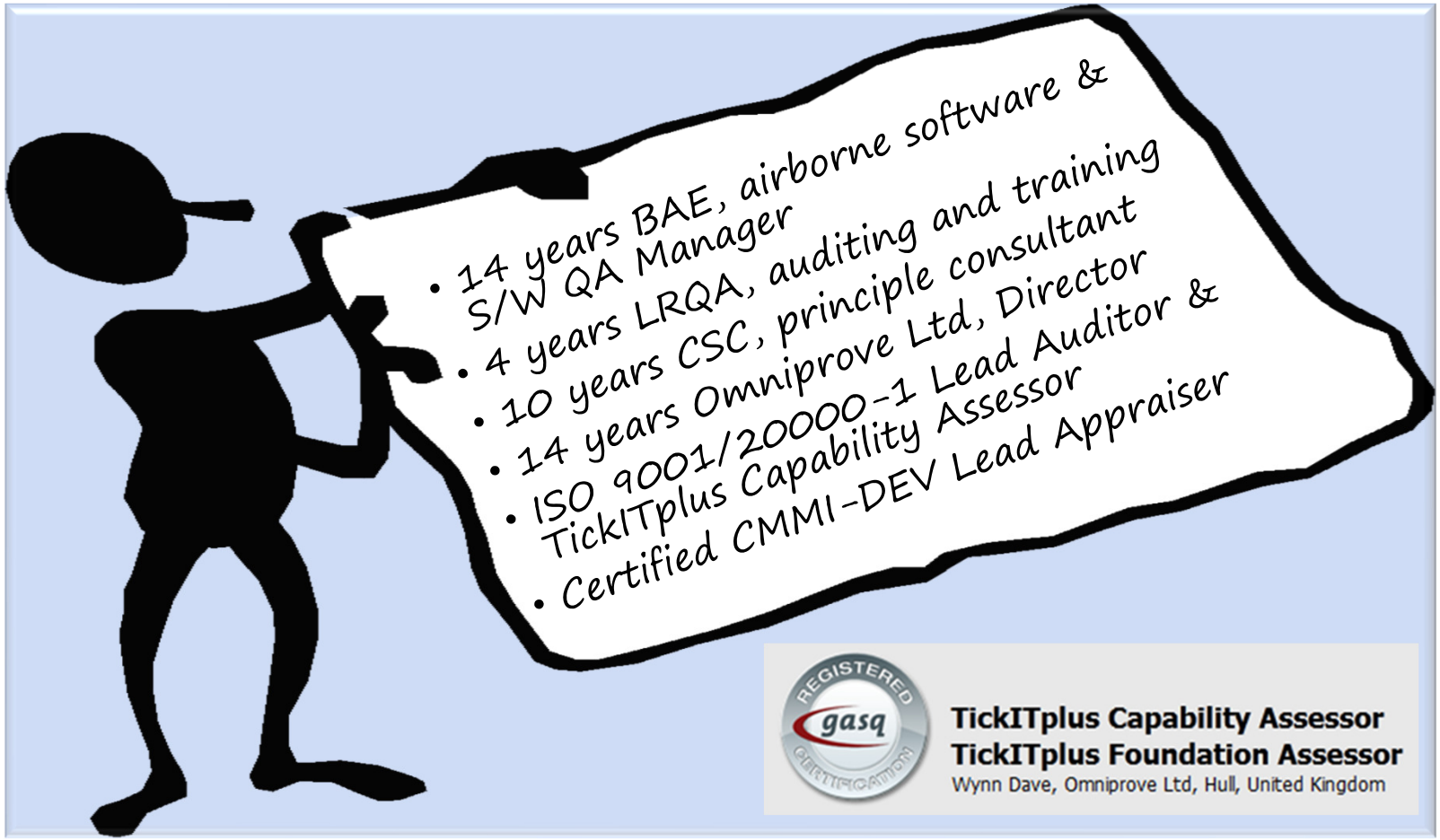
TickIT*plus* – “A Universal Model?”

Welcome

Dave Wynn

BCS Quality SQ, 31st May 2024

Dave Wynn


• 14 years BAE, airborne software & S/W QA Manager
• 4 years LRQA, auditing and training
• 10 years CSC, principle consultant
• 14 years Omniprove Ltd, Director
• ISO 9001/20000-1 Lead Auditor & TickITplus Capability Assessor
• Certified CMMI-DEV Lead Appraiser
REGISTERED
gasq
CERTIFICATION
TickITplus Capability Assessor
TickITplus Foundation Assessor
Wynn Dave, Omniprove Ltd, Hull, United Kingdom

D1

Notable IT and Software related failures
…to name just a few

Therac-25: Mid 80's
Injuries & deaths
Poor requirements analysis

US Voters Data Breach: 2017
198 million users affected
Unpatched server

at&t Long distance phone failure: 1990
Down 8h lost $100 with reputational damage
1 line of code

Data Breach: 2014 onwards
>1500m users affected
Single Spear Phishing Click

Northeast US Blackout: 2003
55m people affected for up to weeks without power
Bug in alarm system

RAF Chinook crash: 1994
29 killed
S/W bug in engine control system

Toyota ECM; 2005 onwards
Deaths, injuries, litigation, compensation >$600m
Poor firmware, bad coding standards

Ariane 5: 1996
$500 million loss, reputational damage
Poor design considerations

F22 Raptor: 2007
$62 billion programme, multiple system failures
Few lines of erroneous code, 48 hour fix

UK PO Horizonal Scandal: 2005 onwards
736 people convicted, jobs lost, families ruined, prison, suicide, huge compensation
Enquiry ongoing, allegedly potential governance problems

Slide 3

D1 Would be better to look for more recent dissatsters related to different causes such as poor design, development, security, safety, data protection, etc.

Dave, 04/05/2024

What next….

AI technology……

“…. has told some users searching for how to make cheese stick to pizza better that they could use non-toxic glue”.

“…. has also said geologists recommend humans eat one rock per day”.

Human Genome

3,300,000,000,000

Equivalent ‘Lines’ of Code

The Process Management Premise
(Based on TQM principles)

"The quality of a product is highly influenced by the quality of the process used to develop and maintain it."

