IBM Cúram Social Program Management
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Cúram Milestone Developer Guide

IBM

Note

Before using this information and the product it supports, read the information in "Notices" on page 14

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Chapter 1. Developing with Milestones

Use this information to design milestone functionality, a key component of Cúram integrated cases. Case milestones are used to track the completion of significant events or tasks during the life cycle of a case, for example, to track the submission, approval, and activation of a case. Milestone processing can be customized to suit agency needs.

Overview

The guide is intended for developers responsible for customizing milestones to suit the business needs of an organization.

The guide describes the design and processing of milestone functionality, which is a key component of Cúram integrated cases. It describes milestone configuration and details how milestone processing can be customized to suit agency needs.

Prerequisites

The reader should be familiar with both the basic elements of case processing in the human services industry and with the functionality available in the Cúram Case Manager.

Background

Milestones functionality satisfies the following business requirements:

- Track the completion of significant events or tasks during the life cycle of a case.
- Provide configuration to associate milestones with a case.
- Provide administration to support the association of milestone configuration with case components and events.
- Support ability to create and complete milestones automatically.
- Capability to configure and use milestone waiver approval requests at user, organization unit, and milestone levels.
- Generic infrastructure support to create or complete milestone deliveries automatically based on raised events.

Sections in this Guide

The following list describes the sections in the guide:

Configuring Milestones
The section covers the administrative configuration options that are available for milestones.

Milestone Entities
The section describes milestone entities and the fields they contain.

Milestone Business Processing
The section describes milestone process classes and associated methods.

Implementing a Generic Milestone Event Handler
The section describes how to implement generic milestone event handlers to create deliveries when milestones are created and also when they are completed.

Configuring Milestones

Case milestones are used to track the completion of significant events or tasks during the lifecycle of a case, for example, to track the submission, approval, and activation of a case. Each milestone has an

expected start and end date during which the important event is scheduled to start and complete and an actual start and end date.

Cúram case management provides administration support to configure milestones, and to associate milestone configurations with cases. Capability to configure and use milestone waiver approval requests at user, organization unit, and milestone level is also provided. For example, a child care solution configures milestones to track the completion of important events that occur on a child care case.

Note: Case milestones can be configured for integrated case, product, and screening case types; however, there is currently no functionality available within these case types to create milestone deliveries. Development effort is required to create milestone deliveries at the case level.

Milestone Configuration Settings

All case milestones are based on an associated milestone configuration.

The following table describes the available milestone configuration settings (both optional and mandatory):

Table 1. Milestone Configuration Settings. This table describes how the milestone configuration settings are used.		
Configuration Settings	**How it is Used**	**Optional or Mandatory**
Name and Type	The name and type are used to distinguish the milestone configuration. When creating a manual milestone, a user must select the milestone configuration to be applied by using the milestone configuration name.	Mandatory
Earliest Start Day (days)	This setting is used to determine the expected start date for automatically created milestones. The expected start date is set to the current date on which the milestone is created plus the number of days that are defined here. This setting is also used to validate the expected start date that is entered by a user when manually creating a milestone. A milestone cannot have an expected start date earlier than this number of days after the start date of the case. For example, if the milestone is created on April 1 and this setting is 3, then the expected start date of the milestone cannot be earlier than April 4.	Mandatory
Duration (days)	This setting is used to determine the expected end date for all milestones. For manually created milestones, the expected end date is set to the user-entered expected start date plus this duration minus one. For example, if the expected start date is April 1 and the duration is 7 days, the expected end date is set to April 6. For automatically created milestones, the same calculation is applied to the expected start date defined by the date on which the milestone was created and the Earliest Start Day (days).	Mandatory
Start Date	The start date determines the active, and thus availability, period of the milestone configuration.	Mandatory

