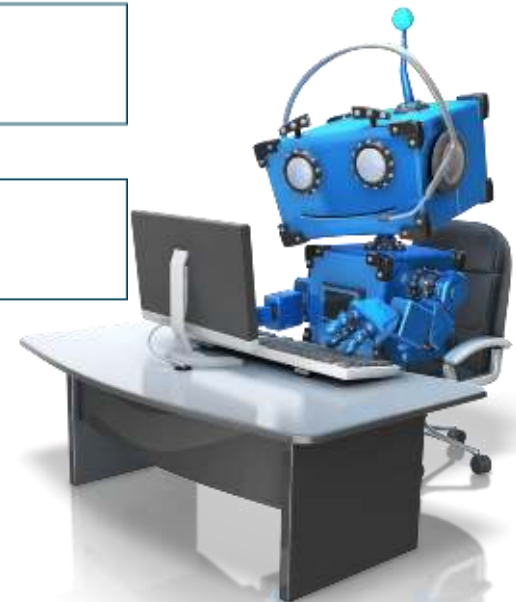
Boundaries from a business perspective

Business Process we reference to

External Boundary
Reference data
– not in scope except EIFs

External Boundary
Business Process where the scope includes perspective of stakeholders, engagement or data exchange

Important Interfaces

Business Process

Business Process

Important Reports

The Focus Boundary

The Focus boundary
Business Processes relevant for this boundary is identified. Do not consider how the business process is developed or delivered when considering boundaries.

Simple Function Points (SFP)

The immediate advantages:

- It is quick
- It is applicable earlier in the lifecycle
- It needs fewer details
- It is easy to learn
- It is a perfect "companion" for story points in agile processes

Difference between FPA and SFP

- Only two Base Functional Components: Elementary Processes and Logical Files
- No "primary intent" identification is needed
- No differentiation between internal and external logical files
- No internal "complexity" of BFCs
- No DET, FTR, RET identification
- A high statistical convertibility with the traditional FPA

Boundaries from a SFP perspective

LF

External Boundary

Reference

EP

EP

LF

Maintained

The Focus Boundary

External Boundary

Functionality required from External boundaries is sized with focus on that boundary.
From The focus boundary only inputs and LGs is sized.