The value of good processes….

43 Quintillion different states
that's
4.3252×10^{19}
or
43,252,000,000,000,000,000

How many ways are there to solve a Rubik's cube?

The value of good processes….

3

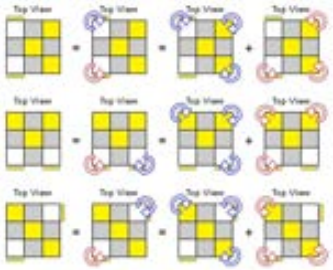
The value of good processes….

1. 

Randomly

2. 

Dubiously

3. 

Successfully

In a minimum of 26 moves

….but what is Quality?

As a 19 year old with my first car, I was well satisfied

“It were right good quality…..”

Quality is delivering customer satisfaction!

I could afford it

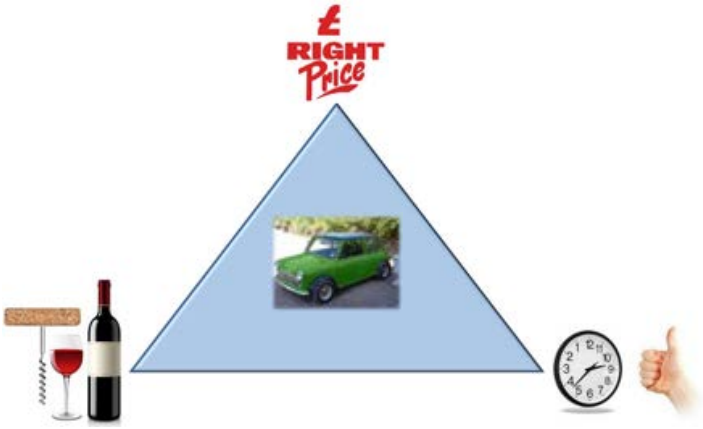
£ RIGHT Price

It did what I wanted it to do

And I got it when I needed it

A quality management system?

Quality Systems



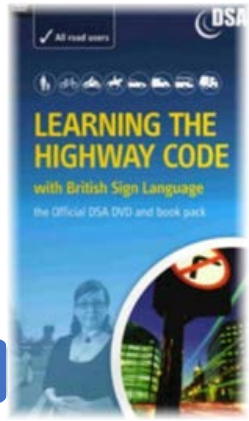
= Delivery Systems
or
Management Systems
or better sill….
Business Systems

What is a system?

