

Introduction to Change Management and SDLC

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Discussion topics

- Why change management and its significance
- Types of changes in production environment
- Change management controls
- Impact of weak change management control
- Integrity management
- Change management leading practices
- Software Development Life Cycle (SDLC)



Why change management and its significance?

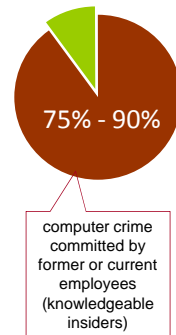
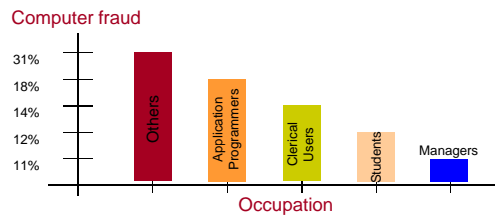
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Why change management and its significance?

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- Total fraud losses in the United States estimated to be \$994 billion in 2008
- Of all the computer crimes reported:



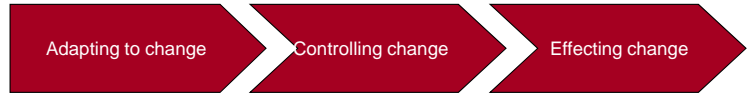
Source: Association of Certified Fraud Examiners and National Center For Computer Crime



Why Change Management and its significance?

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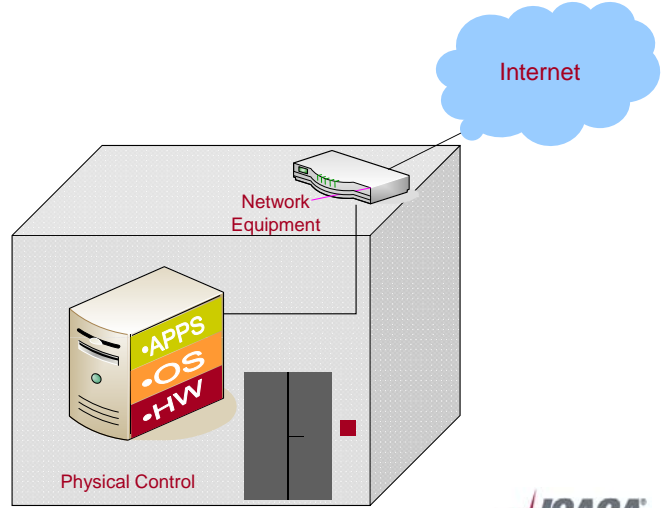
- Change management – it is significant because it helps an organization to be efficient



Types of changes

Changes in production environment

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Types of changes

OS changes (Host)

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- **Applying OS patches**
 - OS vendor recommendation
 - Opening/closing OS services
- **Re-imaging**
 - As a backup plan when an OS update didn't go as planned
 - As part of major/minor/emergency application changes






Types of changes

Network changes

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- **Software changes**
 - Deploying OS
 - Patching OS
- **Configuration Changes**
 - Updating firewall, router, switch configuration
- **Hardware changes**
 - Adding/removing of network equipment






Types of changes

Application changes

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- **Company specific application change**
 - Major, minor and emergency changes
 - New releases
 - Bug fixes
- **Application configuration changes**
- **Database changes**
 - Schema changes
 - Database upgrades (version upgrade)






Types of changes

Physical access change

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- **Physical access to data center**
 - Preventing root level access through a system console
 - Deactivating terminated employee's physical access
 - Deactivating temporary physical access






Types of changes

Logical access change

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- **OS Access Change**
 - privileged access to production/mission-critical server
- **Application Access Change**
 - privileged access to production/mission-critical application
- **Network Access Change**
 - privileged access to network equipment