Configuration Settings	How it is Used	Optional or Mandatory
	Table 1. Milestone Configuration Settings. This table describes how the milestone configuration settings are used. *(continued)*	
End Date	The end date determines when the milestone configuration is no longer active. This date is not mandatory as milestone configurations can remain active for an indefinite time period.	Optional
Expected Date Extension Allowed	This indicates whether the expected start and end dates for an automatically created milestone can be modified by a User. If this indicator is not set, then the expected start and expected end date that is calculated upon creation of a milestone are unchangeable.	Optional
Waiver Required	This indicates whether a waiver is required to change the expected start and expected end date for an automatically created milestone. This can only be set for milestone configurations, which allow the expected dates to be extended (as described in the setting above).	Optional
Milestone Added	Any existing workflow event can be associated with the creation of a milestone. This event can be used to extend the OOTB milestone creation processing. For example, when a milestone is added, a workflow can be enacted to notify the case owner.	Optional
Milestone Complete	Any existing workflow event can be associated with the completion of a milestone. This event can be used to extend the OOTB milestone completion processing. For example, when a milestone is completed, a workflow can be enacted to notify the case owner.	Optional
Expected Start Date Not Achieved	Any existing workflow event can be associated with the expected start date to track the timeliness of the milestone. For example, if no actual start date is entered for the milestone and the expected start date passes, a workflow can be enacted to notify the supervisor that the milestone is not yet started.	Optional
Expected End Date Not Achieved	Any existing workflow event can be associated with the expected end date to track the timeliness of the milestone. For example, if no actual end date is entered for the milestone and the expected end date passes, a workflow can be enacted to notify the supervisor that the milestone is not completed in a timely fashion.	Optional

Associating Milestones with Cases

To support the manual and automatic creation of milestones within a case, it is necessary to set up an association between a milestone configuration and the case type (product delivery, integrated case, or

screening type). There are two options for setting up these associations: either a new milestone configuration can be recorded at the same time it is associated with the case type or an existing milestone configuration can be selected.

When recording a new milestone configuration as part of the association process, the milestone configuration information must be defined. Additional association information can also be defined whether the milestone is to be created automatically. The two main configuration settings for automatically created milestones are the creation event and the completion event. These events are used by the application to automatically create and complete an instance of the milestone.

For example, a milestone can be set up to track the approval of a product delivery case. To set up the automatic creation of this milestone, the Submit Case event can be selected as the creation event and the Approve Case event can be selected as the completion event. When a case is submitted for approval, the Submit Case event triggers an instance of the milestone. Later when the case is approved, the Approve Case event closes the milestone instance.

The matching process for creating milestones within a case can be further specified by using the component type and component category settings. A clear distinction can be made between creation and completion events at the case level and at the case component level. For example, the case component, Contract, can be set, with a creation event of Create Contract and a completion event of Close Contract.

When a contract is created, the Create Contract event triggers an instance of the milestone and the application associates both the contract ID and the case ID with it. Later when the contract is closed, the Close Contract event uses both of these IDs to find and close the correct milestone instance.

Configuring Milestone Waiver Request Approvals

A milestone waiver request may be required in order for the milestone expected start and end dates to be changed for an automatically created milestone. Milestone waiver request approval checks can be set up at the organization and user level. Expected start and end dates for manually created milestones can be changed without a waiver request. The milestone waiver request approval process is used to confirm that the changes in dates to the milestone are valid.

Once a submitted request is approved, the new expected start or end dates or both, take effect.

Milestone waiver requests can only be submitted (that is, the expected dates for a milestone can only be changed) if the Expected Date Extension Allowed setting is configured. The approval process (that is, the need to submit a waiver request for approval) for these requests is only necessary if the Waiver Required setting is also configured. If the Waiver Required setting is not configured, a user is able to change the expected start or end dates or both directly.

Milestone waiver request approval check settings for a milestone include a setting that is used to determine the percentage of submitted waiver requests for a milestone of a particular type that need to be reviewed by a case supervisor, for example, 40%. Alternatively, an administrator can indicate that all waiver requests for a milestone that need to be reviewed by a case supervisor.