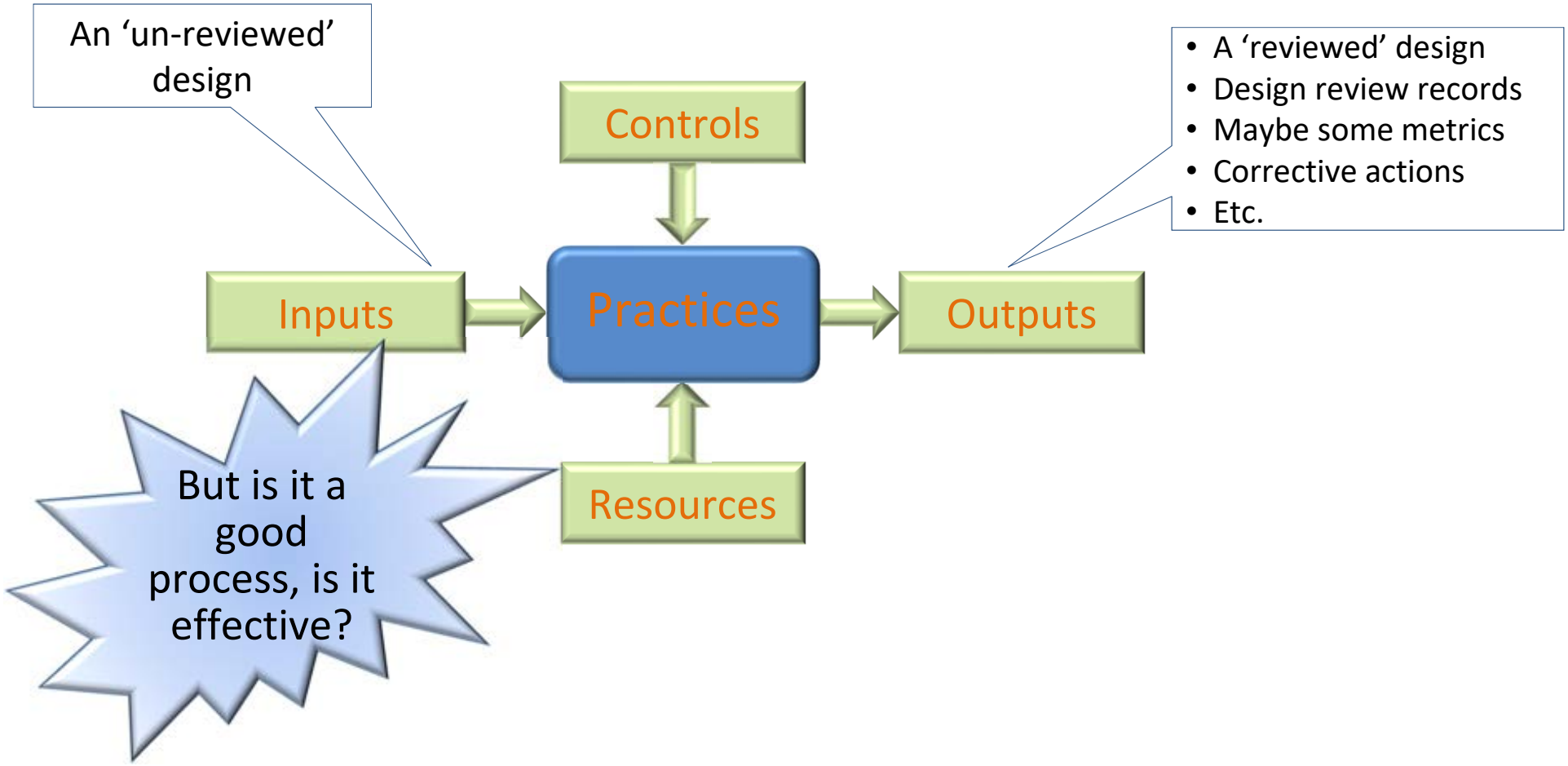
Tools, Facilities, Equipment

People

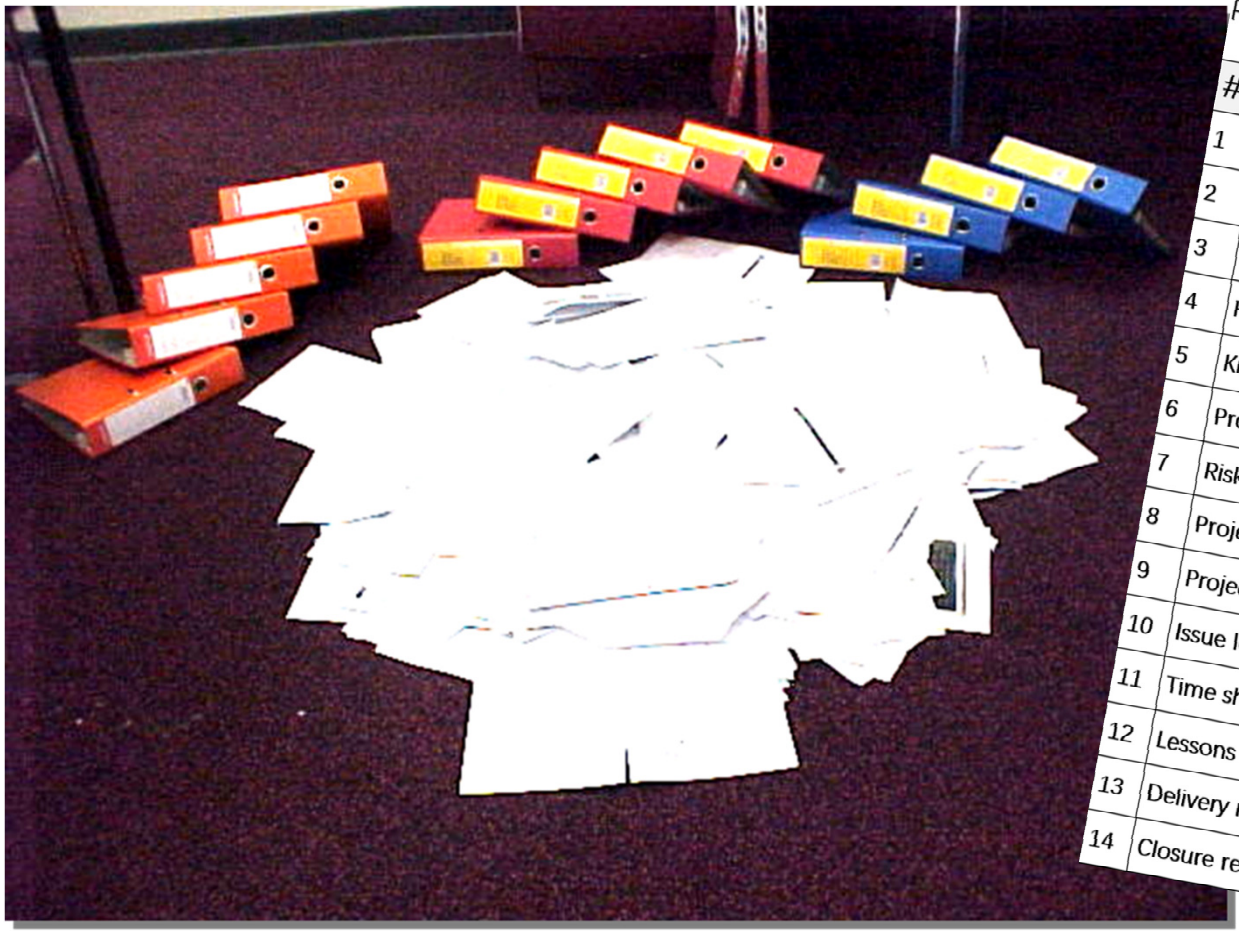
Process



The process model
Design Review



Is this a process?



Project Management Process Checklist

#	Question	Confirm
1	Project management procedure?	✓
2	Project scope?	✓
3	Project Management Plan	✓
4	Project schedule?	✓
5	Kick-off meeting records?	✓
6	Project status reports?	✓
7	Risk Log?	✓
8	Project change record	✓
9	Project change log	✓
10	Issue log	✓
11	Time sheets	✓
12	Lessons learnt log	✓
13	Delivery report	✓
14	Closure record	✓

Is this a pocket watch?[D3]

All the bits are there!

Face
Case
Top plate
Crown wheel
Mainspring barrel
Centre wheel
Balance
Spring
Pallet fork
Winder
……

