INTERSYSTEMS LEARNING SERVICES

# InterSystems Change Control

InterSystems
Creative data technology

# InterSystems Change Control

# COPYRIGHT NOTICE

© 2020 InterSystems Corporation, Cambridge, MA. All rights reserved.
InterSystems is a registered trademark of InterSystems Corporation.

InterSystems, InterSystems Caché, InterSystems Ensemble, InterSystems HealthShare, HealthShare, InterSystems TrakCare, TrakCare, InterSystems DeepSee, and DeepSee are registered trademarks of InterSystems Corporation.

InterSystems IRIS data platform, InterSystems IRIS for Health, InterSystems IRIS, InterSystems iKnow, Zen, and Caché Server Pages are trademarks of InterSystems Corporation.

All other brand or product names used herein are trademarks or registered trademarks of their respective companies or organizations.

This document contains trade secret and confidential information which is the property of InterSystems Corporation, One Congress Street, Boston, MA 02114, or its affiliates, and is furnished for the sole purpose of the operation and maintenance of the products of InterSystems Corporation. No part of this publication is to be used for any other purpose, and this publication is not to be reproduced, copied, disclosed, transmitted, stored in a retrieval system or translated into any human or computer language, in any form, by any means, in whole or in part, without the express prior written consent of InterSystems Corporation.

The copying, use and disposition of this document and the software programs described herein is prohibited except to the limited extent set forth in the standard software license agreement(s) of InterSystems Corporation covering such programs and related documentation. InterSystems Corporation makes no representations and warranties concerning such software programs other than those set forth in such standard software license agreement(s). In addition, the liability of InterSystems Corporation for any losses or damages relating to or arising out of the use of such software programs is limited in the manner set forth in such standard software license agreement(s).

THE FOREGOING IS A GENERAL SUMMARY OF THE RESTRICTIONS AND LIMITATIONS IMPOSED BY INTERSYSTEMS CORPORATION ON THE USE OF, AND LIABILITY ARISING FROM, ITS COMPUTER SOFTWARE. FOR COMPLETE INFORMATION REFERENCE SHOULD BE MADE TO THE STANDARD SOFTWARE LICENSE AGREEMENT(S) OF INTERSYSTEMS CORPORATION, COPIES OF WHICH WILL BE MADE AVAILABLE UPON REQUEST.

InterSystems Corporation disclaims responsibility for errors which may appear in this document, and it reserves the right, in its sole discretion and without notice, to make substitutions and modifications in the products and practices described in this document.

For Support questions about any InterSystems products, contact:

**InterSystems WorldWide Response Center**
Telephone: +1-617-621-0700
Tel: +44 (0) 844 854 2917
Email: support@InterSystems.com

# ICC 100: Introduction to Change Control

InterSystems
Creative data technology

# 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.

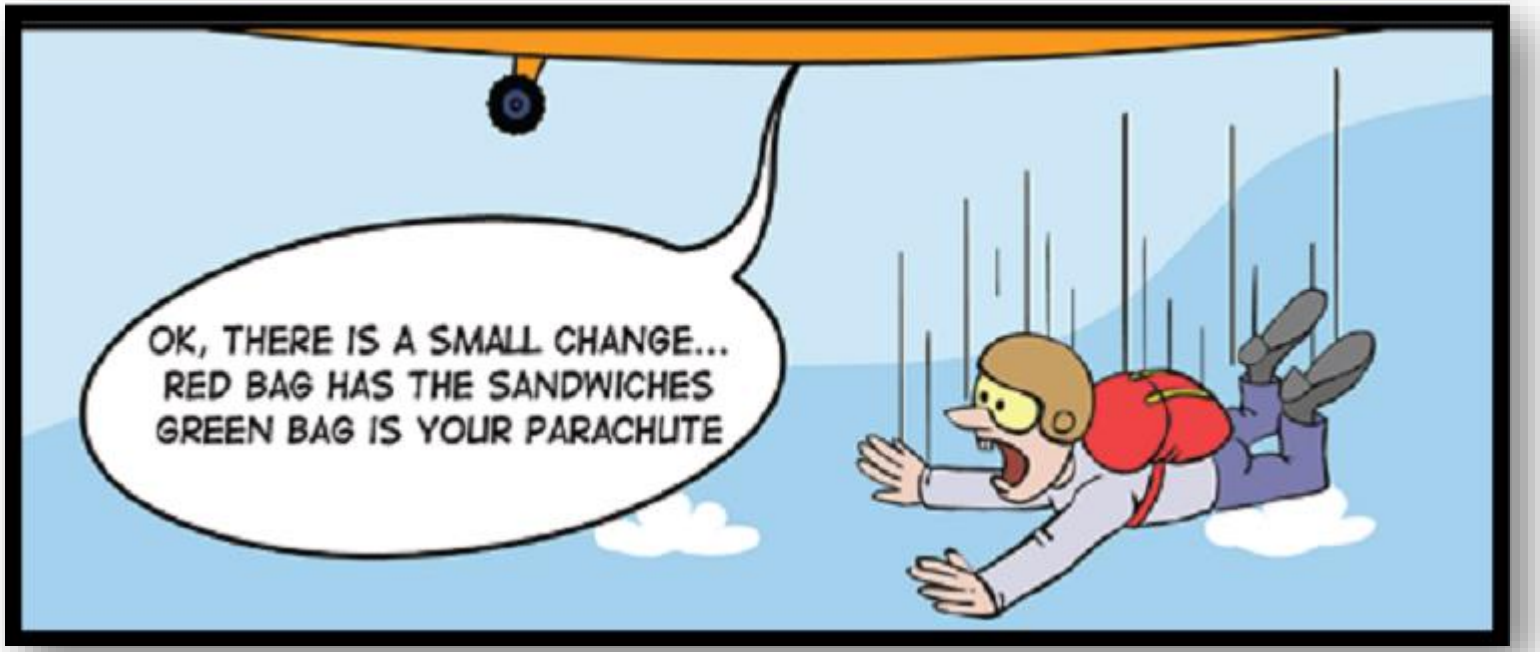
# Downsides of the Gut Feel Approach to Risk Analysis (cont.)