Change management controls



Planned/routine maintenance changes procedure and controls

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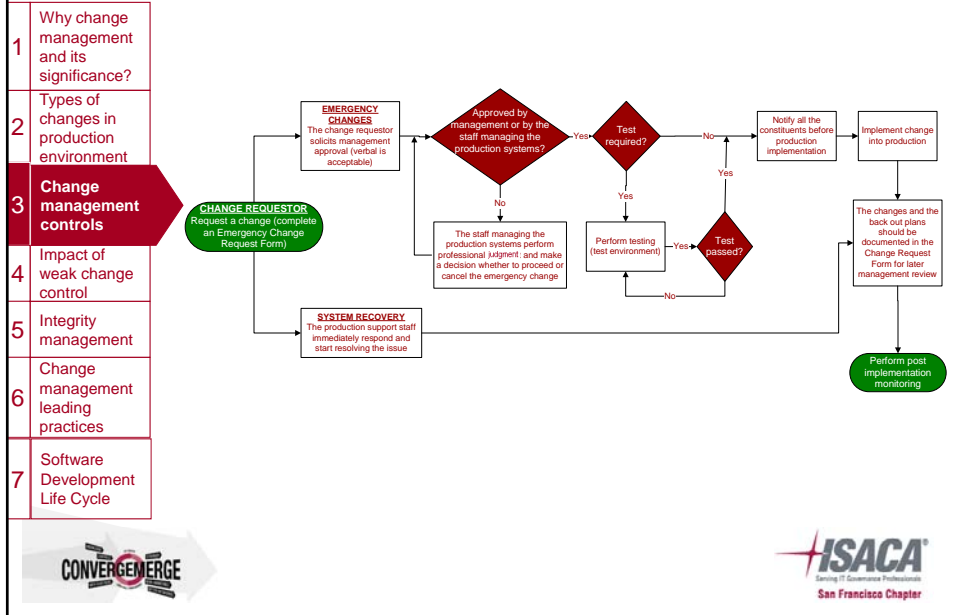
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graph TD
    START([START]) --> CREQ[CHANGE REQUESTOR  
Submit a change request form]
    CREQ --> CM[CHANGE REQUEST MANAGER  
Review the change request form]
    CM --> D1{Change request form completed with the required information?}
    D1 -- No --> CREQ
    D1 -- Yes --> D2{Change request approved?}
    D2 -- No --> CM
    D2 -- Yes --> D3{Test required?}
    D3 -- No --> D4{Approved?}
    D4 -- No --> D2
    D4 -- Yes --> M[Management approval for implementation]
    M --> D4
    D3 -- Yes --> P[Perform test (at the test environment)]
    P --> D5{Test passed?}
    D5 -- No --> D6{Require further testing?}
    D6 -- No --> C[Cancel/postpone change request]
    D6 -- Yes --> P
    D5 -- Yes --> D4
  
```

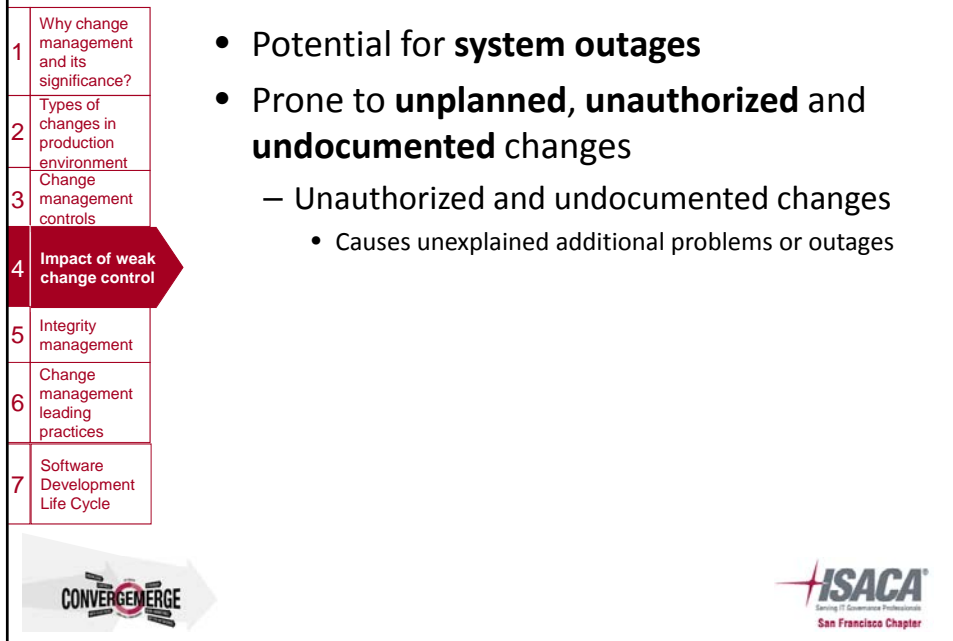



Change management controls

Emergency/System Recovery change procedure and controls



Impact of weak change controls



Impact of weak change controls

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- **Prone to system attack** – example denial of services
- **Misuse of resource**
 - Unplanned work
 - Creates monetary loss
- **Causes legal implication**
 - Due to the exposure of sensitive customer data
 - Due to system unavailability to customers
- **Losing a customer/ business**



Integrity management

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- **Prevention**
 - Restrict logical access
 - Firewall, IDS, OS and Application
 - Unnecessary services
 - Disable at the servers
 - Block by the firewalls
 - Restrict physical access
 - Restrict physical access that houses critical systems to **ONLY** authorized employees
 - Perform periodic physical access reviews



Integrity management

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• Detection

- Monitor metadata and look for changes
 - Create, store and monitor baseline metadata values
 - Metadata values: modification time, file size and cryptographic checksum
- Integrity Management Software
 - Reads files or directories to monitor
 - critical network configuration, data files, customer database files, documents and spreadsheets
 - Takes action when a violation (change) occurs
- Intrusion detection (IDS)



Integrity management

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• Recovery

- Maintain a backup copy of the production data
- Identify changes based on the Integrity Management Software report
- Determine whether a change is authorized or not
- Restore a file if the change is deemed unauthorized or malicious



Change management leading practices

1	Why change management and its significance?	<ul style="list-style-type: none"> • Change management policy, procedure and standards • Change request management • Approval process • Deployment management • Change result management • Monitor application and networks
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Change management leading practices

		<i>Change management policy, procedure and standards</i>
1	Why change management and its significance?	<ul style="list-style-type: none"> • Prioritize/categorize changes based on downtime, lead time, type of services and severity of the change (Low, Medium, High Urgent) • Roles and responsibilities <ul style="list-style-type: none"> – Define and designate qualified personnel's roles – Segregation of duties (SOD) – Communication – Enforce change-management process
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Change management leading practices

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Change Request Management

- **Change Request Analysis**
 - Business Analysis
 - The likelihood of success
 - Significance to business
 - Resources required and business justification
 - Technical Analysis
 - System dependencies
 - Technical requirement
