CSC2012 Professional Software Development 2
Lecture 02

Configuration Management

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Configuration Management

- Configuration management (CM) is a process for establishing and maintaining consistency of a product's performance, functional, and physical attributes with its requirements, design, and operational information throughout its life.
- The CM process is widely used by military engineering organizations to changes throughout the system lifecycle of complex systems, such as systems, military vehicles, and information systems.

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Software Configuration Management

- Outside the military, the CM process is also used with IT service management as defined by ITIL, and with other domain models in the civil engineering and other industrial engineering segments such as roads, bridges, canals, dams, and buildings.
- The software configuration management (SCM) process is looked upon by practitioners as the best solution to handling changes in software projects.
- It identifies the functional and physical attributes of software at various points in time, and performs systematic control of changes to the identified attributes for the

purpose of maintaining software integrity and traceability throughout the software development life cycle.

Software Configuration Management Process

- The SCM process further defines the need to trace changes, and the ability to verify that the final delivered software has all of the planned enhancements that are supposed to be included in the release. It identifies four procedures that must be defined for each software project to ensure that a sound SCM process is implemented. They are:
- Configuration identification
- Configuration control

- Configuration status accounting
- Configuration audits

What is a Service?

- A means of delivering value to customers by facilitating outcomes customers want to achieve, but without the ownership of specific costs and risks.
- Is software a service?
- Yes / No?
- How this question change over time?

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oject Management framework can we apply?

- PMP / PRINCE2 / ITIL?

Configuration Management in ITILv3

- The Process responsible for maintaining information about Configuration Items required to deliver an IT Service, including their Relationships.
- This information is managed throughout the Lifecycle of the CI.
- Configuration Management is part of an overall Service Asset and Configuration Management Process.

Asset and Configuration Item

- An “Asset” is something that has intrinsic value to a person or an enterprise.
- A “Configuration Item” is an entity or thing that tracking (monitoring) is required by you for the delivery of a service.

- An Asset is often a Configuration Item but Configuration Items are not necessarily Assets.

www.rightstar.com/

Asset and Configuration Item

- Make “Server” as an example

- Asset
    - Model, CPU, RAM, OS, etc.
- CI
- Technical: Technical attributes that are similar to Asset attributes.
- Ownership: Responsible Person, Purchase Date, Warranty Info, Location.
- Relationship: Details about how this CI contributes to the delivery of a service which ultimately brings value to the business.

www.rightstar.com/

CMDB

- A configuration management database (CMDB) is a file or written form.
- Nowadays, usually in the form of a standardized database
- It contains all relevant information about the hardware and software components used in an organization's IT (information technology) services and the relationships between those components.
- A CMDB provides an organized view of configuration data and a means of examining that data from any desired perspective.

www.techtarget.com/searchdatacenter/definition/configuration-management-database

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CMDB in ITIL

- Configuration items (CIs) are the focal point of a CMDB. Without a clear definition of what qualifies as a CI, you will constantly struggle with deciding whether to put certain kinds of data into the CMDB.
- Simply put, a CI is an instance of an entity that is part of your environment and has configurable attributes specific to that instance.
- These entities can be physical (such as a computer system), logical (such as an installed instance of a software program), or conceptual (such as a business service).
- But they must be a direct part of your environment, rather than information about such a part.

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Examples of CIs and non-CIs

- Configuration items
- A business service is part of your environment and has configurable attributes, such as criticality to the business and cost of interruption of service.
- A computer system is part of your environment and has configurable attributes, such as serial number, processor speed, and IP address.
- A building is part of your environment and has configurable attributes, such as number of rooms, climate control system, and alarm system.
- An employee is part of your environment and has configurable attributes, such as skills, hours, and department.
- A software instance installed on a computer system is part of your environment and has configurable attributes, such as license key, patch level, and licenses available.

Examples of CIs and non-CIs (Cont)

- Not configuration items
- An incident ticket has configurable attributes but is not a direct part of your environment. It is information about other entities (a computer system, for example) that are part of your environment.
- A software package is not part of your environment, only installed instances of it are, and is usually stored in the .
- An event does not have configurable attributes and is not part of your environment.

