

A Beginner's Guide to Workflow and Webflow

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What is Workflow/Webflow and what does it do?

Does your work flow or does it drip?

If you stop and look at the work you produce, you'll see that your work is part of a work chain involving other people around you. Think about how much overhead you have

- Coordinating your work with others
- Making up for lost time because someone sat on the task for too long
- Finding out what has to be done next
- Finding out who is responsible for doing it
- Tracking the status of a task you've passed on to someone else
- Duplicating the work already done by one of your colleagues without your knowledge

The more time you spend on these activities, the less your work flows. It's not just a question of inefficiency. It's a matter of going home at the end of the day knowing that what you've accomplished that day won't rebound on you in two days time. It's finished, complete, and your mind is clear.

What is a Workflow?

A workflow is an automated electronic representation of a **Business Process**.

There are three (3) main reasons why companies implement workflows:

1. To improve the **SPEED** of a business process
2. To improve the **CONSISTENCY** of the business process
3. To improve the **QUALITY** of a business process

Speeding up the business process improves efficiency, saves time and money, and improves customer satisfaction. The "customer" of the workflow may be an employee of the company, a business partner, or a consumer depending on the business process involved.

Improving the consistency of the business process is a matter of ensuring that the business process happens as designed every time without fail. This reduces errors, reduces maverick activity (i.e. prevents people circumventing the business process), saves time and money dealing with exception situations, prevents things "falling through the cracks", avoids legal/financial penalties, avoids loss of goodwill, and improves customer satisfaction.

Improving the quality of the business process is a matter of making the business process more transparent, improving visibility of the business process, making it clear who is responsible for each activity, using validation and help to improve quality of data, using instructions to improve understanding of the work to be done and attachments to improve communication flow between participants of the business process.

What can workflow do?

In a nutshell, workflow is taking a process and automating it by:

- Pushing the tasks to the correct person when they're ready to be actioned
- Having the system do tasks where no-one needs to be involved
- Holding your hand while you do the task ("Now here's what you have to do, and here's the information you need to do it and this is where you add your data")
- Making the process visible to everyone ("What is going to happen next?", "How far is the processing right now?", "Who did what?")
- Making sure that the process finishes on time (i.e. escalating processes) and that everyone is kept informed
- Building up statistics about the process so that (eventually) useless bureaucratic time-wasting steps are removed, and bottlenecks corrected.
- Removing the task from your task list when it's done or no longer necessary (someone else did it, too late, the request has been retracted...).

Workflow and Webflow are considered to be an integral part of the SAP Basis environment, and as such are available in the majority of SAP systems including R/3, EBP, CRM, ESS, Workplace, etc.

What's the difference between Workflow and Webflow?

Webflow is simply extending workflow out to the web. This might mean anything from accessing some tasks via web pages to sending XML documents over the Internet between different systems. In particular, where business processes cross over the boundaries of the organisation, business partners, service providers, consumers, etc. can readily participate in Webflows.

Special considerations of Webflow:

- Special care should be taken to make accessing and performing tasks via web pages as easy and user-friendly as possible.
- The web environment should be used to support the webflow, e.g. by providing help desk facilities and general reference documents in the Intranet/Extranet.
- Additional infrastructure may be needed, such as a web server and Internet Transaction Server (ITS) for web based tasks. This infrastructure can be shared with non-workflow functionality.
- If sending XML to or receiving XML from non-SAP systems, infrastructure such as SAP Business Connector may be needed to send/receive XML and/or map XML to a different document format.



- Workitems may need to be explicitly translated into web pages if SAPGUI for HTML is not available or unsuitable given the requirements of the business process.
- Additional security may be required to cater for the needs of your web environment (Intranet/Extranet/Internet). The security requirements for web pages versus XML may be significantly different. Both SSL (HTTPS) and Digital Certificates are possible ways of securing web environments.

Creating Workflows/Webflows

How long will it take to build a workflow/webflow?

Simple workflows can generally be created from scratch in a day.

Existing workflows can generally be configured in a day.

Enhancing existing workflows may take several days to a week.

Creating complex workflows from scratch may take a few days to several weeks.

Webflows initially take a little longer than ordinary workflows as extra work may be involved in translating tasks into web pages or XML, and security implications need to be considered. However, once the first Webflow has been built and workflow designers have gained the necessary web skills, the additional time required is reduced to a minimum.

Workflow is an iterative process. That is, you can start with a simple workflow and add to it as your workflow knowledge and knowledge of the business process increases. For instance, you could start with a “pilot” workflow that implements one part of the business process, and add to it over time.