The Focus boundary

The functionality required within the focus boundary. Logical Files - LF. Elementary Process– EP
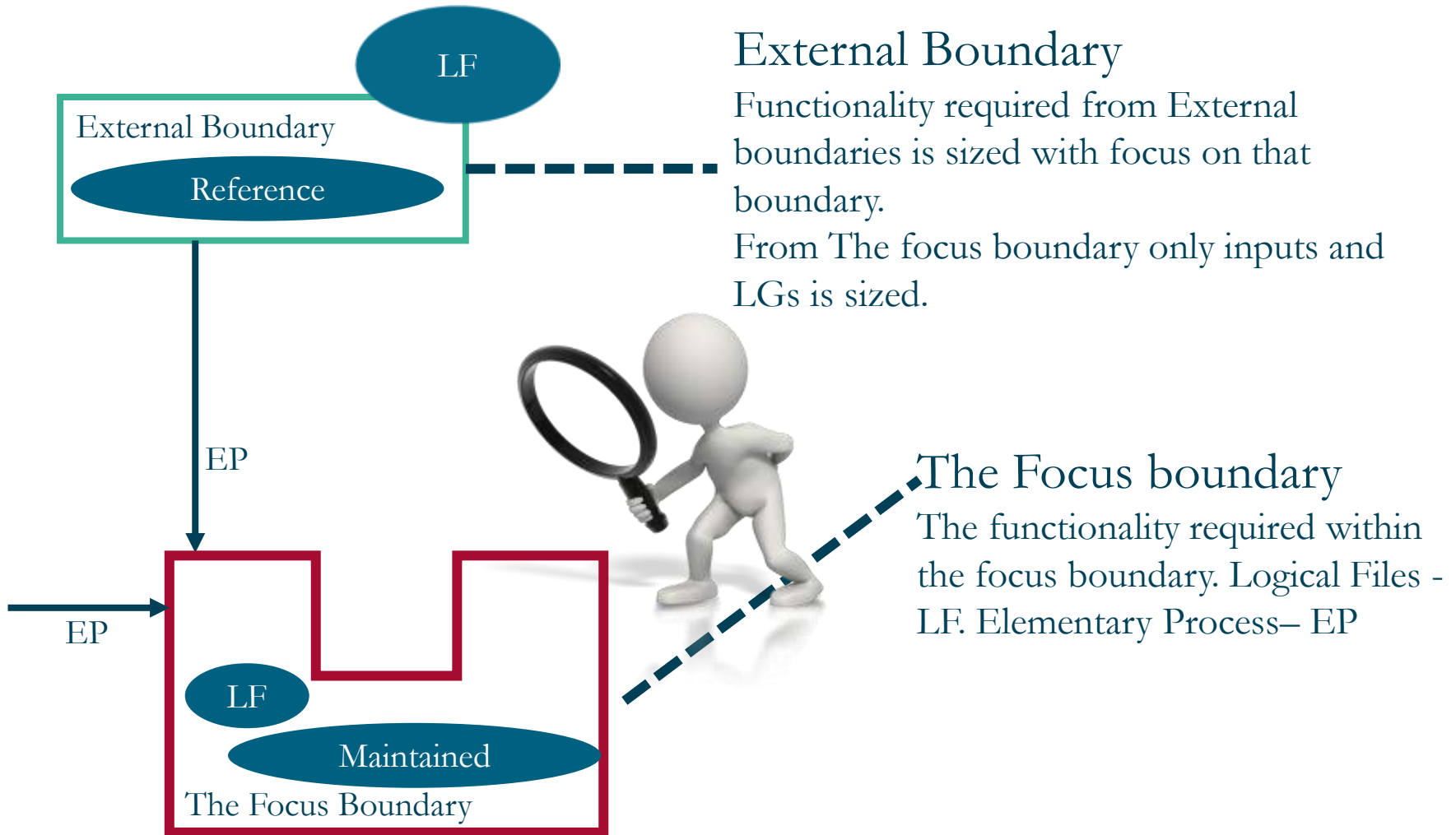
Simple Function Point Process
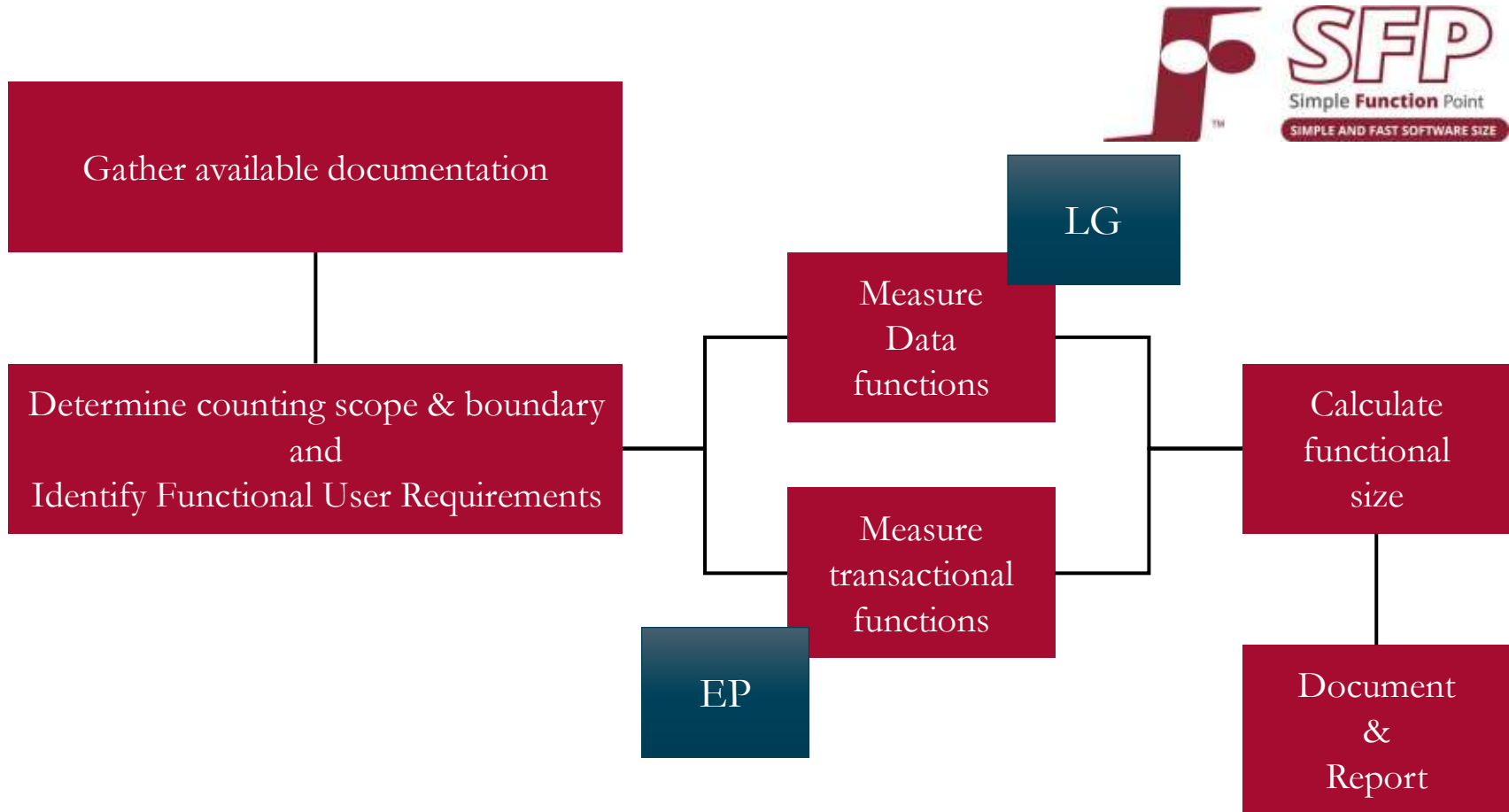
Function Point Analysis

