



INTERSYSTEMS LEARNING SERVICES

# InterSystems Change Control



# **InterSystems Change Control**

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# ICC 100: Introduction to Change Control



# Objectives

- Explain the purpose and importance of change control.
- Explain the differences between change control and source control.
- Identify the 3 different types of changes.
- Identify the types of processes that involve change control.
- Identify the key performance indicators of change control.
- Identify ways to make change control processes successful.
- Articulate the need for and the value of change control for your own personal projects and workflows.



# Part 1: What is Change Control?



# Terms Related to “Change” at InterSystems

- Contract change.
  - Process to change a contract with another group.
- Customer change management.
  - Process to change a business process for our customers.
- Change request.
  - Process for an enhancement request.
- **Change control.**
  - Process for a change to system or environment.
- Consistent use of terminology key to effective communication.



# \*ITIL Change Control related definitions

- Change.
  - Addition, modification or removal of anything that could affect IT services.
- Change record.
  - Record containing the details of a change.
  - Each change record documents the lifecycle of a single change.
- \*ITIL stands for “Information Technology Infrastructure Library.”
  - Set of detailed practices for IT service management.





# Examples of a Change

- Change to:
  - Application configuration.
  - Disk layout.
  - Status of a service.
  - Application code.
  - Web server configuration.
  - User password.
  - User data.



# Goal of Change Control

- “The goal of [change control]\* is to establish **standard procedures** for managing change requests in an **agile** and **efficient manner** in an effort to drastically minimize the **risk** and **impact** a change can have on business operations.”
- \*NOTE:
  - ITIL uses term “change management” to describe change control.
  - We are standardizing on term “change control” and will use it in place of “change management” in these courses.



# Why Change Control?

- Technology, infrastructure and software requirements continuously changing.
  - Solutions becoming more complex.
  - InterSystems Hosted Solutions and Managed Services in specific regions cover full-service offerings and not merely software offerings.
  - This is an important component of meeting SLAs.
  - Part of ITIL and required for ISO20000.
    - TrakCare Support is being certified for ISO20000.
  - Supports other processes already in use.
- 



# Main Benefits of Change Control

- Evaluates the risk involved in a change.
- Maintains records of changes.
  - Documented and tested implementation and backout plans.
- Provides accurate and timely information about the changes to be implemented.
- Formal and recorded review and approval process.



# Main Benefits of Change Control (cont.)

- Ensures that changes are implemented with minimum disruption.
- Improves change prioritization.
- Adherence to compliance and standards.
- Determines the cost and benefit associated with a change.
- Improve quality and customer satisfaction.



# Downsides of the Gut Feel Approach to Risk Analysis

1. This change is simple; it can't fail...
2. I did that so many times...
3. It's easy, anyone can do it...
4. Doesn't require any planning...
5. It will only take 5 minutes...

1. FAILURE.
2. Circumstances change > FAILURE.
3. Inexperienced implementer > FAILURE.
4. Complications arise > FAILURE.
5. Unplanned complexity > FAILURE.



# Downsides of the Gut Feel Approach to Risk Analysis (cont.)

6. It won't impact anything else...

6. Unexpected interdependency > FAILURE.

7. ... I don't need a rollback plan.

7. Can't rollback quickly > FAILURE.

**There is no substitute for proper planning!**



# “Small Change” ≠ “Small Risk”...





# Quiz: Defining Change Control

## Question:

Which of the following is the definition of “change control” for the purposes of this training?

- A. The process by which a contract is changed.
- B. Business process change for our customers.
- C. Management of changes to systems or environments.
- D. The process for handling enhancement requests.

## Answer:

C. Management of changes to systems or environments.



# Quiz: Use of Change Control

## Question:

To what extent does your organization currently use change control?

- A. We have change control processes and tools which work well for us.
- B. We have a change control process in place but struggle to use it consistently.
- C. We are working towards adopting change control processes.
- D. We know we should put change control in place but it's not currently a priority.
- E. What is change control?



# Part 2: Source Control



# What is Source Control?

- Database for flat file Items.
  - Provides central storage for code and configuration.
  - Provides full versioning capabilities.
    - Maintains all history.
    - Prevents permanent deletion.
- How we use it:
  - Answer who, what, when, where, why and how for each change.
  - Maintain every version of every item of configuration or code for a system.
  - Allow automated merging of changes between environments.
  - Provide snapshot of operating environment.



# Change Control with Source Control System

- Layering change control on top of a source control tool enables:
  - Versioning of configuration items.
  - Easier/automated rollout of changes to target environments.
  - Easier/automated rollback of changes when something goes wrong.
  - Further automation of value-add methodologies: Build, Test, Upgrade.