CI Eligibility Matrix

- Consider creating a CI eligibility matrix to help you make decisions about which items in your IT environment should be CIs.
- A CI eligibility matrix lists each CI candidate, its CI type (such as infrastructure or service), and several eligibility criteria to consider as part of your decision-making for CI candidates.
- Specific eligibility criteria vary according to the needs of your business

CI Eligibility Matrix Criteria

Cost or value: Does the CI candidate have an associated monetary cost or value to your business?

Change considerations: Would the CI candidate be impacted by IT change requests?

Traceability: Are you required to track changes made to the CI candidate?

Governance and compliance requirements: Is the CI candidate crucial to maintaining compliance with standards and other requirements?

Management of service commitments: Is the CI candidate required to help you meet your service commitments to the business?

CI Eligibility Matrix Criteria (Cont)

Maintainability: Are you required to maintain the CI candidate?

Delivery cost and quality: Is there a monetary cost associated with how the CI is delivered and maintained?

Others:

Do you, and not a third party, manage the CI candidate?

Is the CI candidate unique?

Other factors specific to your business needs.

Sample CI Record

CI Candidate (include in this list all the item that have been identified as candidates to be a CI)	Type (IT Infrastructure, IT Service)	Match Eligibility Criteria?					Meeting CI Criteria (A or B or C) and D and E
		A	B	C	D	E	
		Under Change Control (independently)	Used for Impact Modeling	Used by Support Team	Identifiable	Maintainable	
Application	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Business Process	Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Business Service	Service	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Cluster	Service	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Database	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Disk Drive	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
IP End Point	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
LAN	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
LAN End Point	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
Mainframe	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Memory	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
Network Device	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Operating System	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
Person	Service	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE
Processor	IT Infrastructure	FALSE	FALSE	TRUE	TRUE	TRUE	TRUE
Role	Service	FALSE	FALSE	FALSE	TRUE	TRUE	FALSE
Server	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Software	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Storage	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
Virtual System	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE
WAN	IT Infrastructure	TRUE	TRUE	TRUE	TRUE	TRUE	TRUE

Source: https://docs.bmc.com/docs/ac81/configuration-items-in-an-itil-cmdb-230262994.html

Protections

- When customers buy products, they want to be reassured that they're making the best decision possible. They need to know that what they spend their money on last, and that if it doesn't, they can reach out to the company for .
- Magnuson–Moss Warranty Act
- Enacted in 1975, the US federal statute governs warranties on consumer products. The law does not require any product to have a warranty (it may be sold "as is")
- But if it does have a warranty, the warranty must comply with this law.
- The law was created to fix problems as a result of manufacturers using disclaimers on warranties in an unfair or misleading manner.

Should You Buy an Extended Warranty for Your Laptop?

- A Consumer Reports survey suggests it's probably not worth the investment.
- The results are based on 36,919 (non-Chromebook) laptops owners who purchased a new device between 2013 and 2018.
- Among the PC owners who sprang for the extra coverage, only 15 percent used it to pay for repairs.
- For the Apple owners with extra coverage, the figure is just 7 percent.

www.consumerreports.org/extended-warranties/extended-warranty-for-laptop-should-you-buy/

Warranty vs Maintenance

- The major difference between maintenance and a warranty is that
- Maintenance is routine service done to your asset that typically comes out of your pocket.
- A warranty is a guarantee to fix your asset if some great damage happens, or if the asset doesn't run up to its full potential.

Acknowledgements

Teaching materials in this slide is derived, referenced and/or extracted from the following sources. We try to make the acknowledgements and references as accurate as possible. Thank you very much.

- Internet Resources, such as Wikipedia, RightStar Inc., DigitalOcean, etc.
- IEEE Library, IEEE Xplore
- COMPSCI4015 Professional Software Development (H), University of Glasgow (UoG), Dr. Tim Storer
- COMPSCI3005 - Software Engineering M3, UoG, Dr. Richard McCreadie
- Software Engineering (Publisher: Pearson), Ian Sommerville
- Engineering Software Products: An Introduction to Modern Software Engineering (Publisher: Pearson), Ian Sommerville.

Comments from Dr Cao Qi