The immediate advantages:

- It breaks down to user story level
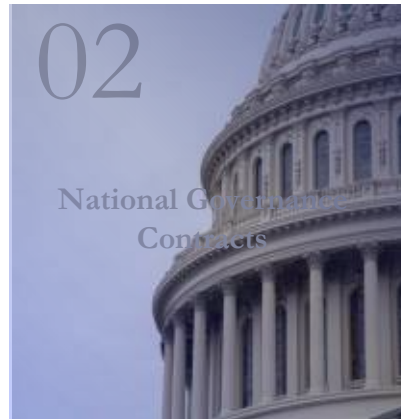- It is a detailed peer review
- It is a perfect "companion" for Accurate Estimation, Pricing and Benchmarking

01 European Union

02 National Government Contracts

03 Defense

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Boundaries from a FPA perspective
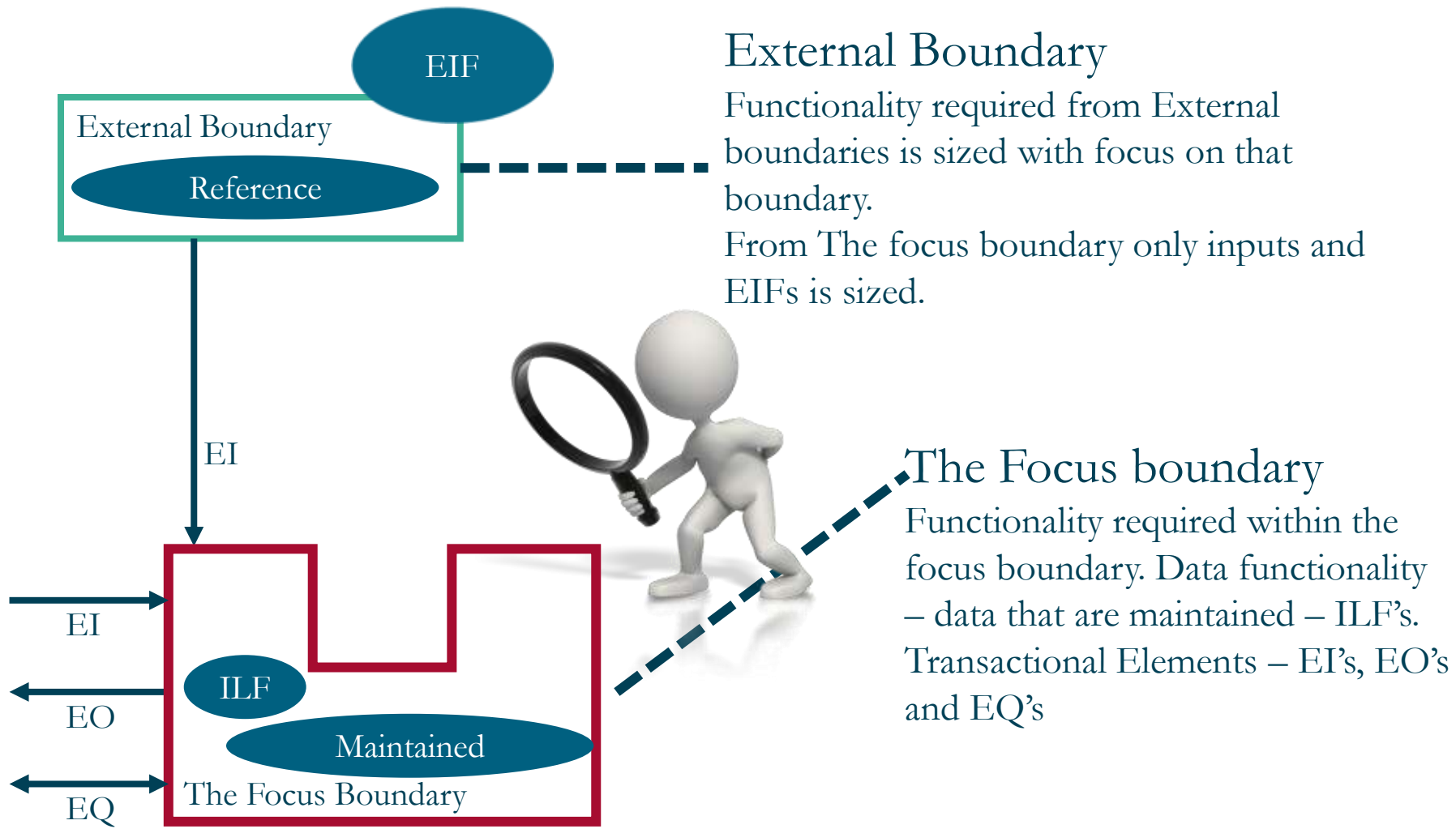
EIF

