Automating Business Processes Using SharePoint Designer

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What is a Workflow?
What is a Workflow

► “The steps required to complete a process”

► A workflow can have the following attributes.
  – May include Steps that must be completed by multiple people in an organization or even outside an organization
  – Interaction with multiple systems and applications (integration)
  – Notification or alerts to let people know when they need to perform a task related to a workflow (email, SMS)
  – Branching logic that chooses the next step based on the result of the current task
  – Can be long running (hours or even days)
  – May need to request data from users
Examples

► Internal
  – HR - Vacation Request, New Hire, performance reviews
  – IT – help desk, equipment procurement

► Internal & External
  – Loan Application
  – College application
Evolution of workflows

► Manual

– Process
  • Paper forms, folders, mail, fax

– Issues
  • Slow, no visibility, error-prone

► Email

– Process
  • PDF/Word forms, shared folders, email

– Issues
  • Better – but still no visibility into status
  • No central location to see status and results
  • Relies on user to follow rules
  • Which is the correct/latest form?

► SharePoint

– Process
  • Lists/InfoPath forms, SPD workflow, email for notification

– Issues
  • Provides central location to view status and results
  • Provides personalized work queue for users
  • Rules documented and enforced
  • Email only used for notification
Types of SharePoint Workflows
Type of SharePoint Workflows

- **SharePoint Designer**
  - Supports only sequential workflows (more powerful in 2013 with loop and transition to stage “goto”)
  - Types
    - List Workflow
    - Reusable Workflow
    - Site Workflow

- **Visual Studio**
  - Custom code-based workflows (only SP 2010)
  - Deploy as a WSP file to a farm
  - Supports sequential and state machine workflows (SP 2010)
Designer – List workflow

- Simplest workflow to create
- Workflow is tied directly to a list or document library
- Cannot be re-used for other lists
- Cannot be published globally.
- Cannot be saved as a template (WSP).
- Cannot be associated with a content type.
- Cannot be exported easily
Designer - Reusable workflow

- Not required to be linked to a specific list or content type – Similar to built in workflows
- Can be published Globally which allows the workflow to be used in all sub-sites in site collection
  - Must be created at top level site and user must be an site admin at top level
- Can be saved as a Template which will create a WSP file in the SiteAssets library
- WSP File Can be imported into Visual Studio - for more advanced options - one-way trip – cannot go back to designer
- Can be associated with a Content type (2010 only) or a list
Designer – Site workflow

- A workflow that runs at the site level – not linked to a list or content type
- Does not have a current item
- Execute from “All Site Content” page on the site
SharePoint Workflow Components (2010 & 2013)

- **Steps** – group actions logically
- **Condition** – if then statements
- **Actions** – do things
- **Impersonation Step (2010)** – run step as user that created the workflow
- **Parallel Block** – Execute actions at the same time
- **Local variables** – hold data that is global to the workflow
SharePoint Workflow Components (2013)

- **Stage** – group steps and actions. Support transition to stage (goto)
- **Loop** – Execute step multiple times in a stage
- **App Steps** – run step as super user (like impersonation steps in 2010)
Demo – Vacation Request
**Business Issue**

- Employee’s manager must approve vacation requests from employees and HR should be notified when a vacation request is approved.

**Flow**

- Employee enters request
- Approval task assigned to manager (can use AD manager lookup)
- If manager approves
  - Notification sent to HR
  - Notification sent to Employee
  - Vacation added to department calendar
- If rejected
  - Notification sent to Employee who can update and re-submit
Show Demo

- Show Demo

“Task Process” action handles approval process with tasks, emails, and reminders

Functionality broken into separate steps to improve maintainability and readability of workflow

SharePoint 2013 on Office 365
Workflow Best Practices & Common Issues
Build a workflow is essentially the same as writing code in a controlled environment

Development Lifecycle

- Gather requirements
  - High level business requirements – the business issues you are trying to address
  - Low level – functions required
- Architecture & Design
  - Architecture - how the solution will be constructed at a high level
  - Design - low level description of how components will be built
- Prototype
  - If requirements are fuzzy a prototype can help to iterate on a solution
- Develop
  - Build the solution and unit test to ensure the component works in the development environment
- QA Testing –
  - A QA or business analysts tests solution fully. Make sure to try all use cases and exercise all workflow paths to ensure workflow functions correctly.
- Deploy to production
- User acceptance testing – have business users test solution and validate functionality
- Go Live – put into daily use
- Maintenance Mode – perform entire lifecycle again for enhancements and bug fixes
Requirements and Design tips

► Start out simple – scope creep can derail the process
► Automate as much of the process as possible with an understanding that there may be manual steps which are replaced over time
► For example
  – Problem
    • The business requirements identify the need to access an HR system to lookup the manager of a user.
    • This requires a large design and development effort to integrate with the HR system
  – Solution
    • Ask the user to enter their manager as part of the process
    • Use a lookup list with user to manager mapping
    • Expand the solution later to include HR system integration
Testing workflows is difficult
- Multiple users involved at different levels of the business
- Difficulty moving from test environment to production
- Reliant on external global data such as AD settings

Tips
- Configure test users – make sure to assign an email address
- Ensure you test all workflow paths
- Use “log to history” action to track flow and allow debugging in a production environment
- Use workflow variables to hold user names when possible to allow quickly changing from test users to real users
- Use workflow variables to share email “snippets” across emails to ease maintenance of workflow
Security

► What user does my workflow run as?
  – Regular steps – runs as user who initiated the workflow
  – Impersonation step (SP 2010 only) – runs as user who published the workflow
  – App Step (2013) – has read/write access to all lists in site (*Site Feature-* > *Enable Workflow Task Content Type*)

► Issues
  – Workflow can break if impersonation steps are used and account that published the workflow is deactivated (2010)– **use a system account to prevent this**
  – Very carefully plan for permissions in your workflow. Make sure you know where exactly you are getting data from and what data you are going to modify and ensure that every potential workflow user has permissions to all these objects.
Synchronous or Asynchronous (2010)?