# Change Control with Source Control System

- Change control process should cover both:
  - Changes that can exist in source control (Versioned).
  - Changes that cannot exist in source control (Documentation only).
  - With time, try to move Documentation-only changes to Versioned changes with improvements to tools used in the process.



# Quiz: Change Control with Source Control

## Question:

To what extent does your organization currently use source control?

- A. We have source control in place and automated with our change control processes.
  - B. We have source control and hope to tie it in with change control workflows.
  - C. We are working towards adopting source control.
  - D. We know we should put source control in place but it's not currently a priority.
  - E. What is source control?
- 



# Part 3:

## Change Control: Real Life Examples





# “Managing” without Change Control (Example 1)

- Serious questionnaire performance crisis.
- InterSystems Support spent several months in crisis mode tracking root cause.
  - Repeated assertions that no one had made any changes to the system.
  - Undocumented icon definition change interacted with other factors to cause crisis.



# “Managing” without Change Control (Example 2)

- Configuration change booking restriction crisis.
  - TrakCare location list changed drastically from one day to the next.
    - Potential clinical risk moving emergency episodes between locations.
- Team worked in crisis mode for one full week before discovering root cause.
  - Customer made undocumented changes to booking restrictions that triggered a change in the location list.



# Reaping the Benefits of Change Control (Example 1)

- Printing crisis at very large hospital.
  - 5pm change to an important report.
  - Crisis call received in the middle of the night that printing was broken.
  - Overnight on-call person found and backed out the change in 15 min.
    - No prior knowledge of that particular change.



# Reaping the Benefits of Change Control (Example 2)

- Managing reapplication of changes during complex upgrades.
  - One very large site had over 300 changes which had to be reapplied to multiple environments as part of upgrade process.
  - Manually it would have taken 2 weeks to reapply, and mistakes were likely.
  - Changes reapplied from change control application in 2 hours with no issues.



# Quiz: Personal Experience

## Question:

How do you relate to the prior examples?

- A. I have stories which align with the “Managing” without Change Control slides.
- B. I have stories which align with the Reaping the Benefits of Change Control slides.
- C. I have stories from both categories.
- D. I couldn't relate to either set of real-world examples.



# Part 4: Types of Changes



# Types of Changes (from ITIL)

- Emergency change.
  - “A change that needs to be evaluated, assessed and either rejected or approved in a short space of time.”
  - “Emergency change should be reserved for changes intended to repair an error in an IT service that is impacting the business to a high degree or to protect the organization from a threat.”
  - Example: rebooting a crashed server.



# Types of Changes (from ITIL, cont.)

- Standard change.
  - "A pre-authorized change that is low risk, relatively common and follows a procedure or work instruction."
  - "Standard changes are not required to follow the normal [change control] process and can be recorded in a different way."
  - Example: resetting a user's password.
- Normal change.
  - "A change that is not an emergency change or a standard change. Normal changes follow the defined steps of the [change control] process."
  - Example: fixing a bug in integration logic.





# Management of Standard Changes

- Catalog of standard changes.
  - Define specific criteria for when to execute the change.
  - Define the work instruction for the change.
- Regularly review and approve changes in catalog.
  - Some changes, such as data fixes, may require review more frequently.
  - Define the review and approval process.
- Can “demote” to a normal change as needed.
  - When predefined criteria aren’t met.
  - When predefined work instruction insufficient.



# Quiz: Identifying Standard Changes

Which of the following could be Standard Changes?

- A. Scheduled network maintenance. ✓
- B. Clear CSPGateway cache. ✓
- C. A specific SQL select statement. ✓
- D. Patching. ✓
- E. One-time data fix. ✗
- F. Custom development change. ✗

**Low-risk, regularly occurring, well understood, repeatable**

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# Part 5: Change Control Processes