User configuration settings take precedence over organization unit settings. When a waiver request is submitted for approval, the system first checks the user's milestone waiver request approval check settings, then checks the milestone waiver request approval check settings for the organization unit that the user belongs to. After checking these settings, the system checks the approval settings at the milestone level. The system may determine at any point in this process that the milestone waiver request requires approval.

Milestone Entities

This section describes milestone entities and the fields they contain.

It should be noted that tables are used to represent each of the following milestone requirements:

- the milestone configuration details available in the system
- the relationship between milestone configuration and a case type

- the milestone waiver approvals percentage for a user, organization unit, or a milestone.
- the milestone deliveries that are created by the user or by the system
- the milestone waiver approvals or requests for a milestone. A milestone can have multiple approval requests.

The following entities form the actual design of milestone functionality:

- MILESTONECONFIGURATION
- MILESTONELINK
- MILESTONEWAIVERAPPROVALCHECK
- MILESTONEDELIVERY
- MILESTONEWAIVERAPPROVALREQUEST

Milestone Configuration

MILESTONECONFIGURATION entity is focused on the administration of milestones within the Administration component. A milestone can be associated with one or more types of cases or service plans. This entity contains the following fields:

Table 2. Summary of MILESTONECONFIGURATION Entity Fields	
Entity Field	**Description**
milestoneConfigurationID	Unique reference number that is assigned by the system to the milestone configuration record.
name	Name of the milestone. This field is mandatory.
type	Type of the milestone. This field is mandatory.
earliestStartDay	The earliest number of days after the service plan or case start date that this milestone can start. This field is mandatory.
duration	Indicates how long this milestone takes to complete(this is used to calculate the expected end date of a milestone unless the milestone is added as part of a service plan template in which case the duration on the template supersedes this value). This field is mandatory.
startDate	The date on which this milestone configuration becomes effective. This field is mandatory.
endDate	The date on which this milestone configuration expires.
addedEvent	Indicates the event to be raised when a milestone of this type is added to a case or service plan
expctdStDateEvent	Indicates the event to be raised when the expected start date of the milestone is reached and its status is Not Started.
expctdEndDateEvent	Indicates the event to be raised when the expected end date of the milestone is reached and its status is Not Started or In Progress.
completeEvent	Indicates the event to be raised when the status of the milestone is Completed, that is, The actual end date is entered and the status is Complete.
creationDate	The date on which this milestone was created.

Table 2. Summary of MILESTONECONFIGURATION Entity Fields (continued)	
Entity Field	**Description**
comments	General remarks that are entered by a user.
waiverRequired	Indicates if an approved waiver is required to modify the automatically created milestone delivery by system.
waiverAllowed	Indicates if a user can modify the Expected Start Date or Expected End Date of an milestone delivery that is automatically created by the system.
commentsTextID	Unique Identifier corresponding to localized TextID of milestone comments.
nameTextID	Unique Identifier corresponding to localized TextID of name.
recordStatus	The status of the milestone, that is, Active or Cancelled. Logical deletion supported.
typeTextID	Unique Identifier corresponding to localized TextID of Milestone type.

Milestone Link

MILESTONELINK entity allows for the administration of the links between cases or service plan and milestones. This entity contains the following fields:

Table 3. Summary of MILESTONELINK Entity Fields	
Entity Field	**Description**
milestoneLinkID	Unique reference number that is assigned by the system to the milestone link record.
caseTypeID	Unique reference number of the case or service plan, which is associated with the milestone record.
caseType	Type of case, which is linked to the milestone configuration, for example, service plan, product, issue.
componentCategory	The category of a component that is associated to a case, which is linked to the milestone configuration.
componentType	Type of a component that is associated to a component category, which is linked to the milestone configuration.
creationEvent	Identifies the event based on which a milestone delivery is created.
completionEvent	Identifies the event based on which a milestone delivery is completed.
milestoneConfigurationID	Unique reference number of the milestone record, which is associated with the case or service plan record.