External Boundary

Reference

External Boundary

Functionality required from External boundaries is sized with focus on that boundary.

From The focus boundary only inputs and EIFs is sized.

EI

EI

ILF

EO

Maintained

EQ

The Focus Boundary

The Focus boundary

Functionality required within the focus boundary. Data functionality – data that are maintained – ILF's. Transactional Elements – EI's, EO's and EQ's

Function Point Analysis Process

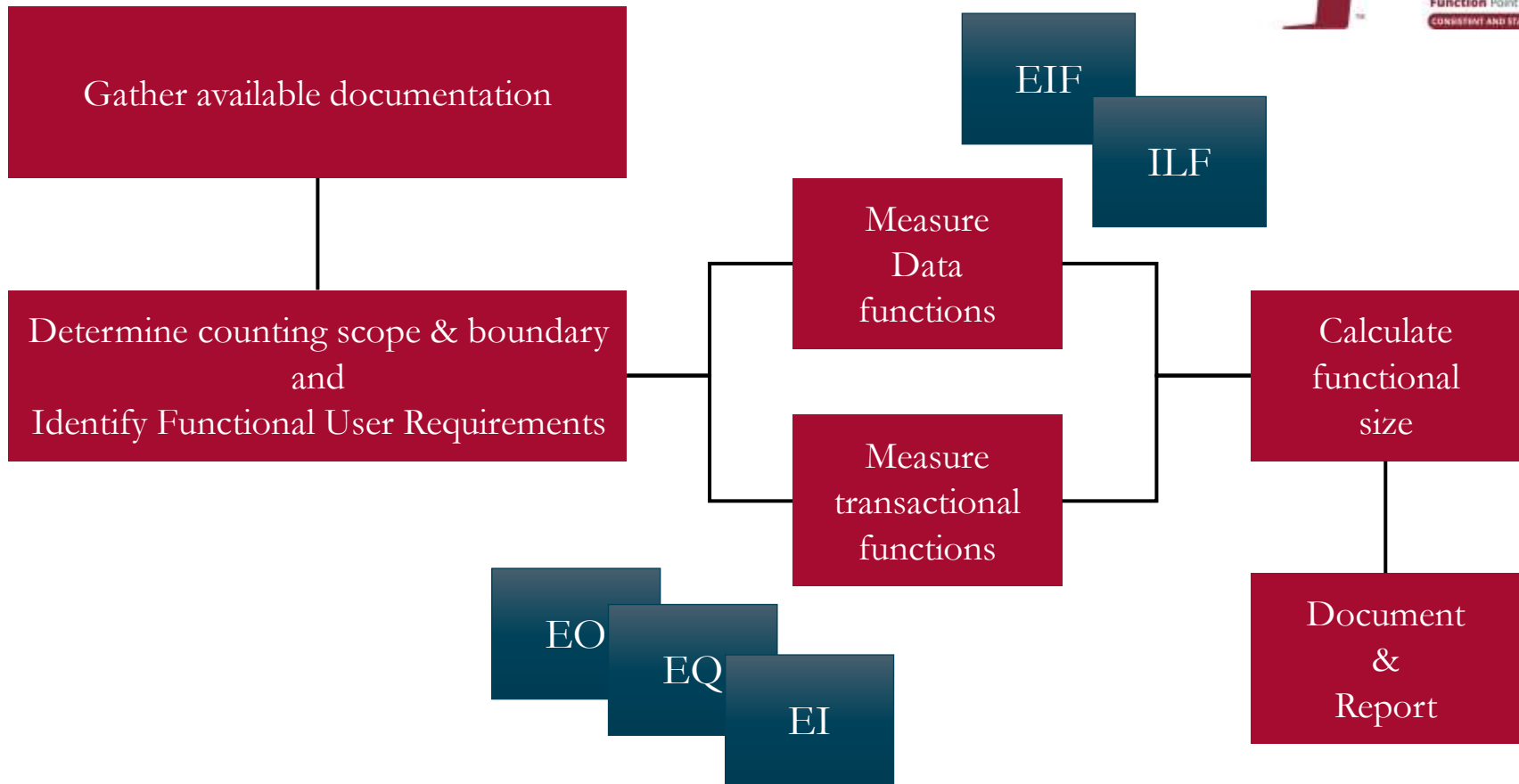# The Accuracy and Reliability of the Scope using FPA

Function Point Analysis Components

Robust ± 25-30%

Ratio ± 30-35%

Elementary Process

Logical Files

Limited ± 10-25%

Transactional Functions
EI (External Input)
EO (External Output)
EQ (External Inquiry)

Data Functions

ILF (Internal Logical File)
EIF (External Interface File)

Detailed ± 10%

Determine their complexity with:

DET
(Data Element Type)

FTR
(File Type Referenced)

DET
(Data Element Type)

RET
(Record Element Type)