 - Project estimate
- **Change Request Reporting**
 - Make the change requests visible to management
 - Retain status of the change request when it is analyzed, prioritized, tested and deployed






Change management leading practices

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Approval Process

- Appropriate approval should be obtained between the different phases of change management process
- Management approval should be documented



Change management leading practices

1	Why change management and its significance?	<p><i>Deployment Management</i></p> <ul style="list-style-type: none"> • Logical environment (separate) – Development, Test/QA and Production • Deployment process <ul style="list-style-type: none"> – High category changes – Low/Medium category changes – Emergency changes • Leverage Technology <ul style="list-style-type: none"> – To provide auditability and versioning throughout the deployment process
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Change management leading practices

1	Why change management and its significance?	<p><i>Result management</i></p> <ul style="list-style-type: none"> • Key Performance Indicators (KPI) about the entire Change Management Process <ul style="list-style-type: none"> – Process bottlenecks, successful techniques, etc. • Use the KPIs (by management) to make adjustments to the change management procedure and practices • Post change implementation monitoring
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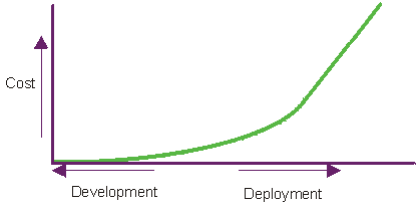
Change management leading practices



1	Why change management and its significance?	<p><i>Monitor application and networks</i></p> <ul style="list-style-type: none"> • Integrity checks <ul style="list-style-type: none"> – using automated monitoring tools – Incident response <ul style="list-style-type: none"> • Escalation process • Periodic reviews <ul style="list-style-type: none"> – User access – OS, apps, network, etc. – System configuration – servers, network equipment, etc.
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Software Development Life Cycle

1	Why change management and its significance?	<p><i>Relationship between change management and SDLC</i></p> <ul style="list-style-type: none"> • Managing change is a critical component of any SDLC model <ul style="list-style-type: none"> – Change Management and SDLC are not mutually exclusive • Change management occurs throughout the development life cycle • Cost of changes is higher once out of development
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Software Development Life Cycle

Relationship between change management and SDLC

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- Waterfall model

Software Development Life Cycle

Relationship between change management and SDLC

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- Iterative model
 - Agile Methodology
 - Rational Unified Process (RUP)
 - Rapid Application Development (RAD)
 - Joint Application Development (JAD)

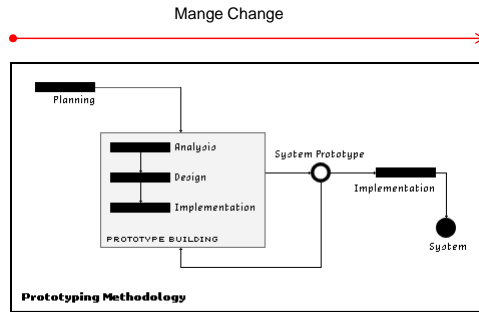
Illustration courtesy of Rational Unified Process

Software Development Life Cycle

Relationship between change management and SDLC

- Prototyping

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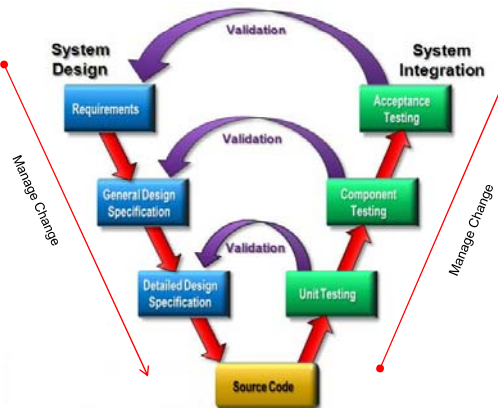


Software Development Life Cycle

Relationship between change management and SDLC

- V Model

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Software Development Life Cycle

Tools to better manage change

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- Requirements Management
- Visual Modeling
- Automated Testing
- Change Management



Course Review

- Why change management and its significance
- Types of changes in production environment
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- Integrity management
- Change management leading practices
- Software Development Life Cycle (SDLC)



Questions



Contact Information

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