There are several factors determining how long it will take to implement a workflow. For instance:

- If an existing workflow or workflow wizard be used as a starting point, this reduces implementation time.
- How well defined is the business process. If the process is already well defined then design time is reduced. Don't forget that the design must also be viable, i.e. the process must work in practice. A well defined but impractical process will result in unnecessary redesign.
- The complexity of the business process. For instance, how many exception situations and error handling situations are to be included in the workflow, or how hard it is to determine agents (i.e. the actual people involved in the workflow). More complex business processes lead to more complex workflows that take longer to design, build and test.
- How much data is used by the workflow. This includes dictionary fields and calculated values that might be used as parameters or in texts throughout the workflow. Each piece of data must be defined in a way that is accessible to workflow. The good news here is that once a piece of data is defined it can be used by all workflows.
- Which user interface will be used by agents to access workflow. Possible user interfaces include SAPOffice, a web browser, or a mail client such as Microsoft Outlook or Lotus Notes. Some user interfaces require more work, for instance you may need to create additional programs to execute the workitem from the web, or Microsoft Outlook or Lotus Notes.

- The availability of personnel with good workflow experience will result in quicker, more accurate design decisions and reduce implementation time.

What helps speed workflow creation?

- Access to business analysts who understand the business process well
- Well designed, viable business processes
- Good workflow skills

In addition, good web skills and good understanding of web security requirements speeds Webflow creation.

Note: Implementing a workflow is frequently the catalyst for business process re-engineering of the business process involved, particularly where how the business process is executed in practice differs from it's description in business procedure manuals.

What skills are needed to build Workflows/Webflows?

All of the following types of people may be needed:

- Business analysts who understand the business process

Business analysts are responsible for communicating with the end users and for deciding how the business process will operate via the workflow. In particular they are responsible for resolving any differences between how the business process is executed in practice and it's description in the business procedures manual.

Key areas for business analysts to consider are what exception situations can occur and whether they will be handled within or without the workflow. If exception situations are to be handled outside the workflow, it is important that the workflow caters for this, i.e. the workflow should not be left hanging but should complete normally.

- Functional analysts with workflow knowledge
Functional analysts are responsible for creating the workflow to fit the business process as described by the business analyst.
- Technical analysts with workflow knowledge
Technical analysts are responsible for ensuring the workflow is implemented using good technical practices to ensure consistency and optimal performance.
- Programmers with workflow knowledge
Programmers may be required to code certain low level programs to support the workflow. For instance: to trigger a workflow from

within a custom program, or to make additional data available to a workflow.

Note: It is possible that one person may fulfil more than one role. For instance the business analyst and functional analyst may be the same person, or the functional analyst/technical analyst/programmer may be the one person.

What additional skills are needed for Webflow?

- Programmers with web knowledge
Depending on the Webflow, skills in coding HTML (a very simple web language) and/or XML (a data description language) are sufficient to implement Webflows. However, additional web skills such as JavaScript coding will help to make web pages more user-friendly and attractive.
- Programmers/Administrators who understand the web environment and web infrastructure used for the Webflow.
- Internet security specialists
These are usually system or web administrators already part of your organisation. Some organisations prefer to use third parties.

How can I extend existing Workflows/Webflows without modification?

In general, any workitem text or description that a user would see can be replaced by a customer specific text without modification.

New triggering events (i.e. changes in the system that cause the workflow to start) can be added to standard workflows. This is useful where, for instance, the standard workflow starts on any change to a document, and you want it to start only on specific changes.

Adding agents to workflows and tasks (individual work steps within the workflow), i.e. assigning the person who will do the work to the matching part of the workflow.

With Webflows, the existing web pages can be replaced by your new web pages. Without modification, this allows the look and feel to be changed, order and placement of fields on the web page to be changed, and existing fields hidden.

Which tools speed up Workflow/Webflow creation?

If you need to go further than this, then you can either:



- a) Copy and modify an existing workflow. This is effective where your business process closely mimics the standard workflow.
- b) Use wizard(s) to speed workflow creation. This is effective where your business process is aligned with the wizard, for instance, using the parallel approval wizard to speed creation of a parallel approval workflow. A bonus of using wizards is that it helps to standardize your workflows reducing maintenance costs and increasing robustness, i.e. the same approach is taken to approvals, escalation, notifications, etc. in all your workflows. Even if the whole business process isn't aligned with a wizard, there are smaller wizards that speed up creation of parts of the workflow, e.g. wizards to set up "send email" steps, wizards to set up escalation, etc.
- c) Develop from scratch. Where there is no standard workflow or wizard suitable as a starting point for your business process, this approach gives maximum flexibility, but is also the most time-consuming. When taking this approach, it's helpful to standardize your workflows as much as you can up front, e.g. agree on a standard approach to escalation, notifications, etc. This applies not just to the workflow itself, but also web pages used in Webflows.