Milestone Waiver Approval Check

MILESTONEWAIVERAPPROVALCHECK entity is focused on the administration of milestone waiver approval. A milestone waiver can be associated with user or milestone or organization unit.

Table 4. Summary of MILESTONEWAIVERAPPROVALCHECK Entity Fields

Entity Field	Description
milestoneWaiverApprovalCheckID	Unique reference number that is assigned by the system to the milestone waiver approval check record. This field is mandatory.
percentage	Percentage of waiver requests for the milestone that requires approval. This field is mandatory.
type	Type of milestone waiver approval check. This field is mandatory.
status	The status of the milestone waiver approval check, that is, Active or Canceled. Logical deletion supported. This field is mandatory.
milestoneConfigurationID	Unique identifier of the milestone configuration on which this milestone waiver approval check is based.
userName	The user name of the milestone waiver approval check.
organisationUnitID	Unique organization unit reference number of the milestone waiver approval check.
comments	General remarks that are entered by a user.
versionNo	Version number of the milestone waiver approval check.

Milestone Delivery

MILESTONEDELIVERY entity is focused on the addition of a milestone to any type of case, for example, service plan, product delivery.

Table 5. Summary of MILESTONEDELIVERY Entity Fields

Entity Field	Description
milestoneDeliveryID	Unique identifier that is assigned by the system to this milestone record. This field is mandatory.
milestoneConfigurationID	Unique identifier of the milestone configuration on which this milestone is based. This field is mandatory.
caseID	Unique identifier of the case to which this milestone is added. This field is mandatory.
ownerUserName	Unique identifier of the user who is the milestone owner. This field is mandatory.
expectedStartDate	Date on which the milestone is expected to start. This field is mandatory.
expectedEndDate	Date on which the milestone is expected to end. This field is mandatory.

Table 5. Summary of MILESTONEDELIVERY Entity Fields (continued)	
Entity Field	**Description**
actualStartDate	Date on which the milestone started.
actualEndDate	Date on which the milestone ended.
comments	General remarks that are entered by a user.
status	Status of this milestone, that is, Not Started, In Progress or Completed. This field is mandatory.
createdBySystem	Indicates whether this milestone delivery is system generated record. This field is mandatory.
relatedID	Identifier, which relates the instance of a milestone to a component category or a component type of a case instance.

Milestone Waiver Approval Request

MILESTONEWAIVERAPPROVALREQUEST entity is focused on the milestone waiver approval request that is raised by the user and is only applicable for system generated milestone deliveries.

Table 6. Summary of MILESTONEWAIVERAPPROVALREQUEST Entity Fields	
Entity Field	**Description**
waiverApprovalRequestID	Unique reference number that is assigned by the system to the milestone waiver approval request record. This field is mandatory.
approvalRequestID	Unique reference number of approval request record.
milestoneDeliveryID	Unique reference number of a milestone delivery to which milestone waiver approval request is related. This field is mandatory.
originalExpStartDate	Date on which the milestone was originally expected to start. This field is mandatory
requestedExpStartDate	Date on which the milestone is being requested to start. This field is mandatory
approvedExpStartDate	Date on which the milestone is approved to start.
originalExpEndDate	Date on which the milestone was originally expected to end.
requestedExpEndDate	Date on which the milestone is being requested to end.
approvedExpEndDate	Date on which the milestone is approved to end.
requestComments	Comments that are entered by a user on submission of a milestone waiver request for approval.
approvalComments	Comments that are entered by a user on approval of a milestone waiver request.
requestedDate	Date on which this milestone waiver approval request created. This field is mandatory.

Milestone Business Processing

Milestone Configuration

The process class, which supports the business process MilestoneConfiguration is Product.