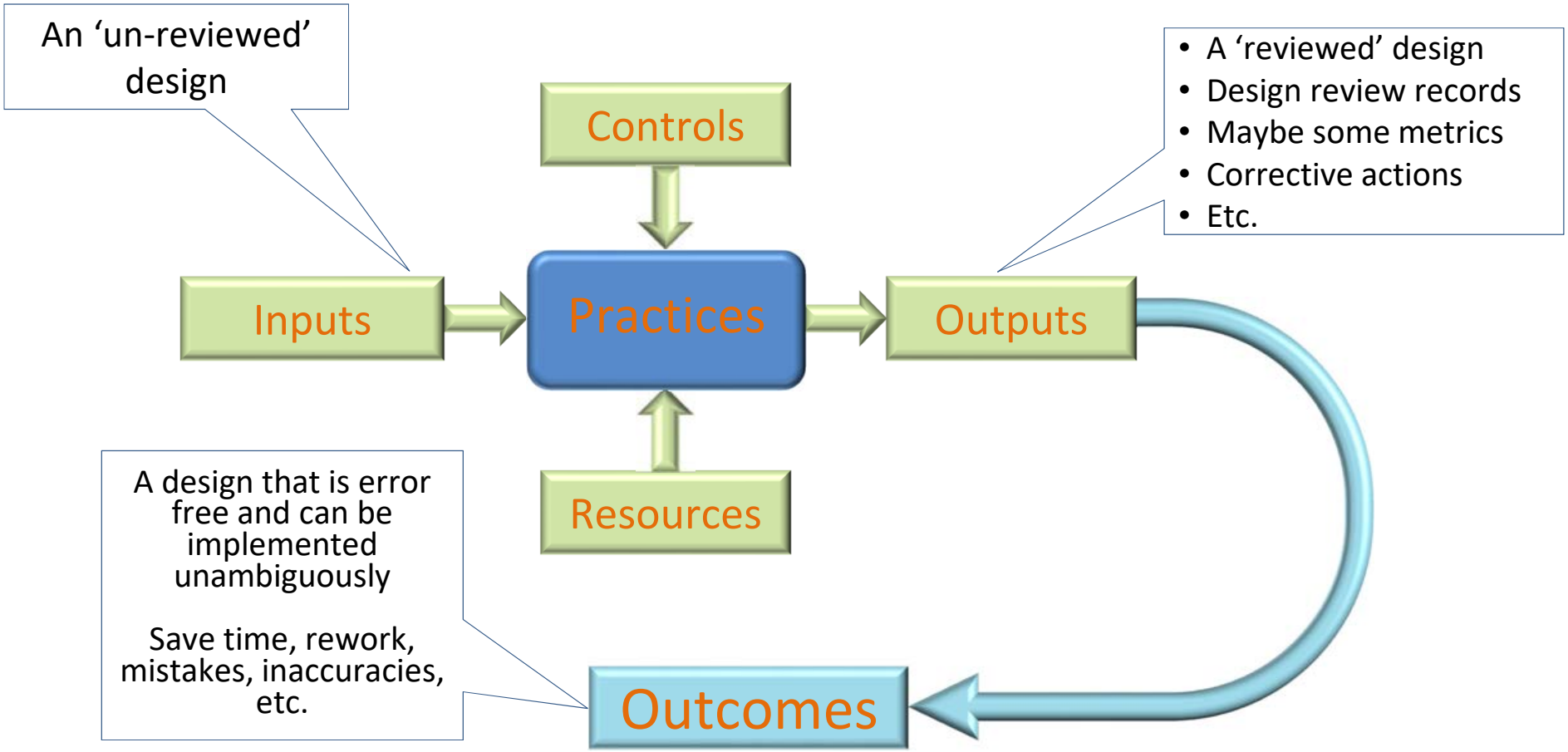
But what time is it?

Slide 16

D3 Annimate a question, well all the parts are there, but what time is it?

Dave, 04/05/2024

Processes need to achieve something
Design Review



Defining processes

1

2

3

Had to stop them….

Average time 13 mins

Average time 17 mins

How much documentation to we need?