Keeping your Workflows and Webflows as consistent as possible by using a pattern-based approach not only speeds design and implementation, but also simplifies troubleshooting and upgrade.

Working with Workflow/Webflow

What skills do users need to work with Workflow/Webflow?

Users need very few skills to work with workflow. As a minimum users should know or be trained in the following:

- Accessing their workflow inbox
- Opening and reading the workitem details (just like opening and reading an email)
- Executing the workitem
- Completing the workitem, e.g. for an approval workflow users may be asked to confirm that their decision is final.

Users accessing and executing items using web pages, as part of a Webflow, should also be trained in general use of an appropriate web browser.

In addition the following skills are very useful:

- Creating attachments to send reasons/explanations/further information to people involved in subsequent steps of the workflow
- Configuring their inbox to help categorise and prioritise their workitems

When Webflows are involved, it's helpful to provide a web-accessible (Intranet/Extranet) help desk support to provide:

- Contact numbers for problem resolution
- FAQs – Frequently asked questions to increase understanding and so that users can help diagnose and resolve their own problems
- Access to generic training material
- Access to “tips and tricks” for dealing with inboxes, attachments, performing tasks, etc.
- Reference documents explaining the business process and workflow, e.g. graphical flowchart
- Highlight new and soon-to-be-provided Workflows/Webflows
- Post interesting results such as: time taken to complete the process before versus after the Workflow/Webflow was implemented; number and frequency of Workflows/Webflows
- Provide a “suggestion box” for ways to improve the Workflow/Webflow
- Acknowledge users who have contributed to improving Workflows/Webflows

What maintenance effort is involved?

The majority of the maintenance effort is involved in ensuring the correct person is identified as the agent to perform a task. Depending on how the workflow has been designed, this may involve any or all of the following:

- a) Maintaining agent assignment to tasks
- b) Maintaining data used for roles
- c) Maintaining security settings for agents



The first person to notice role resolution failures is likely to be the workflow administrator. They must have sufficient information to be able to contact whoever needs to update the data.

Both Workflows and Webflows benefit greatly from having someone dedicated to monitoring performance and errors. This person is called the workflow administrator. Of course, multiple people can be used, and some troubleshooting/error resolution can be given to specially trained “super” users. How much time is required to monitor performance/errors depends on the number and frequency of the Workflows/Webflows being run.

In addition, for Webflows, web administrators should monitor the web environment.

Of course, the workflow administrator, web administrator and system administrator jobs can be combined provided the administrators have been trained in the appropriate skills.

What tools are available to assist with monitoring Workflows/Webflows in production environments?

For management, standard workflow reporting provides tools to:

- a) Determine start/finish/elapsed times of the business process including time spent waiting for agents to act versus processing times
- b) Track number of workitems that have exceeded deadlines, and time by which they have exceeded the deadlines
- c) Determine workload on agents
- d) Track the number and frequency of Workflows/Webflows being run
- e) Number and type of errors occurring, e.g. to determine how well agent assignments are being maintained
- f) Create flexible analyses of Workflows/Webflows by different criteria, including organisation specific criteria

There are many tools available to the workflow administrator. These include:

- a) Identifying workitems without agents
- b) Automatic notification of errors/failures
- c) Ability to restart after error
- d) Graphical and technical logs

For Webflows, infrastructure such as web servers, Internet Transaction Server, and SAP Business Connector provide their own monitoring tools.

What common problems occur when running Workflows/Webflows?

The most common problems in production environments are role resolution errors, i.e. the Workflow or Webflow is unable to determine the correct agent for a workitem.

This is usually a result of poor/delayed maintenance, and/or poor understanding of the importance of agent determination by those maintaining it.