6. It won't impact anything else…
7. … I don't need a rollback plan.

6. Unexpected interdependency > FAILURE.
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. ✗

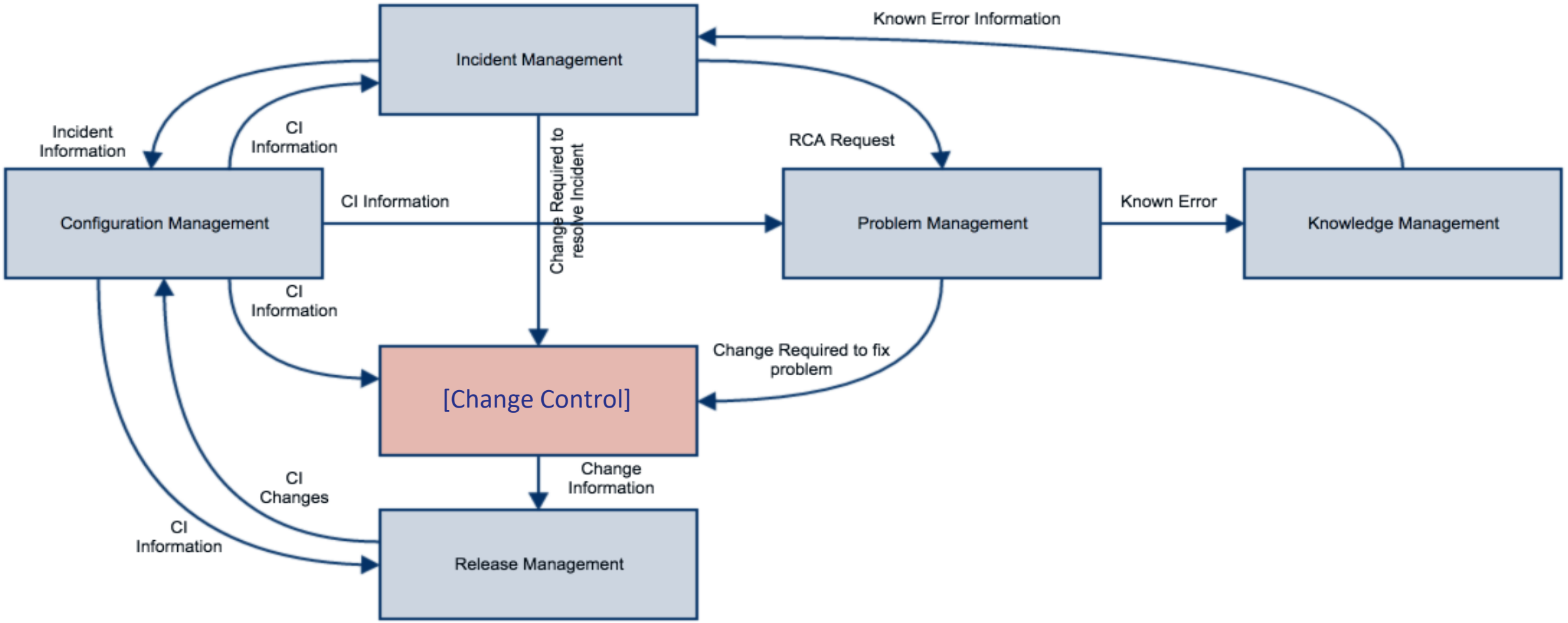
**Low-risk, regularly occurring, well understood, repeatable**

# 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?