Skilled
Experienced
Familiar

People

Unskilled
Inexperienced
Unfamiliar

Guidance

Reference

Periodic Supervision
or Checking

Performance Based
Monitoring

Policy
Process
Training
Measures

Regular Supervision
and Checking

Periodic Supervision
Regular Checking

Instructions

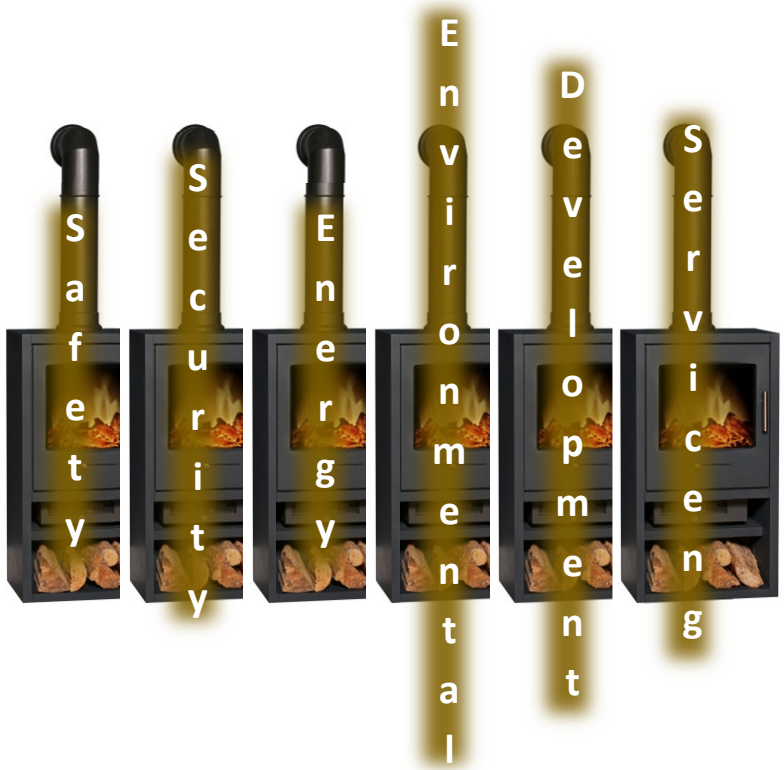
Manuals

None
Manual

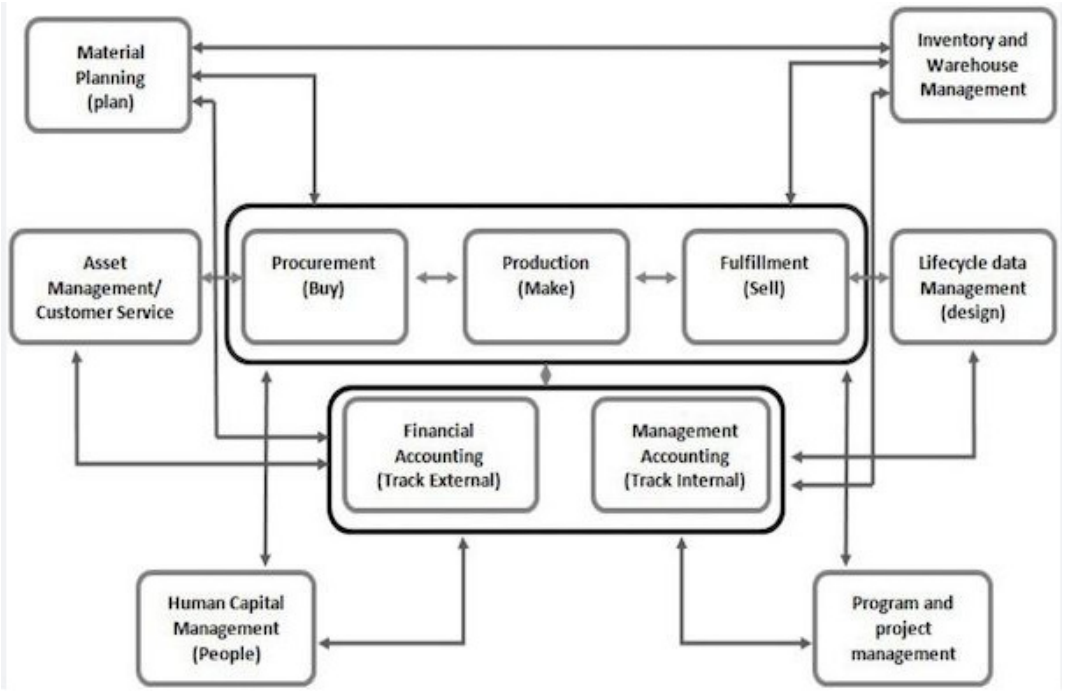
Tools

Automated
AI

Business Structure



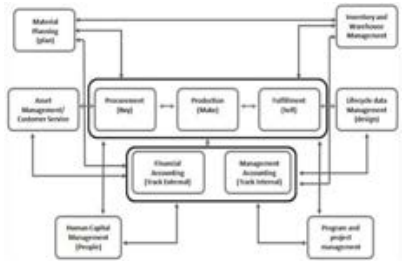
?

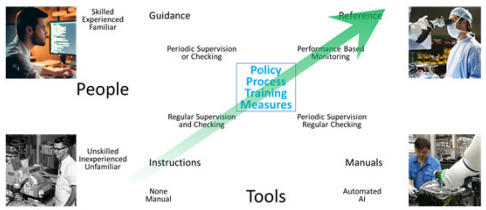


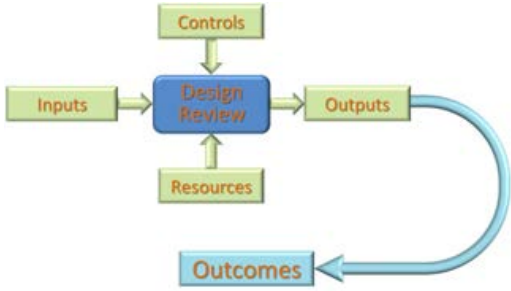
Stovepipes or Highly Integrated

Where to go?