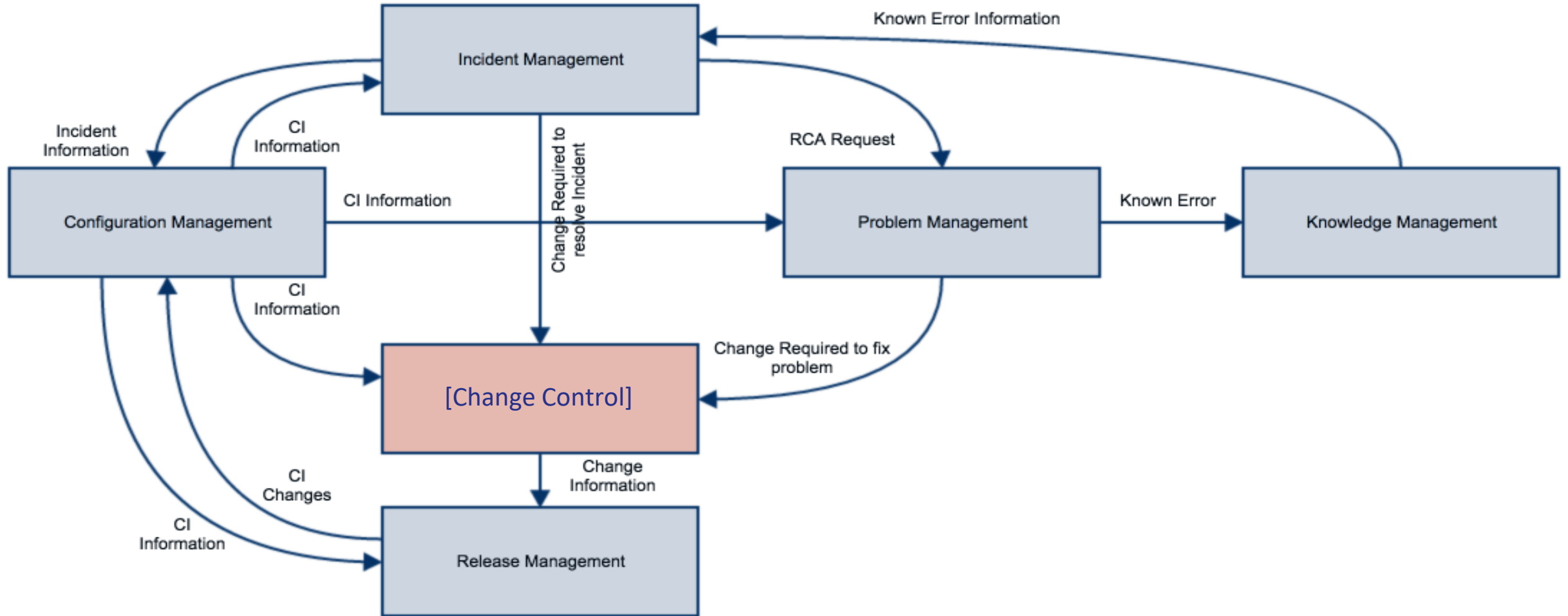


# Objective of Change Control Process

- Ensure that changes are recorded, then:
  - Evaluated.
  - Authorized.
  - Prioritized.
  - Planned.
  - Tested.
  - Implemented.
  - Documented.
  - Reviewed.
- ... all in a controlled manner.



# Interaction with other Processes



# Top five indicators of a poor change control process

- Unauthorized changes.
- Unplanned outages.
- A low change success rate.
- A high number of emergency changes.
- Delayed project implementations.



# Change Control Key Performance Indicators (KPIs)

- With proper change control, over time you should see:
  - Increase in number of successful changes implemented.
  - Reduction in the number of service disruptions.
  - Reduction in unauthorized changes.
  - Decrease in average time to implement a change.
  - Decrease in number of disruptions (incidents, problems) caused by failed changes.
  - Increase in ratio of planned vs. unplanned changes.
  - Decrease in ratio of normal vs. standard changes.



# Roles and Responsibilities (ITIL)

- Change initiator, owner, implementer (could all be the same person).
- Change reviewer, approver.
- Change manager.
  - Review and approve minor normal changes and standard changes.
  - Analyze change records to identify trends.
  - Make sure change control processes are respected.
- CAB/eCAB ((Emergency) Change Advisory Board).
  - Advisory committee for major or significant normal changes.





# Roles and Responsibilities (cont.)






- At a minimum, have a different implementor and reviewer.
  - Promotes at least 2 people understanding system.
    - Only 1 person understanding a system is high risk!
  - Helps catch errors (can't peer review your own work).



# Quiz: Change Control Benefits

## Question:

Which of the following are benefits of proper change control use? Select all that apply.

- A. Reduction in unauthorized changes. 
- B. Low change success rate. 
- C. Reduction in the number of service disruptions. 
- D. High number of emergency changes. 
- E. Documented history of system evolution. 



# Part 6: Tips for Success



# Tips to make Change Control Successful

- Avoid excessive bureaucracy.
  - Make it easy to raise and track changes.
- Have clear procedures defined for all types of changes.
- Communicate processes clearly and make sure they are well understood.
- Appoint change control manager.
  - Responsible for overseeing change control processes within your organization.
  - Empower them to ensure compliance with those policies.



# Tips to make Change Control Successful (cont.)

- Build processes on top of source control wherever possible.
  - Enables automated application of normal changes and automated rollback.
- Automate standard changes.
  - Reduces risk.
- 'Little and often'.
  - Avoid large amounts of changes or changes that sit in development for a long period of time.
- Understand the value of change control.



# Summary

- What are the key points for this course?