- When a workflow starts – automatically or through a manual execution it runs synchronously up to the point where there is a delay - at that point it is suspended

- A suspended workflow is executed in the timer process on a schedule (default is every 5 minutes)

- Issues
  - To reduce the impact on the user of starting a workflow a delay action can be added early in the process to move the workflow to the timer process
  - A delay in the timer process can not be below the timer process scheduled delay (default is 5 minutes) – so a delay of 1 minute can take >=5 minutes

- 2013 workflows run in workflow manager and are always asynchronous and can have delays with 1 minute resolution
Logic Issues

► When mixing “AND” and “OR” logic in a workflow the outcome may not be what is expected

► Designer workflow do not have parenthesis
  – a or b and c

► By default the statement a or b and c is evaluated as (a or b) and c

► If you want a or (b and c)
  – Rewrite as B and c or a
  – Or calculate b and c put into variable x
  – Then use a or x

► “Read” left to right or top to bottom in designer
Versioning (2010)

- Each time a workflow is published a new version is created
- Old versions are renamed with date
- Old versions can be deleted
- 2013 does not create (visible) version workflows but does handle versioning
**Debugging**

- To allow debugging a workflow in production the “Log to history list” action should be used at key places in the workflow.
- Messages passed to this action will be visible in the workflow details screen.
Debugging (Log Example)

```
If Current Item:A equals Yes
or Current Item:B equals Yes
and Current Item:C equals Yes

Log A= yes or b=yes and c=yes to the workflow history list
then Set Result to Yes
```
Workflow History

- Workflow history is a “hidden” list that is created on the sites that have workflow.
- The list holds the workflow history and is used to populate the “workflow information” screen.
- To access the list add “Lists/Workflow%20History/AllItems.aspx” to the site URL.
  - For example, if the site is http://test.dev.edgewater.com/test then the history URL is http://test.dev.edgewater.com/test/Lists/Workflow%20History/AllItems.aspx
- By default, a timer job removes data from this list after 60 days.
- Not intended to be used as permanent audit log
Trigger Workflows Based on a Date

- Use Information retention policy to triggers a time-based workflow using a item Date property (2010 Workflows only)
- Note: Expiration Policy Timer Job Runs weekly in SharePoint online (O365)
What’s new in SharePoint 2013
New Features

► Adds a new workflow engine (based on Workflow Manager)
  – 2010 engine is still available
  – Requires additional setup steps to install
  – Must choose version when creating a new workflow
New Features

► 2013 Workflow Features
- More powerful workflow constructs including
  • Looping
  • “Goto” a stage
  • Start a workflow – including 2010 workflows
  • Call web service
  • Dictionary type to hold collection of name/value pairs
Limitations

► No more Visual Studio Workflows with code – only declarative
  – Call web services for custom code/integration
► No more InfoPath forms – just Asp.Net forms
► Reusable workflow cannot be tied to a Content Type
► Relies more on calling SharePoint REST API to integrate with SharePoint

Discontinued features (highlighted)

  – Actions:
    • Add List Item
    • Inherit List Item Parent Permissions
    • Remove List Item Permissions
    • Replace List Item Permissions
    • Collect Data from a User
    • Start Approval Process (start a task process)
    • Start Custom Task Process
    • Start Feedback Process
  – Conditions:
    • If current item field equals value
    • Check list item permission levels
    • Check list item permissions
  – Steps:
    • Impersonation Step
  – Data sources:
    • User Profile lookup
  – Other features:
    • Visio integration
    • Association Column
    • 'Require Manage List/Web Permission' feature for list/site workflow
Discontinued Features – full list

- **Discontinued Features**
  - **Actions:**
    - Stop Workflow
    - Capture a Version of the Document Set
    - Send Document Set to Repository
    - Set Content Approval Status for the Document Set
    - Start Document Set Approval Process
    - Declare Record
    - Set Content Approval Status
    - Undeclare Record
    - Add List Item
    - Inherit List Item Parent Permissions
    - Remove List Item Permissions
    - Replace List Item Permissions
    - Lookup Manager of a User
    - Assign a Form to a Group
    - Assign a To-Do Item
    - Collect Data from a User
    - Start Approval Process
    - Start Custom Task Process
    - Start Feedback Process
    - Copy List Item (SharePoint Designer 2013 supports only the document-copying action.)

- **Conditions:**
  - If current item field equals value
  - Check list item permission levels
  - Check list item permissions

- **Steps:**
  - Impersonation Step

- **Data sources:**
  - User Profile lookup

- **Other features:**
  - Visio integration
  - Association Column
  - Content Type Association for reusable workflow
  - 'Require Manage List/Web Permission' feature for list/site workflow
  - Globally reusable workflow type
  - Workflow visualization option
New Features of SharePoint Designer 2013

- Copy and Paste support for actions and steps for both 2010 and 2013 workflows
  - Both within a workflow and between workflows, and across sites
- Support for new 2013 workflows
Questions