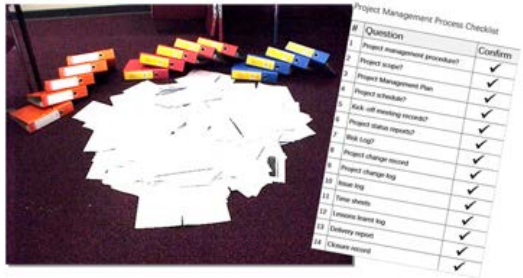

Tools, Facilities, Equipment
People
Process



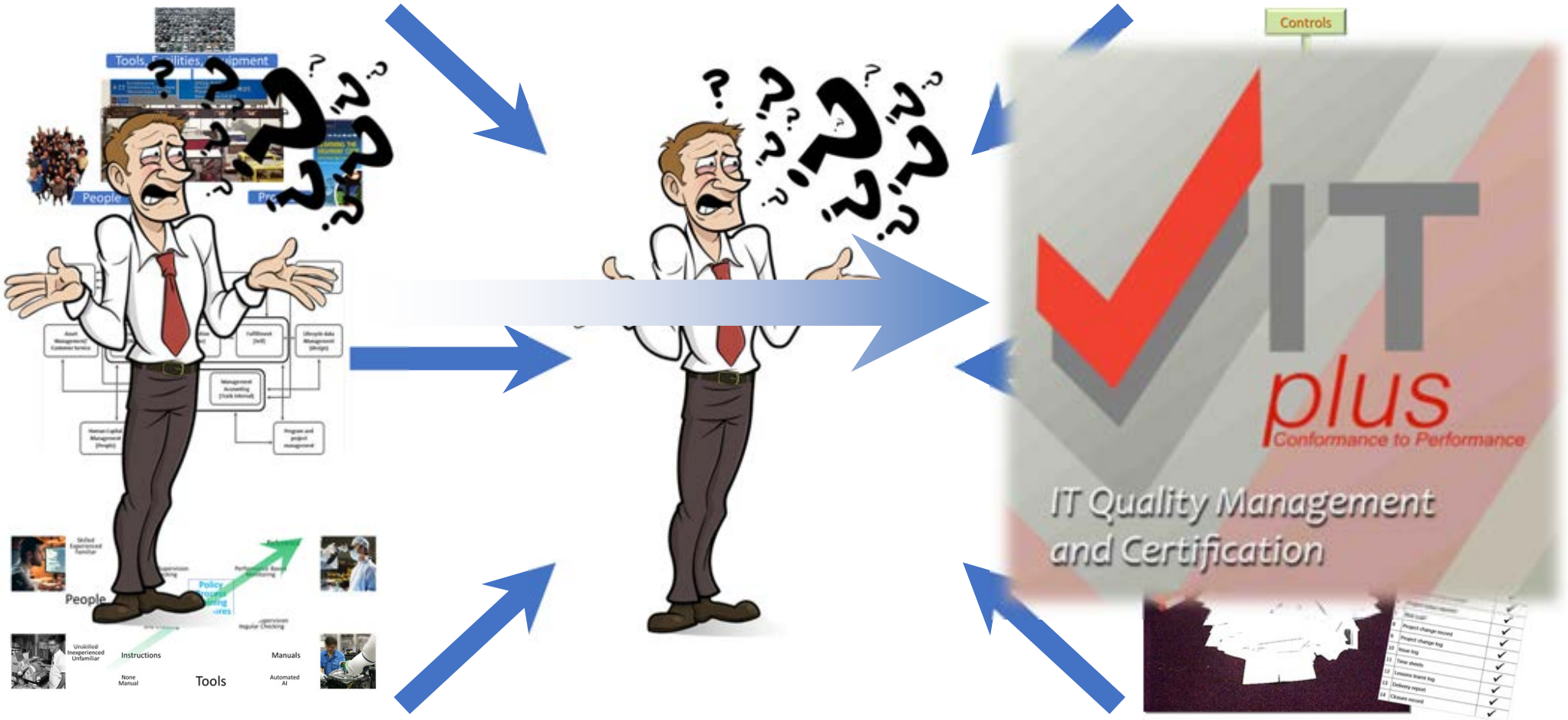

Skilled
Experienced
Familiar
Guidance
Reference
Periodic Supervision or Checking
Performance Based Monitoring
People
Policy
Process
Training
Measures
Regular Supervision and Checking
Periodic Supervision
Regular Checking
Unskilled
Inexperienced
Unfamiliar
Instructions
Manuals
None
Manual
Tools
Automated
AI


Controls
Inputs
Design Review
Outputs
Resources
Outcomes


Therac-25
Mid 80's
at&t
Long distance
phone failure1990
Northeast US
Blackout 2003
Ariane 5
1996
F22 Raptor
2007
Toyota ECM
2005 onwards



TickIT*plus* can help



D5
D6

What is TickIT*plus*

Scope profiles

Competent IT & software SME

Defined scheme

Repeatable results

Requirement & Reference Standards

Capability levels

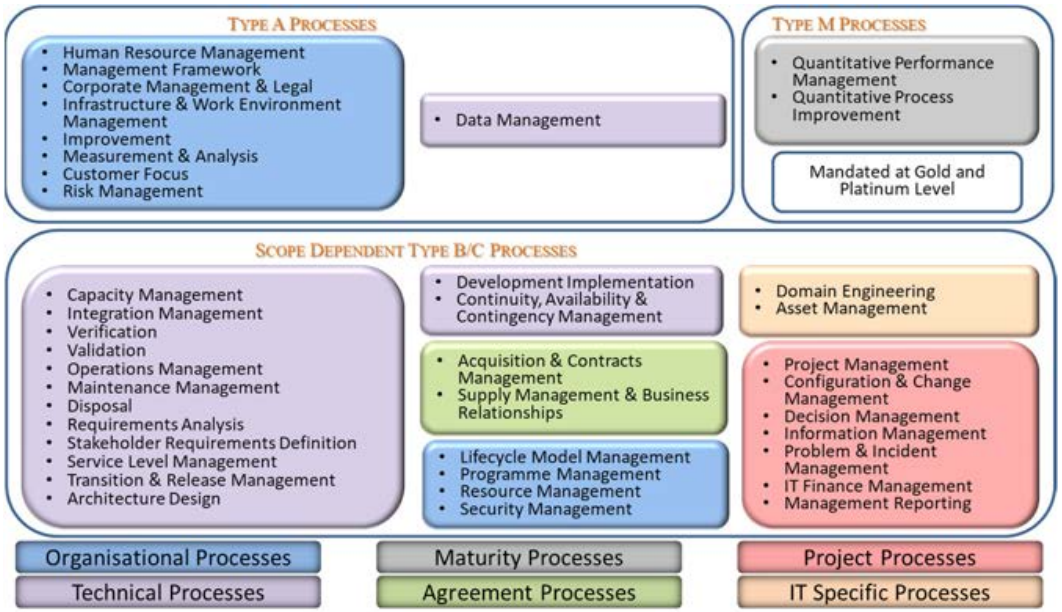
Slide 23

D5 What is T+
Dave, 04/05/2024

D6 Explain the strucutre
Dave, 04/05/2024

The Base Process Library

40 Software Engineering & IT Related Processes



The Processes

Type A	Type B/C	Type C	Type M
Mandatory in all cases Mainly covering ISO 9001 Clauses 4,5,6,7 & 9	Scope Profile Dependent Mainly covering ISO 9001 Clause 8, but expanding on other clauses	Optional	Mandatory at Gold & Platinum

PRJ.7 Management Reporting
TEC.2 Capacity Management
TEC.3 Integration Management
TEC.4 Verification
TEC.5 Validation
TEC.6 Transition & Release Management
TEC.7 Operations Management
TEC.8 Maintenance Management
TEC.9 Disposal
TEC.10 Stakeholder Requirements Definition
TEC.11 Requirements Analysis
TEC.12 Service Level Management
TEC.13 Architectural Design
TEC.14 Development Implementation
TEC.15 Continuity, Availability and Contingency Management
ITS.1 Asset Management
AGR.1 Acquisition and Contract Management
AGR.2 Supply Management and Business Relationships

ORG: Organisational
PRJ: Project
ITS: IT Specific
AGR: Agreement

Scope Profiles

	Legal and Compliance	Dealing with the delivery of products or services within a legal and compliance framework; covering business analysis, corporate responsibility, risk and compliance audit
	Service Management	Operations in a service management environment; delivering IT based services to clients – either outsourced or internal
	Systems & Software Development & Support	All aspects of systems and software development, both traditional and new methodologies. Long term support and maintenance.
	Project & Programme Management	Multidiscipline programme and project delivery as a specialist area: analysis, reporting, risk and general project management.
	Corporate Strategy Planning & Management	Taking an organisational wide view of IT operations, long term planning, high level management.
	Information Management & Security	Delivery of information and systems to meet both data and security requirements.
	Product Validation, Quality & Measurement	Independent testing and validation of product and services. Ensuring quantitative quality and measurements are applied to product development and delivery.
	IT Systems Engineering & Infrastructure	Operations involving network and data handling systems, server farms, data centres and supporting infrastructure.