Role resolution errors can be reduced by:

- a) Making sure that the role is transparent, i.e. it is crystal clear to everyone involved in the workflow who will be sent a particular workitem and why. Avoid complex responsibility matrices – as a rule of thumb, if you can't work it out in your head in a few seconds, it's likely to be too difficult to maintain/audit.
- b) Ensuring everyone who is assigned to the role is also allowed to execute the matching workitem, i.e. they are assigned as a possible agent and have sufficient security access to complete their tasks.
- c) Building the role with a "default" agent, i.e. if you can't find anyone matching the criteria, send it to the "default" agent. The "default" agent should be trained to forward it to the correct agent, and ensure the role is updated with the missing criteria/agents.
- d) Include some self-help in your workitem descriptions so workitem agents know why they are receiving workitems and have a contact to correct any agent determination problems. E.g. "You have received this workitem because you have been identified as the manager of cost centre 12345. If you are not the manager of cost centre 12345, please contact the workflow helpdesk on 9999 8888 to have this corrected."
- e) Making sure personnel maintaining the role understand how it works and the importance of keeping it up-to-date.

The most common problem when developing Workflows and Webflows is trying to identify how to start your workflow. The most common triggering mechanisms include:

- a) Direct start, e.g. by a user entering data into a web-based form.
- b) Configuration tables, i.e. trigger workflow based on pre-set conditions, e.g. "new employee hired". This mechanism is especially useful for HR processes.
- c) Output determination, i.e. trigger workflow when a document is output, e.g. "purchase order sent to vendor". This mechanism is especially useful for SD and MM processes.
- d) Status management, i.e. trigger workflow on change of status, e.g. "budget milestone reached". This mechanism is especially useful for CO, PP, PM processes.



- e) Audit trail (i.e. change documents), i.e. trigger workflow on add/change/delete of master data, e.g. "specific field on material master record changed".
- f) Coding a function call to raise an event into existing user exits or customer programs.

It helps to determine the triggering mechanism as early as possible.

What happens if the business process changes?

Workflows can be updated on the fly. Changing the business process is often a simple cut and paste, for instance when adding/removing/diverting steps. It's even easier to change the wording of texts or what information is displayed (provided the information is already in a workflow accessible format).

When a workflow is changed, a new version is created. Existing workflows are automatically completed using the old version of the workflow, while new workflows automatically use the new version.

If you provide a web-accessible help desk this is a good place to:

- Highlight that the Workflow/Webflow has changed
- Explain why the Workflow/Webflow has been changed and what benefit the changes will give
- Explain the differences between the new and old process
- Explain what if any affect this will have on users of the Workflow/Webflow



What else should you know before using Workflow/Webflow?

OSS Help

The following OSS notes are continuously updated so that they remain up to date. It's worth checking for updates now and then.

322526	Debugging workflows
217229	Accessing the Consultants forum for SAP Business Workflow/WebFlow
152871	Release Upgrade considerations for workflow
134322	New Workflow Academy - Course TAWF10
131795	Automatic e-mail notifications
125400	Modifying a productive Workflow
72923	Workflow interfaces
72923	Business Workflow Performance

What about security?

Workflow security consists of several layers.

The top layer is access to the workflow environment. Depending on how workitems are delivered to the agent, this may include access to an email system (such as Microsoft Outlook, Lotus Notes, or SAPOffice), access to a web site (e.g. SAP Workplace, or ITS Web Inbox), and/or access to relevant software e.g. SAPGUI, or web browser. This level of access also includes the userid and its' assigned authorisations used to access the SAP system.

Once the workflow environment has been accessed, the agent must have access to execute workitems of the relevant task. This may include HR structural authorisations (if they are active for the SAP system), or simply being assigned as a possible agent of the task.

Finally, the agent must have access to the individual workitem, i.e. be identified as the agent by role resolution, or by having the workitem forwarded to them.

Note that it is also possible to prevent access at the individual workitem level. For instance, approval workitems are often set up to exclude the person who initiated the business process from being able to approve, even if that person is normally able to execute other approval workitems of the same task.

What about transport?

Most parts of workflow are client independent. This means they are transported in a similar manner to ABAP programs. This includes the workflow definition, task definition, data definitions used by workflow, etc.

Even web pages are transported in the same way as ABAP programs.

Mechanisms to trigger workflows are usually activated within a specific client. For instance they are often entries in configuration tables. This means they are transported as customizing changes.

User security settings, agent assignments to tasks, data values used in role resolution are usually master data and should not be transported, but instead should be entered directly in the production environment.

What about differences between releases?

Despite the many differences in the workflow environment in different SAP releases, as a general rule workflows created in former releases can be executed in more recent releases. However, the individual tasks within the workflow must be examined in detail to ensure they are still correct and complete in the new release.

A quick summary of major differences includes:

- 3.1 – Workflow works but is still fairly technical, expect to need more time from a technical analyst
- 4.0 – Workflow becomes user-friendly for the workflow builder.
- 4.5 – Graphical workflow log introduced making workflow tracking more user friendly for the workflow agent.
- 4.6 – New look workflow builder and workflow log displays.