Estimation

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The Cone of Uncertainty
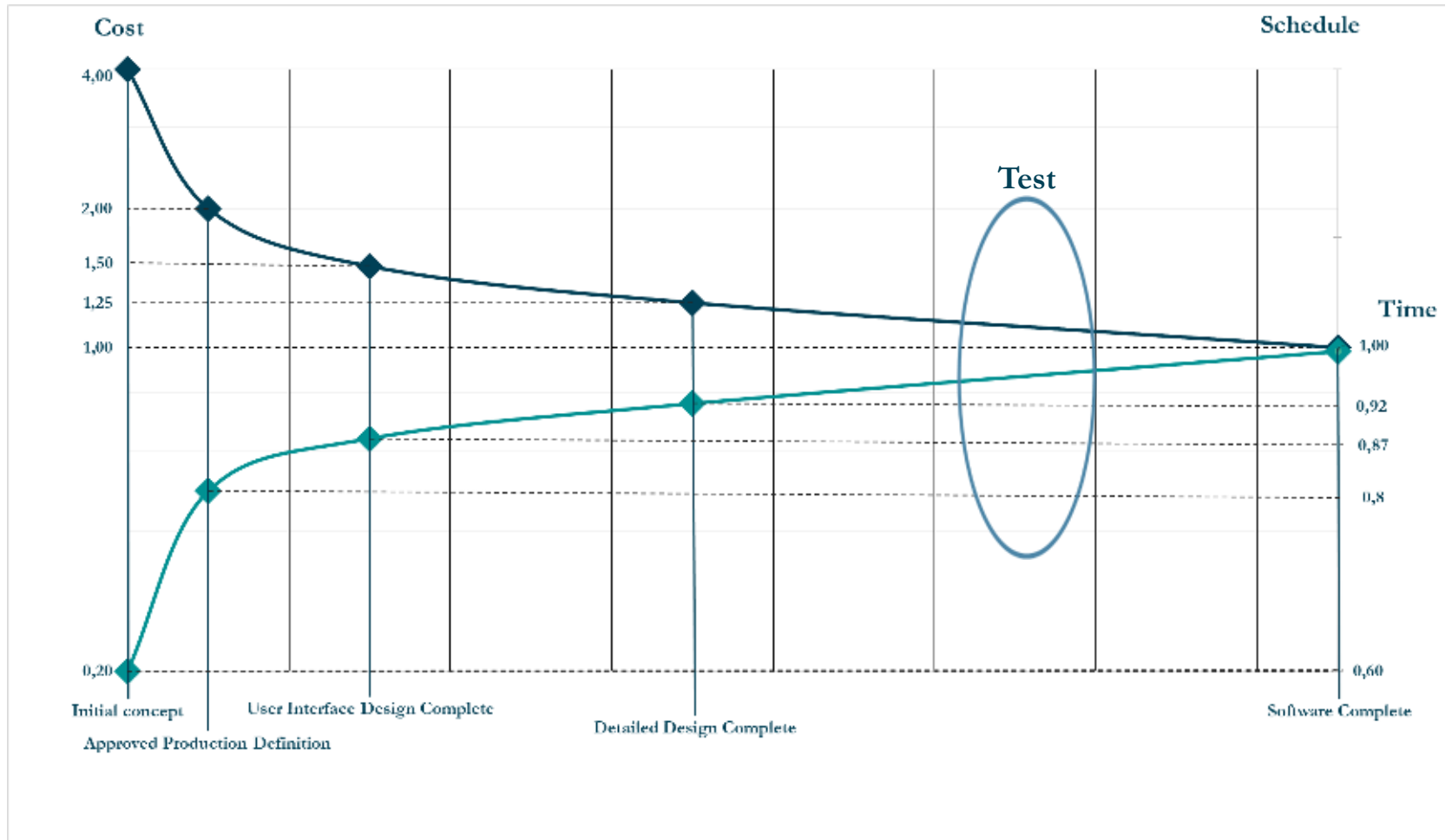
Iron Triangle Paradigm Shift

Risk declines as project progress

Plan driven approach creates cost/time estimates

Fixed Scope (Requirements)

Quality

Estimated Cost

Estimated Time

Subject to cost, time and quality risks

Waterfall

Change driven approach creates feature estimates

Fixed Cost

Fixed Time

Quality

Estimated Scope (Features)

Agile

33

Estimating Techniques

Parametric
-Benchmark
-Modeling
-Scenario Analysis
-Monte Carlo

Analogue
-We did this before
-Historical info

Bottom up
-Expert
-WBS
-Task based
-Risk based

Productivity
-Influencers
-Complexity

Scope
-Reuse

Characteristic
-Type
-Method/Model

Defects	Duration	Effort	Staff

Three Point Estimation

Phase	Optimistic	Most likely	Pessimistic	Expected (PERT)
				$E = (O + 4M + P) / 6$
Requirement 1	10	15	35	18
Requirement 2	15	20	66	27
Requirement 3	44	55	66	55
Requirement 4	40	60	80	60
Requirement 5	60	88	130	90
Requirement 6	10	15	20	15
Requirement 7	8	16	32	17
Requirement 8	20	30	40	30
Requirement 9	20	30	40	30

Feet & Three Point

Deviation	Feet		Accuracy	Low	Expected	High	Comment
SD = ((P - O) / 6)				L=E+E*-Accuracy	E = (O + 4M +P) / 6	H=E+E*Accuracy	
4		1000	35%	11	18	24	
9		100	10%	24	27	30	
4		500	25%	41	55	69	
7		1000	35%	39	60	81	
12	Constrain		10%	81	90	99	This requirement was very Complex and not very well defined. Added constrain to the estimate that it would be a maximum of 100 FP by end of Design phase. Additional FP will follow the
2	Assumption		20%	12	15	18	Made the assumption that there would be only one LG.
4		100	10%	16	17	19	
3		500	25%	23	30	38	
3		1000	35%	20	30	41	

QUESTIONS?

Christine Green

Owner of IP$_{by}$Green

www.ipbygreen.com
Skype: christine.green
LinkedIn: christinegreendk

IP$_{by}$Green

Mobile: +45 81 72 11 22
Email: info@ipbygreen.com