Mapping between Scope Profiles and Processes

Legal and Compliance

Service Management

Systems & Software Development & Support

Project & Programme Management

Corporate Strategy Planning & Management

Information Management & Security

Product Validation, Quality & Measurement

IT Systems Engineering & Infrastructure

ORG.9 Programme Management
ORG.10 Lifecycle Model Management
ORG.11 Resource Management
ORG.12 Security Management
PRJ.1 Project Management
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Type B/C

Mapping between Scope Profiles and Processes
Legal and Cmpliance

Legal and Compliance

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Type B/C

Mapping between Scope Profiles and Processes
Service Management

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Mapping between Scope Profiles and Processes
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Type B/C

Mapping between Scope Profiles and Processes
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Project & Programme Management

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Type B/C

Mapping between Scope Profiles and Processes
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Type B/C

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Type B/C

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Product Validation, Quality & Measurement

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Type B/C

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IT Systems Eningeerng & Infrastructure

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Type B/C

BPL Process Structure
ISO 9001

Process ID	PRJ.2	Process Name	Decision Management	Category	Project Processes	Type	B/C
Process Purpose	To ensure that key business decisions are managed.					Version	v4r0

Process Outcome	Process Base Practices	Input Work Products	Output Work Products	ISO 9001 2015	ISO/IEC 20000-1 2018	ISO/IEC 27001 2013	ISO/IEC 27001 2022	BS 10754-1 2018	ISO 26262 2011
OU.1 Key business decisions are managed effectively and subsequent issues do not arise.	**BP.1 Establish Decision Management Policy** A policy for making, managing and recording key business decisions is established, approved and communicated. The policy takes into account the nature of work undertaken by the organization, provides the definition of a key business decision and defines the records to be maintained. The policy is maintained under the management framework.	• Business Plan • Management Framework	• Decision Management Policy	4.4.1c 7.5					
	BP.2 Manage Key Business Decisions Planning for making decisions includes recording the need for a decision, criteria for identifying the required outcome, the activities to be undertaken, involving stakeholders and maintaining records.	• Decision Management Policy	• Decision Plan	4.4.1 6.1.1 7.1.1 7.1.6 8.7.1 10.1 10.2.1b					
	BP.3 Consider Alternative Options Alternative options are identified, recorded and evaluated. The alternative options provide positive and negative impacts on the required outcome and include a mechanism for allowing the options to be compared.	• Decision Plan	• Alternative Options	4.4.1 6.1.1 6.1.2 7.1.1 7.1.6 8.7.1 10.1 10.2.1b					

BPL Process Structure
Multiple standards

Process ID	ORG.7	Process Name	Customer Focus	Category	Organizational Processes	Type	A
Process Purpose	To establish and manage a positive relationship with the customer by understanding their business needs, objectives and expectations.					Version	v4r0

Process Outcome	Process Base Practices	Input Work Products	Output Work Products	ISO 9001 2015	ISO/IEC 20000-1 2018	ISO/IEC 27001 2013	ISO/IEC 27001 2022	BS 10754-1 2018	ISO 26262 2011
OU.1 The organization has a complete understanding of the relationship with its customers and is in a position to address all negative feedback successfully.	**BP.1 Establish Business Relationship Framework** The organization identifies and documents its customers and other stakeholders, along with the processes, roles and responsibilities for managing the relationships.	• [Identified Stakeholders]	• Customer Relationship Management Plan	4.2 5.1.2 8.2.1	7.4 8.3.2	4.2	4.2		
	BP.2 Establish Customer Focused Procedures Procedures for managing customer relationships are defined, including agreeing requirements, review, customer feedback, risks, complaints and escalations. The procedures are maintained under the management framework.	• Customer Relationship Management Plan • Management Framework	• Customer Feedback Procedures	4.4.2 7.4 7.5	4.4	4.4	4.4		
	BP.3 Collect and Analyse Customer Feedback Agreed requirements are implemented and stakeholder feedback is collected and understood with the aim of driving improvements. Customer complaints are addressed within agreed timescales. Risks associated with customer feedback are understood and managed.	• Customer Feedback Procedures	• Customer Feedback • Customer Relationship Report • Risks	5.1.2 8.2.1c 8.5.5d 8.5.5e 10.2	7.4 8.3.2	9.1	9.1		
	BP.4 Review Relationship Regular communication takes place between the organization, customer and other stakeholders to review the extent to which the needs, objectives and expectations of the customer are met. Action is taken to address any identified issues or improvement opportunities.	• Customer Relationship Management Plan	• Corrective Action Request • Improvement Request • Review Records	4.4.1h 5.1.1i 5.1.2 7.4 9.3 10	7.4 8.3.2	9.3 10	9.3 10		

Multiple Standards and Additional Outcomes
ISO 9001 & BS 10754 & ISO 26262

Process ID	TEC.11	Process Name	Requirements Analysis	Category	Technical Processes	Type	B/C
Process Purpose	To transform stakeholder requirements into system requirements.					Version	v4r2

Process Outcome	Process Base Practices	Input Work Products	Output Work Products	ISO 9001 2015	ISO/IEC 20000-1 2018	ISO/IEC 27001 2013	ISO/IEC 27001 2022	BS 10754-1 2018	ISO 26262 2011
OU.1 The organization has a set of established system requirements that require no unexpected rework.	**BP.1 Develop Syste** The customer needs are analysed and inte requirements. The organization con strategy in light of sta System and safety re maintained under co								
	BP.2 Estimate Syst An estimate of the siz reviewed and docum The size estimate is budgetary, schedule reviewed and approv								
	BP.3 Manage Syste System requirements aid estimation, facilita development. Each system requirer source referenced ar development, integra The system requirem configuration control,								
	BP.4 Manage Changes to System Requirements Changes to the system requirements are formally controlled through the change control process. Changes to the system requirements are reviewed by stakeholders for their impact on cost, schedule and customer needs. The results of the review are communicated to stakeholders, and records maintained.	• Change Request • System Requirements	• Change Record • System Requirements	8.2.4 8.3.6 8.5.6				6.4.4.3	
OU.2 All the requirements for identifying the trustworthy characteristics of the product are established.	**BP.5 Establish the Basis for Providing Confirmation of Assurance** The project has a risk managed approach for the consideration of the factors that influence the trustworthiness of the products and services. These include as a minimum the needs for assurance, privacy and the special factors relating to cryptography. The results of the consideration are documented in an assurance case.	• Risks • Stakeholder Requirements	• Assurance Case					6.4.4.5	
OU.3 The organization has a set of established safety requirements that require no unexpected rework	**BP.6 Tailor Safety Lifestyle** Safety related objectives are understood and clear distinction is made between new development and tailored re-use. A safety plan is produced which includes system level safety activities and associated work products are re-worked to reflect results from analysis. Safety requirements are decomposed and appropriate Automotive Safety Integrity Levels (ASIL) are assigned. Supporting information is considered to enable an impact analysis to be undertaken and additional safety related work products identified.	• Safety Plan • Stakeholder Requirements	• Impact Analysis • Safety Plan						3-6.4.1.1 3-6.4.2 4-5.4.4 6-5.4.2 8-8.3.1 8-10.3.1 9-5.4 9-6.4 9-8.3.1