Table 7. Summary of MilestoneConfiguration Methods	
Method	**Description**
cancelMilestoneConfiguration	This method sets the status of a milestone configuration to canceled.
createMilestoneConfiguration	This method creates a milestone configuration record. The milestone type of a milestone configuration must be unique.
listMilestoneConfigurationsForCaseType	This method lists all active and canceled milestone configuration records.
modifyMilestoneConfiguration	Modifies the details of a milestone configuration record.
readMilestoneConfiguration	Reads the details for a milestone configuration record.
addInvestigationCaseExistingMilestone	This method adds a set of existing milestones to the investigation case.
createInvestigationCaseMilestone	This method creates a new milestone configuration and then creates the link between the milestone and the investigation case.
listMilestone	This method lists all the milestones, which are currently associated with a particular product.
listUnassociatedMilestone	Lists all the active milestones that are not already associated with a particular product.
removeMilestone	This method removes the link between a milestone and a product.
cancelApprovalCheckForInvestigation	This method allows an administrator to cancel an Investigation Approval Check for a particular investigation.
getComponentList	This method returns a list of components based on the component base type. This method works on a hook mechanism and is based on the component base type, which is being passed to it.
getSubComponentList	This method returns a list of sub components based on the component base type. The list of sub components that are retrieved is also handled by a hook mechanism ,which is driven by the component base type.
addInvestigationCaseExistingMilestoneWithConfig	This method adds a set of existing milestones to the investigation case along with configuration details such as component category, component type, creation event, and completion event.

Table 7. Summary of MilestoneConfiguration Methods (continued)	
Method	**Description**
modifyMilestoneLinkAssociation	This method modifies associated configuration details such as creation event, completion event, component type, and sub component type for the milestone link.

Maintain Milestone Waiver Approval

Table 8. Summary of MaintainMilestoneWaiverApproval Methods	
Method	**Description**
viewOrgUnitMWApproval	This method returns milestone waiver approval check details based on the milestone waiver approval check id for an organizational unit. A similar method exists for users.
listMilestoneApprovals	This method lists the milestone approval checks for a particular milestone configuration. It also determines whether a new milestone approval can be created or not.
listUserMWApprovals	Returns a list of milestone waiver approval check records based on the organizational unit id.
viewUserMWApproval	Returns milestone waiver approval check details based on the milestone waiver approval check id.

Maintain Waiver Approval Request

The process class, which supports the business process MilestoneConfiguration is ProductDelivery.

Table 9. Summary of MaintainWaiverApprovalRequest Methods	
Method	**Description**
readMilestoneDeliveryDetails	This method reads milestone details such as expected start date and end date that is administratively configured for the milestone.
createWaiverApprovalRequest	This method allows users to create a waiver request for a milestone and submit it for the approval. It also checks whether the manual approval is required or not based on case supervisor or milestone approval checks. If not required it approves the waiver request automatically.
listMilestoneWaiverRequests	This method lists all the waivers that are requested for a milestone along with the status whether it is in submit status or approved or rejected.
readMilestoneWaiverRequests	This method reads the details of waiver request.
approveWaiver	This method approves the waiver request. It also checks the date validations and whether the approver has the supervisor privilege to approve the waiver or checks the approval check for a user or for user belonging to an organization and which has approval check.

Table 9. Summary of MaintainWaiverApprovalRequest Methods (continued)	
Method	**Description**
modifyAndApprove	This method allows system to modify the waiver request details and approve the waiver request. It also checks the date validations and whether the approver has the supervisor privilege to approve the waiver or checks the approval check for a user or for user belonging to an organization and which has approval check.
rejectWaiver	This method rejects the waiver request. It also checks the date validations and whether the logged in user has the supervisor privilege to reject the waiver.
readExpStartAndEndDate	This method reads the expected start date and end date of a waiver request.
readWaiverIndicatorDetails	This method sets a boolean parameter to true only when the Expected Time Frame indicator is set to true and if Waiver Required indicator is set to false in the Administration application for a milestone. Based on this boolean value the user is allowed to change the Expected Start and End Date at the client side.
modifyMilestoneForWaiver	This method is used to modify the milestone delivery details

Milestone Delivery

The methods that are listed here are part of the APIs, which support automatic creation of milestone deliveries by using the milestone configuration.