In all releases, Webflow is available. The latest web servers and Internet Transaction Servers can be successfully used against older release SAP systems.

If further detail is required, the release notes for the relevant SAP release should be examined.

What about system upgrade?

Read OSS note 152871 a few times to help plan your upgrade. Try and do some steps ahead of time, e.g. converting T/WF tasks to TS/WS tasks.

Standardize your workflows as much as possible. If you use the same patterns for approval, escalation, notification, etc., upgrading your workflows will be more straightforward.

Follow the recommended standards, e.g. limit tasks to standard tasks (TS) and workflow templates (WS).



Keep good documentation.

Review future opportunities as you upgrade. For example, can you simplify your workflows by using new techniques/functionality available? Can we improve current processes by making the most of new techniques/functionality such as sending mail with attachments?

New opportunities should also be reviewed when upgrading web infrastructure.

Watch out for changes in underlying transactions – use BAPIs in your workflows rather than transaction calls (such as batch input) where possible, as they are less likely to change from one release to the next.

Appendix: Workflow in a nutshell - Basic concepts

A Workflow (or Webflow) formally defines and electronically implements a business process.

Workflows have three (3) main purposes:

1. To improve the SPEED of the business process.
2. To improve the CONSISTENCY of the business process.
3. To improve the QUALITY of the business process.

So that we can build the workflow, we need to ask five key questions about each part of the business process.

1. Who Should?
2. Do What?
3. To What?
4. When?
5. In What Order?

Knowing the answers to the above questions gives us enough information to understand the business process and therefore to put together the workflow.

Starting with question 5 and working our way back up...

In What Order? (The Workflow Definition)

The workflow definition is a flowchart that controls the business process. This includes controlling the order in which the individual pieces of work are executed, and any temporary data needed along the way.

The workflow container is used to hold all temporary data.

A workflow definition consists of a triggering event (which starts the workflow) and steps.

Steps may be control logic (e.g. if amount > \$1000 follow "Approval required" path, else follow "No approval needed" path) or actual pieces of work to be done (e.g. approve requisition), which we call tasks.

When? (Events)

Events tell the workflow something has happened so that the workflow can react.

Events are usually some activity that has just happened in the system, for instance, document saved, master record created, milestone reached, etc.

Events are usually used to start a workflow, but they can also be used to stop a workflow or to confirm that a particular task is completed (e.g. to confirm that data has been saved to the database).

Do What? To What? (Tasks)

This question refers to each single piece of work that needs to be done i.e. tasks.

A task might execute a transaction, a report, a function module, run a routine in an external system, update a spreadsheet, or simply act as a reminder to perform a manual task.

For reasons of convenience, consistency and reusability the logic required to perform the transaction/report/etc. is coded using object-oriented techniques i.e. methods of business objects. For more information go to the workflow courses.

A task may act as a mini standalone workflow. For example in IDoc Error Processing where we just want to notify someone that the error has occurred. If a task needs to be performed by an actual person (rather than by the system in background), then an agent (i.e. userid) needs to be assigned. At runtime the task generates a workitem in the agent's office inbox. This workitem not only notifies the agent that they need to do something, it also brings the necessary instructions to them, and allows them to execute the piece of work directly from the workitem.

Who Should? (Organisational Plan & Roles)

To decide who should receive a workitem and therefore execute the task, we use organisation plans and roles.

Note: You don't need HR to do this! - it is delivered with the Basis system.

The organisation plan details the relationships between different departments, sections and teams (which are all called organisational units) within your company. Within an org unit, positions indicate the "physical desk" at which a user (assigned holder of a position) sits, while jobs are used to generically describe a number of positions. E.g, job - clerk; position - Accounts payable clerk 1. Tasks can be assigned to org units, positions, and jobs.

If you don't wish to use an organisation plan at all, tasks can be assigned to activity groups (profile generator roles) in later SAP releases. (It is also possible to make a task a "general task", i.e. anyone can execute it; however this may have adverse security implications.)

Everyone assigned to a task will receive the workitem. If only certain users should receive the workitem a role (which is a piece of logic) can be created



to restrict the agents receiving the workitem to a desired subset of the agents assigned to the task.

Note that normally only one agent will execute the workitem. Once the workitem is executed it will be removed from all agents' inboxes. If multiple agents need to perform the same task on the same data, then each agent needs to be sent a separate workitem.