Requirement & Reference Standards
Already mapped

ISO 9001:2015
Quality Management

ISO/IEC 20000-1:2018
IT Service Management

ISO/IEC 27001:2013
ISO/IEC 27001:2022
Information Security Management

BS 10754:2018
IT Systems Trustworthiness

ISO 26262:2011
Road Vehicles Functional Safety

ISO/IEC/IEEE 12207:2017
Systems and Software Engineering
Software Life Cycle Processes

ISO/IEC/IEEE 15288:2015
Systems and Software Engineering
System Life Cycle Processes

Requirement & Reference Standards

In work, planned or being considered

AQAP-2210:2022
NATO S/W QA Requirements to AQAP-2110 OR AQAP-2310

AS9115:2010
Requirements for Aviation, Space and Defense Organizations – Deliverable Software

ISO 9001:2015
Quality Management

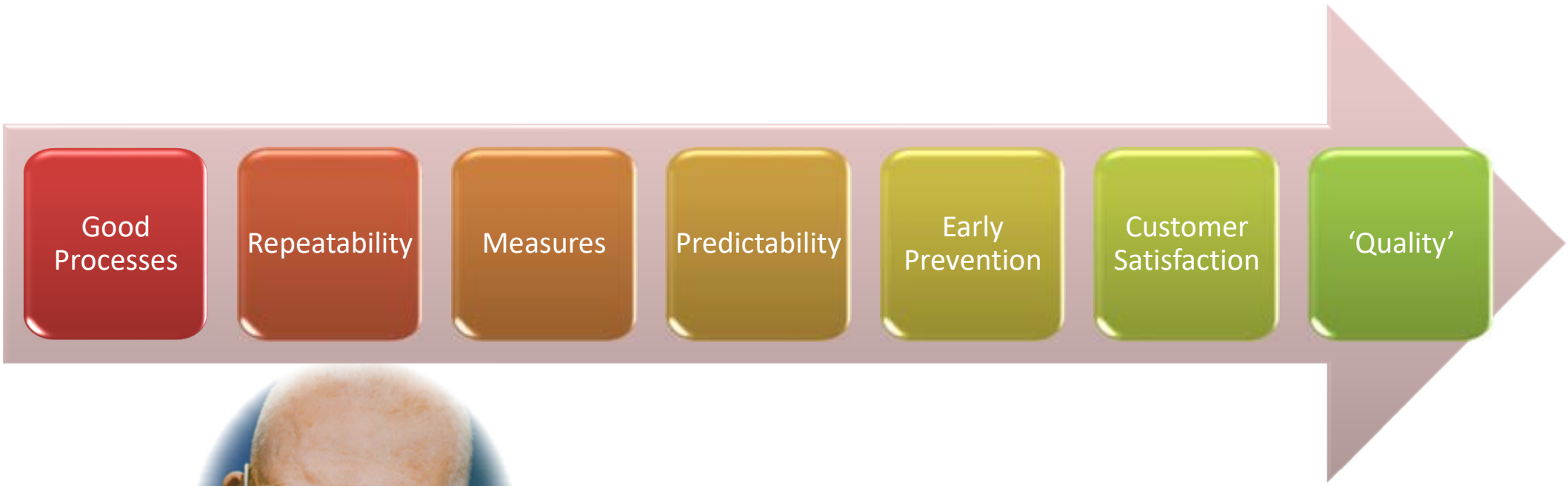
ISO 61508
Functional Safety of Electrical/Electronic/Programmable Electronic Safety-related Systems

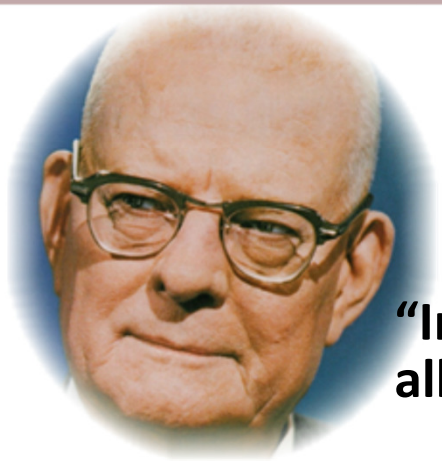
IEC 62304
Medical Devices

Benefits from adopting TickIT*plus*

- Establishing and improving auditor competence
- Providing specific ISO 9001 certification in the IT sector
- Focusing on a true process-based model
- Covering multiple IT related standards
- Enabling organisational improvement using capability levels
- Providing a practical route to other capability models
- Encouraging organisational participation in Assessments
- Offering better consistency in the Assessment approach
- Benefiting from clearly defined process outcomes
- Promoting real business improvement

The bottom line





**"In God we trust;
all others must bring data"**

- W. Edwards Deming

Further information

Further information can be obtained from the TickITplus website:

www.tickitplus.org

Specifically:

Kickstart Guide
Core Scheme Requirements
Base Process Library
Requirements for Assessor and Practitioner

Any Questions

TickIT*plus* – “A Universal Model?”

Welcome