Administration configuration allows the user to associate work flow events with a milestone type for the creation and completion of milestone deliveries. When such events are raised, the appropriate event handlers use create or complete milestone delivery APIs.

Table 10. Summary of MilestoneDelivery Methods	
Method	**Description**
createMilestoneDelivery	This method Creates milestone delivery based on event details. All milestone deliveries that are created by this method have 'Created By System' indicator set to true. The earliest start day is added to the current date to calculate the expected start date of this milestone delivery.
completeMilestoneDelivery	This method completes milestone delivery based on event details. If related ID has been passed as a parameter, then a search for milestone deliveries is based on the 'Related Id'. Once retrieved these milestone deliveries are completed. If the related id is not passed, then a search based on case type, component and the completion event is made. The list of milestone deliveries retrieved are then completed.

Implementing a Generic Milestone Event Handler

Create Milestone Delivery when Milestone Creation Event is Raised

Customers, who want to have milestone deliveries that are created when a milestone creation event is raised, can follow the steps here.

- For milestones configured at the case level:

  1. Configure the Creation Event for a milestone.
  2. Define an entry in handler_config.xml to map the configured Creation Event class to 'MilestoneCreationEventHandler'.
  3. Customers raise the creation event with 'caseID' as primary data.

- For milestones configured on case component level:

  1. Configure the Creation Event for a milestone.
  2. Define an entry in handler_config.xml to map the configured Creation Event class to 'MilestoneCreationEventHandler'.
  3. Implement the sample interface 'MilestoneComponentDelivery' and provide an implementation for the 'populateMilestoneCreationDetails' method. This method populates the milestone creation start date according to the business requirements.
  4. Create a module class that extends the AbstractModule (com.google.inject.AbstractModule).
  5. Define a Map Binder to bind implemented class to 'MilestoneComponentDelivery' interface.

     ```
     Ex: MapBinder<String, MilestoneComponentDelivery> mapbinder
              = MapBinder.newMapBinder(binder(), String.class,
     MilestoneComponentDelivery.class);
     mapbinder.addBinding().toInstance
     (new 'customimplentationclass'();
     ```
  6. Customers raise the creation event with 'caseID' as primary data and ID of the component as the secondary data.

Complete Milestone Delivery when a Milestone Completion Event is Raised

Customers, who want to complete a milestone delivery when a milestone completion event is raised, can follow the steps here.

- For milestones configured at the case level:

  1. Configure the Completion Event for a milestone.
  2. Define an entry in handler_config.xml to map the configured Completion Event class to 'MilestoneCompletionEventHandler'.
  3. Customers raise the completion event with 'CaseID' as primary data.

- For milestones configured at the case component level:

  1. Configure the Completion Event for a milestone.
  2. Define an entry in handler_config.xml to map the configured Completion Event class to 'MilestoneCompletionEventHandler'.
  3. Implement the sample interface 'MilestoneComponentDelivery' and provide an implementation for the method 'populateMilestoneCompletionDetails. This method populates the milestone actual end date according to the business requirements.
  4. Create a module class that extends the AbstractModule (com.google.inject.AbstractModule).
  5. Define a Map Binder to bind the implemented class to the 'MilestoneComponentDelivery' interface.

     ```
     Ex: MapBinder<String, MilestoneComponentDelivery> mapbinder
     = MapBinder.newMapBinder(binder(), String.class,
     MilestoneComponentDelivery.class);
     mapbinder.addBinding().toInstance
     (new 'customimplentationclass'();
     ```

Note: There is no need to repeat Step 4 and 5 if the entry exists in the module class.

6. Customers raise the completion event with 'caseID' as the primary data and the ID of the component as the secondary data.

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